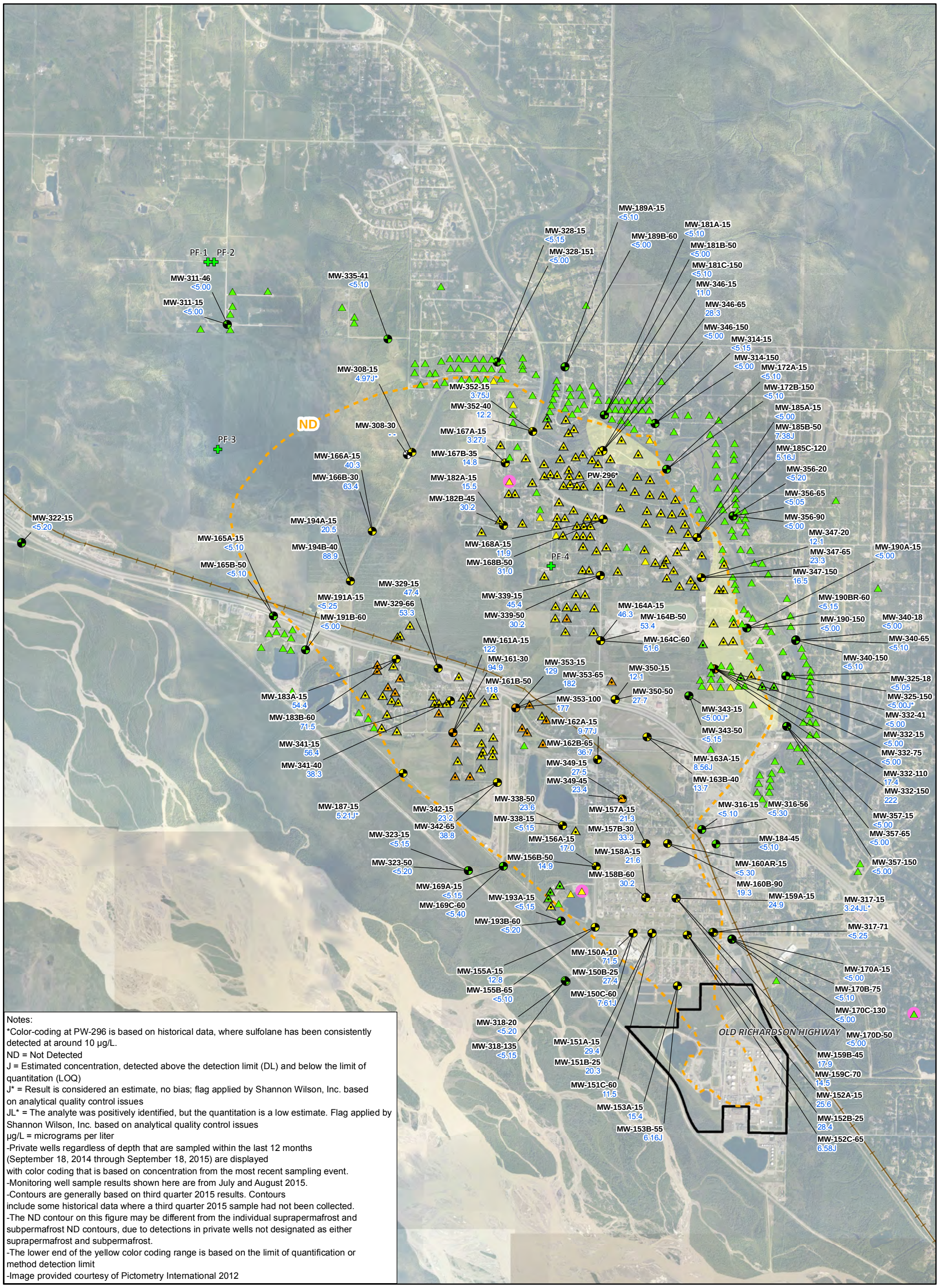
CITY: HIGHLANDS RANCH, CO DIV/GROUP: ENV/IM DB: BGRIFFITH LD: G FRANCE
PATH: W:\GISPROJECTS_ENV\FHR_AK\NORTHPOLEREFINERY\GW_MONITORING\2015_Q4\MXD\SECONDSEMIANNUAL_OFFSITE\FIG 4-9 OFFSITEGWANALYTICALRESULTS_SUPRAPERMAFROSTSUBPERMAFROST.MXD DATE: 1/27/2016 TIME: 1:01:27 PM



Notes:
*Color-coding at PW-296 is based on historical data, where sulfolane has been consistently detected at around 10 µg/L.
ND = Not Detected
J = Estimated concentration, detected above the detection limit (DL) and below the limit of quantitation (LOQ)
J* = Result is considered an estimate, no bias; flag applied by Shannon Wilson, Inc. based on analytical quality control issues
JL* = The analyte was positively identified, but the quantitation is a low estimate. Flag applied by Shannon Wilson, Inc. based on analytical quality control issues
µg/L = micrograms per liter
-Private wells regardless of depth that are sampled within the last 12 months (September 18, 2014 through September 18, 2015) are displayed with color coding that is based on concentration from the most recent sampling event.
-Monitoring well sample results shown here are from July and August 2015.
-Contours are generally based on third quarter 2015 results. Contours include some historical data where a third quarter 2015 sample had not been collected.
-The ND contour on this figure may be different from the individual suprapermafrost and subpermafrost ND contours, due to detections in private wells not designated as either suprapermafrost and subpermafrost.
-The lower end of the yellow color coding range is based on the limit of quantification or method detection limit
-Image provided courtesy of Pictometry International 2012

Legend

- Monitoring Well
- Point-of-entry treatment system sample collected
- Private Well
- Initial Result from Third Quarter 2015
- Permafrost Boring
- Suprapermafrost and Subpermafrost Mixing Zone
- FHRA Property Boundary
- -- Not sampled due to well being frozen or obstructed
- Approximate Sulfolane Isopleth Regardless of Depth in µg/L

Private Well Sulfolane Results

- Not Detected
- 1.0 - 100 µg/L
- 100 - 1,000 µg/L

Monitoring Well Sulfolane Results

- Not Detected
- 3.1 - 100 µg/L
- 100 - 1,000 µg/L

129 Sulfolane Concentration (µg/L)
< Not detected: detection limit listed
MW-353-15 Monitoring Well Location ID

0 2,500 5,000
SCALE IN FEET

FLINT HILLS RESOURCES ALASKA, LLC
NORTH POLE TERMINAL, NORTH POLE, ALASKA

SECOND SEMIANNUAL 2015 OFFSITE GROUNDWATER MONITORING REPORT

THIRD QUARTER 2015 APPROXIMATE EXTENT OF SULFOLANE IMPACTS IN OFFSITE MONITORING WELLS AND PRIVATE WELLS

ARCADIS

FIGURE
4-9