5 December 2001
File No. 60532-064

Agency of Natural Resources, Sites Management Section
Department of Environmental Conservation
103 South Main Street/West Office
Waterbury, Vermont 05671-0404

Attention: Mr. Brian Woods

Subject: Corrective Action Plan and Feasibility Study
Woodstock East Site / Gerrish Motors
Woodstock, Vermont

Dear Mr. Woods:

Enclosed is the final report in electronic and hard copy for the Corrective Action Plan and Feasibility Study Report for the Gerrish Property in Woodstock, Vermont (Site #87-0023). Per our discussions, we would be happy to provide additional color hard copies at a charge of $150/each. Please feel free to call at 603.625.5353 if you have any questions

Sincerely yours,
HALEY & ALDRICH, INC.

Muriel S. Robinette, P.G.
Senior Vice President

c: Pomerleau Realty; Attn: Ernie Pomerleau (with hard copy report)
Robert Manchester (with hard copy report)

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EXECUTIVE SUMMARY

This Corrective Action Plan and Feasibility Study report has been prepared to support the redevelopment of the Woodstock East/Gerrish Motors Site (Site) in Woodstock, Vermont. The Corrective Action Plan and Feasibility Study have been combined into one document that meets the requirements of 10VSA.6615 a(h) and Corrective Action Guidance and Corrective Action Feasibility Investigation Guidance by the Vermont Agency of Natural Resources Waste Management Division.

The Woodstock/East Gerrish Motors Site is located in Woodstock Village, Vermont, situated to the east of the Ottauquechee River (Figure 1). Three buildings are currently located on the Site as shown on the Site plan (Figure 2). The area has been used for commercial and industrial purposes for many years, and its topography has been substantially altered by cut and fill activities in the past. The physical relief in the immediate vicinity of the Site is generally high. Two small streams bracket the Site on the northern and southern boundaries and both are culverted beneath Route 4, which abuts the Site to the west.

The Site has experienced a variety of past uses. From the late 1960s through the end of 1987, the northern end of the main building was the operations, sales and service center for the Gerrish Corporation car dealership. A health club operated in the southern portion of the main building during the 1970s. A range of commercial enterprises occupied various portions of the Site over the years, including restaurants, a furniture refinishing operation, a day-care center, a tool and die manufacturer, a carwash, a laundromat, a retail petroleum facility, a solid waste hauling operation facility and residential apartments.

Environmental concern at the Site was initiated by a large gasoline release at a retail petroleum facility in 1973. Roughly eleven years later, the Vermont Agency of Natural Resources (VTANR) began to receive complaints from fishermen of sheens on the Ottauquechee River. Based in part on those concerns, VTANR initiated investigation in 1985. Environmental investigations by a number of parties have been performed through the present year (2001).

The Woodstock East Site was entered into the Vermont Brownfields program in 1999 to facilitate its remediation for redevelopment. A Site Investigation Report completed by Haley & Aldrich in 2000 summarizes the remedial options considered and recommended for the Site. An approximately 35,000 square foot grocery store with associated landscaping and a paved parking lot is planned for the Site.

This Feasibility Study/Corrective Action Plan (FS/CAP) report summarizes additional field work completed to evaluate remedial alternatives for cleanup of the five areas of concern identified as a result of the Site Investigation work. These areas are:

AREA I. Former Gasoline/Diesel Underground Storage Tank (UST) Area (including French drain): Impacts to soil and groundwater consisting of metals and gasoline and diesel components.

AREA II. Former Fuel Oil UST Area: Residual impacts to soil and groundwater, including chlorinated volatile organic compounds (VOCs) and diesel components.

AREA III. Former Oil/Water Separator Area: Field monitoring indicated impacts to soil at the time of unit removal. Test borings were installed after excavation was refilled. Soil samples were collected from the test borings and submitted for laboratory analysis for VOCs. VOCs were not detected above Vermont criteria.

AREA IV. Former Waste Oil Tank Area: Free product had been detected in the area of the former waste oil tank in 1995. Measurable free product was not observed from this area during recent groundwater sampling events. Sampling in general has indicated reduced groundwater contamination in this area.

AREA V. Former Water Supply Well: Groundwater samples collected from the deep production well indicated low concentrations of tetrachloroethylene at depth.

The Feasibility Study of this Corrective Action Plan (Section III) evaluates specific remedial alternatives to address each of these areas of concern related to the risks posed to human health or the environment. The alternatives evaluation considered potential routes of exposure, implementation time, technical implementability and cost.

Remedial alternatives ranged from a low cost, no action/monitoring alternative that was not likely to meet cleanup objectives for several years to full excavation of areas with soil impacts coupled with groundwater air sparging which likely would meet cleanup objectives in a very rapid timeframe but at a high cost. The recommended remedial alternative includes a combination of approaches which attempts to optimize Site compliance in a relatively short timeframe at a reasonable cost. The recommended corrective action by area is as follows:

AREA I. Corrective actions recommended for Area I include removal of the french drain and installation and operation of an aggressive air sparge/ soil vapor extraction (AS/SVE) system. The french drain removal should eliminate the groundwater conduit to off-Site and surface water. It is expected that soils will be removed coincident with the pipe removal. Excavated soils will be disposed off-Site. The AS/SVE system is proposed for installation in the immediate area and downgradient of the former USTs, following the general contours of the plume. The proposed system consists of eight sparge and eight vacuum wells (Figure 3) that will operate in a pulsed configuration to maximize the contaminant removal during the period of operation. The AS/SVE is expected to reduce the current mass of VOCs in this area by (1) supplying oxygen to the subsurface to enhance biological degradation of contaminants, and (2) stripping VOCs from the groundwater and removing these VOCs from the vadose zone using soil vapor extraction wells. Recovered vapors will be treated with granular activated carbon (GAC). A process flow diagram and treatment system layout are attached as Figures 4 and 5. The AS/SVE is proposed to operate for 5 to 6 months following which the system will be decommissioned and the area paved as part of the Site redevelopment. Monitoring wells will be installed at upgradient and downgradient locations to monitor the natural attenuation of the groundwater after the AS/SVE system is removed.

AREA II. The Corrective Action proposed for Area II is removal of “hot spot” soils. Impacts to soil in the area from previous tank closures appears to be affecting groundwater quality in the area. Removing “hot spot” soils based on the results of a soil boring program will likely remove the majority of contaminant mass remaining in soil and retard the further contaminant transfer to groundwater in the area. This area will be paved during the Site redevelopment. A monitoring well will be placed downgradient of this area to monitor the natural attenuation of remaining groundwater impacts.

