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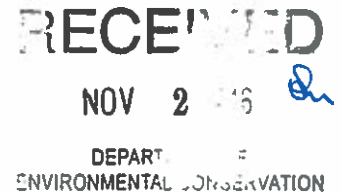
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November 1, 2016
1197-10

Alaska Department of Environmental Conservation
Spill Prevention and Response Division of Contaminated Sites
610 University Avenue
Fairbanks, Alaska 99709



Attention: Laura Jacobs – Environmental Program Specialist

Re: Groundwater Gradient Site Characterization Report, Seekins Ford-Lincoln
File No. 100.26.131

Dear Ms. Jacobs:

Travis/Peterson Environmental Consulting, Inc. (TPECI) presents the following letter report documenting work performed under the ADEC approved Groundwater Gradient Determination Work Plan at Seekins Ford-Lincoln (Seekins) in Fairbanks, Alaska. The Work Plan was developed, and the associated work was performed in response to a request from the Alaska Department of Environmental Conservation (ADEC) to acquire more information about the project site. Specifically, the work documented in this letter addressed DEC perceived data gaps with regard to groundwater gradient and flow direction, and increases in contamination detected in one or more wells, and to help formulate a plan toward site closure for the subject property (Figure 1).

Scope

The scope of work for this project was limited to the installation and monitoring of barometrically-compensated pressure transducers into four monitoring wells on the subject property. Data was periodically downloaded by TPECI personnel on site at each well location (See Attachment 2 for field notes). Additionally TPECI contracted Northland Surveying and Consulting, LLC to complete a survey of the monitoring wells located on the subject property.

Well Locations

TPECI installed data loggers in wells MW-1, MW-3, MW-6, and MW-7 (Figure 2). Well construction is detailed in Table 1.

Table 1
Monitoring Well Construction

Well ID	Install Date	Material	Total Depth (feet)	Well Screen Depth (ft bgs)	Slot Size (inches)
MW-1	7/17/1995	Schedule 40 PVC	25.00	10.0-25.0	0.010
MW-2	7/17/1995	Schedule 40 PVC	25.00	10.0-25.0	0.010
MW-3	7/17/1995	Schedule 40 PVC	25.00	10.0-25.0	0.010
MW-6	1996	Schedule 40 PVC	22.00	7.0-22.0	0.010
MW-7	1996	Schedule 40 PVC	22.00	7.0-22.0	0.010

Notes:
 PVC – poly vinyl chloride

Equipment

TPECI utilized four Aquistar™ PT2X Pressure/Temperature Smart Sensors from GeoTech Environmental equipment suppliers in Denver, Colorado. The Aquistar™ PT2X pressure transducers are barometrically compensated and do not need an external barometer installed.

Methods

TPECI employees installed four Aquistar™ PT2X Pressure/Temperature Smart Sensors (data loggers) in wells on the subject property on October 6, 2015. These data loggers were left in place until August 22, 2016. During this time the data loggers recorded water pressure in each of the chosen wells once daily. The water pressure data from each well was then used to calculate the height of the water above the sensor. TPECI employees then compared this data to the surveyed elevations of the wells to determine the elevation of the water table at any given data point. The elevation data from multiple wells was then used to calculate the groundwater flow direction and gradient beneath the subject property.

Well Survey Results

Northland Surveying and Consulting, LLC conducted a survey of the monitoring wells located on the subject property on April 21, 2016. The data produced during this survey was used to convert the water pressure data collected from the data loggers into elevation data. See Attachment 3 for the results of the survey.

Transducer Study

TPECI employees installed transducers in wells MW-1, MW-3, MW-6, and MW-7 on October 6, 2015. TPECI employees retrieved information from each transducer on the following dates:

- March 25, 2016;
- May 31, 2016; and
- August 23, 2016.

The transducers remained in their wells from October 6, 2015 until they were removed on August 23, 2016. The transducer in well MW-3 failed at some point between its installation and March 25, 2016, and was therefore removed on that date. The transducer in well MW-1 failed on August 9, 2016, prompting the completion of the study, and removal of all remaining transducers on August 23, 2016. TPECI believes the data collection period was sufficient for the purposes of this study.

