Woman Owned Business
Aztech Environmental
TECHNOLOGIES
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Mr. Carl Hoffman
NYSDEC
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March 15, 2016

RE: 2015 Annual Site Status Report
Mohonk Road Industrial Site
High Falls, NY

Dear Mr. Hoffman,

Aztech Technologies, Inc. (Aztech) has prepared the following correspondence to summarize operation and maintenance activities and laboratory analytical results for the above referenced project. The fieldwork summarized within this report includes operation and maintenance activities and system sampling results conducted by Aztech throughout 2015.

Site Background

The Mohonk Road Industrial Plant (the Site) is a manufacturing facility located in High Falls, NY. The Site consists of a 43,000 square foot building on a 14.5 acre lot. In the past, the Site was residence to various commercial businesses ranging from a metal finishing company, wet spray paint facility, and a manufacturer of store display fixtures; all of whom used solvents through various manufacturing processes beginning in the 1960's and continuing until 1993.

The Site is in a predominately residential area with local residences and businesses formally obtaining their potable water from individual wells which draw from the fractured bedrock aquifer. In 1994, a nearby resident contacted the Ulster County Health Department concerning the quality of their drinking water. In April 1994 their well was sampled and volatile organic compounds (VOCs) were found above the New York State drinking water standards. Subsequent sampling identified at least seventy (70) homes and businesses down-gradient of the Site whose wells were also contaminated with VOCs. As a result of this monitoring program, the NYSDEC provided residents with individual Granular Activated Carbon (GAC) treatment systems.

The NYSDEC performed several investigations to determine the source and extent of groundwater contamination at the Site from 1996 to 1998. The potential point source was identified as a 1,000 gallon septic tank at the Site property, which was subsequently removed by the NYSDEC in 1997. The Site was subsequently added to the Superfund National Priorities List, and control over site activities was relinquished to the United States Environmental Protection Agency (EPA). A subsequent groundwater treatment system was constructed and became operational in May 2000. In the fall of 2011, the EPA transferred operation and maintenance activities of the onsite treatment system to the NYSDEC.

Operation and Maintenance

System operation and maintenance (O&M) activities continued at the site thru 2015. Below is a summary of O&M activities that have occurred onsite during site visits.

January 2015

- The system treated 681,876 gallons of water between January 1 and January 31, 2015.
- On January 8th Aztech technicians mobilized to the site to check system status and perform routine O&M tasks. The system was non-operational upon arrival due to the water lines being frozen at the inlet of the air stripper trailer. Technicians disconnected water lines from the Influent tank and the air stripper trailer and reconnected the influent hose directly to the carbon unit. Upon inspection, it was found that Influent lines were frozen in the dog house where they enter the treatment plant. Technicians wrapped influent lines with heat trace and insulation, and manually shut down recovery wells 7R, 5R, and ERT1. The system was restarted. Technicians noted that there was no flow from recovery wells 7R or 5R. Technicians manually shut down 7R, 5R, and ERT1. The system was non-operational upon departure.
- On January 15th an Aztech technician arrived on site to check system status. The system was non-operational upon arrival. The system was restarted. Only ERT1 was operational upon departure.
- On January 20th Aztech technicians mobilized to the site to check system status and perform routine O&M tasks. Only ERT1 was operational upon arrival. Technicians restarted the system. 5R would not start. ERT1 and 7R were functioning properly upon departure.

February 2015

- The system treated 1,083,491 gallons of water between February 1 and February 28, 2015.
- On February 6th Aztech technicians mobilized to the site to check system status, perform routine O&M tasks, and collect routine samples for laboratory analysis. The system was functioning properly upon arrival. Technicians collected system readings and routine samples for laboratory analysis. The system was operational upon departure.
- On February 19th Aztech technicians mobilized to the site to check system status and perform routine O&M tasks. The system was functioning properly upon arrival. Technicians noted that water leaks were present. Technicians recorded system readings. The system was functioning properly upon departure.

March 2015

- The system treated 550,865 gallons of water between March 1 and March 31, 2015.
- On March 3rd Aztech technicians mobilized to the site to check system status, perform routine O&M tasks, and collect routine samples for laboratory analysis. The system was functioning properly upon arrival. Technicians recorded system readings and collected routine samples for laboratory analysis. The system was functioning properly upon departure.
- On March 17th Aztech technicians mobilized to the site to check system status and perform routine O&M tasks. The system was not functioning properly upon arrival. Technicians were instructed to leave the system non-operational upon departure, pending future repairs.

