

FIGURES

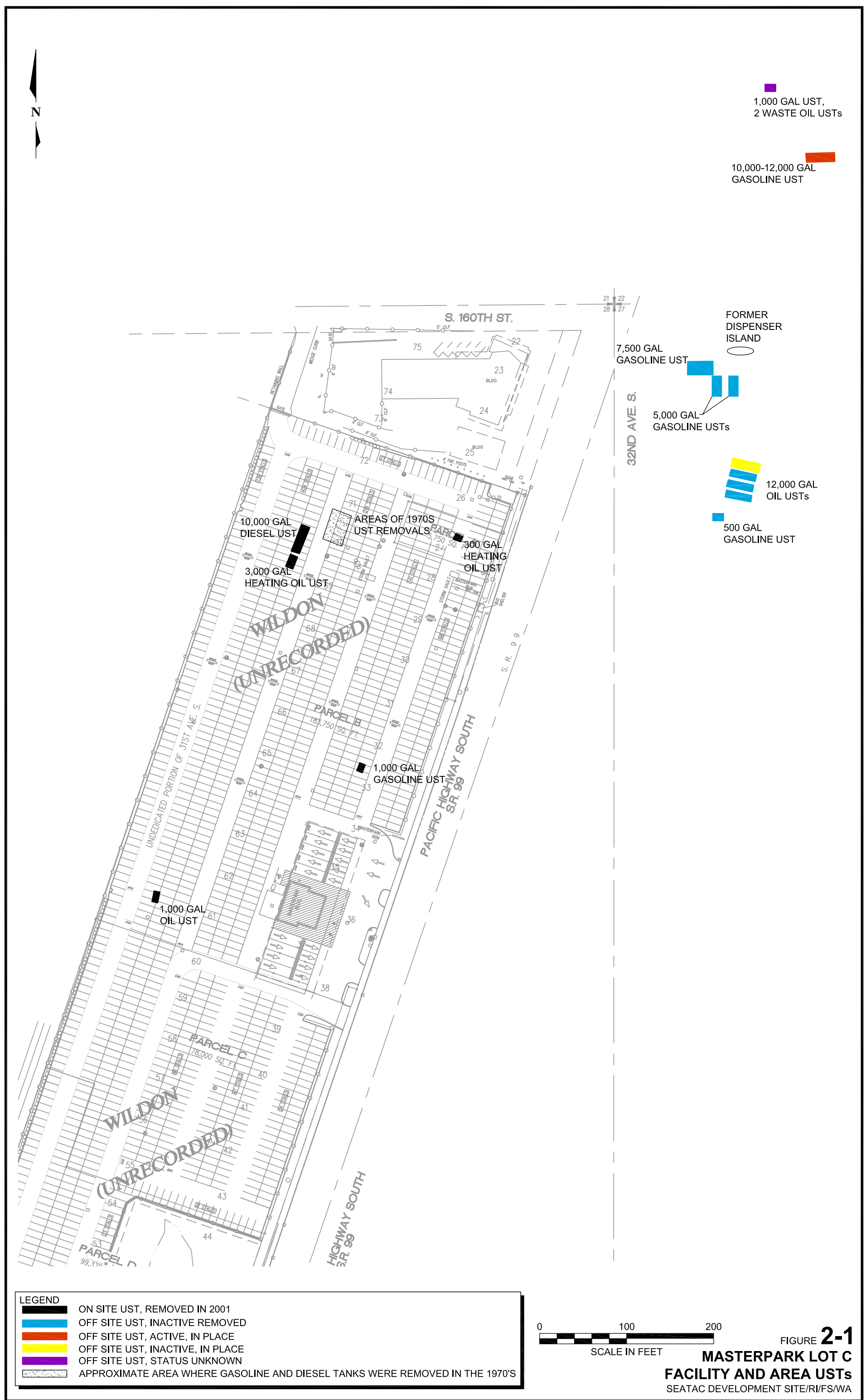


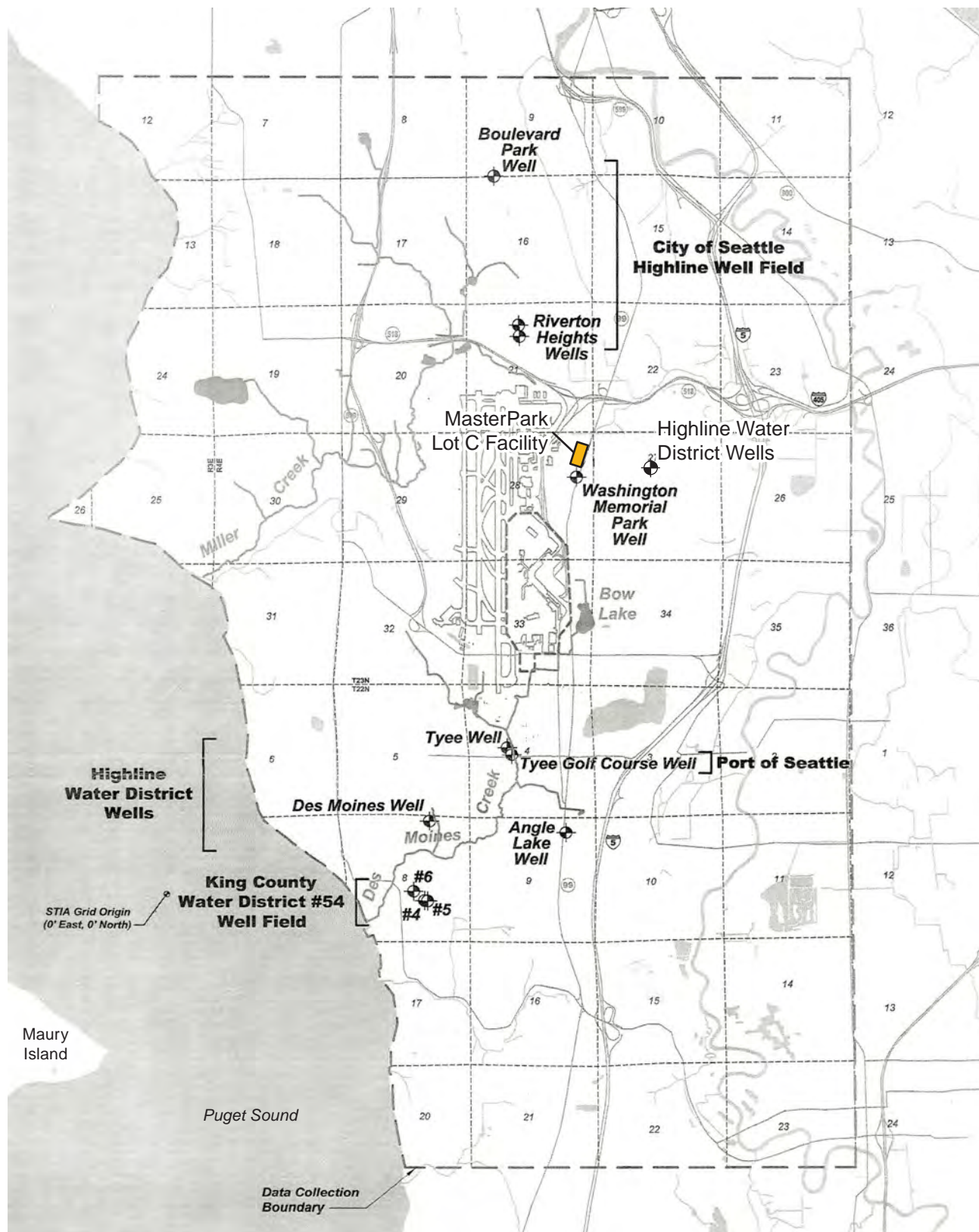
0 2000
SCALE IN FEET



Source: Google Earth Pro

FIGURE **1-1**
SITE LOCATION MAP
SEATAC DEVELOPMENT SITE/RI/FS/WA





LEGEND

- Groundwater Supply Well(s)

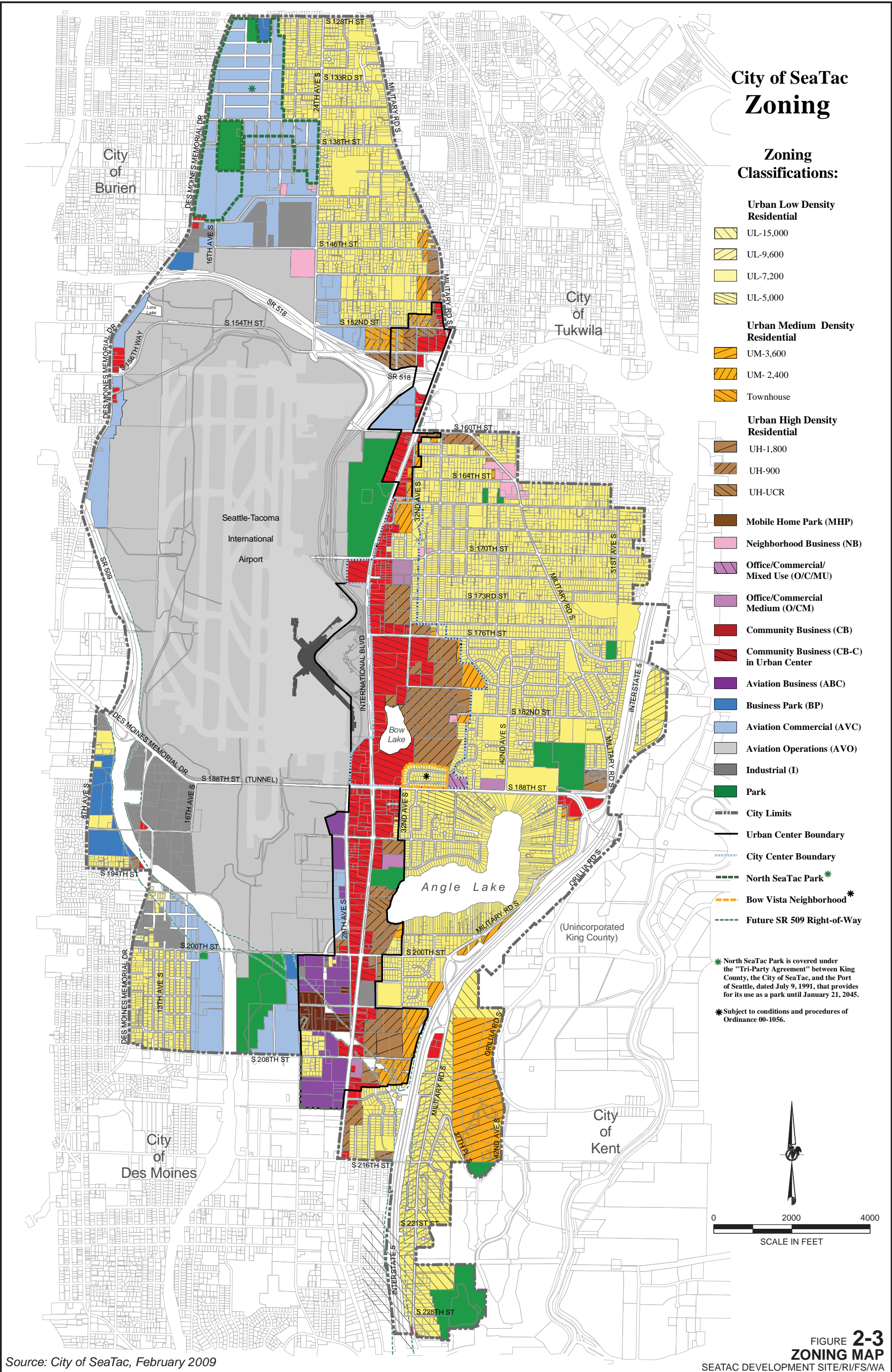
Note: Private drinking water supply wells are not shown on this figure.