AREA III. No further action is proposed for Area III, the location of the former oil/water separator. During the unit removal, field monitoring and observation indicated possible VOC and petroleum impacts to soil. Laboratory analytical results from subsequent soil test borings indicated no detectable VOCs, PAHs and only minor TPH contamination. The area will be paved and/or covered by buildings during the Site redevelopment, which would likely eliminate a route of exposure to impacted soil.

AREA IV. A monitoring well in Area IV was identified as having free phase product in 1995. Since that time, the level of groundwater impacts in the area has decreased, and free phase product has not been observed. This area is located upgradient of Area I. It is expected that contamination in this area will be partially treated by the AS/SVE system and further diminished by natural attenuation.

AREA V. Corrective action proposed for the former production well located near the front of the property is abandonment in accordance with Vermont regulations. All pumps, wiring and piping will be removed from the well. The well will be grouted to the surface to eliminate any future use of this well.

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I. INTRODUCTION

This Corrective Action Plan and Feasibility Study report has been prepared to support the redevelopment of the Woodstock East / Gerrish Motors Site (Site) in Woodstock, Vermont. The Corrective Action Plan and Feasibility Study have been combined into one document that meets the requirements of 10VSA.6615 a(h) and Corrective Action Guidance and Corrective Action Feasibility Investigation Guidance by the Vermont Agency of Natural Resources Waste Management Division.

Design drawings and specifications have been prepared for the recommended Corrective Action (Appendix F).

1.01 Site Setting

The Site is located in Woodstock Village, Vermont (Figure 1) situated to the east of the Ottauquechee River. Three buildings are currently located on the Site as shown on Figure 2. The area has been commercial and industrial for many years, and its topography has been substantially altered by cut and fill activities in the past. The physical relief in the immediate vicinity is generally high. Two small streams bracket the Site on the northern and southern boundaries; both are culverted beneath Route 4 and drain into the Ottauquechee River.

The area has experienced a variety of past uses. From the late 1960s through the end of 1987, the northern end of the main building was the operations, sales and service center for the Gerrish Corporation car dealership. A health club operated in the southern portion of the section of the main building during the 1970s. A range of commercial enterprises occupied various portions of the Site over the years, including restaurants, a furniture refinishing operation, a day-care center, a tool and die manufacturer, a carwash, a laundromat, a retail petroleum facility, a solid waste hauling operation facility and residential apartments.

Background information from the October 2000 Site Investigation Report is included in Appendix A. Table A-I in Appendix A summarizes the names and contact information for Site owners and abutters, as well as downgradient potential receptors.

Site features are shown on Figure A-3, including former locations of above ground and underground tanks and fuel lines. Currently, a french drain appears to direct groundwater from the MW-10 area to the stream bank in the vicinity of MW-4. The groundwater directed to this area has previously been treated through a granular activated carbon treatment system, however, this system is not currently operational.

1.02 Existing Site Geology and Hydrogeology

Previous investigations on the Site are summarized in the Site Investigation Report (Haley & Aldrich, October 2000) including information regarding the current hydrologic conditions, and soil and water quality data that have been used as the basis for development of a remedial strategy for the Site.

The Site geology generally consists of glaciofluvial deposits and glacial till overlying hornblende schist and amphibolite bedrock belonging to the Lower Devonian Standing Pond Volcanic Member of the Waits River Formation. The Site overburden geology consists of a fill layer consisting mainly of brown and gray brown fine sand approximately 3 to 20 feet thick. A silt layer ranging in thickness from 2 to 27 feet ranges from a gray hard clayey silt to a stiff fine sandy silt with varying amounts of coarse sand and fine gravel. Although found over most of

the Site, the silt layer is not completely contiguous. However, it does appear to act as a confining layer in Area I. A sand layer underlying the silt generally consists of a dense brown to gray-brown silty fine sand with varying amounts of medium to fine gravel.
Geologic cross-sections from the Site Investigation Report are shown on Figures A-4 and A-5 of Appendix A.

Groundwater elevations collected at the Site are tabulated in Table I. Groundwater elevation contours and interpreted groundwater flow direction based on June 2000 water levels are shown on Figure A-6. Groundwater from the Site is generally flowing in a northwesterly direction towards the Ottaquechee River, although groundwater from the southern portion of the Site appears to flow in a southwesterly direction to a brook at the southwestern edge of the property, which also drains into the Ottaquechee River. The horizontal gradient in the southern portion of the Site is estimated to range from 0.03 to 0.08 ft/ft, while the gradient ranges between 0.8 and 1.1 ft/ft over much of the northern portion of the Site. The horizontal gradient is steep through the area of contaminated soil in Area I. This gradient combined with conductive fill soils allows for rapid groundwater flow.

The vertical flow across the Site was evaluated using the June 2000 water level elevations. Upward gradients are evident in locations of well couplets or triplets, at the MW-101 triplet, MW-10/MW-103 couplet, and the MW-4/MW-104 couplet. Upward gradients are observed in the MW-10/MW-103 couplet, having a value of approximately 0.1 ft/ft. Flowing artesian conditions exist at MW-104. This suggests the silt layer in the northern portion of the Site is acting as a fairly competent confining layer allowing the lower confined aquifer to maintain significantly higher head than the unconfined aquifer above.

As described in the October 2000 Site Investigation Report, the average horizontal groundwater velocity in the shallow aquifer is approximately 30 feet per day. The velocity of dissolved phase contaminants will be considerably lower due to retardation effects from organic carbon in the aquifer matrix. The velocity of the dissolved phase contaminants on the Site in the vicinity of the plume would be approximately 0.6 to 13 feet per day.

Contaminant concentration isocontour maps from the Site Investigation Report for groundwater and soil are included as Figures A-7 through A-10 in Appendix A.

1.03 Environmental Concerns on Site

Based on soil and groundwater laboratory analytical results and field sampling results during the Site investigations, five areas of concern, shown on Figure 2, were identified as follows:

- Former Gasoline/Diesel UST area (Area I)
  - This location, as shown on Figure 2, is the Site of former underground gasoline and diesel tanks. It is in the northwestern portion of the Site in the vicinity of MW-2 and MW-103. The estimated volume of impacted soil in this area is approximately 4,000 cubic yards. Soil quality in this area is summarized in Table II.
  - Groundwater impacts observed in this portion of the property are predominantly gasoline and oil-related compounds, with major constituents including BTEX (benzene, toluene, ethylbenzene and xylenes) compounds, alkylbenzenes, naphthalene and lead. The impacts to groundwater are likely a

result of residual soil impacts from the former UST area. Groundwater quality for Area I is summarized in Table III.

- An existing french drain apparently acts as a conduit for groundwater from the former tank area to the north property boundary. The french drain is perforated and is surrounded by petroleum-impacted soil and gravel. The decommissioning of the french drain will likely decrease contaminated groundwater transport.