- On March 31st Aztech technicians mobilized to the site to check system status, perform routine O&M tasks, replace carbon in the lead and lag units, and attempt to acid wash the carbon in the lag unit to remove the calcium scaling present in the vessel. The system was not operating properly upon arrival. Technicians replaced spent carbon from the lead carbon unit with regenerated carbon. Technicians attempted a chemical rinse of the lag carbon unit. Due to a failure of the system control platform, technicians were unable to clean the lag unit. The system was non-operational upon departure due to the control system failure.

April 2015

- Aztech personnel began to source a new control platform and developed a program to run the treatment system. The new control platform utilized a new ProControl Model A1 manufactured by EOS Research, Ltd. The ProControl was paired with a telemetry system that automatically transmits daily email reports via cellular modem. The email reports contain operational data recorded by the system over the past 24 hours. The ProView software grants remote login access to the ProControl, which allows the user to download historic operational data, alter system parameters, monitor system status in real-time, and reprogram the unit.

May 2015

- The system treated 357,615 gallons between May 21st and May 31st.
- On May 6th and 7th Aztech personnel mobilized to the site to install the new ProControl unit. In addition, several existing sensors were tested for accuracy and proper operation and various electrical hardware was replaced. During this visit, Aztech personnel utilized an aqueous blended de-scaler and bio dispersant in the lag carbon vessel to remove calcium that had accumulated on the granular carbon which reduced its absorption capabilities. This blended product (Redux 520) was diluted from a concentrated blend and then circulated through the lag carbon vessel for approximately three hours. Once completed, the mixture was removed from the unit and the system was re-plumbed to continue phase III of the treatment pilot test.
- On May 19th and 20th Aztech personnel mobilized to the site to replace the water level transducer in well 5-R. The system was restarted and the ProControl began logging operational data and providing daily system summary emails. The system pumped from the wells directly through two (2) 1,000 pound carbon units plumbed sequentially. This was considered a continuation of phase III of the pilot test. Phase III was to test whether carbon treatment with properly functioning vessels would be a suitable method to treat the contaminated water. The aging carbon vessels previously utilized at the site were no longer suitable for service because the flow diffusers completely rusted off. Upon restart of the system, it was noted that well 5-R was not pumping and was left in the off position upon departure.
- On May 20th the system was restarted and the ProControl began data logging and providing daily system summary emails. The system was pumping directly from the wells and through two (2) 1,000 pound carbon units. This was considered a continuation of phase III of the pilot test. The phase was to confirm or deny if carbon treatment with properly functioning vessels would be a suitable process to treat the contaminated water. The carbon vessels previously utilized at the site are rusted and

the flow diffusers have completely rusted off. Upon restart of the system, it was noted that well 5-R was not pumping and was left in the off position upon departure.

- On May 26th Aztech personnel mobilized to the site to conduct routine O&M of the system. The technicians attempted to remove the pump from well 5-R to troubleshoot operational issues with the pump. Removal was unsuccessful during this mobilization because, due to the depth and size of the pump, use of a mechanical pump pulling device was necessary.

June 2015

- In June the system treated 270,125 gallons between June 1st and June 30th.
- On June 6th Aztech personnel mobilized to the site with a mechanical pump pulling hoist. Technicians removed the pump from the well and decontaminated the hose and pump. The pump was brought back to Aztech's shop for evaluation. Further inspection of the pump indicated that the motor had failed and a replacement motor was needed. Laboratory analysis from effluent samples samples collected on May 26th indicated an exceedance in the discharge limits for 1,1-Dichloroethane, 1,1-Dichloroethylene, and 1,1,1-Trichloroethane. The system was subsequently shutdown prior to demobilization until the spent carbon could be replaced.
- On June 25th- 26th Aztech personnel mobilized to the site to replace the spent carbon present in the temporary vessels with regenerated carbon. The vessels were refilled with water at a low flow rate so that channeling would not occur through either of the vessels. The system was returned to normal operating conditions with the exception of well 5R, which remained offline pending replacement of the failed pump motor.
- On June 30th Aztech personnel mobilized to the site to reinstall the pump and new motor into well 5-R. HDPE pipe and new fittings were utilized to attach the pump. The pulling rope was replaced with a new polyethylene rope, as the old rope had deteriorated. Despite installation of a new motor, attempts to restore the pump to working order were unsuccessful. The crew demobilized and the system continued to pump from wells 7-R and ERT-1.

