

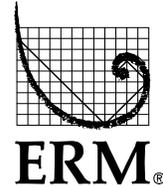
Appendix E
Monitoring Well Plugging and
Abandonment Reports

*2015 Monitoring Well Abandonment
Report*

Monitoring Well Abandonment Summary

GE Apparatus Service Center
18075 Krause Street, Riverview, Michigan

On 14 September 2015, ERM oversaw the plugging and abandonment of eleven monitoring wells. The abandonments were completed by Terra Probe Environmental (Terra Probe) of Ottawa Lake, Michigan.



Methods

The well abandonments were completed in accordance with Michigan Department of Environmental Quality protocol (i.e., ASTM D5299-92 *Standard Guide for Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities*) as discussed and documented in photographs below.

Terra Probe personnel used a breaking bar to loosen and remove the concrete pad and steel protective casing from around each well, as shown below.



Next, the two-inch diameter PVC well screens and casings were removed from the ground with the assistance of the Geoprobe track rig (a chain was

placed around the well and the hydraulic hammer from the track rig was used to pull the well out of the ground, see photo below).



Then each bore hole was sealed to within six inches of the surface with bentonite chips and compacted with the breaking bar to prevent bridging (see photo below).



Finally, the surface at each location was restored to a similar condition. In the gravel covered areas, the final six inches were filled with gravel. In the asphalt area at OW-9, the final six inches were filled with concrete (see photo below).



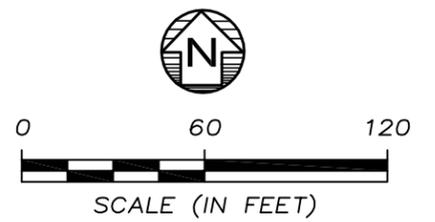
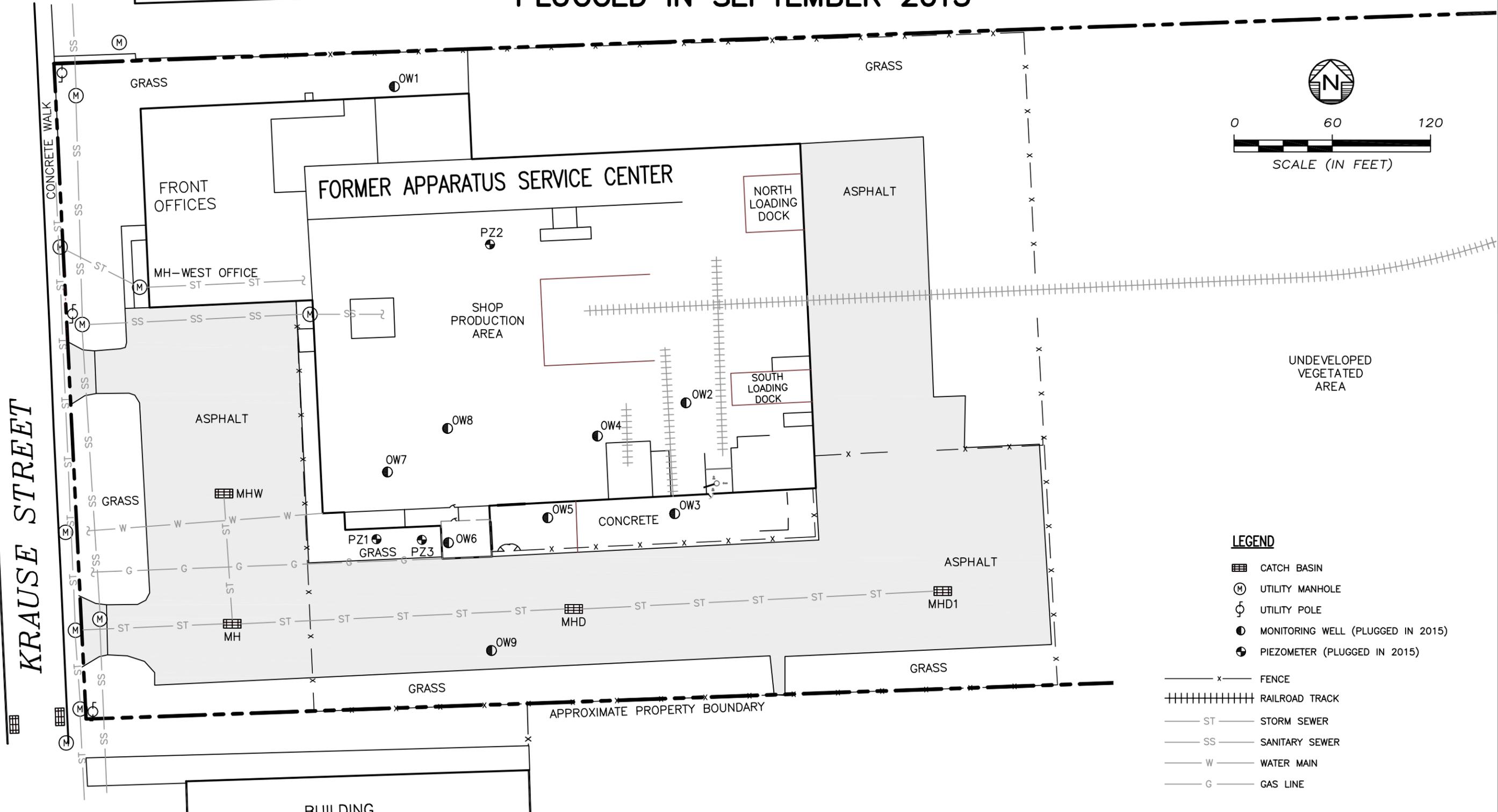
Summary of Wells Abandoned