■ Former Fuel Oil UST Area (Area II)

- This area of impacted soil is in the vicinity of the MW-102 couplet and MW-16 on the edge of the steep slope on the southwestern side of the Site as shown on Figure 2. The source of contamination in the area is likely the former 10,000 gallon fuel oil AST. It appears that some soil was removed from the area and replaced with clean fill, but an estimated volume of 100 cubic yards of contaminated soil was left in place along the steep slope. Area II soil quality is summarized in Table IV.

- Gasoline, oil-related compounds, tetrachloroethene and its degradation products impact groundwater quality in this vicinity. Groundwater from this area is flowing down the slope into the unnamed stream to the southwest of the Site. The removal of residual soil contamination will likely remove the source of groundwater contamination in this area. Groundwater quality for Area II is summarized in Table V.

■ Former Oil/Water Separator Area (Area III)

- Soil from the oil/water separator tank removal on the eastern portion of the Site was replaced with clean backfill in the excavation shown as Area III on Figure 2. Test borings were installed to delineate the extent of impacts to soil. The area of concern has been limited to replaced soils which indicated some contamination by field monitoring during excavation. Laboratory analytical results are summarized in Table VI.

- Based on water samples collected from borings B-31 and B-38 groundwater does not appear to have been impacted in this area.

- Former Waste Oil Tank Area (Area IV)

  - No impacts to soil were detected in this area, as summarized in Table VII.

  - MW-12 has historically (1995) shown free product in the well, and groundwater was not sampled from this location. This well has been included in historic groundwater plumes drawn for the Site. However, during the 2000 sampling, no free product was encountered and the groundwater from this well had low levels of contaminants. Groundwater quality for Area IV is summarized in Table VIII. Table VIII also includes analytical data for groundwater samples from MW-1 and MW-13, which are located generally downgradient from Area IV.

- Former Water Supply Well (Area V)

  - The former water supply well located to the northeast and shown on Figure 2 indicated low concentrations of PCE at depth. The well may act as a pathway for vertical migration of impacted groundwater and will therefore be decommissioned as part of the corrective action. Historic water quality from the former production well is summarized in Table IX.

The soil contamination is generally limited to three areas on Site (Areas I, II, and III), and generally consists of BTEX and related gasoline compounds. When encountered, impacted soil is generally found at depths of 4 ft to 12 ft below the paved ground surface. Impacted soils do not pose significant risk under current and likely future use, however limited soil remediation is recommended to reduce residual source material from impacting groundwater. The focus of remedial actions on the Site will be to prevent off-Site migration of impacted groundwater.

1.04 Site Clean Up Goals

Soil clean-up standards or guidance standards have not been adopted in Vermont. Analytical results from the soil samples collected during the Site investigation were compared to EPA Region 9 Preliminary Remediation Goals (PRG) [October 1999]. PRGs are risk-based concentrations derived from standardized equations, combining exposure information assumptions and EPA toxicity data. Considering the proposed commercial redevelopment of the Site, soil concentrations were compared to the industrial PRGs in this report.

The PRGs contained in the Region 9 PRG Table are generic and calculated without Site specific information. A 28 November 2000 letter from Mr. Brian Woods at the VT ANR identified the industrial PRGs as the clean up goals for the Site.

CONTAMINANT	SOIL CLEANUP GOAL mg/kg [EPA REGION 9 INDUSTRIAL PRGs]
TPH	1,000*
Benzene	1.5
Hexane	110
1,2,4-Trimethylbenzene	5.7
1,3,5-Trimethylbenzene	70
1,2,3-Trimethylbenzene	0.0031
Iron	100,000
Benzo(a)anthracene	2.9
Benzo(a)pyrene	0.29

Notes: *VT Petroleum Contaminated Soils value

Analytical results from the groundwater samples collected from the Site were compared to the VTDEC Primary Groundwater Quality Standards (PGQS) from the Vermont Agency of Natural Resources Groundwater Protection Rule and Strategy (November 1997). Secondary groundwater quality standards (SGQS) were used for comparison when PGQS did not exist.

CONTAMINANT	GROUNDWATER CLEANUP GOAL (ug/L) [VT GWES]
Benzene	5
Chloromethane	3
1,2-Dichloroethane	5
Ethylbenzene	700
Hexachlorobutadiene	1
MTBE	40
Naphthalene	20
Tetrachloroethylene	5
Toluene	1,000
Trichloroethene	5
1,2,4-Trimethylbenzene	5
1,3,5-Trimethylbenzene	4
1,1-Dichloroethene	7
Cis-1,2 Dichloroethene	70
Trans-1,2 Dichloroethene	100
Vinyl chloride	2
Cadmium	5
Lead	15
Aluminum	200*
Iron	300*

Notes: *Secondary Groundwater Enforcement Standard

Impacted soil is appears to be limited to the shallow overburden in three areas of the site. Because of upward hydraulic gradients on the Site, these soils likely do not pose a threat to deeper soil and groundwater quality. Based on Site conditions and planned redevelopment activities, residual contamination of soil likely does not pose a threat to human health since it is buried and will not be exposed at the surface under planned future use.

Groundwater from the Site is not a source of drinking water and thus does not pose a threat to human health, but its migration to the north may impact surface water quality in the northern stream. Therefore, Site remediation will focus on groundwater, to reduce its concentrations and minimize off-Site migration.

The goals for the corrective action at the Site have been incorporated into the Memorandum of Understanding (MOU) among the parties dated 1 May 2001, excerpts which are outlined below.

The Site Clean-up Goals and Standards for the remediation of the Property are as follows:

a. Overburden Groundwater: Substances in the groundwater leaving the Property shall not reach or exceed the primary and secondary groundwater quality enforcement standards listed in Appendix A of the Vermont Groundwater Protection Rule and Strategy (the "VGPR&S") at the Property boundary as demonstrated by six, consecutive bi-monthly sampling events taken after conclusion of any active remediation activities. The compliance point for groundwater quality shall be the Property boundary. See VGPR&S, § 12-801(1)(c). Actual compliance points (e.g. monitoring wells) will be proposed in the Corrective Action Plan and will be subject to approval of the ANR. Acceptable methods for achieving these standards include but are not limited to air sparging/soil vapor extraction.

b. Bedrock Groundwater: Exposure to substances in bedrock groundwater will be controlled by closing and abandoning the exisiting bedrock water supply well located at the Property in accordance with the Vermont Water Supply Rule Appendix A paragraphs 12.3.5 and 12.4.18.