July 2015

- In July the system treated 392,785 gallons from July 1st through July 31st.
- On July 30th Aztech personnel mobilized to the site to check system status, perform routine O&M tasks, and collect routine samples for laboratory analysis. Wells 7-R and ERT-1 were functioning properly upon arrival. Technicians collected system readings and routine samples for laboratory analysis. Wells 7-R and ERT-1 were operational upon departure.

August 2015

- The system treated 409,148 gallons from August 1st through August 31st.
- On August 13th Aztech personnel mobilized to the site to replace a faulty transducer in well 5-R. Transducer replacement alone did not result in resuming operational status of well 5-R. Additional programming was required. At the time of departure, wells 7-R and ERT-1 were operational.
- On August 27th Aztech personnel mobilized to the site to check system status, perform routine O&M tasks, and collect routine samples for laboratory analysis. Wells ERT-1 and

7-R were functioning properly upon arrival. Technicians collected system readings and routine samples for laboratory analysis. The system was operational upon departure.

September 2015

- During the month of September the system treated 103,185 gallons.
- On September 8th and 9th Aztech personnel mobilized to the site to remove the extraction well pumps to allow for AMEC to conduct downhole geophysics and packer sampling of each well. The pumps remained out of the wells for approximately three weeks while the sampling took place. During that time the laboratory results from the August 27th systems sampling provided by Test America indicated that the effluent was in exceedance of the discharge limits for 1,1,1-Trichloroethane. The system would remain shut down until new carbon could be delivered and the existing carbon removed.
- On September 28th Aztech personnel mobilized to the site and reinstalled the pumps that were removed from wells ERT-1, 5-R, and 7-R during the downhole geophysical study conducted by AMEC. The system was not restarted pending replacement of the spent carbon present in the carbon vessels.

October 2015

- From October 8th through October 31st the system treated 446,466 gallons.
- On October 6th and 7th Aztech personnel mobilized to the site to receive a delivery of regenerated carbon and replaced the spent carbon in the temporary vessels. During this time, programming issues regarding well 5-R were addressed and resolved.
- On October 13th Aztech personnel mobilized to the site to conduct routine maintenance of the system and troubleshoot the malfunctioning water level transducer in well 7-R. The transducer's equilibrium tube was found to be obstructed and technicians attempted to clear the obstruction and restart well 7-R. The transducer operated properly until Oct. 18th when the obstruction caused another failure. Well 7-R was deactivated until the obstruction could be cleared. Technicians collected system readings and routine samples for laboratory analysis. Wells ERT-1 and 5-R were operational upon departure.
- On October 29th Aztech technicians mobilized to the site to check system status and perform routine O&M tasks. Wells ERT-1 and 5-R were functioning properly upon arrival. Technicians recorded system readings and cleaned up the treatment plant. Wells ERT-1 and 5-R were functioning properly upon departure.

November 2015

- During November, the system treated 364,869 gallons.
- On November 2nd-6th Aztech personnel mobilized to the site to remove the legacy carbon vessels. Process water was being treated by the temporary carbon vessels and system operation was not interrupted by the removal activities. The crew placed the spent carbon from the existing vessels into super sacks and palletized all existing spent carbon on poly sheeting adjacent to the treatment building. The carbon vessels were triple rinsed with an Alconox and water solution and the rinsate was run through the treatment system prior to discharge. The crew also began to disassemble the other non-operational and/or unused components of the former treatment process. This

included the air stripper units, the vapor phase carbon vessels and any pumps, blowers and sensors no longer in operation or utilized by the current system configuration.
All major components found to be in good working condition were saved and stored in the shipping container adjacent to the treatment building. Other components were decontaminated and disposed of.

- On November 9th-12th, Aztech personnel mobilized to the site to continue removing any system components. Once all of the legacy components not for reuse were removed from the treatment building, the crew pressured washed the floors. The crew also removed a large portion of plumbing that was no longer in use, including the pipes that historically connected to wells to the exterior holding tanks. The small doghouse attachment was removed from the building and the exterior wall penetration that once conveyed the plumbing to the exterior tank connections was sealed.
- On November 16th Aztech personnel remobilized to pour concrete housekeeping pads for the influent tank, transfer pump, discharge pump, and new air stripper unit and blower. The crew allowed the concrete to set for a day and returned to the site on November 18th and began to construct the framing for the new treatment system room. The crew continued framing the remainder of the week.
- On November 23rd-25th Aztech personnel remobilized to continue constructing the walls and installing the insulation for the treatment system room.
- On November 30th - December 3rd Aztech personnel remobilized and continued working on framing the room and ceiling. All walls were insulated with rigid foam board and plywood sheathing.