Data Discussion

The raw data retrieved from the transducers was converted from feet of water above the sensor into elevation data. Due to movement of the sensor and the influence of surface water during snow melt the data had to be corrected at three different times. Data obtained from manual groundwater depth measurements was then used to check the data to ensure the data recorded by the instrument matched with manual observations.

Gradient and Flow Summary

The calculated groundwater gradient beneath the subject property varied between 0.001609 and 0.037389. The average gradient was 0.014688. The calculated groundwater flow direction beneath the subject property varied between 266.7° and 274.8°. The average groundwater flow direction was 269.5° (See Figure 2).

Seasonality Discussion

The winter gradient and flow direction were calculated using data from between October 22, 2015 and March 24, 2016. Over this period the groundwater gradient fluctuated between a maximum of 0.007937 and a minimum of 0.004828. The average gradient between those dates was 0.006501. Flow direction fluctuated between 266.7° and 270.5°. The average flow direction was 267.7°.

The spring gradient and flow direction were calculated using data from between March 26, 2016 and May 31, 2016. Between these dates the groundwater gradient fluctuated between a maximum of 0.037389 and a minimum of 0.027225. The average gradient during this time period was 0.031784, an increase from the average winter gradient, likely reflecting water addition to the aquifer. The groundwater flow direction fluctuated between 268.3° and 270.0° with an average of 269.2°. This is a shift of 1.5° north.

The summer gradient and flow direction were calculated using data from between June 2, 2016 and August 9, 2016. Between those dates the groundwater gradient fluctuated between 0.018981 and 0.016099. The average gradient during this time period was 0.018187, a decrease from the spring gradient. The groundwater flow direction fluctuated between 273.7° and 274.8° with an average of 274°. This is a shift of 4.8° north.

Data Comparison to Manual Measurements

Due to movement of the transducers at various points of the study the data calculations were adjusted to more closely match manually measured groundwater depths. A comparison of transducer readings to manual groundwater measurements is presented in Table 2.

Table 2
Comparison of Transducer Measurements to Manual Measurements

Date	Well	Manual Measurement (Feet Above Mean Sea Level)	Calculated Measurement (Feet Above Mean Sea Level)	Difference (Feet)
9-28-15	MW-1	432.23	432.53 (10-7-15)	0.3
	MW-6	432.21	432.59 (10-7-15)	0.38
	MW-7	432.28	432.78 (10-7-15)	0.5
3-25-16	MW-1	430.26	430.05	0.21
	MW-6	430.03	430.03	0.0
	MW-7	430.09	430.09	0.0
5-31-16	MW-1	430.01	429.94	0.07
	MW-6	429.95	429.98	0.03
	MW-7	431.04	430.93	0.11
8-23-16	MW-1	434.27	-	-
	MW-6	434.2	434.11	0.09
	MW-7	434.27	434.28	0.01

The adjustments made over the course of the study were successful in ensuring that the calculated groundwater elevation was close to the manual measurements. The discrepancy of 0.21 observed in MW-1 on 3-25-16 is attributed to melt water entering the well as it was opened. This caused a difference between the manual observation taken after opening the well and the transducer reading which was taken prior to the well opening.

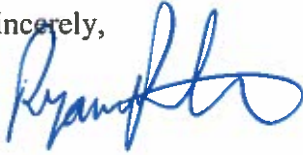
Conclusions

Based on the data obtained during the Seekins transducer study, the groundwater flow direction is pre-dominantly west. While there is some season variation, the total range is 8.1°, meaning flow direction is fairly consistent year round. Groundwater flow direction is consistent with the direction reported in the past for this site. Therefore the wells are properly placed on the subject property. Groundwater gradient, however, fluctuates much more than flow direction. Over the winter the gradient is extremely low (0.006501 on average). Over the spring the gradient increases as ground thaws and melt water enters the system. This continues through the summer. While the gradient does increase over the course of the spring and summer, it remains low throughout the year (0.037389 maximum).