c. Surface Water: Discharges from the Property will be controlled so that water quality in the unnamed stream which borders the Property to the north shall meet the Water Quality Criteria for Protection of Human Health for Consumption of Water and Organisms under the Vermont Water Quality Standards (the "VWQS"), or in the absence of a water quality standard for a particular substance, the groundwater quality standard under the VGPR&S, as demonstrated by six, consecutive bi-monthly sampling events taken after conclusion of any active remediation activities. The compliance point for surface water quality will be at any point within the Property or along the Property boundary where exposure to contaminated surface water could occur. Actual compliance points (e.g. surface water sampling locations) will be proposed in the Corrective Action Plan and will be subject to approval of the ANR. In addition, the existing french drain at the Property shall be decomissioned, provided that such decommissioning shall not result in surface water discharges from the Property on or over lands within the Route 4 highway right of way. The existing passive treatment system *located at the northeast corner of the property in the vicinty of the Route 4 box culvert shall also be dismantled and disposed of properly.*

d. *Soil: Soil contamination at the Property shall be addressed by preventing human exposure to contaminated soil, such as through containment by paving or the placement of buildings on the Property.*

e. *Air: Discharges of contaminants into the air will be controlled as required by the Vermont Air Pollution Control Regulations.*

f. *Institutional controls shall be implemented at the Property through deed restrictions preventing the use of groundwater at the Property for drinking water purposes, requiring ANR notification and applicable health and safety plans if excavations at depths may expose workers to contamination, and requiring the Property owner to properly maintain the containment paving/structures at the Property (the "Institutional Controls").*

II. SUPPLEMENTAL INVESTIGATIONS

Based on the results of Haley & Aldrich's Site Investigation and the five areas of concern that were established at the Site, potential remedial alternatives for each of the areas of concern were identified in advance of this Corrective Action Plan/Feasibility Study Report. Supplemental investigations were conducted to obtain data to evaluate the feasibility of implementing potential remedial alternatives; and obtain predesign data which was used to assist in the design of remedial alternatives.

Investigations included (1) a drainage analysis specifically evaluating the location of the existing french drain and analysis of potential breakout in the absence of the drain; (2) an air sparging/soil vapor extraction pilot test; and (3) additional groundwater quality analyses.

2.01 Drainage Analysis

A. French Drain Investigation

The exact location of the french drain connected to the passive activated carbon filter was not known because previous Site plans indicated four different locations. Test pits were completed to try to locate the french drain so it could be decommissioned, eliminating a potential conduit for off-Site migration.

A day of test pit excavations was completed by Capital Environmental Drilling Services, Inc. (CEDSI) with a Kubota KX61-2 track-mounted excavator under the observation of Haley & Aldrich on 6 June 2001. The initial attempt to find the french drain included excavating along the side of the driveway adjacent to the stream. This test pit was backfilled after excavating to a depth of 3 ft below ground surface due to water in the excavation. Another test pit was excavated across the driveway adjacent to an apparent cut in the pavement. When the drain was not encountered at that location, an approximately 80 foot long trench, 8 feet in depth (the reach of the excavator) was excavated along the west side of the Site driveway from Route 4. A 2-inch diameter PVC pipe was observed in this test pit, but the french drain was not encountered.

A second day of test pit excavations was completed by CEDSI with a Fermec 860 B backhoe under the observation of Haley & Aldrich on 18 June 2001. The Fermec had a longer reach (20 ft) than the Kubota, which allowed for deeper test pits. A steel snake was inserted into the end of the french drain to try to find a bend in the PVC pipe to locate where the french drain came out of the stream and crossed the driveway. An apparent bend in the pipe was observed approximately 57 feet up the driveway from the existing treatment shed, which was consistent with the location shown on Groundwater Technology, Inc. figures. An 80-foot-long trench was excavated to a depth of 8 to 12 feet. The excavation had entered into the gray silty sand layer that appeared to be native soil; therefore, the excavation was terminated. The french drain was not encountered in this test pit. Additional test pits were excavated adjacent to the stream and at the location indicated on the KSKGeoS Figure 5 from Kent S. Koptiuch, Inc. Report, dated July 1994.

The french drain was successfully located near the treatment shed at the base of the driveway. The 4-inch diameter slotted PVC drain was encountered in the center of the driveway in a gravel bed approximately 36 feet from MW-104, in line with the post at the base of the planter and the drainage line from the parking lot near MW-2. The PVC pipe was surrounded by a layer of gravel that was heavily stained and exhibited a gasoline odor. The top of the gravel layer was approximately 4 feet below ground surface, and the bottom of the PVC pipe was at a depth of approximately 5 feet. A 2 to 3 foot piece of the pipe was inadvertently torn during the excavation exposing a pool of black water under the pipe. The test pit was backfilled and water continued to flow through the gravel bed.

B. Soil Drainage and Potential Break Out

Groundwater elevation measurements were collected by Haley & Aldrich on 13 June 2001 from monitoring wells in the vicinity of Route 4 and the unnamed stream, including MW-2, MW-4, MW-5, MW-6, MW-8, MW-10 and MW-11. Groundwater depths ranged from 1.4 feet to 8.3 feet below ground surface. Surface water elevations were also measured at three surveyed locations along the stream to the north of the Site.

The flow rate from the french drain through the existing treatment shed was measured three times using a five gallon bucket and a stopwatch. An average flow rate of 4.5 gallons per minute (gpm) was observed.

Site corrective action will include the decommissioning of the drain by excavation and removal of the entire length of the drain in the driveway area proximate to Route 4 on the northern portion of the Site in the vicinity of the unnamed stream. Since decommissioning the drain system may impact the groundwater regime, the potential for groundwater breakout from slopes on the northern portion of the Site was assessed. Calculations for this analysis are included in Appendix B.

Based on the analysis, decommissioning of the drain will likely result in increases in the groundwater table elevation in the area of MW-11 along the driveway from Route 4. Measurements of drain flow rates indicate that 10 gpm of additional drainage through the soil is possible. This could result in approximately 2.2 feet of elevation gain in the groundwater table at high groundwater conditions. An increase of this magnitude would likely cause discharge to the surface from the retaining wall area along the driveway in the vicinity of MW-11, and water could flow toward, and onto, Route 4 from the Southwest shoulder of the driveway. Accordingly, Site redevelopment needs to include means for controlling drainage along the driveway and Route 4.

Decommissioning the drain may also adversely affect groundwater conditions at the toe of the slope along Route 4, however it is unlikely that this area would be impacted to the same extent as the MW-11 area because it appears to be somewhat outside of the drain’s influence zone. The soil boring log from MW-6 (Groundwater Technology, 1986) indicates that the conductive sand stratum is fairly thin (less than 5 feet), making the area more susceptible to flooding. Additionally, the ground surface near MW-6 has often been observed wet, indicating possible groundwater seepage. The stability of the slope along Route 4 should be assessed under redevelopment scenarios for potentially elevated groundwater conditions.