Eleven wells were plugged and abandoned by Terra Probe. A 12th was removed during the excavation activities in December 2014. The 12 monitoring well locations are identified on Figure 1 as PZ1 through PZ3 and OW1 through OW9. A summary of the final disposition of the 12 monitoring wells is provided in the following table:

Well ID	Well Length (Screen plus Casing) (ft)	Sealant Material	Comments
PZ1	6	Bentonite	Screen/casing removed
PZ2	5	NA	The well, which was located in the center of the >5,000 sq ft 4-foot deep remedial soil excavation completed within the former northern shop area in December 2014, was completely excavated. The bottom one foot of the former borehole was plugged with native clay and covered by a bentonite mat installed across the northern shop area at a depth of 4 ft.

PZ3	3.5	Bentonite	Screen/casing removed
OW1	10	Bentonite	Screen/casing removed
OW2	9	Bentonite	Screen/casing removed
OW3	8	Bentonite	Screen/casing removed
OW4	8.5	Bentonite	Screen/casing removed
OW5	8	Bentonite	Only four feet of casing could be pulled from borehole due to casing break.
OW6	9	Bentonite	Screen/casing removed
OW7	8.5	Bentonite	Screen/casing removed
OW8	9	Bentonite	Screen/casing removed
OW9	9	Bentonite	Screen/casing removed, last six inches of sealed borehole were capped with concrete.

LOCATIONS OF MONITORING WELLS PLUGGED IN SEPTEMBER 2015



- LEGEND**
- CATCH BASIN
 - UTILITY MANHOLE
 - UTILITY POLE
 - MONITORING WELL (PLUGGED IN 2015)
 - PIEZOMETER (PLUGGED IN 2015)
 - FENCE
 - RAILROAD TRACK
 - ST STORM SEWER
 - SS SANITARY SEWER
 - W WATER MAIN
 - G GAS LINE

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Drawn By GML
CADD Review RMK
Date Drawn/Rev'd 2/28/12-9/23/15



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Environmental Resources Management

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FIGURE 1

*2018 Monitoring Well and Vapor Point
Abandonment Report*

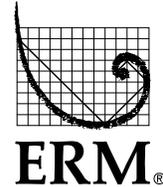
Soil Vapor and Monitoring Well Abandonment Summary

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On 3 July 2018, ERM oversaw the plugging and abandonment of eight monitoring wells, and ten soil vapor probes. The abandonments were completed by Terra Probe Environmental (Terra Probe) of Ottawa Lake, Michigan.



Methods

The well and soil vapor probe abandonments were completed in accordance with Michigan Department of Environmental Quality protocol (i.e., ASTM D5299-92 *Standard Guide for Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities*) as discussed and documented in photographs below.

Terra Probe personnel used a breaking bar to loosen and remove the concrete pad around soil vapor and monitoring wells VP-7 and VP-8, as shown below.



Next, the one-inch diameter PVC well screens and casings were removed from the ground with the assistance of the Geoprobe track rig (a chain was placed around the well and the hydraulic hammer from the track rig was used to pull the well out of the ground, see photo above). Tubing associated with the soil vapor probe was detached from the vapor probe and pulled from the ground.



Then each borehole was sealed to the surface with bentonite chips and compacted with the breaking bar to prevent bridging.



Finally, the surface at each location was restored to a similar condition. Fill sand was placed over the around the former borehole (see photo below).