The following recommendations supersede the recommendations that were in the 2016 Annual Groundwater Monitoring Report. Based on the data obtained over the course of this study, combined with data obtained from historical analytical sampling on the subject property, TPECI recommends the continued annual sampling of well MW-1 until no contaminants are detected in the well in concentrations that exceed the ADEC cleanup limits for three consecutive years. TPECI recommends the cessation of annual sampling at wells MW-2, MW-3, MW-6, and MW-7, which have all had three consecutive years where no contaminants have been detected in concentrations that exceed the ADEC cleanup levels. TPECI recommends well MW-7 be sampled at a reduced frequency of once every three years. TPECI asserts that the low concentrations of contaminants present in MW-1 in particular, combined with the low

groundwater gradient and steady flow direction justify this course of action. The Transducer Elevation Workbook, Groundwater Flow Direction Summary Workbook, and Gradient Calculation spreadsheets are attached to this report via data CD.

Sincerely,



Ryan Peterson
Staff Scientist

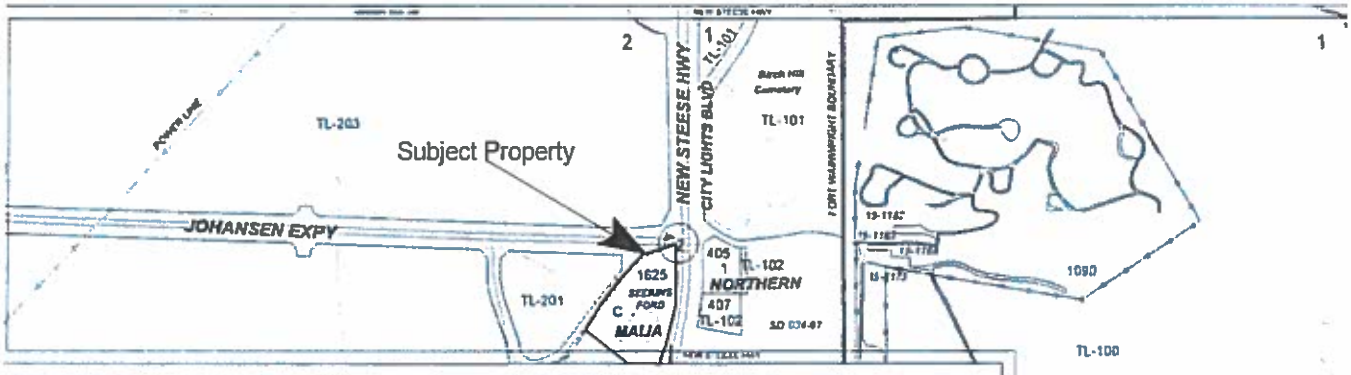
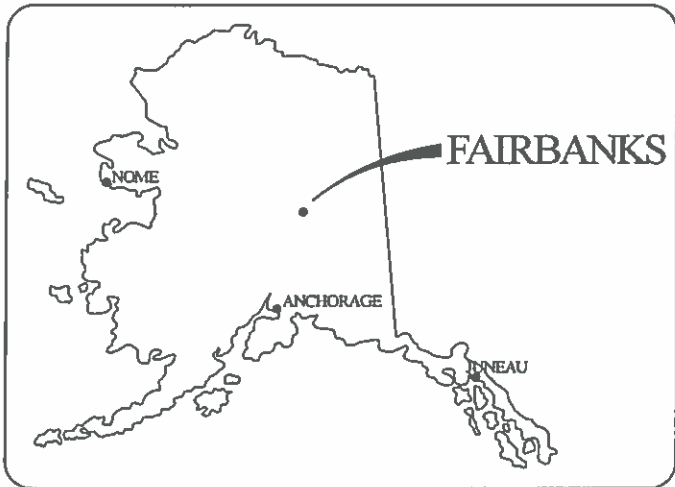
Cc: Margaret Russell
Paul Austin

