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October 26, 1988

DEC 0 8. 88

Hasty Truck Terminal
Attn: Ervin Radunz
Route 1 Exit 183
Clearwater, MN 55302

RE: C88-204 LEAKING UNDERGROUND STORAGE TANK INVESTIGATION
Hasty Truck Terminal
Hasty, Minnesota

Dear Mr. Radunz:

On August 22, 1988, Braun Environmental Laboratories received authorization from you to conduct a field investigation at the Hasty Truck Terminal located at the intersection of Interstate 94 and County Road 8, Hasty, Minnesota. The investigation was requested by the Minnesota Pollution Control Agency (MPCA). Its purpose was to assess the extent of subsurface contamination resulting from the release of diesel fuel from an underground storage tank located on-site.

BACKGROUND

On Thursday, July 28, 1988, a loss of product was discovered in a set of fully equalizing diesel fuel storage tanks, located on the west end of the storage facility, during daily product inventory. The following day, when a greater amount of fuel was missing, the tanks were disconnected from service and Stan Kalinoski (MPCA) was contacted. At this time, it was not known which of the two equalizing tanks was releasing product. An estimated 2,000-gallons of diesel fuel was unaccounted for and presumed to have leaked into the soils surrounding the affected tanks.

On Tuesday, August 1, 1988, equipment was brought on-site to excavate contaminated soil and to remove defective storage equipment. Stan Kalinoski was on-site to observe and supervise the project. Soil overlying the tanks was removed to expose the service and equalizing lines. It was observed that a coupling in the equalizing line had ruptured, releasing product into the soil.

The west tank was then exposed and removed. Careful inspection of both the removed tank and the tank remaining in the ground revealed no holes, cracks, excessive corrosion, or other signs of structural failure. Soil surrounding and beneath the removed tank was found to be saturated with diesel fuel and a pool of product was observed on the bottom of the excavation.

To recover as much product as possible, a depression (approximately 2 feet deep) was cut into clay soil beneath the removed tank. Product flowed into the depression where it was pumped out of the excavation into a tank truck. Approximately 1,200-gallons of product was recovered in this manner. The recovered product was then shipped to the Koch Refinery located in Rosemont, Minnesota for disposal. After all recoverable free product was pumped from the excavation, the remaining contaminated soil was excavated. A total of approximately 170 cubic yards of petroleum saturated soil was removed and dumped in an open area to the west of the truck terminal. The soil was then thin-spread into 6-inch lifts covering approxiamtely two acres and disked repeatedly every three to four days to drive off volatile organic compounds contained within the contaminated soil.

The underground storage tank previously removed was not replaced, service lines were re-routed to the tank remaining in the ground, and the excavation was backfilled to the surface with "clean" material.

SCOPE

On September 12, 1988, Braun Environmental Laboratories, Inc. conducted a total of six soil borings at the Hasty Truck Terminal site to determine the lateral limits of contamination resulting from the product release. An environmental geologist was provided on-site during drilling to determine the extent and environmental impact of the release (see attached soil boring location map).

GENERAL GEOLOGIC CONDITIONS

The site is located within the limits of terrace sediments associated with the Mississippi River. Soils consist of sands, silty sands, and gravelly sands of alluvial origin. Underlying the terrace deposits are clays and sandy clays interpreted as flood plain deposits. These alluvial sediments occur in the channel cut by the Mississippi River into a surrounding outwash plain associated with the Grantsburg Sublobe of the Late Wisconsinan Des Moines Glaciation (Geologic Map of Minnesota, Quaternary Geology, Hobbs and Goebel, 1982). Bedrock is represented by igneous rocks of Middle Precambrian age. They include quartz monzonite, quartz diorite, and granodiorite of the Stearns Magma Series common around

the St. Cloud area (Middle Precambrian Geology of East-Central Minnesota, Keighlin, C.W. et al; Geology of Minnesota, Centennial Volume, 1972). Hydrogeologic data provided by wells placed within the region reveal groundwater flowing from highlands to the east and west, down towards the Mississippi River. The gradient is relatively steep and hydraulic conductivity quite high in the area. Yields from wells in surficial deposits within the area are usually less than 100-gallons per minute (Water Resources of the Mississippi and Sauk Rivers Watershed, Central Minnesota, Helgesen J.O., USGS Hydrologic Investigations, Atlas HA-534, 1975).