It is likely that water surface elevations in the unnamed stream could also increase slightly, however the affects are likely to be minimal, since the water from the drain presently discharges to the stream near MW-4 without adverse hydraulic impacts at the culvert under Route 4 or downstream.

2.02 Additional Groundwater Quality Analysis

An additional round of groundwater quality samples was collected on 13 June 2001 in Area I (MW-10 and MW-11) and Area II (MW-16 and MW-102S) during corrective action predesign work at the Site. Water quality samples were collected by low flow protocol using a peristaltic pump. Field measurements of dissolved oxygen (DO), oxidation reduction potential (ORP), specific conductance, temperature and pH were collected. Samples from MW-102S and MW-16 were submitted to Eastern Analytical, Inc. (EAI) for analysis for VOCs (EPA Method 8260B), semi-volatile extractables (EPA Method 8270/ABN), dissolved 8 RCRA metals, dissolved aluminum (Al), dissolved iron (Fe) and dissolved zinc (Zn).

Prior to the air sparging pilot test on 20 June 2001, groundwater samples from MW-10 and MW-11 were collected, field filtered and submitted for dissolved iron analysis. Previous samples in this area were analyzed for total iron.

Laboratory analytical results are included in Appendix D. The groundwater results from MW-102S in June 2001 were similar to those collected in May 2000 at the same location. Gasoline-related compounds (trimethylbenzenes and naphthalene) and chlorinated compounds (tetrachloroethene and trichloroethene) were detected at concentrations greater than Vermont Primary Ground Water Quality Standards (VT PGQS). Dissolved iron and lead concentrations were detected at levels above VT PGQS in this location (MW-102S).

The groundwater results for MW-16 indicated a general increase in chemical concentrations. Although no groundwater constituent exceeded VT PGQS in May 2000 at this location, concentrations of four compounds exceeded standards in June 2001, including 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, tetrachloroethene and dissolved iron. As MW-16 is located downgradient from MW-102S, these results indicate that contaminated groundwater may be moving off-site. Laboratory analytical results from MW-16 and MW-102S are summarized in Table V.

Dissolved iron analytical results from monitoring wells MW-10 and MW-11 indicated that much of the total iron concentration in groundwater in Area I consists of dissolved iron. Results for MW-10 and MW-11 are included in Table III. Historical and recent groundwater chemistry information was used in evaluating and designing corrective action remedial options.

2.03 Air Sparge/Soil Vapor Extraction Pilot Test

An air sparge/soil vapor extraction (AS/SVE) pilot test was performed by Handex, Inc., under the observation of Haley & Aldrich on 20 June 2001. The results of the pilot test are included in Appendix C.

III. FEASIBILITY STUDY

In accordance with the Corrective Action Guidance (November 1997) by the Vermont Agency of Natural Resources Waste Management Division, corrective action is necessary if any of the following conditions exist:

- when free floating product exists on the water table in amounts that are feasible to recover;
- when dense non-aqueous phase liquid (DNAPL) is present either as residual phase DNAPL or as free product, and remediation is technically practicable;
- when a sensitive receptor is either directly affected or at risk of being affected by contamination at concentrations that pose an unacceptable health or environmental risk;
- when published soil standards or risk based maximum soil concentrations standards are exceeded and there is a direct contact threat to human health or the environment;
- when any state or federal statutory authority or regulation requires corrective action;
- when groundwater contamination is migrating off-site at concentrations exceeding the Vermont Groundwater Enforcement Standards and the SMA determines that it is not being sufficiently remediated by natural attenuation processes; or,
- when required as part of a federally mandated cleanup at sites regulated under the Superfund or RCRA Corrective Action programs.

The necessity for corrective actions at the Woodstock East/Gerrish Motors Site was based on impacts to soil in excess of risk based standards and to groundwater in excess of state standards, and the future use of the Site.

The corrective action alternatives were assessed based on the following criteria:

- Effectiveness
- Time to Complete
- Implementability
- Cost

Several corrective action alternatives were evaluated for each of the areas requiring corrective action in accordance with the Vermont guidance. The feasibility study of alternatives is summarized in Table X.

3.01 Description of Alternatives

No Further Action: This alternative would require no further Site activities, would include no Site monitoring and would not require future operations and maintenance of systems.

Monitored Natural Attenuation: This alternative relies on the naturally occurring processes to degrade soil and groundwater contamination at the Site. This alternative would likely require monitoring for indicator parameters for a period of 10 or more years. Installation of additional monitoring wells may be warranted to facilitate the monitoring.

Excavation: This alternative includes excavation of contaminated soil with associated dewatering of the excavation. The location and size of excavations would be determined based on previous Site investigations. Soil and groundwater removed during the course of excavations would be containerized, analyzed and disposed of at appropriately permitted off-site facilities. Clean backfill would be placed in the excavation.

Groundwater Treatment: This alternative would include recovering groundwater from extraction wells and treating the groundwater with carbon, air stripping or other technologies that would adequately remove the contaminants of concern. Treated water would likely be discharged via a NPDES permit to the Ottauquechee River. System operation and maintenance would be required. System influent and effluent samples would be collected and analyzed to monitor system performance. System operation would likely be 5 or more years. A groundwater treatment alternative would also require monitoring to track its ability to control the Site plume.

Well Decommissioning: This alternative was specifically evaluated for the deep production well located at Area V. The well would be sealed by removing all pumps and ancillary equipment and grouting to ground surface. Other Site monitoring wells will be decommissioned in accordance with the Vermont regulations for well closure.

Air Sparge/Soil Vapor Extraction: Air sparging (AS) is the process of injecting atmospheric air into an aquifer. Contaminant removal is achieved through a combination of volatilization and biodegradation. Soil vapor extraction (SVE) is a vacuum system designed to capture and treat contaminant vapors that are carried into the vadose zone. A system combining both technologies is evaluated for the Gerrish Site. The system would require installation of air sparge and soil vapor collection points, a temporary building to house mechanical equipment and a vapor treatment system. Operation and maintenance of the system will be required during the period of operation. System performance will be evaluated based on mass removal rates, Site contaminants remaining in groundwater, and pressure/vacuum readings. Vapor treatment consisting of granular activated carbon will be required to treat the recovered vapors prior to discharge to the atmosphere.

3.02 Feasibility Evaluation of Area-Specific Alternatives

The following sections provide feasibility assessments specific to each impacted area of the Site (Areas I through V). As stated above, the assessments are based on four criteria: effectiveness, time of completion, implementibility, and cost.