Attachments

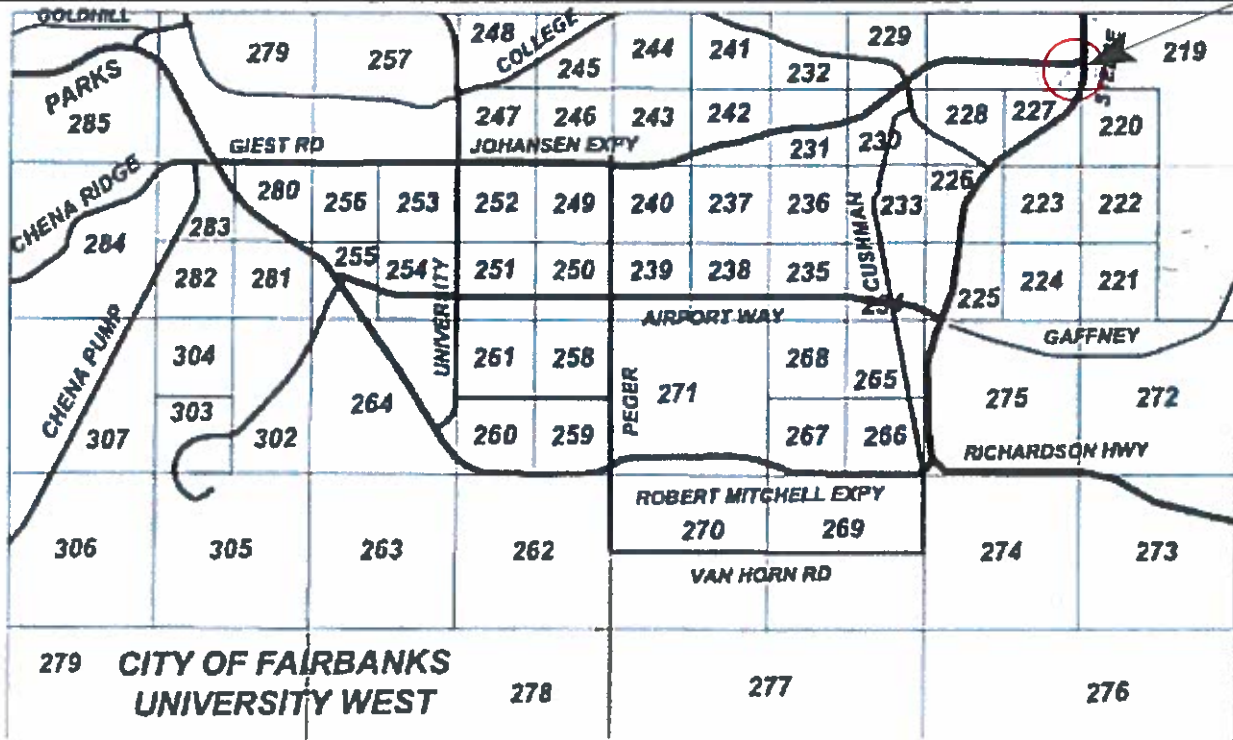
Figure 1
Field Notes
Northland Surveying and Consulting, LLC Survey Results
Figure 2
Data CD:
 Transducer Elevation Workbook
 Groundwater Flow Direction Summary Workbook
 Gradient Calculation Spreadsheets

ATTACHMENT 1

FIGURE 1



Subject Property Overview



TRAVIS/PETERSON ENVIRONMENTAL CONSULTING, INC.
329 2ND STREET
FAIRBANKS, ALASKA 99701

SEEKINS FORD-LINCOLN

FIGURE 1
LOCATION & VICINITY

ATTACHMENT 2

FIELD NOTES

2
March, 25 - 2010

Arrived on site at: 11:50 AM to find wells, take measurements, and get data logged information out. Seekins Ford.

Warmer is pouring slowly 30°F
Noon located MW-3 and began ice removal.

located 3 wells, could not find MW-3.
off site at 1:00 pm

Arrived back on site at 2:41 pm. Located MW-6 to start initial readings.

