LINCOLN
APPLIED GEOLOGY, INC.
ENVIRONMENTAL CONSULTANTS

October 30, 1995

Mr. Warren Beeken
President
Richmond Land Trust
P.O. Box 486
Richmond, Vermont 05477

RE: House Dump Evaluation - Lower Gorge Property, Dugway Road, Richmond, Vermont

Dear Warren:

On October 25, 1995 Lincoln Applied Geology, Inc. (LAG) conducted a site visit to an old house dump located on the Lower Gorge property on the south side of Dugway Road, in Richmond, Vermont. The purpose of the visit was to evaluate the volume and contents of materials present in the house dump and to determine whether the dump materials may have contaminated the soils and/or ground water on the Lower Gorge property. The Richmond Land Trust is currently negotiating to purchase the 19 acre parcel.

The Lower Gorge property, house dump, nearby residential house, and Huntington River are shown on the General Location Map included as **Figure 1**. The house dump is located about 75 feet south of the residential house. Evaluation of the dump and downgradient area using a photoionization detector (PID), visual observations, and the collection of a ground water sample indicate that the house dump has not contaminated soils and ground water on the Lower Gorge property with volatile organic compounds (i.e. the most probable contaminant impact). Although it is visually offensive, the house dump does not present an environmental contamination threat to the Lower Gorge property.

House Dump Description

The dump area includes mostly household domestic waste and measures about 40 feet long (N to S) by 30 feet wide (E to W) and averages about 2.5 feet in height. The total estimated volume of dump material is about 110 yds^3. The dumped materials were originally discarded at the edge of the steep slope (30 - 35% slope) leading down to the Huntington River. As dumping continued, the dump area was built up and expanded downslope. Dumped materials visible during the site visit include the following: household appliances (washing machine and refrigerator), glass bottles and jars, metal cans, galvanized metal, chimney piping, aluminum window frames, hot water baseboard, empty plastic jugs, rusted paint cans, empty gasoline can, empty diesel

can, radiator, wood, a 275-gallon fuel oil aboveground storage tank (AST), tree limbs, bicycle, child's plastic bike, plastic cloth webbing, concrete pieces, plastic garbage container, parts of a television, bed springs, and the rusted body and chassis of a late 1960's or early 1970's Oldsmobile Cutlass automobile without an engine. Some of the materials present appear to be from renovation of the nearby residential house. The house dump is not currently used, and its age is estimated to be since about the 1960's based upon some of the dump materials visible and the location of the automobile near the lower edge of the dump.

Soil Contaminant Evaluation

A HNU PID with 10.2 eV lamp was used to screen items from the dump and shallow soils surrounding the dump for the presence of volatile organic compounds (VOCs) (i.e. the most probable contaminant impact). The interior of the 275-gallon AST contained 2.0 parts per million (ppm) VOCs and a fuel oil odor. The gasoline tank on the Oldsmobile Cutlass automobile was empty and assayed only background (BG) PID levels. Other items including old fuel and paint cans also assayed BG PID levels.

Eleven shallow soil borings (1 - 1.5 feet) were installed around the perimeter of the dump using a hand auger. Both soils extracted from the borings and the inside of the boring were screened for VOCs using the PID. PID levels ranged from 18 ppm to BG. The positive PID levels are attributed to volatile terpene compounds released from white pine needles that are present in the forest litter along the west, south, and part of the east sides of the dump. To test whether the PID levels were caused by the pine needles, two soil borings located about 75 feet west and 100 feet southwest of the dump were also augered to determine what "background" PID levels were for the soils. Both borings were placed under pine trees and soil PID levels ranged from 5 to 10 ppm. Additionally, two soil borings on the uphill (north) side of the dump located under hardwood trees with only a few pine needles contained PID levels of 0.4 and 0.1 ppm. These data indicate that the pine needles and their natural terpene compounds caused the positive PID assays, and that there is no evidence that suggests VOC contamination of soils from materials in the house dump.

Soils beneath the house dump include tan brown fine sandy silt with gravel. These shallow soils are underlain at a depth of 0.5 to 1.0 feet by olive, clayey silt glacial till with abundant gravel and cobbles. The glacial till forms a lower confining layer that causes shallow ground water to perch atop the glacial till. Nearby bedrock outcrops of mica schist on the Lower Gorge property indicate that depth to bedrock is very shallow, and that the thin glacial till mantles the bedrock surface.

Ground Water

Perched shallow ground water from beneath the dump flows downhill atop the glacial till. A shallow pit was hand excavated into the glacial till soils at a wet area located 48 feet immediately downgradient of the dump. Perched ground water filled the pit, and a water quality sample was collected for VOCs analysis by EPA Method 8260 at the Green Mountain Laboratories, Inc. (GML) in Middlesex, Vermont. PID of soils in the pit were at BG. The GML water quality laboratory report is presented as **Attachment A** and indicates that no detectable levels of VOCs were present in the ground water sample. Additionally, no visible sheens or other evidence of surface water contamination were observed on the Huntington River below the dump.