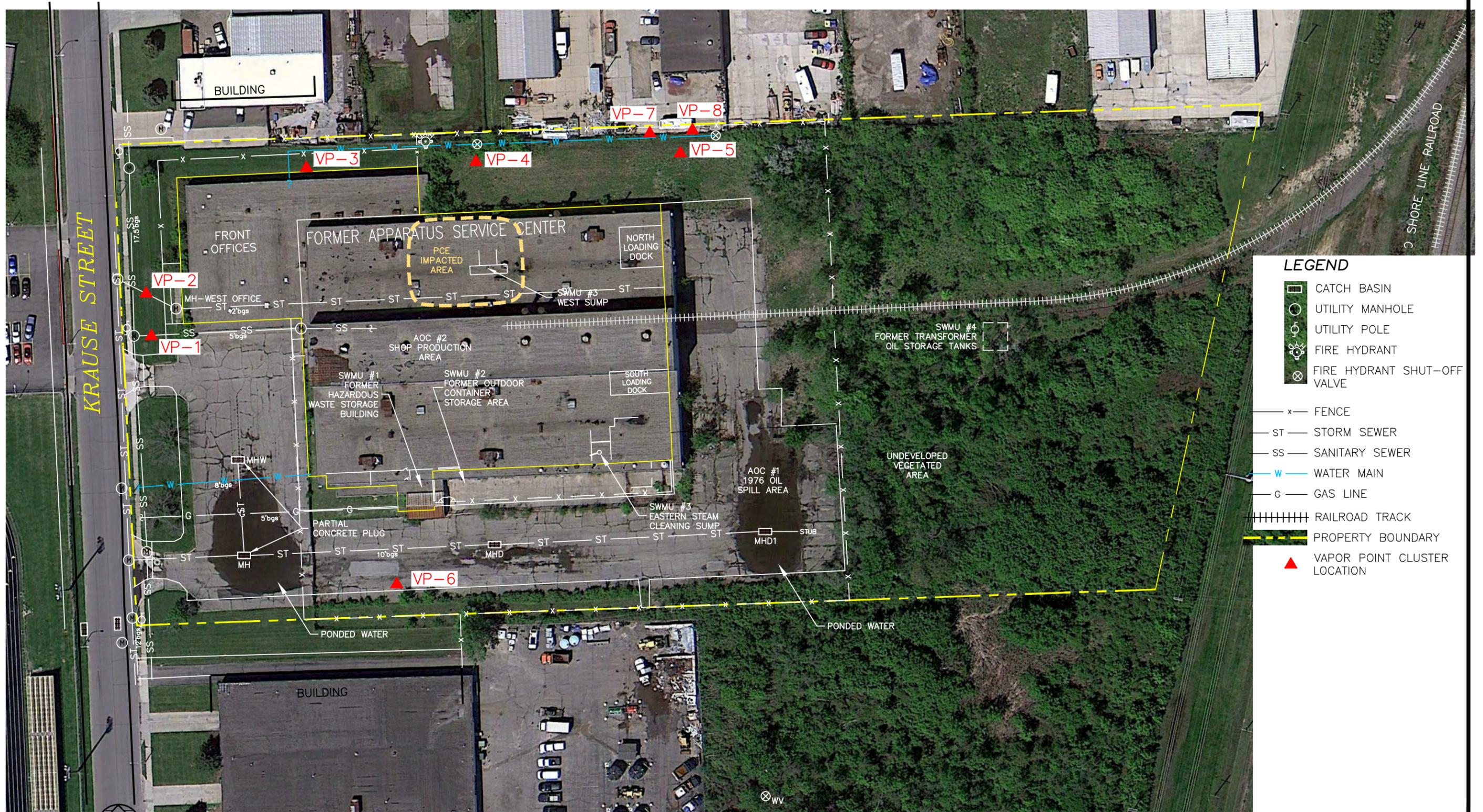
Summary of Wells Abandoned

Eight wells and ten soil vapor probes were plugged and abandoned by Terra Probe. The vapor probes were left in-place and the tubing connecting the probes were removed from the ground. The locations of the monitoring wells and soil vapor probes are located on Figure 1. A

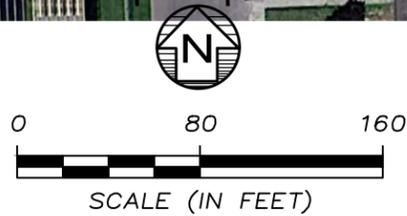
summary of the final disposition of the monitoring wells and soil vapor probes are provided in the following table:

Well ID	Well Length (Screen plus Casing) (ft)	Sealant Material	Comments
VP-1	9.5	Bentonite	Screen/casing removed
VP-1, 5.5'	5.5	Bentonite	Tubing removed; vapor probe
VP-2	10	Bentonite	Screen/casing removed
VP-2, 5.5'	5.5	Bentonite	Tubing removed; vapor probe
VP-3	10	Bentonite	Screen/casing removed
VP-4	10	Bentonite	Screen/casing removed
VP-4, 5.5'	5.5	Bentonite	Tubing removed; vapor probe
VP-4, 8.5'	8.5	Bentonite	Tubing removed, vapor probe
VP-5	10	Bentonite	Screen/casing removed
VP-5, 5.5'	5.5	Bentonite	Tubing removed; vapor probe
VP-5, 8'	8	Bentonite	Tubing removed; vapor probe
VP-6	10	Bentonite	Screen/casing removed
VP-7	10	Bentonite	Screen/casing removed
VP-7, 5'	5	Bentonite	Tubing removed; vapor probe
VP-7, 8'	8	Bentonite	Tubing removed; vapor probe
VP-8	10	Bentonite	Screen/casing removed
VP-8, 5'	5	Bentonite	Tubing removed; vapor probe
VP-8, 8'	8	Bentonite	Tubing removed; vapor probe

FORMER MONITORING WELL AND SOIL VAPOR PROBE LOCATIONS



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NOTE: THE AERIAL PHOTO WAS TAKEN PRIOR TO THE NOV/DEC 2014 BUILDING DECONSTRUCTION

Drawn By GML
CADD Review RMK
Date Drawn/Rev'd 2/24/12 - 4/24/18



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FIGURE 1