Source: Modified from Aspect Consulting
- Draft Groundwater Study Report, 2005



FIGURE **2-2**
**LOCAL GROUNDWATER
SUPPLY WELLS**

SEATAC DEVELOPMENT SITE/RI/FS/WA







LEGEND	
	ON SITE UST, REMOVED IN 2001
	OFF SITE UST, INACTIVE REMOVED
	OFF SITE UST, ACTIVE, IN PLACE
	OFF SITE UST, INACTIVE, IN PLACE
	OFF SITE UST, STATUS UNKNOWN
	APPROXIMATE AREA WHERE GASOLINE AND DIESEL TANKS WERE REMOVED IN THE 1970'S
	GP-4 APPROXIMATE GEOPROBE LOCATIONS
	MW-4 SOIL SAMPLE COLLECTED DURING INSTALLATION OF MONITORING WELL
	SB-04 SOIL BORING



FIGURE **3-2**
2007 SOIL BORINGS
SEATAC DEVELOPMENT SITE/RI/FS/WA

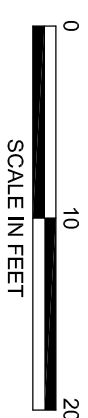
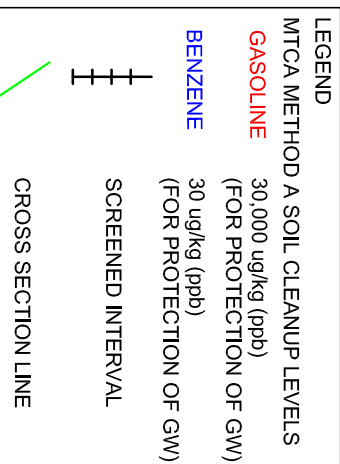
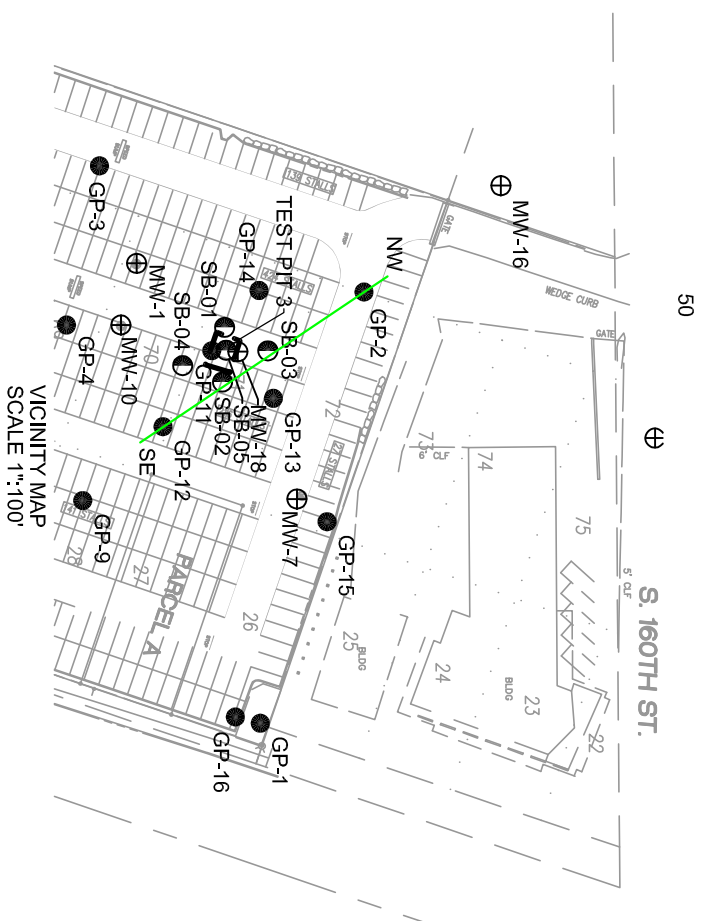
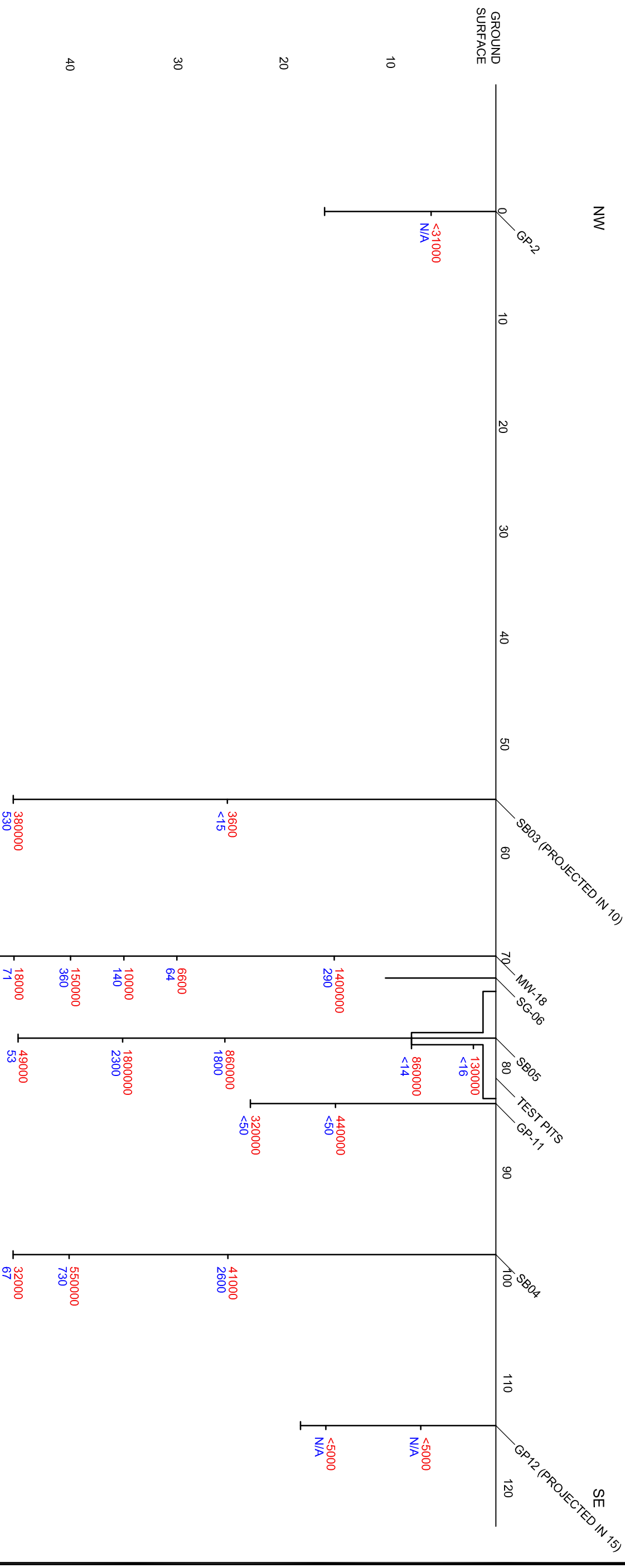


FIGURE 3-3
SOURCE AREA CROSS-SECTION
SEATAC DEVELOPMENT SITE/RI/FSWA

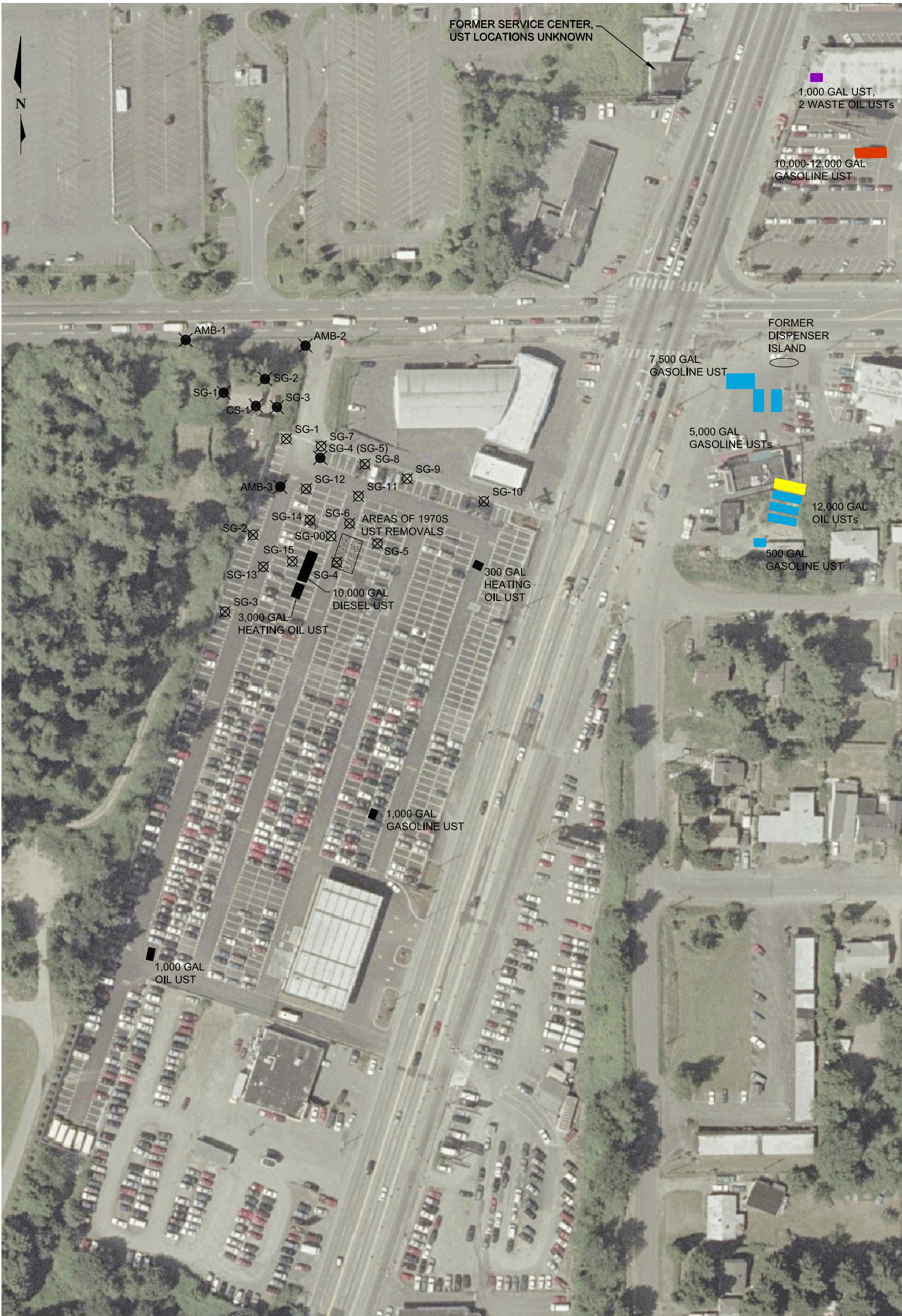


LEGEND:

- MW-5QVA AQUIFER MONITORING WELL LOCATIONS
- MW-2MONITORING WELLS SCREENED IN PERCHED AQUIFER
- PORT MW-1PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)
- TACO TIME DTACO TIME (QVA) MONITORING WELL (ABANDONED)



FIGURE 3-4
MONITORING WELL LOCATIONS
SEATAC DEVELOPMENT SITE/RI/FS/WA

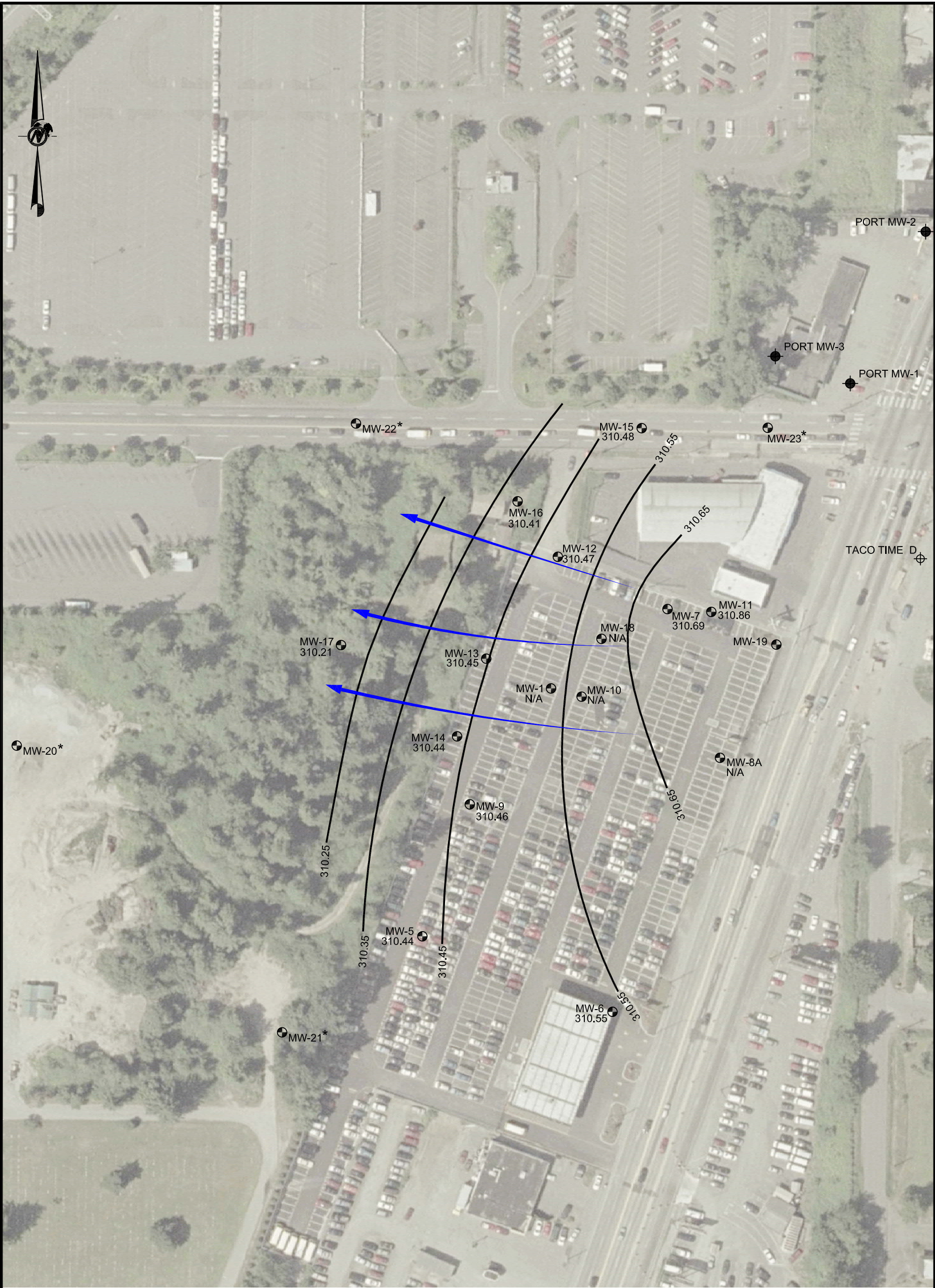


LEGEND

- ON SITE UST, REMOVED IN 2001
- OFF SITE UST, INACTIVE REMOVED
- OFF SITE UST, ACTIVE, IN PLACE
- OFF SITE UST, INACTIVE, IN PLACE
- OFF SITE UST, STATUS UNKNOWN
- APPROXIMATE AREA WHERE GASOLINE AND DIESEL TANKS WERE REMOVED IN THE 1970'S
- SG-1 APPROXIMATE SOIL VAPOR PROBE LOCATIONS (2007)
- SG-1 APPROXIMATE SOIL VAPOR PROBE LOCATIONS (2009)
- (SG-5) DUPLICATE SAMPLE COLLECTED AT SG-4

0 100 200
SCALE IN FEET

FIGURE **3-5**
SOIL VAPOR PROBE LOCATIONS
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND

310.65

GROUNDWATER ELEVATION CONTOUR
(FEET ABOVE MEAN SEA LEVEL ON NOVEMBER 2007)

MW-5
310.44

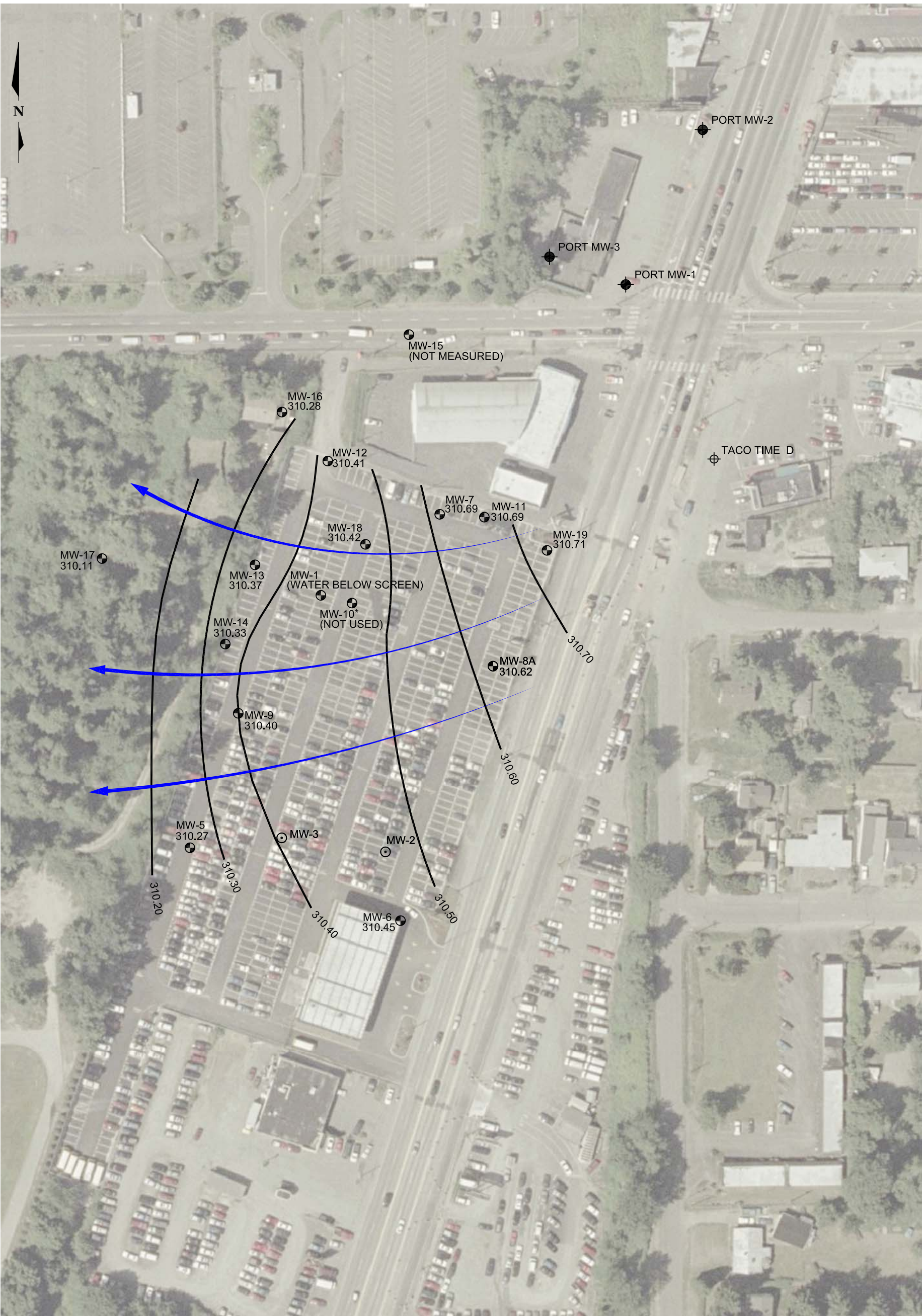
APPROXIMATE MONITORING WELL LOCATIONS AND
GROUNDWATER ELEVATIONS

*

APPROXIMATE DIRECTION OF GROUNDWATER FLOW
NOT INSTALLED UNTIL DECEMBER 2009

0 100 200
SCALE IN FEET

FIGURE **3-6**
GROUNDWATER ELEVATION CONTOUR -
NOVEMBER 2007
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND

MW-10*

NOT USED FOR CONTOURING, THE WELL IS COMPLETED IN A DEEPER PORTION OF AQUIFER

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

310.20

GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL ON FEB. 4, 2008)

MW-5

QVA AQUIFER MONITORING WELL LOCATIONS

MW-2

MONITORING WELLS SCREENED IN PERCHED AQUIFER

PORT MW-1

PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)

