



September 1, 2016

Petty Machine Company, Inc.
2403 Forbes Road
Gastonia, North Carolina 28052

Attention: Mr. Larry Petty

Reference: **Vertical Extent of Groundwater Contaminant Plume
Petty Machine Company, NCD 991 278 805**
Gastonia, North Carolina
S&ME Project No. 4335-15-109

Dear Mr. Petty:

S&ME, Inc. (S&ME) submits this letter addressing the vertical extent of the groundwater contaminant plume for AOC 1 (TCE Surface Release Area) as requested in the North Carolina Department of Environmental Quality (NCDEQ), Division of Waste Management's (DWM) letter dated June 17, 2016. The NCDEQ's letter was a response to S&ME's Facility Characterization Report (FCR), revised June 10, 2016.

In the FCR report, the results of the sampling of the newest deep well MW-7C indicated concentrations of several constituents that exceeded the 15A NCAC 2L .0202 groundwater quality standards. As indicated in the FCR, the well was planned to have been installed to a depth of 145 feet below land surface with a screen set at a depth of 140 to 145 feet. Due to the fractured nature of the weathered rock (regolith, not competent bedrock) at this depth, there was difficulty in retrieving the drilling tools, and after retrieval, rock fragments had collapsed to a depth of 133 feet, where the well was installed. The concentrations of the constituents were generally similar to those detected in monitoring well MW-7B screened from approximately 107 to 117 feet below land surface.

Mr. Al Quarles of S&ME contacted McCall Brothers (Mike Floyd) to discuss general hydrogeological conditions in the area of the site. In an August 30, 2016 email, Mr. Floyd indicated that he was not aware of any pattern relative to fracture zones in the area. However, based on wells drilled in the area, the overburden (unweathered bedrock) routinely requires 150 feet to 200 feet of well casing before getting into solid bedrock. A recent well installed by McCall Brothers in the area required 168 feet of casing, with two main water bearing fractures (220 feet and 240 feet), indicating a competent bedrock layer without water bearing fractures of more than 32 feet.

Based on Mr. Floyd's recommendation, on August 31, 2016 Mr. Quarles contacted Aqua of North Carolina (Charles Mincer, Denver office) who maintains several community water supply wells in the area. Mr. Mincer provided data for three water wells located at two communities. Pertinent data provided regarding the three wells are presented below. Of note is that the minimum separation from the top of bedrock to the water bearing zone is 112 feet (Wesley Acres # 2, Ferncliff Drive well).



Public Water Supply Wells:

- ◆ Wesley Acres #2, Wesley Drive Well, Installed January 1974, ~1.1 miles east of PMC
PWS ID # 0136287
Bedrock at 32 feet, Casing to 36 feet, Total Depth 488 feet, Water Bearing Zone 485 feet
- ◆ Wesley Acres # 2, Ferncliff Drive, Installed January 1974, ~1.1 miles east of PMC
PWS ID # 0136287
Bedrock at 32 feet, Casing to 38 feet, Total Depth 200 feet, Water Bearing Zone 150 feet
- ◆ Yorkwood S/D, Stagecoach Drive, Installed January 1974, ~1.5 miles north of PMC
PWS ID # 0136204
Bedrock at 42 feet, Casing to 42 feet, Total Depth 480 feet, Water Bearing Zone 320 feet

While the information presented above for local water supply wells is specific to those well locations, the information suggests that we could anticipate at least 32 feet of non-water bearing bedrock below the top of competent bedrock. This would suggest that groundwater would not readily flow to the upper water bearing fracture zone in the competent bedrock.

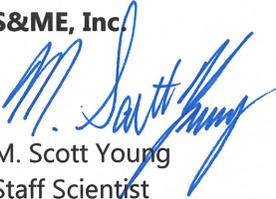
At well MW-7C, competent rock was not encountered at the 145-foot depth. Conservatively, we would anticipate that competent bedrock would be encountered within 25 feet below this depth based on the observed rock cuttings (non-stained or oxidized "weathered" rock chips). Thus, we would not expect the contaminant plume to extend vertically deeper than the top of competent bedrock. In addition, the concentrations of the volatile organics would suggest that the vertical migration of the contaminants would not be density driven, but rather flow with groundwater.

Based on the above, S&ME does not recommend additional assessment of the vertical extent of the groundwater plume.

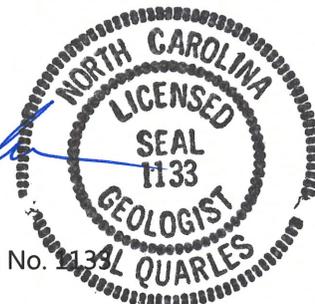
If you have any questions or comments regarding this letter, please contact us at your convenience.

Sincerely,

S&ME, Inc.


M. Scott Young
Staff Scientist


Al Quarles, L.G.
Project Geologist
NC PG Registration No. 1334



cc: Ms. Mary Siedlecki, NCDEQ, DWM