A. Area I: Former Gasoline/Diesel UST Area

1. No Further Action

This alternative is easily implemented but not considered effective because of the potential for discharge of impacted groundwater to surface water to the northeast of the Site. The discharge of impacted groundwater to surface water must be addressed because it represents a potential route of exposure for humans and the environment.

2. Monitored Natural Attenuation

It appears that Site groundwater flows at a rate which does not provide adequate time for natural attenuation processes to degrade the impacted groundwater prior to off-site migration. This alternative is relatively easy to implement but not considered effective in addressing the potential risk to surface water and was not considered as an appropriate stand-alone alternative. Monitored natural attenuation would be considered an appropriate measure used in conjunction with source removal (excavation) or source reduction (AS/SVE).

3. French Drain Excavation and Removal

Currently, the french drain appears to act as a conduit for impacted groundwater to be transferred further downgradient from the area of the former UST installation. Removing the french drain by excavation is an effective way of limiting the further migration of contaminated groundwater. During the excavation, piping, stained soils and gravel bedding will be removed and containerized for off-Site disposal. This alternative can be accomplished in a relatively short time frame and can be relatively easy to implement. The cost for removing the french drain has been estimated (see cost estimates, Appendix E) based on the estimated depth and length of the drain line.

4. Excavation and Off-Site Disposal

This alternative would include excavating impacted soil in the area, which has likely been contributing to groundwater contamination. The soil at this location is not expected to contribute significantly to the further contamination of the groundwater in the area. The soil will be covered by the redevelopment of the Site and will therefore not represent a potential pathway for risk of exposure. The costs for this alternative are high due to (1) the volume of soil affected and (2) the potential for excavation failure due to upward hydraulic gradients, which would increase the volume of soil requiring excavation and the volume of dewatering effluent requiring treatment or disposal. This alternative was not considered further.

5. Air Sparge/Soil Vacuum Extraction with Monitored Natural Attenuation

This alternative would include construction of an AS/SVE system in the area of known impacts to groundwater and operation and maintenance during an estimated 5 to 6 month period of time to reduce the majority of the contaminant mass. The AS/SVE system is designed based on the results of a pilot test (Appendix C) and engineering design guidance available from the U.S. Environmental Protection Agency. Based on the results of the pilot test and the chemical characteristics of the contaminants, this technology will be effective in removing VOCs from the groundwater in a relatively short period of time.

Groundwater quality data from the Site indicate that lead is present at concentrations greater than VT PGQS in groundwater at several monitoring wells. Tetraethyl lead is an anti-knock compound that was added to gasoline to increase engine performance. Tetraethyl lead is an organic compound that eventually degrades to inorganic lead (Pb^{+2}) in groundwater (Handbook of Environmental Data on Organic Chemicals, 1983). As described in EPA's OSWER Monitored Natural Attenuation Directive (9200.4-17P, 1999), the dominant mechanisms responsible for the natural attenuation of inorganics in groundwater (including metals such as lead) are sorption and redox reactions. According to this Directive, sorption mechanisms include precipitation, adsorption on the surface of soil minerals, absorption into the matrix of soil minerals, or partitioning into organic matter. As with many metals, lead is more soluble at low Eh and pH conditions, but is relatively insoluble at background groundwater conditions.

Site investigations have indicated that migration of Site contaminants, including lead, appear to be preferentially flowing away from the source area through the french drain. This preferential pathway, coupled with the depressed Eh conditions in the source area caused by ongoing BTEX biodegradation, appear to account for the existence of lead at concentrations greater than regulatory standards in groundwater downgradient from the source area. Decreases in concentrations of lead along the plume centerline indicate natural attenuation of the lead is occurring, likely due to sorption and precipitation mechanisms. Work done by Sandia National Laboratories indicates that lead sorbs readily to iron hydroxides, and Site groundwater quality indicates the presence of relatively high iron concentrations.

The operation of the air sparge system would increase the oxygen and Eh levels of the groundwater. These conditions would enhance the natural attenuation of the lead by increasing the occurrence of the iron hydroxides and associated sorption and precipitation reactions. Although sorption reactions can be reversible after cessation of active remediation, precipitation reactions are generally more stable (EPA, 1999). Post-remediation monitoring would be performed to confirm that natural attenuation processes are in place as anticipated.

During the pilot test, mass removal rates as high as 17 lbs/day were achieved from a single sparge point. The total mass of VOCs in the area was estimated by Haley & Aldrich (Appendix B) based on data from previous groundwater and soil sampling and plume contours. The total mass of VOCs appears to range from 800 to 1,700 pounds. It appears that a time frame of 5 to 6 months of AS/SVE operation will remove the majority of the contamination in the area, sufficient to allow the natural attenuation process to takeover.

AS/SVE is fairly easy to implement on the Site as a temporary installation due to the shallow groundwater and permeability of Site soils. Based on the current understanding of the Site redevelopment schedule, the active corrective action could be implemented and then removed to make way for the redevelopment. Implementation of AS/SVE will be followed by monitored natural attenuation, which will allow further degradation of residual contaminants before they migrate from the Site. The progress of natural attenuation will be monitored at the Site perimeter and three surface water monitoring points (see Figure 2 for monitoring well locations).

Cost estimates for the AS/SVE system and the monitored natural attenuation phase are included in Appendix E.

B. Area II: Former Fuel UST Area (MW-102/MW-16 Vicinity)

1. No Further Action

This alternative does not effectively address the potential for migration of VOCs to the stream to the northwest of the property boundary.

2. Groundwater Treatment

This alternative would be effective at mitigating off-site migration of contaminants by recovering the groundwater and treating the contaminants at the surface. Contaminants would either be removed by carbon adsorption or through air stripping. This alternative would be difficult to implement on the Site due to the potential length of time estimated for operation of the pump and treat system. A system constructed to operate for 5 or more years would interfere with the intended redevelopment of the Site. Operating costs for this alternative would be high due to the period of operation.

3. Soil Excavation

This alternative would involve excavation of "hot spot" soils in the vicinity of the former tank installation. Removal of the hot spot soils would decrease the contaminant mass available for dissolution into the groundwater. Currently groundwater contaminant levels do not represent a risk to the human or environmental receptors at the surface creek located to the northwest of the property. Removal of soil contaminants that may in the future affect the quality of the groundwater will be an effective corrective action. Following excavation, groundwater quality will be monitored using a monitoring well installed downgradient from Area II (Figure 2).

The excavation could be implemented in a short period of time allowing future Site redevelopment. The estimated costs for this alternative are included in Appendix E.