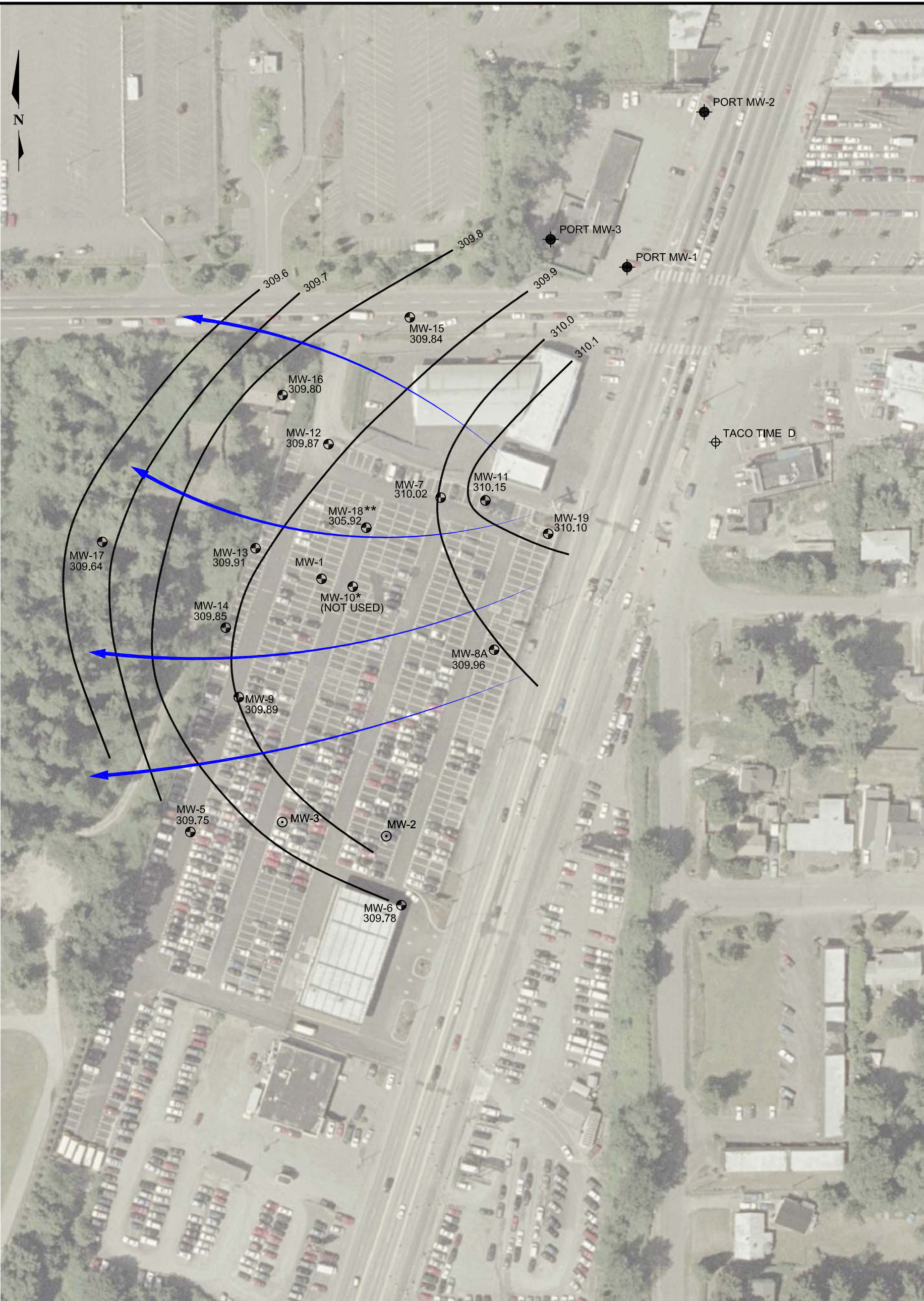
TACO TIME D

TACO TIME (QVA) MONITORING WELL (ABANDONED)

FIGURE **3-7**
GROUNDWATER ELEVATION CONTOUR
FEBURARY 2008
SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\3\073_93368_05_03_F3-7_4-1_4-4.DWG | Fig 3-7 | Mod: 01/27/2010, 09:50 | Plotted: 01/28/2010, 09:29 | SSimmons

Golder Associates



LEGEND

MW-10*

NOT USED FOR CONTOURING, THE WELL IS COMPLETED IN A DEEPER PORTION OF AQUIFER

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

310.20

GROUNDWATER ELEVATION CONTOUR
(FEET ABOVE MEAN SEA LEVEL ON MAY 22, 2009)

MW-5

QVA AQUIFER MONITORING WELL LOCATIONS

MW-2

MONITORING WELLS SCREENED IN PERCHED AQUIFER

PORT MW-1

PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)

TACO TIME D

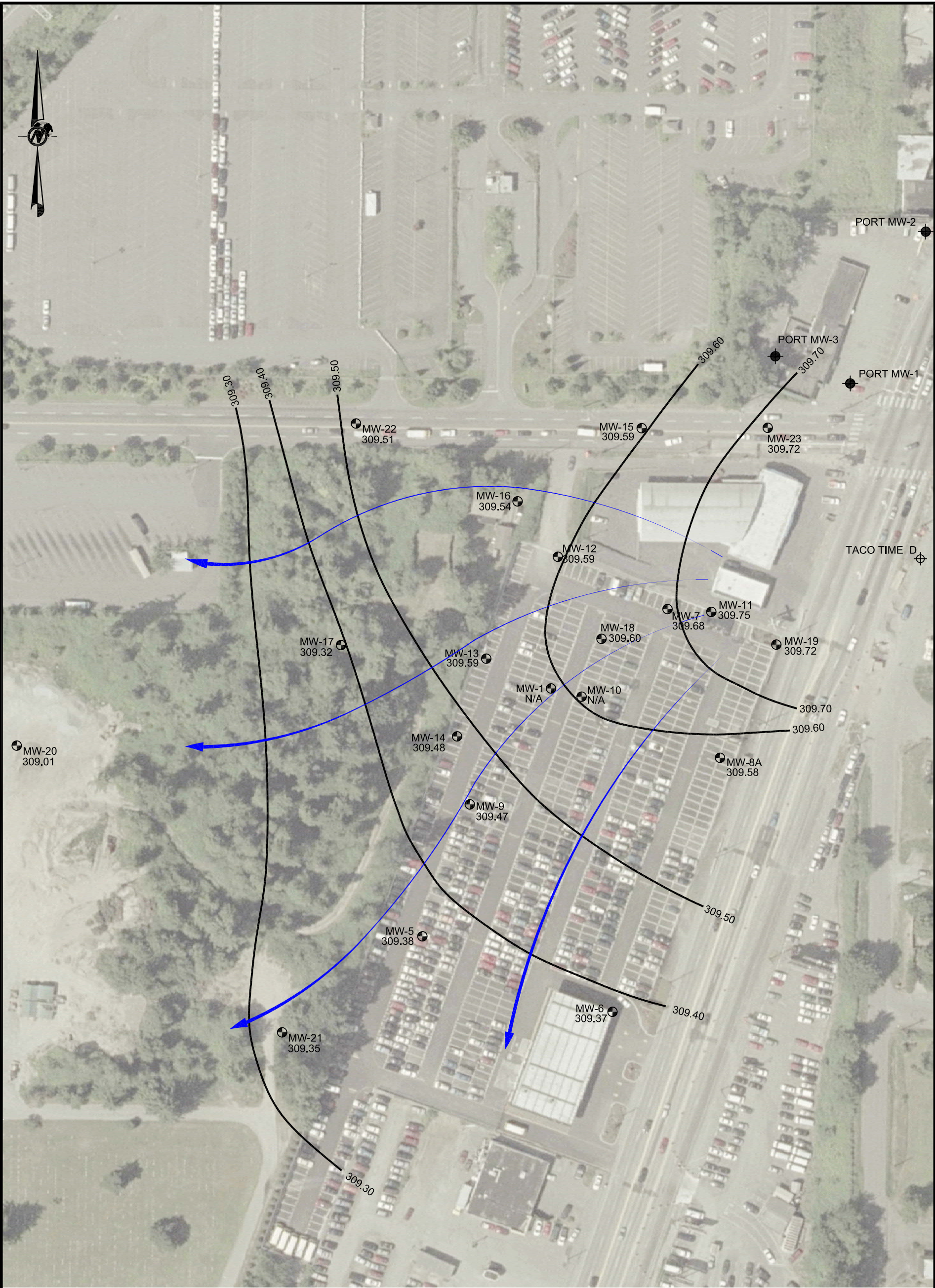
TACO TIME (QVA) MONITORING WELL (ABANDONED)

** NOTE: WATER LEVEL IS SUSPECT. DOES NOT CONFORM WITH SURROUNDING WELLS. ELEVATION NOT USED TO CALCULATE CONTOURS.

FIGURE 3-8
GROUNDWATER ELEVATION CONTOUR - MAY 2009
SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\3\073_93368_05_03_F3-8.DWG | FIG 3-8 | Mod: 01/28/2010, 09:39 | Plotted: 01/28/2010, 14:23 | SSimmons

Golder Associates



LEGEND

- 310.65 GROUNDWATER ELEVATION CONTOUR
(FEET ABOVE MEAN SEA LEVEL ON DECEMBER 2009)
- MW-11 309.75 APPROXIMATE MONITORING WELL LOCATIONS AND
GROUNDWATER ELEVATIONS
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW

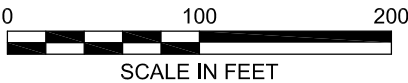
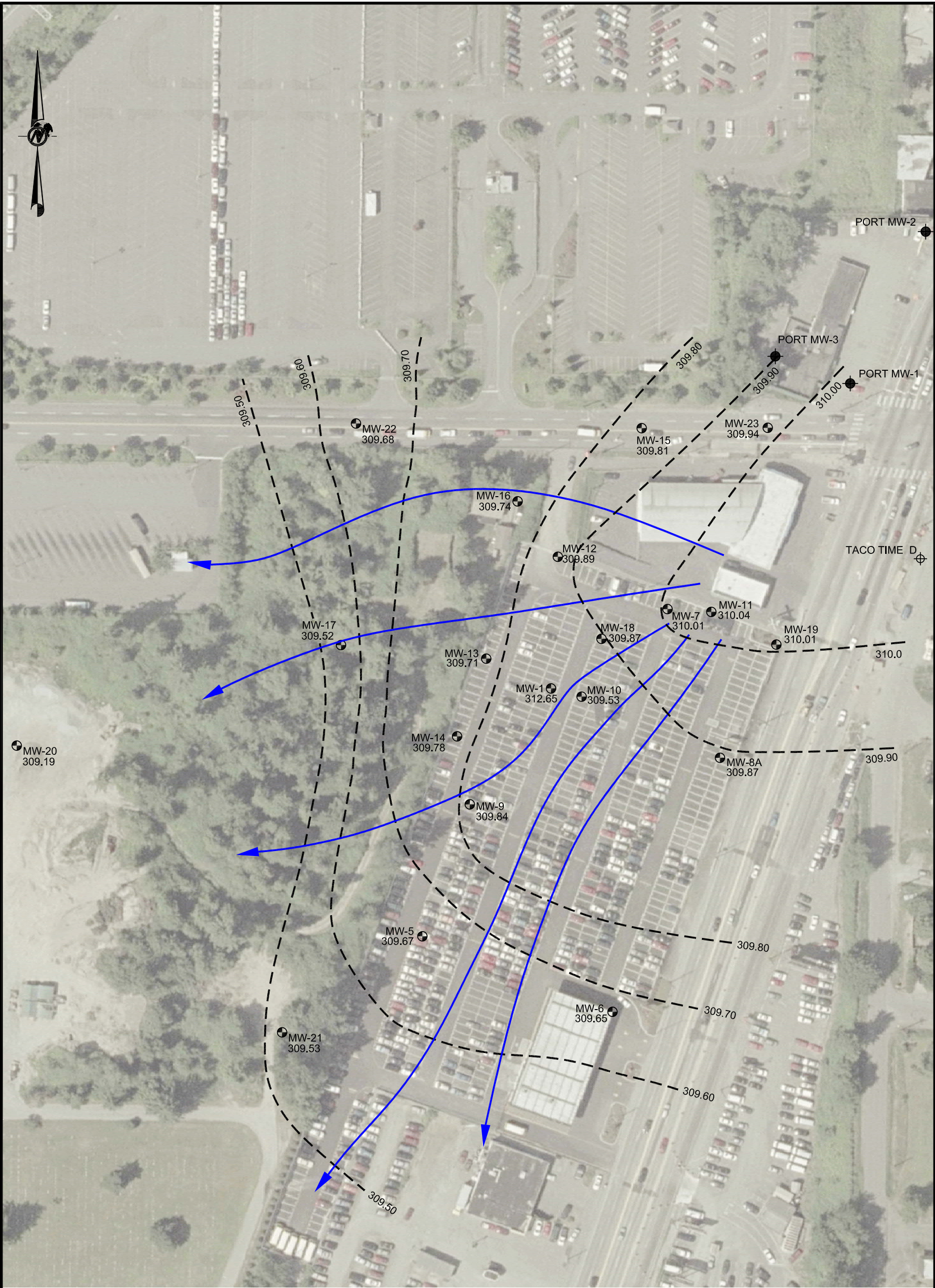


FIGURE **3-9**
GROUNDWATER ELEVATION CONTOUR -
DECEMBER 2009
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND

- 310.70 GROUNDWATER ELEVATION CONTOUR
(FEET ABOVE MEAN SEA LEVEL ON MARCH 2010)
- MW-11 310.04 APPROXIMATE MONITORING WELL LOCATIONS AND
GROUNDWATER ELEVATIONS
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW

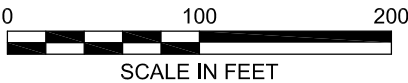


FIGURE **3-10**
GROUNDWATER ELEVATION CONTOUR -
MARCH 2010
SEATAC DEVELOPMENT SITE/RI/FS/WA

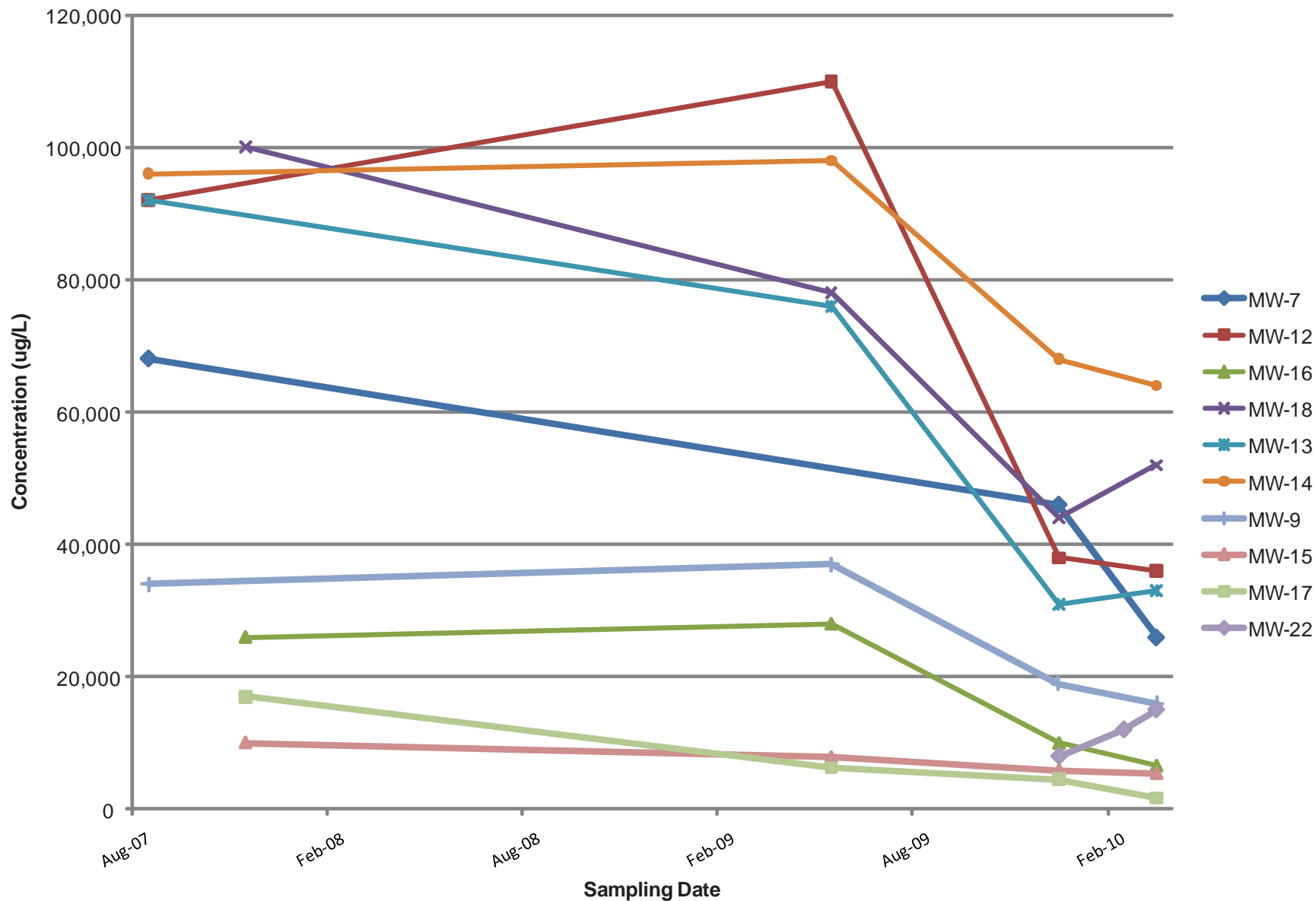


FIGURE 4-1
GASOLINE TREND GRAPH
SEATAC DEVELOPMENT SITE/RI/FS/WA

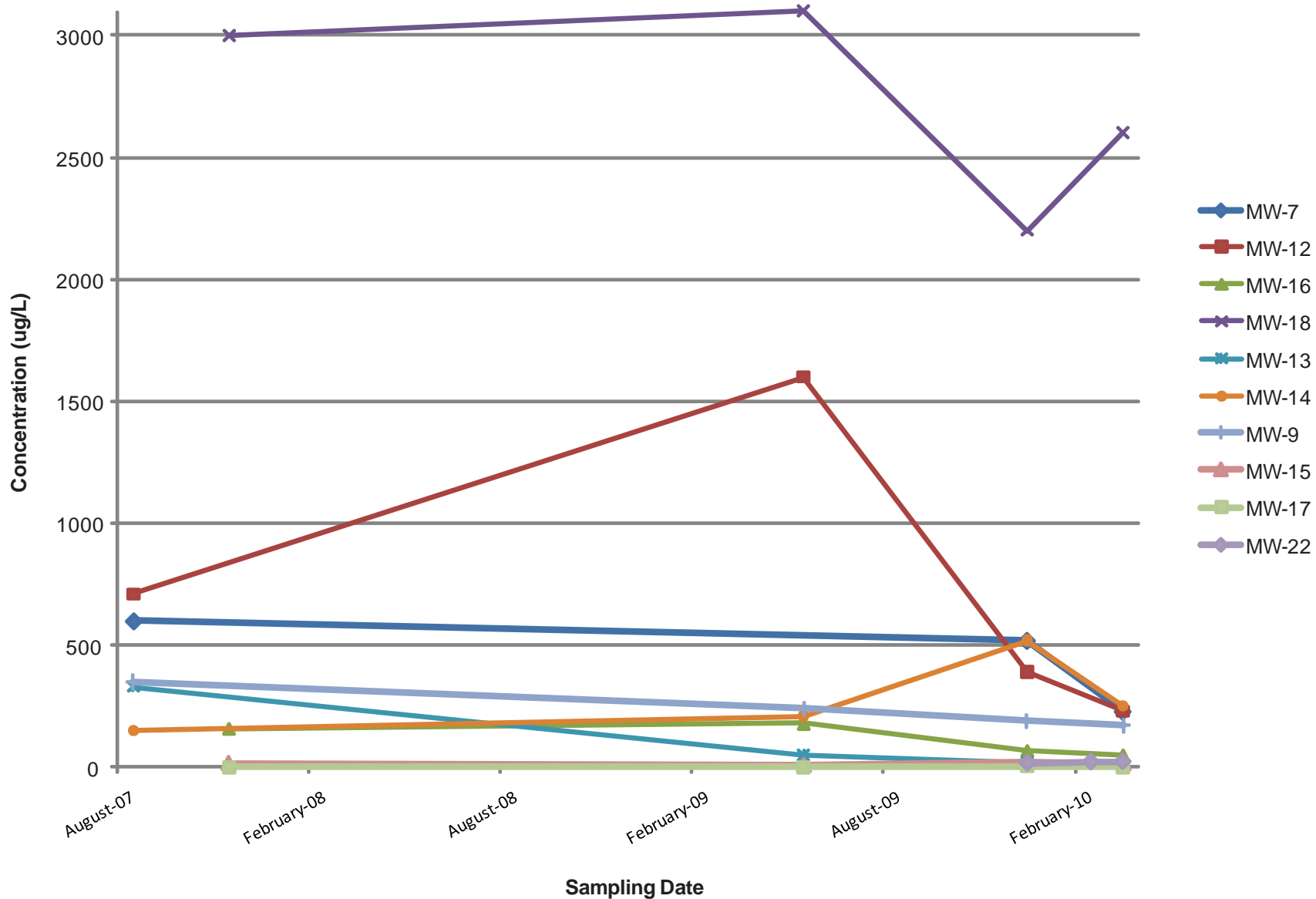


FIGURE 4-2
BENZENE TREND GRAPH
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND

800

● MW-5

○ MW-2

● PORT MW-1

⊕ TACO TIME D

NS

GASOLINE CONCENTRATION CONTOUR (ug/L) 2007-2008

QVA AQUIFER MONITORING WELL LOCATIONS

MONITORING WELLS SCREENED IN PERCHED AQUIFER

PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)

TACO TIME (QVA) MONITORING WELL (ABANDONED)

NOT SAMPLED

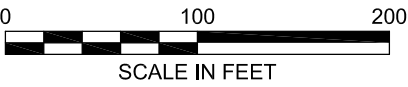
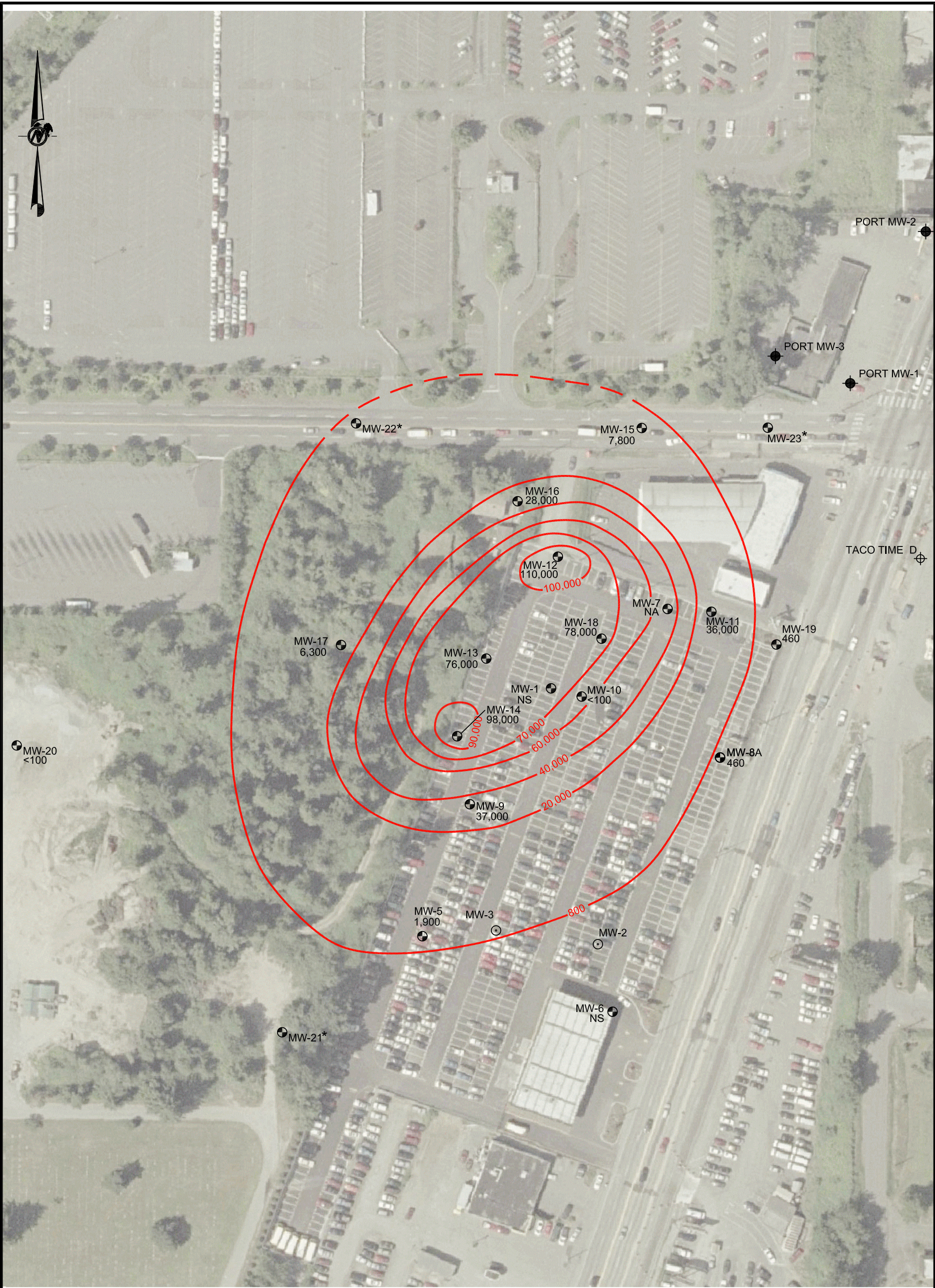


FIGURE **4-3**
2007-2008 GASOLINE
ISOCONCENTRATION CONTOURS
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND:

- | | | |
|------|-------------|--|
| | 1,000 | GASOLINE CONCENTRATION CONTOUR (ug/L) |
| * | | NOT INSTALLED UNTIL DECEMBER 2009 |
| NA = | | NOT ANALYZED |
| NS = | | NOT SAMPLED |
| | MW-5 | QVA AQUIFER MONITORING WELL LOCATIONS |
| | MW-2 | MONITORING WELLS SCREENED IN PERCHED AQUIFER |
| | PORT MW-1 | PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED) |
| | TACO TIME D | TACO TIME (QVA) MONITORING WELL (ABANDONED) |

0 100 200
SCALE IN FEET

FIGURE **4-4**
GASOLINE ISOCONCENTRATION CONTOURS -
MAY 2009
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND:

- | | | |
|------|-------------|--|
| | 800 | GASOLINE CONCENTRATION CONTOUR (ug/L) |
| NS = | | NOT SAMPLED DUE TO INSUFFICIENT WATER VOLUME |
| | MW-5 | QVA AQUIFER MONITORING WELL LOCATIONS |
| | MW-2 | MONITORING WELLS SCREENED IN PERCHED AQUIFER |
| | PORT MW-1 | PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED) |
| | TACO TIME D | TACO TIME (QVA) MONITORING WELL (ABANDONED) |



FIGURE **4-5**
GASOLINE ISOCONCENTRATION CONTOURS -
DECEMBER 2009
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND:

	MW-5	QVA AQUIFER MONITORING WELL LOCATIONS
	MW-2	MONITORING WELLS SCREENED IN PERCHED AQUIFER
	PORT MW-1	PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)
	TACO TIME D	TACO TIME (QVA) MONITORING WELL (ABANDONED)
NS	NOT SAMPLED	
<100	GASOLINE CONCENTRATION VALUE (ug/L)	
	GASOLINE CONCENTRATION CONTOUR (ug/L)	

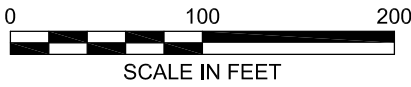
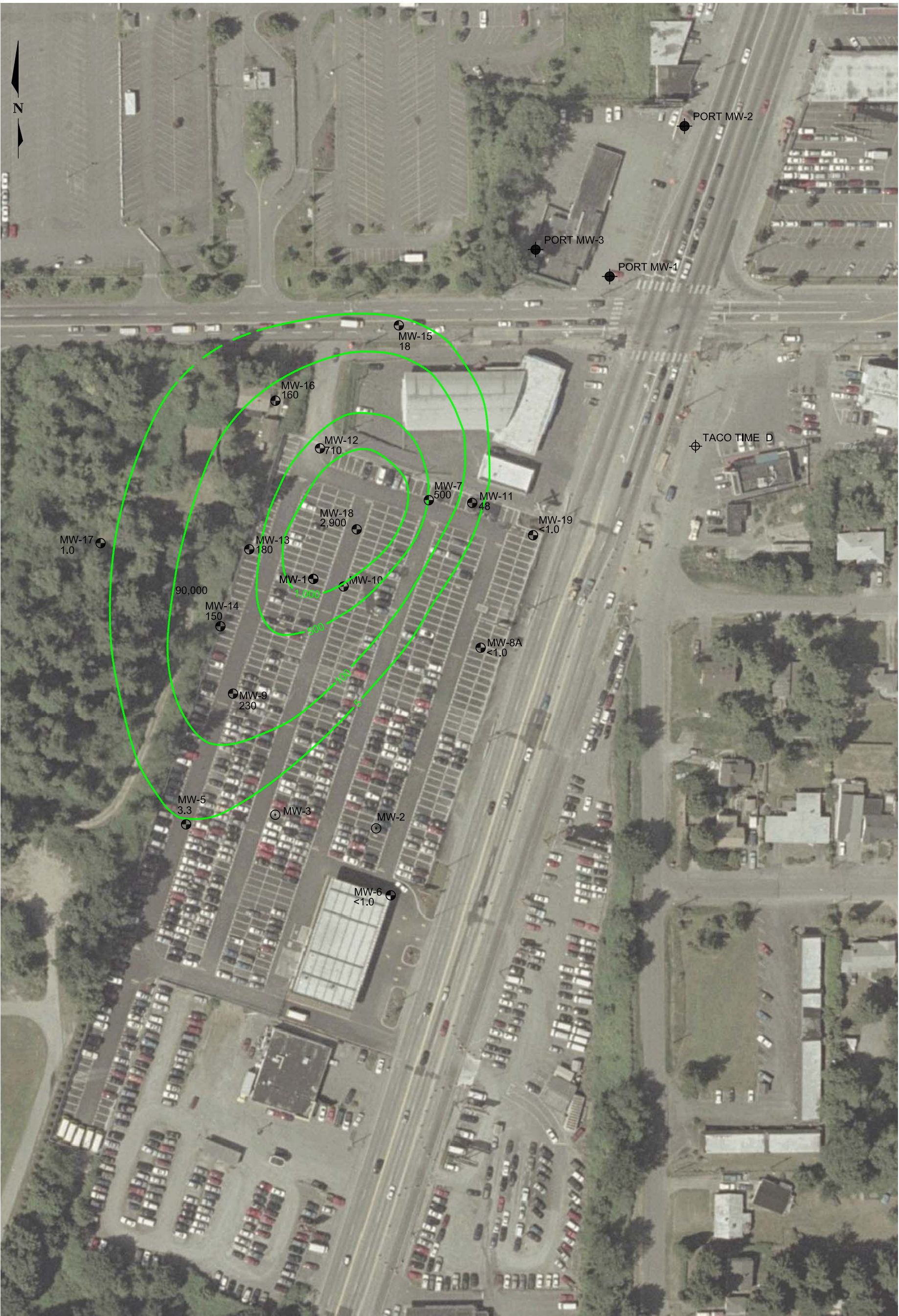


FIGURE **4-6**
GASOLINE ISOCONCENTRATION CONTOURS
MARCH 2010
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND

310.20

BENZENE CONCENTRATION CONTOUR (ug/L) 2007-2008

MW-5

QVA AQUIFER MONITORING WELL LOCATIONS

MW-2

MONITORING WELLS SCREENED IN PERCHED AQUIFER

PORT MW-1

PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)

TACO TIME D

TACO TIME (QVA) MONITORING WELL (ABANDONED)