Barney 2.9 volts, 171 records,
Sensor depth 20.55 feet Depth to water

is 15.86 feet. Depth to bottom is ~~22.11 ft~~
located MW-2 started at 3:21 pm

located MW-1 started at 3:41 pm.
there was water in the well when opened.

MW-1 - 3:47 pm barney 2.9V, 171 records.
Sensor depth 20:19 feet Depth to water

is 15.61 feet. Depth to bottom is 24.6 feet.
MW-7 at 4:00 pm barney 2.9V, 171 records

Sensor depth 20.02 feet Depth to water 10.24 ft.
Depth to bottom 21.13 feet.

2 5-31-16

12:10 pm - arrived onsite in Seelins
to collect data from transducers
in 3 wells

weather - mostly cloudy, 60's F

MW-6 - DTB - 22.11'

DTW - 15.94'

- Bath-2.7v - 238 records uploaded

MW-1 - DTB - 25.57'

- DTW - 15.86'

- Bath-2.7v - 238 records uploaded

MW-7 - DTB - 21.22'

- DTW - 15.29'

Bath-2.8v - 238 records uploaded

3

7:50am MLH arrived onsite

went to inform burner
Spoke w/a receptionist
and gave business card.

Here to groundwater sample
MW-1, MW-2, MW-3, MW-7

MW-6 for GED, DED, ~~3 B~~
VOCs

currently ~ 55°F
2 mph winds.
partly cloudy

MW-3
DTN = 11H
DTB = 22.04H.

11.04 x 0.103 = 1.89 x 3well volume = 5.67
gallons purged.

* water appears a little murky
no obvious odor.

8:37am MW-3 sample collected for
VOCs, GED, DED.

8:45am MW-4 sample collected for
VOCs, GED, DED (DUPLICATE)

MW-1
DTN = 11.0
DTB = 24.59

12.99 x 0.103 = 2.11 x 3well = 6.35 gal
Purge.

9:40am MW-1 sampled for VOCs, GED,
and DED

* Transducer length 20.8

MW-2
DTN = 12.05H
DTB = 24.48H.

12.43 x 0.103 = 2.02 x 3well volume = 6.07
Purge.

10:35am MW-2 sample collected
for VOCs, DED, GED.

MW-7
DTN = 12.06H
DTB = 21.18H.

9.12 x 0.103 = 1.48 x 3well = 4.45 gal Purge.

* Transducer 20.85 ft
* water appears a little murky no odor.

11:07am MW-7 sampled for VOCs,
GED, and DED.

MW-10

* Transducer length
20.55 ft.

DTN: 11.0914.

DTB: 22.124.

 $10.434 \times 0.103 = 1.7 \times 3 \text{ feet} = 5.1 \text{ purge}$

VOLUME.

11:58 am

MW-10 sample collected
for VOCs, GEO, ? BTEX.

12:10 pm RCO, MUD OFFSITE.

ATTACHMENT 3

NORTHLAND SURVEYING AND CONSULTING, LLC SURVEY RESULTS

Monitor Well survey at the Seekins Ford Dealership in Fairbanks, AK.

The legal description for the parcel is Tract C, Majja Subdivision, Plat No. 87-129, F.R.D.

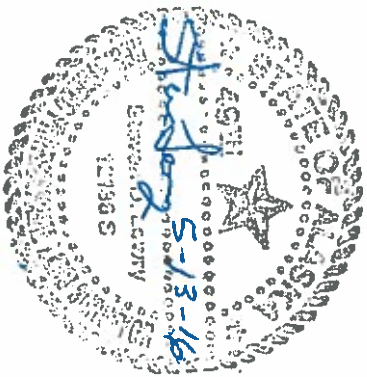
Prepared for Travis/Peterson Environmental Consulting, Inc.