Conclusions

In summary, the limited investigation of the house dump on the Lower Gorge property indicates that:

- The dump contains domestic household debris, house renovation materials, and a 60's or 70's vintage Oldsmobile Cutlass automobile without an engine. The dump materials have probably been dumped since the 1960's, and the dump is not currently in use.

- The dump is small and is located behind (south) of a nearby residential house at the upper edge of a steep slope leading down to the Huntington River. There are about 100 yds^3 of materials contained in the dump.

- PID levels and visual screening of eleven shallow soil borings surrounding the dump and two soil borings at distance from the dump indicate positive levels of VOCs that are attributed to natural terpene compounds from white pine needles on the forest floor. No evidence was found of VOC soil contamination from materials in the dump.

- A ground water sample from a shallow test pit excavated 48 feet south and immediately downgradient of the dump contained no detectable levels of VOCs by EPA Method 8260.

- Other than being visually offensive, the dump on the Lower Gorge property does not present an environmental liability with regard to soil and ground water contamination.

Based upon the findings from the limited investigation of the house dump on the Lower Gorge property, we recommend that the house dump materials should be removed from the property and properly disposed. This may require cutting trees to gain access for a backhoe and/or a dump truck. Since there appears to be a sizeable amount of metal objects and an old automobile, some of the metal can probably be recycled, while other materials should be disposed in a permitted landfill. Following removal of the dump materials, the ground surface should be properly reseeded and planted to prevent soil erosion.

If you have any questions or comments, please call me or Steve Revell, Senior Hydrogeologist at 453-4384. It has been a pleasure performing this assessment with you and Steve Libby for the Richmond Land Trust.