C. Area III: Former Oil Water Separator

1. No Further Action

This alternative will be effective in addressing the contaminants in this area. Analytical results from soil samples collected from test borings installed in the area of the former oil water separator met the soil clean up criteria applicable to commercial sites. Pavement or buildings as part of the Site redevelopment will cover soils that were previously replaced in the excavation. No significant groundwater contamination has been identified associated with this area. No pathway for exposure to human or environmental receptors exists.

2. Soil Excavation

This alternative is not recommended because there is no exposure pathway that requires corrective action in the area.

D. Area IV: Former Waste Oil Tank Area (MW-12)

1. No Further Action

Based on the analytical results of recent groundwater sampling and the low concentrations of VOCs in soil, a "No Further Action" alternative is recommended. This alternative will be effective because residual groundwater impacts will be adequately addressed by the corrective action proposed for Area I. Because of proposed Site redevelopment no pathway for human or environmental exposure exists that would require corrective action under future use conditions.

2. Groundwater Treatment

This alternative would be effective in removing contaminants from groundwater in the area. It is not recommended because there is no pathway for exposure that requires corrective action. The groundwater system would operate for a period of 10 or more years. This alternative is not implementable given the proposed Site redevelopment.

E. Area V: Former Water Supply Well

1. No Further Action

As per the DEC's Water Supply Rule (Section 12.3.5 of Appendix A of Chapter 21 of the Environmental Protection Rules), the former production well must be decommissioned. Consequently, the no action alternative does not meet the State's regulatory requirements.

2. Well Decommissioning

This alternative is recommended because it is required for compliance with a regulation of the State of Vermont. By grouting the well, all future use as a production well is eliminated, thereby removing a potential pathway for human exposure. Costs for a video survey, well decommissioning and grouting have been estimated based on the reported 697-foot depth of the well, and are included with the cost estimates in Appendix E.

IV. CORRECTIVE ACTION PLAN

The objective of the corrective actions at the Gerrish Site is to eliminate pathways for contaminant impacts to potential receptors and to meet the required clean-up goals for groundwater at the property boundaries.

4.01 Recommended Corrective Actions

Based on the results of the feasibility study described in the previous section the following corrective actions are recommended for the areas of concern at the Gerrish Site:

Area I: French drain removal with implementation of an AS/SVE system followed with monitored natural attenuation.

Area II: Excavation of “hot spot” soils to reduce future dissolution into groundwater.

Area III: No further action.

Area IV: No further action.

Area V: Grout former production well to ground surface.

In addition, institutional controls and continued groundwater monitoring at Site property boundaries are recommended for the Site.

4.02 Corrective Action Remedial Design

The details of the proposed corrective actions are shown on Figures 3 through 7. Technical specifications for the proposed corrective actions are included in Appendix F. The technical specifications are not intended to serve as the sole construction documents for the corrective actions. The technical specifications must be supplemented by contract terms and conditions acceptable to the entity undertaking the corrective actions. The technical specifications must also be supplemented with all available logs of subsurface explorations, chemical analysis data and other pertinent data obtained during previous investigations at the Site so that contractors performing the work are provided with sufficient information regarding Site conditions.

Recommended excavations include the excavation of the french drain pipe, gravel bed and stained soils over the length of the drain line and the hot spot soils in Area II. At Area I, the contractor will be required to locate the lower end of the drain pipe and excavate to an anticipated depth of 6 feet. Excavation shall continue along the drain line in the driveway to the terminus of the drain pipe, which is reported to be at the north corner of the former showroom building. The existing passive water treatment system will be removed and properly disposed. Excavation at Area II is anticipated to be to a depth of 12 feet in the approximate area shown on Figure 2. Excavation dewatering will be required with appropriate treatment/discharge or off-site disposal of dewatering effluent. Excavations are anticipated to be open-cut with side slopes meeting OSHA excavation standards. Following excavation to the defined limits, samples will be collected from side walls and the bottom of the excavation. These samples will be analyzed by headspace field screening procedures. Impacted soil resulting from these excavations will be properly treated or disposed at an approved facility.

An AS/SVE system is proposed for installation in the area of former UST removal and within and downgradient of the plumes of impacted groundwater shown on Figures A-7 through A-9 (Appendix A). The system has been designed using data collected during the pilot test conducted on-Site during June 2001 (Appendix C) and guidance for system design available from the U.S. Environmental Protection Agency. The proposed system consists of eight sparge and eight vacuum wells located on 15 foot spacings that will operate in a pulsed configuration to maximize the contaminant removal during the period of operation. The rate of pulsing between the front and back lines of wells depicted on Figure 3 will be determined based on system start-up testing. A process flow diagram is shown on Figure 4.

Air flow to each of the sparging wells is designed at 20 cfm, and the design vacuum air flow rate is 40 cfm. Each well head will be fitted with pressure/vacuum gauges and valves that will allow the operator to balance the flow to the wells.

The installation will be temporary and will be installed above ground surface. Sparge and vacuum piping will be routed to a temporary building which will house the AS/SVE skid and a carbon treatment train for recovered vapors. The proposed building layout is shown on Figure 5. AS/SVE well installation details are shown on Figure 6 and described in the technical specifications (Appendix F). The installation will be surrounded with a temporary fence. Existing monitoring wells will be used as additional system monitoring points.

The AS/SVE is expected to augment the naturally occurring degradation processes by supplying oxygen to the subsurface. The AS/SVE is proposed to operate 5 to 6 months on a 24 hour basis. A start-up monitoring plan will be proposed and operations will include frequent Site visits to monitor the system performance during the period of operation. The system will be shut off and decommissioned when the mass removal has reached an asymptote or the natural attenuation modeling based on system performance has indicated that sufficient removal has occurred to establish that groundwater criteria are met at the Site boundaries.

Monitoring wells will be installed at upgradient and downgradient positions as shown on Figure 2 to monitor the natural attenuation of the groundwater and compliance with the State clean-up criteria. Monitoring wells MW-4, MW-5, and MW-6 will be decommissioned. Details for new monitoring well construction are shown on Figure 6.

4.03 Schedule for CAP Implementation

The schedule for corrective action implementation is shown on Table XI.

4.04 Corrective Action Costs

Cost estimates for the corrective actions are included in Appendix E. Estimated costs are provided for corrective actions proposed for Areas I, II and V. Estimated costs for installation of new monitoring wells and decommissioning of MW-4, MW-5 and MW-6 are included in the Area I cost estimate. Estimated costs are also included for contingency paving of Areas III and IV where no further action is recommended, decommissioning the AS/SVE system and continued groundwater monitoring.

4.05 Corrective Action Operation

There will be no operation of systems associated with the corrective actions specified for excavation actions and areas of no further action.