Prepared by S. Lowry with Northland Surveying and Consulting LLC

Monitor Well	Point #	Latitude	Longitude	Grid North	Grid East	Top PVC Elev.	Well Lid Elev.	Ground Elev.
MW-1	101	64°51'24.13461"N	147°40'40.62150"W	3971057.20	1379371.35	445.87'	446.40'	446.32'
MW-2	102	64°51'23.41097"N	147°40'42.45721"W	3970985.81	1379290.09	446.34'	446.85'	446.76'
MW-3	103	64°51'22.61662"N	147°40'40.97594"W	3970903.43	1379351.95	445.32'	445.80'	445.63'
MW-6	105	64°51'23.89954"N	147°40'53.55749"W	3971048.16	1378811.79	445.89'	446.71'	446.51'
MW-7	104	64°51'23.70101"N	147°40'47.43785"W	3971020.98	1379075.67	446.33'	446.83'	446.65'

Notes:

1. Latitude/Longitude, and Grid North/Grid East are based on a GPS static session, and an OPUS solution (attached).
2. Grid North and Grid East are Alaska Zone 3 State Plane (Grid) coordinates in US Survey Feet.
3. All elevations are US Survey Feet.
4. All elevations are NAVD88 based on NGS Benchmark "XX 12" (data sheet attached).