December 2015

- In December the system treated 479,330 gallons.
- On December 8th-11th Aztech personnel remobilized to the site to complete the construction of the treatment system room and begin the process plumbing. The crew also worked on interior lighting and began painting the interior of the room to protect the walls from moisture.
- On December 15th-16th Aztech personnel continued working on the painting and system construction.
- On December 21st-23rd Aztech personnel worked on the remaining framing and painting. Technicians also began to install new conduits for the pumps, air stripper blower, and various control sensors.
- On December 28th-31st Aztech personnel remobilized to the site to work on the remaining exterior sheathing and trim work, as well as the remaining painting.

Sampling Summary

Monthly system samples were collected at the site during the months which the temporary treatment system was operational. The results of those sampling events are summarized in the tables below.

Sampling Results - February 5, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	777,492	5.2	1.2	ND	ND	302	ND	7.07
ERT-1	305,999	8	3.3	ND	ND	318	ND	7.13
W5R	0	NR	NR	NR	NR	NR	NR	NR
Combined Influent	-	52	13	18	4.4	285	ND	7.15
Between Carbon	-	20	7.8	ND	ND	322	66.4	7.41
Effluent	1,083,491	0.45	ND	ND	ND	311	ND	7.09
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Sampling Results - March 2, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	387,204	51	15	18	3.1	337	ND	7.04
ERT-1	163,661	54	11	29	7	295	ND	7.13
W5R	0	NR	NR	NR	NR	NR	NR	NR
Combined Influent	-	57	14	26	4.9	347	29.2	7.09
Between Carbon	-	54	14	17	ND	335	ND	7.15
Effluent	550,865	21	11	ND	ND	331	ND	7.08
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Sampling Results - May 26, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	163,569	68	23	9.8	1.7	348	ND	6.54
ERT-1	194,046	120	14	26	9.7	358	ND	6.50
W5R	0	NR	NR	NR	NR	NR	NR	NR
Combined Influent	-	96	18	20	6.3	349	ND	6.46
Between Carbon	-	92	17	21	7.5	341	ND	6.49
Effluent	357,615	94	18	22	6.3	349	ND	6.48
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Sampling Results - June 30, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	95,954	44	18	6.8	1	343	ND	6.97
ERT-1	174,166	80	11	20	5.8	328	ND	6.96
W5R	5	NR	NR	NR	NR	NR	NR	NR
Combined Influent	-	77	16	14	4.7	349	ND	6.98
Between Carbon	-	83	18	20	6.3	377	ND	6.93

Effluent	270,125	0.61	1.9	ND	ND	638	5.6	7.07
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Sampling Results - July 30, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	185,314	83	32	14	1.9	373	ND	7.30
ERT-1	207,470	76	9.6	18	6.7	400	ND	7.28
W5R	1	NR	NR	NR	NR	NR	NR	NR
Combined Influent	-	81	19	15	4.6	388	ND	7.25
Between Carbon	-	16	4.5	ND	ND	398	ND	7.50
Effluent	392,785	2.7	1.3	ND	ND	402	ND	7.51
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Sampling Results - August 27, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	229,070	59	17	11	2.5	359	ND	6.88
ERT-1	180,059	52	16	9.0	2.2	354	ND	6.93
W5R	19	NR	NR	NR	NR	NR	NR	NR
Combined Influent	-	64	18	11	64	357	ND	6.88
Between Carbon	-	48	12	3.7	ND	361	ND	7.05
Effluent	409,148	33	8.3	ND	ND	364	ND	7.06
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Sampling Results - October 13, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	95,476	51	18	9.6	1.5	353	ND	7.14
ERT-1	188,312	71	8.8	20	6.1	365	ND	7.14
W5R	162,678	48	2.8	11	3.2	393	ND	7.27
Combined Influent	-	61	10	14	4.0	384	ND	7.22
Between Carbon	-	0.90	0.99	ND	ND	375	ND	7.23
Effluent	446,466	ND	ND	ND	ND	381	ND	7.22
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Sampling Results - December 3, 2015								
µg/L	**Monthly Gallons**	**1,1,1-TCE**	**1,1-DCA**	**1,1-DCE**	**TCE**	**TDS**	**TSS**	**pH**
W7R	674	130	45	15	1.7	348	ND	7.22
ERT-1	252,610	51	13	13	3.7	354	ND	7.11
W5R	226,046	57	4.1	15	4.5	363	ND	7.13
Combined Influent	-	65	14	13	3.8	354	ND	7.41
Between Carbon	-	46	8.4	6	ND	364	ND	7.23