LOCAL GEOLOGY

Soil borings conducted by BRAUN on September 12, 1988, revealed the statigraphy of soils on-site to a depth of 20 feet. Development on the site has disturbed the near subsurface material. The area within the underground fuel storage facility has been excavated and backfilled with poorly graded sand to a depth of 14 to 15 feet. The tanks are buried within the fill which overlies a brown sandy lean clay. In relatively undisturbed areas within the site, surficial material consists of 2 to 5 feet of topsoil composed of dark brown sand with silt and gravel. The topsoil overlies 3 to 6 feet of silty terrace sands which grade down into "cleaner" alluvial sands. At 13 1/2 to 14 feet, a yellowish-brown sandy lean clay of probable flood plain origin is encountered. The clay was found to be continuous to the termination depth of boring ST-2 (20 feet) and assumed to maintain this elevation throughout the site (see attached generalized geologic cross section).

It is difficult to determine the direction of groundwater flow on-site, but based on the migration direction of petroleum product through groundwater saturated soils, it is thought that local flow is in a general easterly direction. Please refer to the attached soil boring logs for detailed descriptions of soils encountered.

FIELD TESTING AND SAMPLING

The penetration test borings were performed with a truck-mounted core and auger drill. Sampling for the borings was conducted in accordance with ASTM D 1586 "Penetration Test and Split-Barrel Sampling of Soils". Using this method, the bore hole was advanced with the hollow-stem auger to the desired test depth. Then, a 140-pound hammer falling 30 inches drove a standard, 2-inch OD, split-barrel sampler a total penetration of 1 1/2 feet below the tip of the lead flight of the hollow-stem auger. The blows for the last foot of penetration were recorded and are used as an index of soil strength characteristics and for stratigraphic correlation. Samples were taken at 5-foot intervals to the termination depth of the borings. Immediately after taking the final sample in the

bottom of the boring, the bore hole was probed through the hollow-stem auger to check for the presence of groundwater. Immediately after withdrawal of the auger, the bore hole was again probed and the depth to water or cave-in was noted. The boring was checked at one hour intervals and then backfilled in accordance with the Minnesota Department of Health Water Well Construction Code prior to leaving the site.

GROUNDWATER MEASUREMENT

Groundwater was not encountered when measured in borings immediately after completion. However, borings ST-2, ST-5 and ST-6 were left open to allow groundwater to enter the bore hole through surrounding soils. Borings ST-5 and ST-6 were left open for approximately 1/2 hour, when groundwater level was rechecked. No water had entered either boring during the interval. Boring ST-2 was measured after remaining open for 1 1/4 and 2 hour intervals. After 1 1/4 hour, groundwater was measured at 17.5 feet of depth. At 2 hours groundwater had risen to a depth of 13.5 feet. Clay soil encountered within borings was wet, suggesting that the potentiometric surface is relatively close to the 13.5 depth measured in ST-2.

SOILS CLASSIFICATION

Soils encountered in the borings were visually and manually classified in the field by the crew chief in accordance with ASTM D 2487 "Unified Soils Classification System" and ASTM D 2488 "Recommended Practice for Visual and Manual Description of Soils". A copy of ASTM D 2487 is attached. All samples were then returned to the laboratory for review of the field classifications by an environmental geologist. Representative samples will remain in our Minneapolis office for a period of 60 days to be available for your examination.

H-Nu Monitoring

During the field sampling, soils were inspected visually for unusual staining as well as scanned with an H-Nu photoionization detector to determine if hydrocarbon vapors were present.

Hydrocarbon vapors were detected in borings ST-1, ST-2, ST-3 and ST-5 at levels less than 10 parts per million (ppm). In borings ST-1, ST-2, and ST-3 hydrocarbon vapors were not detected at depths less than 13 feet. H-Nu monitoring conducted on samples collected at depths of 13 feet or more revealed low level (<4.0 ppm) contamination which seem to be concentrated within 1 foot of the sand/clay interface. Boring ST-5 was conducted within fill to the immediate west of the excavated tank where hydrocarbon vapors

were detected to the termination depth of the boring (see attached H-Nu field data sheets for specific information).