The AS/SVE system operation will be optimized during the initial week of operation by balancing flow to the sparge and vacuum points and setting the pulse rate. The pulse rate will be set by monitoring the pressure at the wells installed during the pilot test to determine the frequency of pulsing. The system timers will be set to the desired pulse rate.

Weekly samples will be collected from the monitoring wells and the effluent from the vacuum skid and carbon treatment to monitor system performance during the first month of operation. System parameters will be monitored every two weeks during the period of operation and groundwater samples will be collected once per month and analyzed for the organic contaminants of concern and lead. The mass removal accomplished by the system will be calculated based on analytical samples and system flow rates. Table XII provides a performance and compliance groundwater monitoring schedule.

System operators will periodically perform preventative maintenance on the sparge and vacuum skids as recommended by the manufacturer and check the condensate level accumulating in the drum from the air/water separator.

The air sparge system would be designed to operate for a relatively short period of time for aggressive source area mass removal. It is proposed that an analytical fate and transport model be used as a tool to assist with quantifying system performance and identifying the appropriate point for system shut-down.

The model suggested for use is the Domenico analytical fate-and-transport model (Domenico, 1987) which is appropriate for evaluating basic fate and transport processes at sites with simple, uncomplicated hydrogeological settings. This model incorporates characteristics of contaminant plumes such as source width, source concentration, longitudinal and transverse dispersion, groundwater flow velocity, contaminant retardation (slowing of movement caused by sorption), and first-order decay or biodegradation. The Domenico model is well-established in the literature. An updated version of the model is currently being used in risk-based assessments as described in the American Society for Testing and Materials document entitled "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, ASTM Guide E 1739-95" (ASTM, 1995).

The analytical model would be used as follows: (1) Pre-remediation groundwater conditions would be utilized to calibrate the model to accurately depict current Site conditions, (2) The model would be utilized to “back-calculate” the acceptable source area residuals that could remain and allow for acceptable downgradient contaminant concentrations. These calculated acceptable source area residuals would then be compared with periodic groundwater quality data from the source area wells to determine the appropriate point at which to shut-down the air sparge system.

4.06 Required Permits and Plans

The temporary building for the AS/SVE equipment will require a building permit. Permits to discharge treated groundwater from dewatering operations will be required if water is discharged to either the municipal sewer system or to surface water. The need for an air discharge permit for vapors recovered by SVE will be evaluated; however, a permit is not anticipated to be needed because of the planned use of vapor treatment equipment.

4.07 Health & Safety

An example Health & Safety Plan (H&SP) is included in Appendix G for informational purposes. While a contractor may use the example H&SP as a guide, the contractor shall be required to prepare its own H&SP specific to its work at the Site and shall be responsible for the health and safety of its employees and employees of its subcontractors, if any, working at the Site.

V. LIMITATIONS

This Corrective Action Plan and Feasibility Study has been prepared for the exclusive use of Pomerleau Real Estate and Gerrish Motors. The conclusions and recommendations provided by Haley & Aldrich are based solely on the scope of work conducted and the sources of information referenced in this report. During the preparation of this report, Haley & Aldrich has partly relied on data prepared by others. Independent verification of the work performed by others was not always possible. Any additional information that becomes available concerning this Site should be provided to Haley & Aldrich so that our conclusions may be reviewed and modified as necessary.

This Corrective Action Plan and Feasibility Study was prepared pursuant to an Agreement between Gerrish Motors, Pomerleau Real Estate and Haley & Aldrich, Inc established by Haley & Aldrich's proposal dated 6 April 2001. All uses of this Corrective Action Plan and Feasibility Study are subject to, and deemed acceptance of, the conditions and restrictions contained in the Agreement. The observations, investigations, and proposed remedial design/specifications described in this Corrective Action Plan and Feasibility Study are based solely on the Scope of Services provided pursuant to the Agreement. Haley & Aldrich has not performed any additional observations, investigations, studies or other testing not specified in the Agreement. Haley & Aldrich shall not be liable for the existence of any condition the discovery of which would have required the performance of services not authorized under the Agreement. This work has been undertaken in accordance with generally accepted consulting practices. No other warranty, express or implied, is made.

This Corrective Action Plan and Feasibility Study reflects site conditions observed and described by records available to Haley & Aldrich as of the date of report preparation. The passage of time may result in significant changes in site conditions, technology, or economic conditions, which could alter the findings, cost estimates and/or recommendations of the report. Accordingly, the Client and any other party to whom the Corrective Action Plan and Feasibility Study is provided recognize and agree that Haley & Aldrich shall bear no liability for deviations from observed conditions or available records after the time of report preparation.

It is our understanding that this Corrective Action Plan and Feasibility Study is to be used and distributed exclusively for purposes connected with an impending remedial action for the Gerrish Motors Site. Unless Haley & Aldrich, Inc. is retained by the owner or redeveloper to observe construction of the remedial action to verify that construction is performed in accordance with the specifications and consistent with the intent of the remedial design, Haley & Aldrich will not bear any liability as design engineer on the project. It should be noted that the remedial design and specifications are based on limited site investigation and testing. Consequently, modifications to the design may be necessary during construction based on conditions encountered during construction. Any proposed changes to the design or specifications should be reviewed by Haley & Aldrich, Inc.

The contents of this report may not be copied, provided or otherwise relied upon in whole or in part by any party other than Gerrish Motors or Pomerleau Realty without the prior written consent of Haley & Aldrich, Inc. We agree, however, that the report may be conveyed to the appropriate regulatory agencies, as necessary.

Use of this Corrective Action Plan and Feasibility Study by any person or entity in violation of the restrictions expressed in this Corrective Action Plan and Feasibility Study shall be deemed and accepted by the user as conclusive evidence that such use and the reliance placed on this

Corrective Action Plan and Feasibility Study, or any portions thereof, is unreasonable, and that the user accepts full and exclusive responsibility and liability for any losses, damages or other liability which may result.

VI. REFERENCES

1. Agency of Natural Resources Department of Environmental Conservation, Environmental Protection Rules, Chapter 21, Water Supply Rule, Appendix A, Part 12 – Well Construction Standards, 1 August 1999.

2. American Society for Testing and Materials, "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, ASTM Guide E 1739-95" (ASTM, 1995).

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12. United States Environmental Protection Agency, Region 9 Preliminary Remediation Goals (PRGs), October 1999.

APPENDIX A

Selections from Haley & Aldrich's October 2000 Site Investigation Report

APPENDIX B

Drainage Analysis and Contaminant Mass Calculations

APPENDIX C

Pilot Test Results

APPENDIX D

Laboratory Analytical Results

APPENDIX E

Cost Estimating Tables

APPENDIX F

Technical Specifications

APPENDIX G

Example Health & Safety Plan for the Gerrish Motors/Woodstock East Site