Sincerely,

William D. Norland

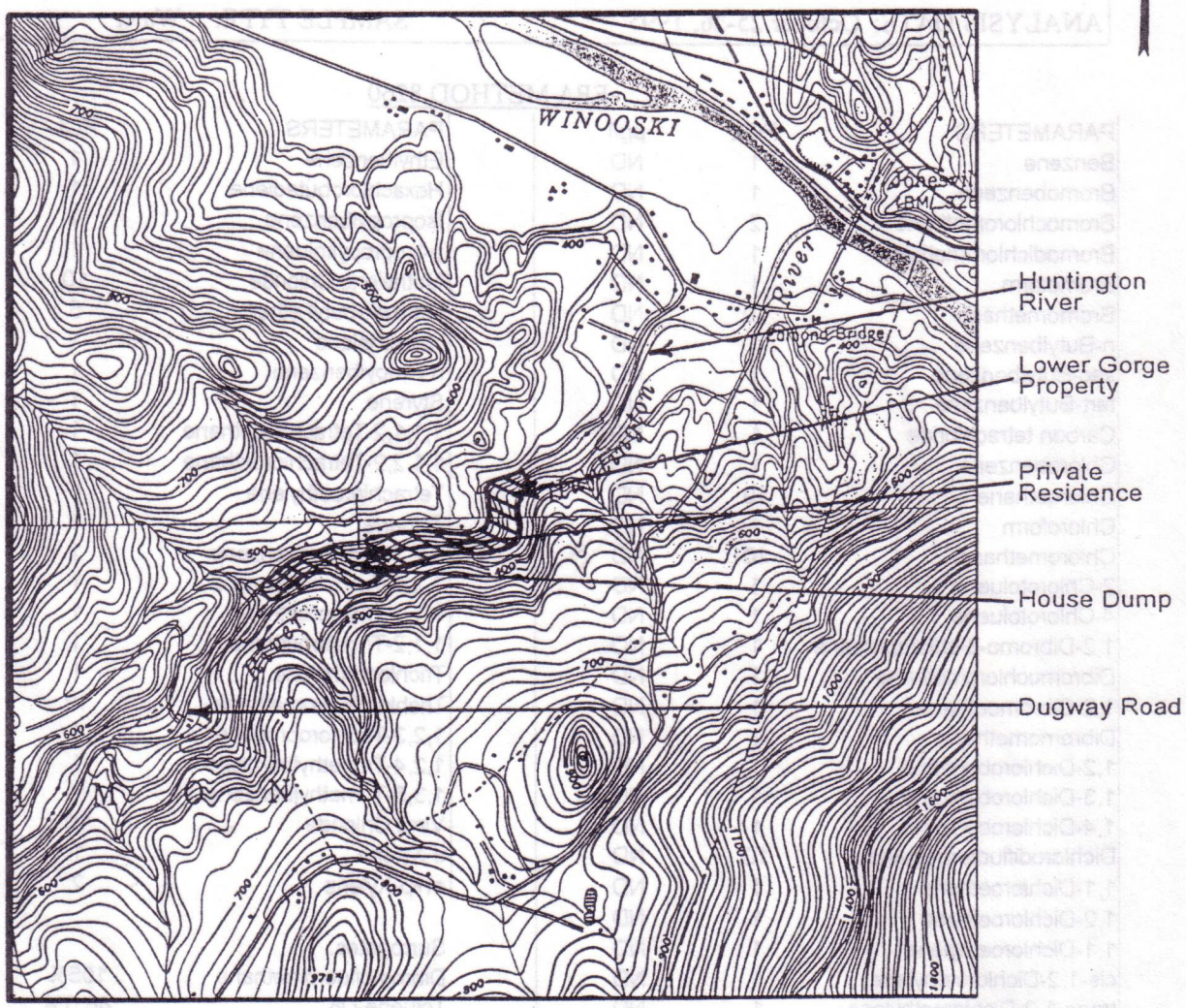
William D. Norland
Hydrogeologist

WDN/smk
enclosures
cc: Steve Libby, Scantic Designs

Lincoln Applied Geology, Inc.
Environmental Consultants
RD # 1 Box 710 • Bristol, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

Figure 1

Lower Gorge Property
Dugway Road
Richmond, Vermont
GENERAL LOCATION MAP



Source: U.S.G.S. 7.5 Min Topo Series
Richmond and Huntington, VT Quad.
1948 (Photorevised 1980)

Scale: 1" = 2,000'

Green Mountain Laboratories, Inc

RR#3, Box 5210
Montpelier, Vermont 05602
Phone: (802) 223-1428 Fax: (802) 223-8688

LABORATORY RESULTS

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	NA
PROJECT NAME:	Lower Gorge Property	REF.#:	0258
REPORT DATE:	October 27, 1995	STATION:	House Dump-Downgradient Pit
DATE SAMPLED:	October 25, 1995	TIME SAMPLED:	0932
DATE RECEIVED:	October 25, 1995	SAMPLER:	Bill Norland
ANALYSIS DATE:	October 25-26, 1995	SAMPLE TYPE:	Water

EPA METHOD 8260

PARAMETERS	PQL	µg/l
Benzene	1	ND
Bromobenzene	1	ND
Bromochloromethane	2	ND
Bromodichloromethane	1	ND
Bromoform	1	ND
Bromomethane	10	ND
n-Butylbenzene	1	ND
sec-Butylbenzene	1	ND
tert-Butylbenzene	1	ND
Carbon tetrachloride	1	ND
Chlorobenzene	1	ND
Chloroethane	10	ND
Chloroform	1	ND
Chloromethane	10	ND
2-Chlorotoluene	1	ND
4-Chlorotoluene	1	ND
1,2-Dibromo-3-chloropropane	1	ND
Dibromochloromethane	1	ND
1,2-Dibromoethane	1	ND
Dibromomethane	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Dichlorodifluoromethane	10	ND
1,1-Dichloroethane	1	ND
1,2-Dichloroethane	1	ND
1,1-Dichloroethylene	1	ND
cis-1,2-Dichloroethylene	1	ND
trans-1,2-Dichloroethylene	1	ND
1,2-Dichloropropane	1	ND
1,3-Dichloropropane	1	ND
2,2-Dichloropropane	1	ND
1,1-Dichloropropene	1	ND

PARAMETERS	PQL	µg/l
Ethylbenzene	1	ND
Hexachlorobutadiene	1	ND
Isopropylbenzene	1	ND
p-Isopropyltoluene	1	ND
Methylene Chloride	10	ND
Methyl-t-butyl ether	5	ND
Naphthalene	1	ND
n-Propylbenzene	1	ND
Styrene	1	ND
1,1,1,2-Tetrachloroethane	1	ND
1,1,2,2-Tetrachloroethane	1	ND
Tetrachloroethylene	1	ND
Toluene	1	ND
1,2,3-Trichlorobenzene	1	ND
1,2,4-Trichlorobenzene	1	ND
1,1,1-Trichloroethane	1	ND
1,1,2-Trichloroethane	1	ND
Trichloroethylene	1	ND
Trichlorofluoromethane	10	ND
1,2,3-Trichloropropane	1	ND
1,2,4-Trimethylbenzene	1	ND
1,3,5-Trimethylbenzene	1	ND
Vinyl Chloride	10	ND
o-Xylene	1	ND
m+p-Xylene	2	ND

Surrogates:	
Dibromofluoromethane	105%
Toluene-D8	86.0%
4-Bromofluorobenzene	109%

ND - Not Detected
Concentration units = µg/l