CHEMICAL SAMPLING

Representative soil samples were collected from the borings by an environmental geologist for chemical analysis. The samples were placed in clean, VOA glass, screw top vials with teflon-lined caps, labeled, and transported to our laboratory under refrigerated conditions using BRAUN Chain-of-Custody procedures.

CHEMICAL ANALYSIS

Soil samples collected from borings ST-2 and ST-6 at the 14-foot depth and from thin-spread soil excavated on August 1, 1988 were analyzed in our laboratory for the presence of benzene, ethyl benzene, toluene, total xylenes (BETX), and total hydrocarbons as fuel oil.

All analyses were performed using EPA or other recognized standard procedures. Data has been reviewed prior to release and all quality control guidelines have been met. Specific information on standard operating procedures, detection limits, and quality control measures is available upon request.

Levels of BETX were found to be below method detection limits. Hydrocarbons as fuel oil were detected in boring ST-2 and in the thin-spread soil, but were found to be below method detection limits in boring ST-6.

CONCLUSIONS AND RECOMMENDATIONS

waste oil ?

Approximately 2000-gallons of fuel oil were released into subsurface soils from a ruptured equalizing line spanning two underground storage tanks at the Hasty Truck Terminal, Hasty, Minnesota. The release occurred over a two day period after which the tanks were disconnected from service. Within five days of the release, remedial actions were implemented under the supervision of Stan Kalinoski of the MPCA. Approximately 170 cubic yards of petroleum saturated soil surrounding the underground storage tanks were excavated and thin-spread in an area to the west of the site. The west tank was removed and inspected for structural damage. The tank remaining in the ground was also inspected. No sign of structural failure was noted in either tank. Fuel oil that had pooled on the bottom of the excavation was pumped to the surface and into a tank truck. Approximately 1200-gallons of product were pumped out and shipped to Koch Refinery for disposal. Additional soil contaminated with fuel oil was removed from the bottom and sides of the excavation and thin-spread along with the previously

excavated material. Service lines were then reconnected to the tank remaining in the ground and the excavation backfilled to the surface with "clean" soil. The six borings conducted by BRAUN revealed that a minor amount of fuel oil had migrated east along the interface between sand and underlying clay soils and had not penetrated into the clay significantly.

Results of H-Nu monitoring and chemical analysis suggest that contamination encountered in subsurface soils is limited in extent both laterally and vertically and present only in low levels (see geologic cross section for interpretation of subsurface conditions).

Contaminated soil excavated from around and beneath the affected tanks has been thin-spread over an area of approximately 2 acres in 6-inch lifts, where it has been repeatedly aerated with an agricultural disc. Chemical analysis conducted on a representative sample of thin spread soils yielded fuel oil contamination at a level of 250 ppm. It is recommended that the soil continue to be disked until frost and that a second chemical analysis be conducted in the spring of 1989 to assess effectiveness of the treatment. In addition, it is recommended that the MPCA be contacted in the spring and furnished with the results of the laboratory analyses conducted on the thin-spread soil.

Based on the results of our investigation, it is believed that hydrocarbon contamination resulting from a release of fuel oil still exists in the subsurface soils as evidenced in boring ST-2. However, the levels of contamination (55 ppm as fuel oil) are very low. Because the release occurred over a short time period and that remedial action was carried out immediately, it is likely that a larger-scale impact has been mitigated. Consequently, we do not feel additional investigation is warranted.

GENERAL

Services performed by the geologists and environmental scientists for this project have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar budget and time restraints. No warranty, expressed or implied, is made.

We appreciate the opportunity to provide our professional services on this project. Should you have any questions regarding the contents of this report, please contact us at your convenience.

Very truly yours,

BRAUN ENVIRONMENTAL LABORATORIES, INC.

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Environmental Geologist

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KNZ/DJB/GDK:jmd/C88-204.OCT

Attachments: Soil Boring Location Map
Cross Section
Log of Boring Sheets
H-Nu Field Data Sheets
Laboratory Report

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