ATTACHMENT 4

FIGURE 2

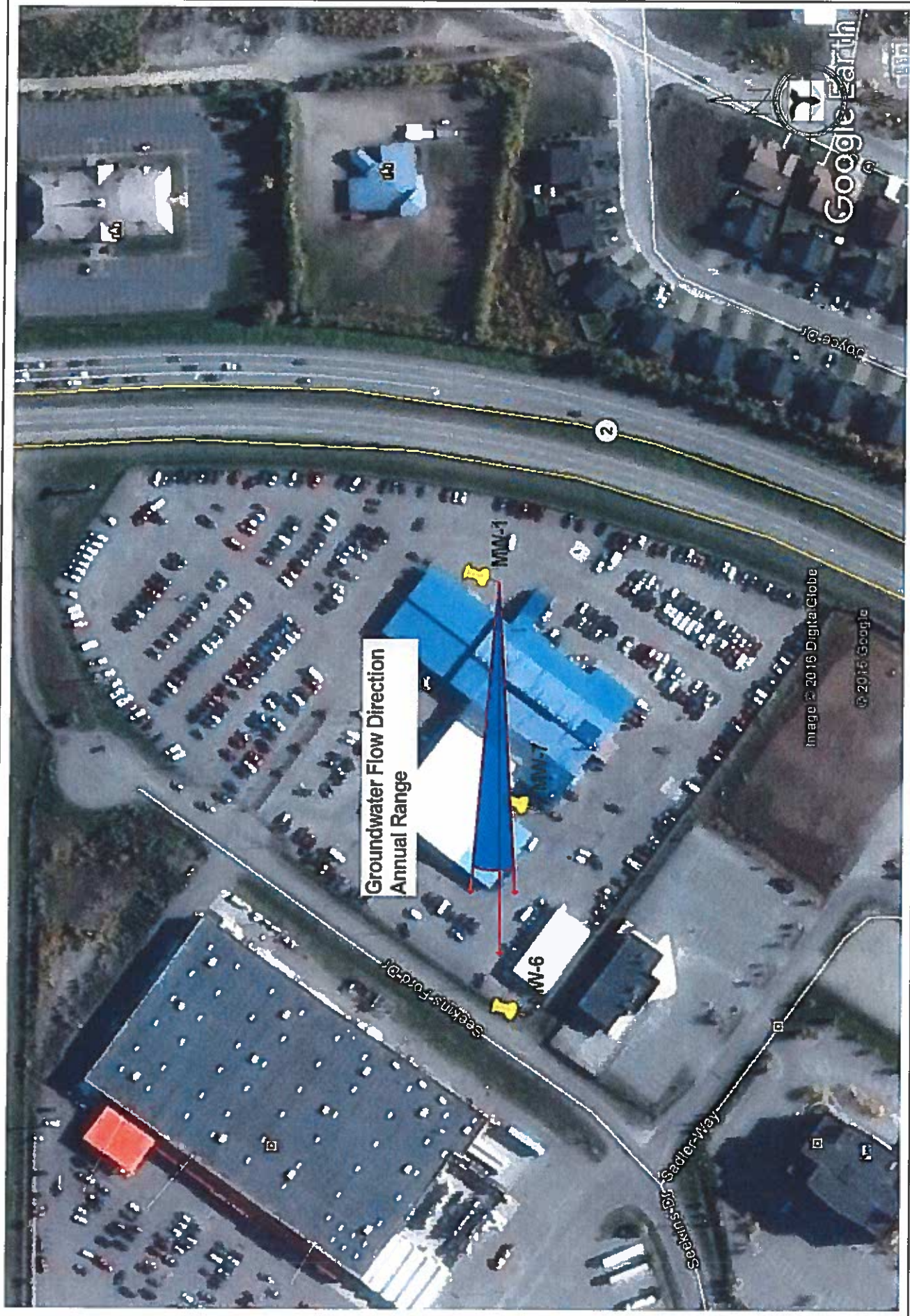


FIGURE 2
GROUNDWATER FLOW DIRECTION

GROUNDWATER TRANSDUCER STUDY
SEEKINS FORD-LINCOLN

TRAVIS/PETERSON ENVIRONMENTAL CONSULTING, INC.
329 2ND STREET
FAIRBANKS, ALASKA 99701

DATE: 10/19/16

SCALE: NO SCALE

PROJECT No: 1197-10 FILE: 1197/10/figure 2.skt

100.26.131

Comment Number	Comment	Response
1	In "Sampling Discussion", the report concludes that there were no sample results above the DEC cleanup levels. In fact, GRO was measured at 4,900 ug/L (4.9 mg/L) well above the cleanup level of 2.2 mg/L. Also, total xylenes is reported at 2,250 ug/L in Table 2, and 2,258 ug/L in the table labeled "Historic groundwater analytical data for Seekins Ford-Lincoln-Mercury Monitoring Wells, and reported by the lab as 2,250 ug/L. Please make the appropriate corrections.	Corrections made per reviewers comment.
2	Table 2, Cleanup Levels, isopropylbenzene 370 ug/L should be removed. Isopropylbenzene which is also known as cumene should have a listed cleanup level of 3700 ug/L. There should only be one entry in the table for this analyte.	Corrections made per reviewers comment.
3	Table 2, Cleanup Levels, n-propylbenzene is listed as 1800 ug/L but should have a listed cleanup level of 370 ug/L.	Corrections made per reviewers comment.
4	Table 2, Cleanup Levels should list 1,2 - dichloroethane as 5 ug/L.	Corrections made per reviewers comment.
5	Ditto should list 1,4-dichlorobenzene as 75 ug/L.	Corrections made per reviewers comment.
6	Table 2, MW-6 results should list a "J" next to the reported value for chloromethane (0.960J).	Corrections made per reviewers comment.
7	Table of "Field Duplicate Precision" erroneously lists MW-8 as a duplicate for MW-6. Instead, MW-4 is a duplicate of MW-3.	Corrections made per reviewers comment.
8	MW-7 data listed the results for chloromethane as 1.44 ug/L in Table 2, but in the lab results is reported as 0.750J ug/L.	Corrections made per reviewers comment.
9	The trip blank results include chloromethane at 0.530J. There should be some discussion about what this could mean and how it could affect other sample data.	Corrections made per reviewers comment.
10	DEC was expecting the results of the year-long recording of transducer data for groundwater. Please provide those data in a report form.	The final copy of the groundwater gradient report was completed today. A copy will be delivered to DEC.

*Please note that Larry Peterson obtained a copy of the letter including the comments from Seekins Ford-Lincoln on November 1, 2016. No letter was mailed or emailed to either Michaela Hale or any other Travis/Peterson Environmental Consulting, Inc. employee

RECEIVED



NOV 2 2016