Effluent	479,330	8.8	4.8	ND	ND	354	ND	7.27
Notes:	ND = Non-Detect, NS = Not Sampled, NR = Not Running							

Conclusion/Recommendations

Due to the premature breakthrough of contaminants through the carbon media, it was determined that utilizing the existing vessels as the primary treatment were ineffective and alternative methods should be evaluated. Following the second carbon change in approximately six (6) months, a pilot testing plan was proposed to evaluate the use of an air stripper as the primary treatment method versus utilizing new carbon vessels in conjunction with a mild acid amendment to prevent calcium scaling. Each phase of the pilot test was schedule to run for approximately 60 days. The first phase consisted of utilizing the portable air stripper in conjunction with the Redux 390 product to prevent calcium scaling. The second phase would continue the use of the air stripper without the Redux to determine approximately how much calcium would build up inside of the air stripper over a pre-determined duration. The third phase included introducing two rented 1,000-pound carbon vessels to be used as the primary treatment with Redux added to the influent to prevent calcium buildup on the carbon vessels.

Phase one utilized a portable air stripper unit mobilized to the site to be used as the primary treatment method beginning on June 12th of 2014. The air stripper unit successfully batch-treated influent flows as high as 55 gpm. From the initial startup through October 13th 2014, the use of Redux 390 was injected into the influent to keep the calcium in suspension and prevent scaling on their air stripper trays and other components. Redux 390 was chosen as an additive which has been historically successful at other treatment systems where calcium accumulation has been a problem.

On October 13th, the use of Redux was discontinued to initiate phase II of the pilot testing. This phase involved the continuation of batch treatment through the air stripper unit at an approximate flow of 55 gpm. This phase continued until a power outage shut down the power to the treatment system and the temporary hoses connecting the batch tank to the temporary treatment trailer froze due to cold temperatures. This phase ran from October 13th through January 2nd. Following phase II, the air stripper unit was inspected for calcium scaling. At that time, no noticeable scaling was observed.

On January 15th the third phase of the pilot test began with the two rented 1,000-pound carbon vessels and the Redux injected into the influent to prevent calcium scaling. During this phase, wells ERT-1, and 7-R flowed directly into the carbon vessels at an approximate total rate of 24gpm. This phase of the pilot test ran through March 17th, when the process controls experienced a fatal error and became unresponsive.

During the time which the legacy system controls were upgraded, the laboratory analysis from the March system sampling concluded that after only two months of process treatment, contaminants of concern were identified in the effluent in exceedance of the discharge limits. In April, carbon was replaced in the lead vessel. An acid product was washed through the lag vessel in an effort to de-scale any calcium which had accumulated on the granular carbon. The treatment process resumed in May and continued while the three phases of the pilot test were evaluated. The system ran intermittently through September 8th until results from the August sampling event indicated breakthrough again and the system was then shut down until the carbon could be replaced.

Based on the consistent failure of the granular carbon, it was determined that an air stripper unit would be utilized for primary treatment at the site. Cost comparisons showed that a new air stripper unit

coupled with the reuse of some legacy equipment as well as a reduction in the size of the treatment building would be the most economical approach to the continuation of groundwater extraction and treatment.
On October 8th, the two rental carbon units were emptied and the carbon was replaced. The system resumed operation while a new treatment process was constructed. Once again, the carbon failed and breakthrough was identified in the effluent sample. The system was shut down on January 21st 2016.

The new treatment system and housing upgrades took place from October through February. On March 2nd 2016, the air stripper and subsequent treatment process began operation. The system has been running with a constant average flow total of 30 gpm. More details of the new treatment process will be provided in the first quarter summary report to be issued in April 2016.

At this time the influent flow from each well is being regulated through the use of a mechanical valve. Each well is pumping at approximately 10 gpm without any downtime. Once the water table becomes depressed and the pumps begin to cycle, it is recommended that the extraction well pumps be exchanged with pumps of lesser horse power to maintain a constant flow without the need to regulate flow with a valve. Another option is to construct well controls at each well which would include a VFD capable of controlling the flow from each well. Both options would reduce utility costs.

Other system recommendations include the reduction in blower speed based on analytical sampling of the effluent. This is currently pending and will be adjusted accordingly. This will result in a direct costs savings to the utility expenses.

Lastly, it is recommended that the remaining legacy tanks be decontaminated and removed from the site.

Thank you for your time and consideration.

Sincerely,

AZTECH TECHNOLOGIES, INC.

Joseph J Sabanos
Engineering Manager