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SPILL CLOSURE/ INVESTIGATION REPORT

June 2008

Metro-North Railroad
Croton Harmon Yard
One Croton Point Avenue
Croton-On-Hudson, NY
NYSDEC Spill # 07-13794

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1.0 Introduction

In March 2008, Miller Environmental Group, Inc. (MEG) was retained by the Metro-North Railroad Department of Environmental Compliance & Services (MNR DECS) to perform emergency response activities and conduct a soil and liquid phase hydrocarbon (LPH) investigation at the Metro-North Railroad Croton Harmon Yard, Croton-On-Hudson, New York. The initial contact by Metro-North Railroad was due to the loss of 17,000 gallons of diesel fuel and the subsequent presence of locomotive diesel fuel within a sanitary sewer junction box located to the west of the Train & Engine (T&E) Building (#15). It was determined that the diesel fuel was a result of a valve failure within Building #30 (fuel pump house). The diesel fuel flowed down Building #30's floor drains which led to the sanitary sewer junction box, which was temporarily disconnected from the sanitary treatment system because of ongoing construction. Miller Environmental Group, Inc. (MEG) conducted the removal of diesel fuel (via vacuum truck), excavation of impacted soils, delineation of subsurface LPH extent, the installation of monitoring/recovery wells and the installation of a multi-phase extraction system.

Miller Environmental Group, Inc. initiated recovery activities by excavating soils down-gradient (south) of the sanitary sewer junction box and utilizing a vacuum truck to remove liquid phase hydrocarbons (LPH). MEG then performed a subsurface investigation, which included extraction/delineation borings installed with a "Pressvac Super Vac" and the installation of overburden monitoring/recovery wells to characterize the existing conditions and the extent of contamination within the soil and groundwater. Certain wells would also be used as liquid phase hydrocarbon recovery points. The fieldwork performed was initiated on March 31, 2008 and is currently ongoing.

MNR DECS arranged for all waste disposals including oil soaked debris associated with the cleanup and investigation, the impacted soils and the liquid phase hydrocarbon/water removed from the excavations, the junction boxes, and the wells. This report documents all the above activities.

2.0 Site Description/Background

The site address is One Croton Point Avenue, Croton-on-Hudson located in Westchester County, NY. A Site Location Map is provided in Figure 1 and a Site Plan is provided in Figure 2. The spill site originated within Building #30 (fuel pump house) and impacted the surrounding area including the area around the T&E Building all within the Metro-North Railroad, Harmon Yard. The site is bounded to the east by railroad tracks and there is a 208,000 gallon diesel fuel tank (22W) located 20-feet north of Building #30. The Hudson River is located approximately 1000-feet to the southeast of the property (Figure 3). Topography of the site consists of gently sloping terrain trending

towards the southwest.

3.0 Subsurface Geology/Hydrogeology

The overburden subsurface materials are primarily fill material consisting of brown to grey sandy silt. There is a layer of peat that was found throughout the site, at approximately 10-feet below the ground surface. Local surface water flows towards the west/southwest and groundwater has been documented by others in earlier investigations to flow towards the east (towards an inlet in the Hudson River).

4.0 Methods Used

Contaminated Soil Removal

Diesel fuel impacted soil was excavated by Skanska and disposed of by Waste Technology Services (WTS), both working directly through Metro-North Railroad. During excavation activities soils were screened by MEG for Volatile Organic Compounds (VOCs) in the field using a calibrated PID equipped with a 10.2 eV lamp. PID readings from the excavation ranged from 3.6 ppm to 256 ppm. Approximately 895 tons of contaminated soil was removed. The maximum excavation depth was roughly 10-feet below grade. Groundwater was encountered during the excavation process at approximately 8 to 10 feet below grade. If a nominal value of 1.5 gallons /ton is used to calculate adsorbed phase LPH removal, then an additional 1342.5 gallons of diesel fuel was removed with the soil.

“Super Vac” Subsurface Investigation

From April 11 through April 24, 2008 Miller Environmental Group, Inc. performed a subsurface investigation at the above referenced site. The purpose of this investigation was to define the vertical and lateral extent of the liquid phase hydrocarbons. Due to the large amount of underground utilities and uncertainty with respect to the documentation of their correct locations, a “Super Vac” truck was used instead of a geoprobe to conduct a subsurface investigation. The objective of this investigation was to further define the extent of LPH. The work included the advancement of twenty-one (21) “Super Vac” holes (Figure 4). Once down 10 to 12-feet, the groundwater was observed to determine whether or not there was any liquid phase hydrocarbon present. The following holes contained LPH: GH-4, GH-7, GH-8 (RW-1), GH-9 to GH-13, GH-16 and GH-21. None of the remaining “Super Vac” holes showed any signs of free phase product.



Overburden Wells

Between April 23 and April 29, 2008; two (2) recovery wells (RW-1 and RW-2) and four (4) delineation wells (MEG-1 to MEG-4) were installed by Miller Environmental Group, Inc. using a Gus Peck Drill Rig equipped with 6 ¼ inch I.D. hollow stem augers (Figure 2). The total depth of each well was 15-feet for the delineation wells and 20-feet for the recovery wells. The surface completions of the wells are an 8" x 12" manhole. Each well consists of 10-15 feet of .020 slot screen and 5 feet of well riser (4" PVC for the delineation wells and 6" for the recovery wells). All riser casing and screen materials arrived on-site individually sealed by the manufacturer. The annular space between the well screen and borehole wall was backfilled with clean No.1 silica well sand for the delineation wells and No.2 for the recovery wells. The sand pack was extended at least one (1) foot above the top of the well screen. Bentonite pellets were then poured down the borehole and allowed to hydrate thus forming a seal. All wells were pre-cleared with a guzzler truck to avoid hitting any underground utilities. Drilling equipment was decontaminated between holes to prevent cross contamination. All impacted soil from the well installation activities was stockpiled on site for disposal at a later date.

Well Development

Upon completion of the well construction activities described above, the wells were developed in an attempt to restore the natural hydraulic connection between the well screen and surrounding soils/bedrock. A vacuum truck was used to purge groundwater from each well until the water was free of appreciable sediment. A minimum of five (5) well volumes of water was removed during development.

Liquid Phase Hydrocarbon Removal/Gauging

As soon as informed of the spill, MEG personnel mobilized to collect as much fuel oil as possible before it could absorb into the soil. Throughout the spill a vacuum truck and tanker were used to remove a total of 14,990-gallons of diesel fuel. The vacuum trucks were used to pull fuel from excavations, existing and MEG installed wells and from a multiphase extraction system. The product thicknesses in the wells were recorded on a daily basis throughout the fuel removal process (Table 1). After collected, the majority of the fuel was transferred into a frac tank and then distributed amongst the on-site (Metro-North Railroad) waste oil tanks for potential re-use.

The multi-phase extraction (MPX) system was designed to speed up the removal of both liquid phase hydrocarbons and the associated vapors from around Building #30. The MPX system was installed along the northeast side of Building #30 (in between the building and the fence) and consists of nine (9) 2-inch wells to a depth of 12-feet. All nine wells were manifolded together utilizing a 2-inch PVC trunk line, necked down to 1-



inch ball valves (to adjust the flow) and poly tubing and hooked into 1-inch adjustable PVC stingers. Photographs of this system can be seen in Appendix A.

5.0 Waste Disposal

Throughout the entire spill response process all of the oil soaked debris and any other materials that were generated during the spill were placed in 55-gallon drums and disposed of by WTS. A total of five (5) drums are currently stored on-site for disposal by WTS at a later date. As of June 13, 2008 all diesel fuel; approximately 14,990 gallons obtained were transferred to and stored in on-site waste oil tanks for use at a later time. Any excess recovered oil was removed for offsite re-blending or disposal. Approximately 895 tons of diesel fuel impacted soil was excavated and later disposed of by WTS. All disposal paper work can be found in Appendix B.

6.0 Sensitive Receptors

The most significant potential "Sensitive Receptor" in the area is an inlet to the Hudson River. However, the inlet is roughly 1000-feet away at its closest point. According to the New York State GIS website this is also the location of the nearest designated wetland area (Figure 3). There are no known potable water wells in the area. The Metro-North facility and the local community is supplied water from the Village of Croton well field system located on the Croton River adjacent to Route 129. In a recent conversation with Dan O'Connor (Village of Croton Engineer) he indicated that the well field is approximately 11,000 feet from the site. At this distance, no impact to this water source would be expected.

7.0 Conclusions

Throughout the spill cleanup process 895 tons of contaminated soil were excavated and disposed of by WTS. Five (5) 55-gallon drums of the oil soaked debris are currently staged on-site of disposal by WTS at a later date. Due to the large amount of underground utilities and uncertainty with respect to the documentation of the correct locations, a guzzler truck was used to conduct a subsurface investigation. "Super Vac" borings GH-4, GH-7, GH-8 (RW-1), GH-9 to GH-13, GH-16 and GH-21 contained liquid phase hydrocarbon. Two (2) recovery wells (RW-1 and RW-2) and four (4) delineation wells (MEG-1 to MEG-4) were installed by Miller Environmental Group, Inc. Throughout the spill a vacuum truck and tanker were used to remove approximately 14,990-gallons of diesel fuel from excavations, existing and MEG installed wells and from a multiphase extraction system.



After collection, the fuel was distributed amongst the on-site waste oil tanks. The multi-phase extraction (MPX) system was designed to speed up the removal of product recovery. The most significant potential "Sensitive Receptor" in the area is the Hudson River located roughly 1000-feet away at its closest point. There is no evidence that the product reached the receptor.

The current total amount of diesel fuel recovered during spill clean up activities when combined with LPH removed in the adsorbed phase during soil excavation is 16,332.5 gallons (96 % recovery).

8.0 Recommendation

Based on the above conclusions Miller Environmental Group, Inc. recommends the following:

- Perform monthly gauging and removal of the liquid phase hydrocarbons encountered in the monitoring wells and the multi-phase extraction system until the amounts of product dissipate to acceptable levels. Generate and submit monitoring reports on a quarterly basis. Miller Environmental has been retained to operate the system for the next several months. Following that the system will be operated by Metro-North's in-house forces with oversight by MNR DECS.

If you should have any questions or require any additional information please feel free to contact me at (845) 569-1200 Ext. 118.

Sincerely,
Miller Environmental Group, Inc

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Cc: Mr. Todd Ghiosay - NYSDEC
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