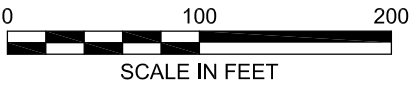
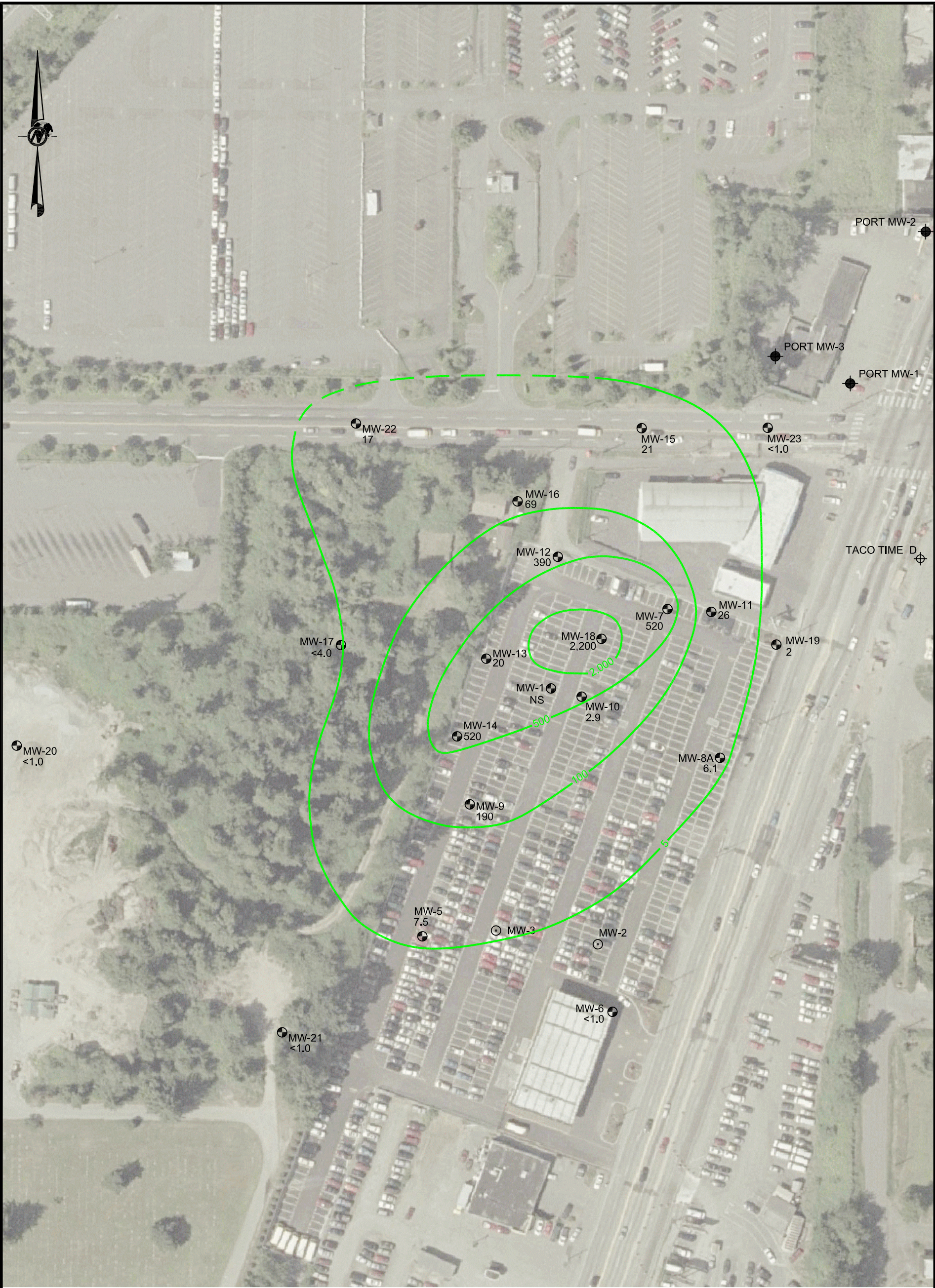


FIGURE **4-7**
2007-2008 BENZENE
ISOCONCENTRATION CONTOURS
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND

MW-5

MW-2

PORT MW-1

TACO TIME D

NS

BENZENE CONCENTRATION CONTOUR (ug/L) DECEMBER 2009

QVA AQUIFER MONITORING WELL LOCATIONS

MONITORING WELLS SCREENED IN PERCHED AQUIFER

PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)

TACO TIME (QVA) MONITORING WELL (ABANDONED)

NOT SAMPLED

FIGURE **4-9**

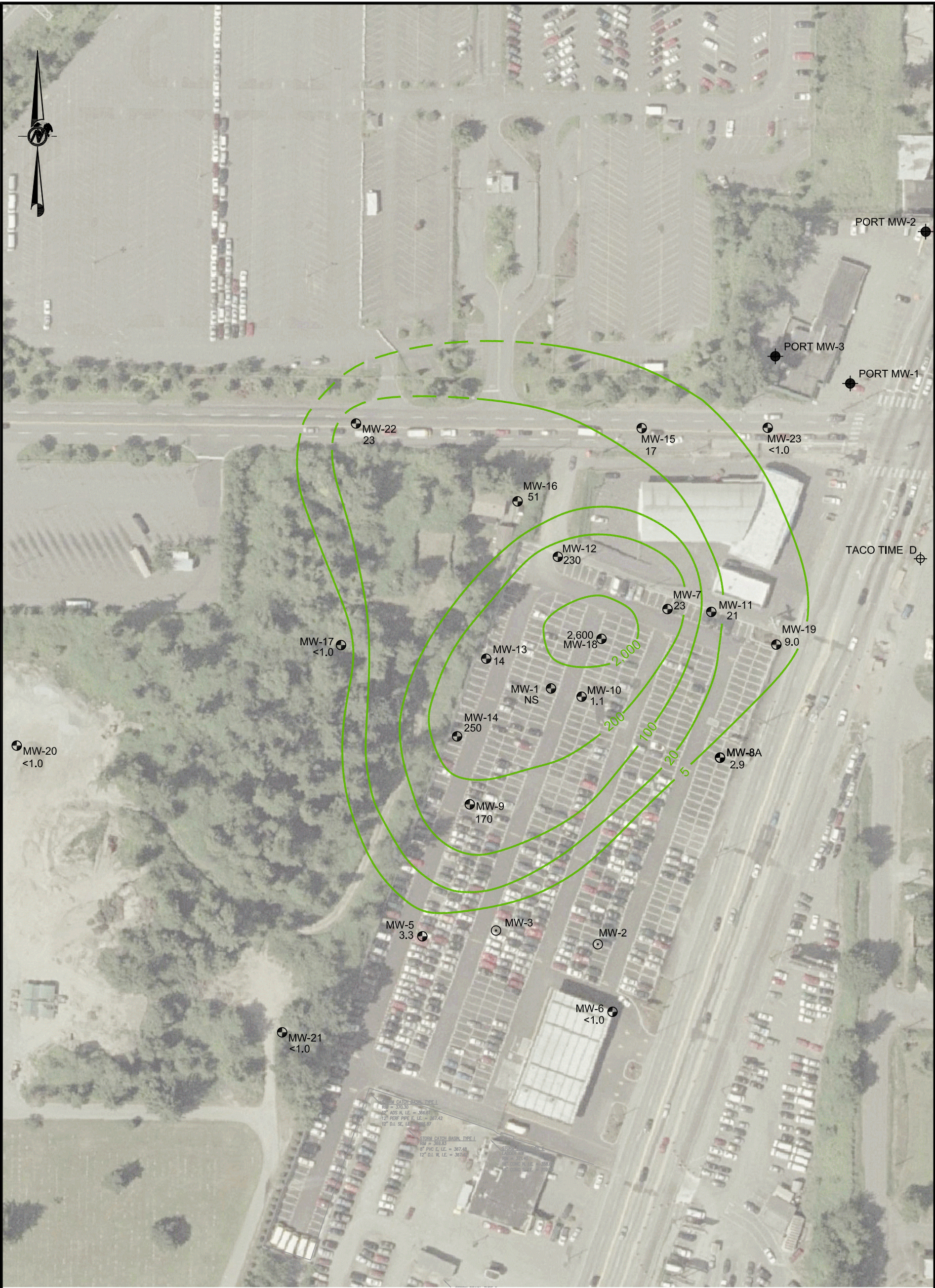
BENZENE ISOCONCENTRATION CONTOURS -

DECEMBER 2009

SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\3\2010-08-02\073_93368_05_3_F4-9.dwg | Fig 4-9 | Mod: 08/02/2010, 12:39 | Plotted: 08/02/2010, 12:49 | Aforlder

Golder Associates

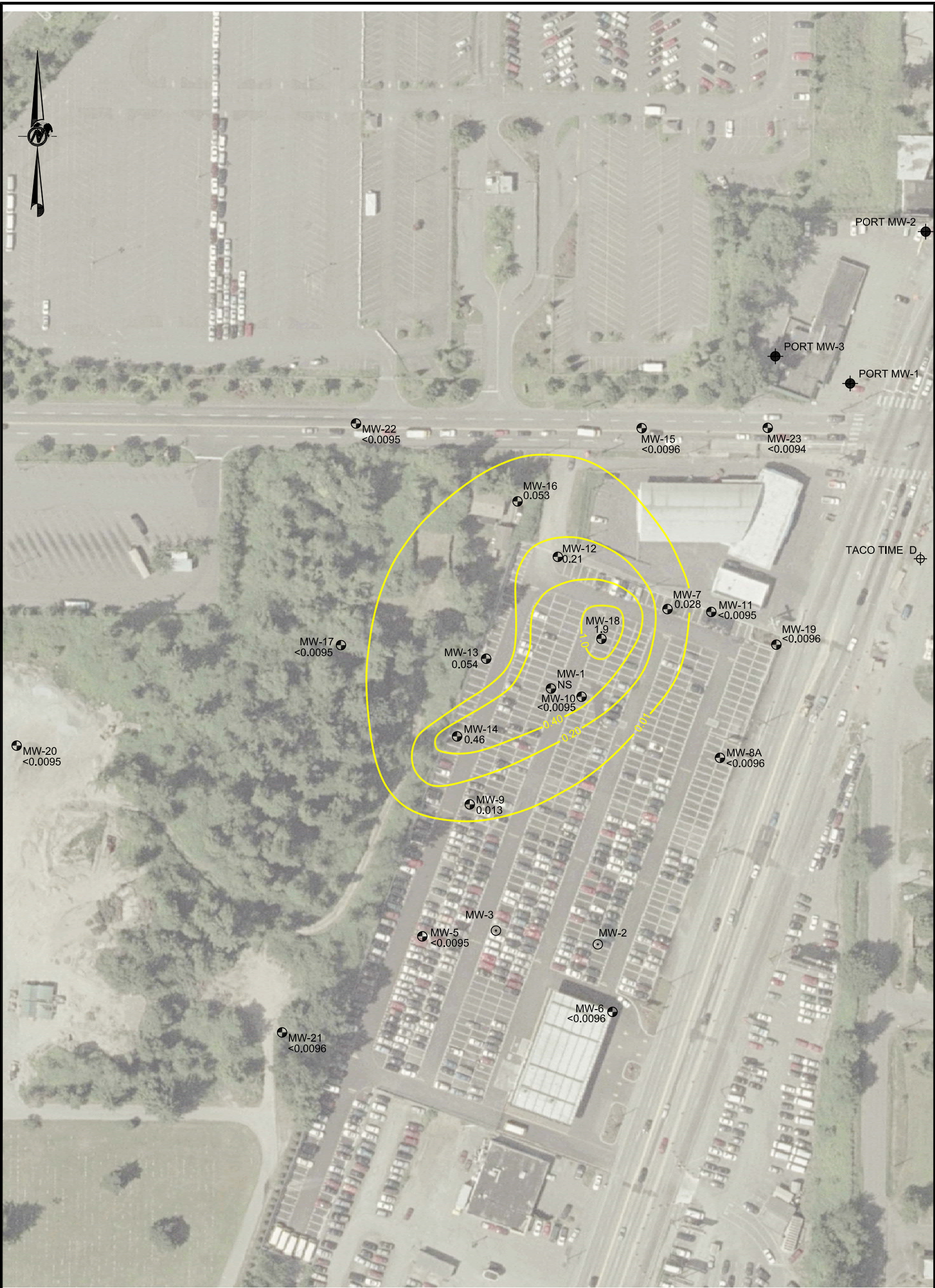


LEGEND:

- | | | |
|------|-------------|--|
| | MW-5 | QVA AQUIFER MONITORING WELL LOCATIONS |
| | MW-2 | MONITORING WELLS SCREENED IN PERCHED AQUIFER |
| | PORT MW-1 | PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED) |
| | TACO TIME D | TACO TIME (QVA) MONITORING WELL (ABANDONED) |
| NS | NS | NOT SAMPLED |
| <0.1 | <0.1 | BENZENE CONCENTRATION VALUE (ug/L) |
| | | BENZENE CONCENTRATION CONTOUR (ug/L) |

0 100 200
SCALE IN FEET

FIGURE **4-10**
BENZENE ISOCONCENTRATION CONTOURS
MARCH 2010
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND:

1.0

EDB CONCENTRATION CONTOUR (ug/L)

MW-5

QVA AQUIFER MONITORING WELL LOCATIONS

MW-2

MONITORING WELLS SCREENED IN PERCHED AQUIFER

PORT MW-1

PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)

TACO TIME D

TACO TIME (QVA) MONITORING WELL (ABANDONED)

NS

NOT SAMPLED

FIGURE **4-11**
EDB ISOCONCENTRATION CONTOURS -
DECEMBER 2009
SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\3\2010-04-02\073_93368_05_3_F4-11.dwg | Fig 4-11 | Mod: 04/14/2010, 09:29 | Plotted: 04/15/2010, 14:27 | afor

Golder Associates

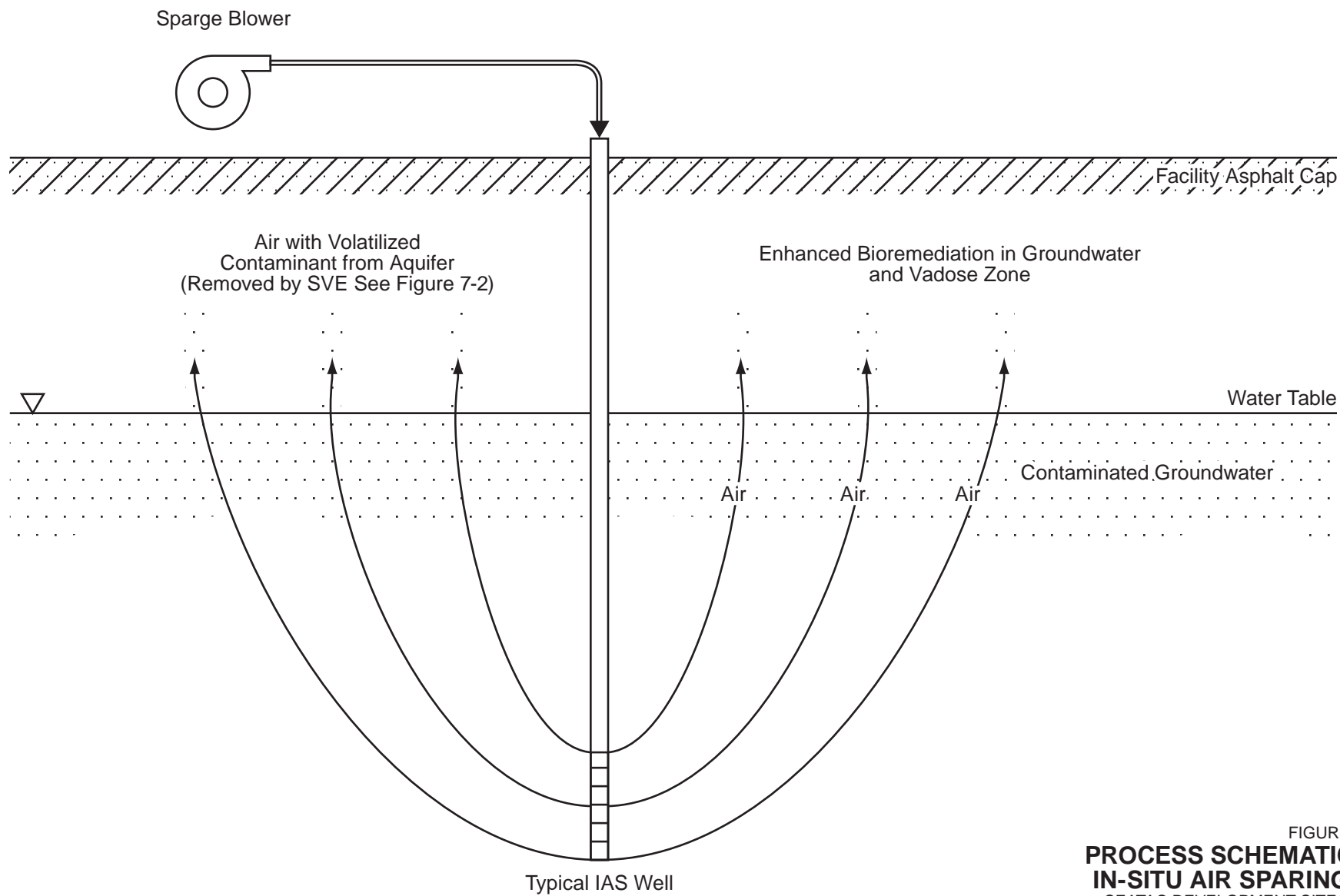


FIGURE **7-1**
**PROCESS SCHEMATIC FOR
 IN-SITU AIR SPARGING (IAS)**
 SEATAC DEVELOPMENT SITE/RI/FS/WA

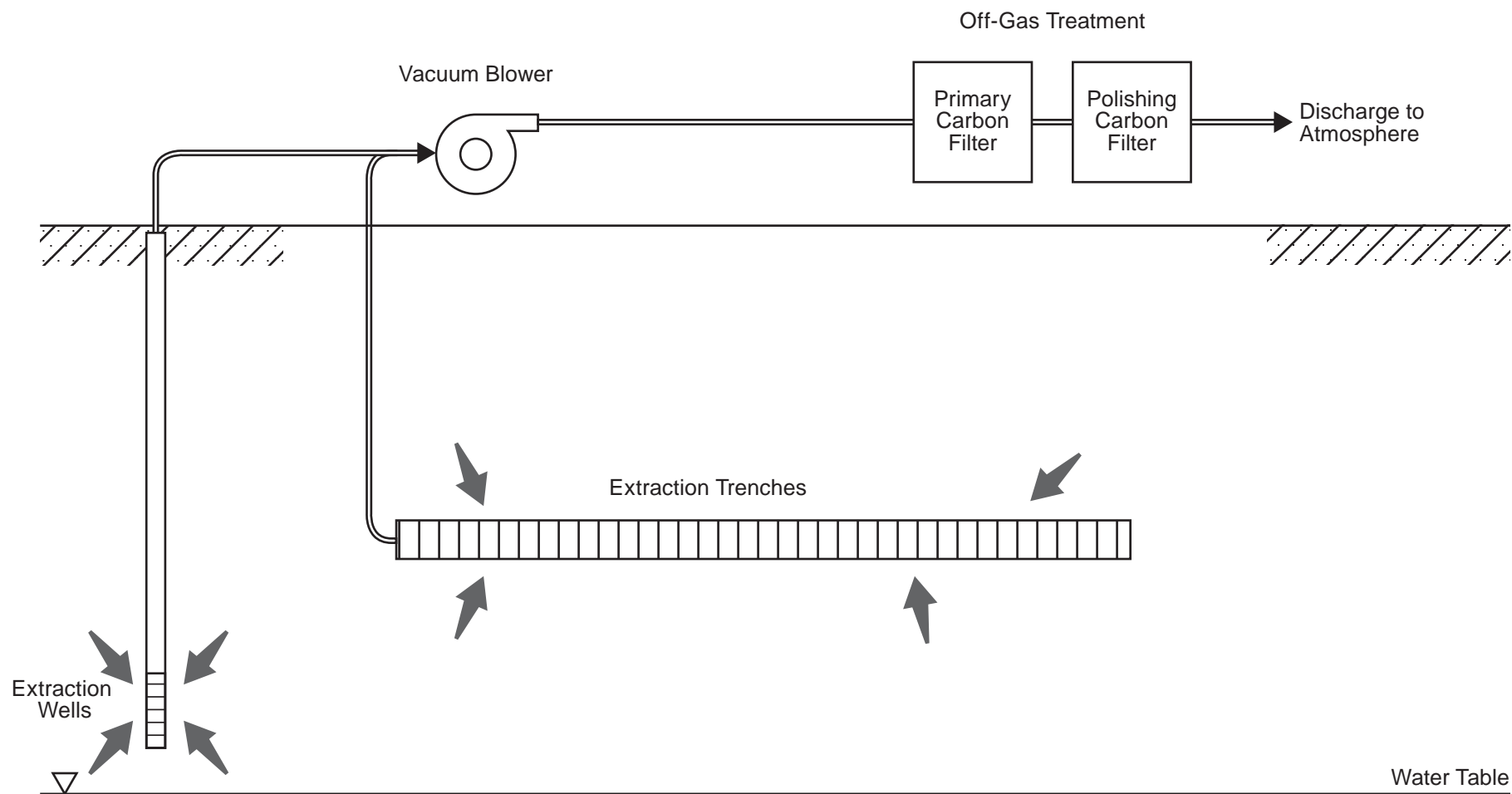


FIGURE 7-2
**PROCESS SCHEMATIC FOR
 SOIL VAPOR EXTRACTION (SVE)**
 SEATAC DEVELOPMENT SITE/RI/FS/WA

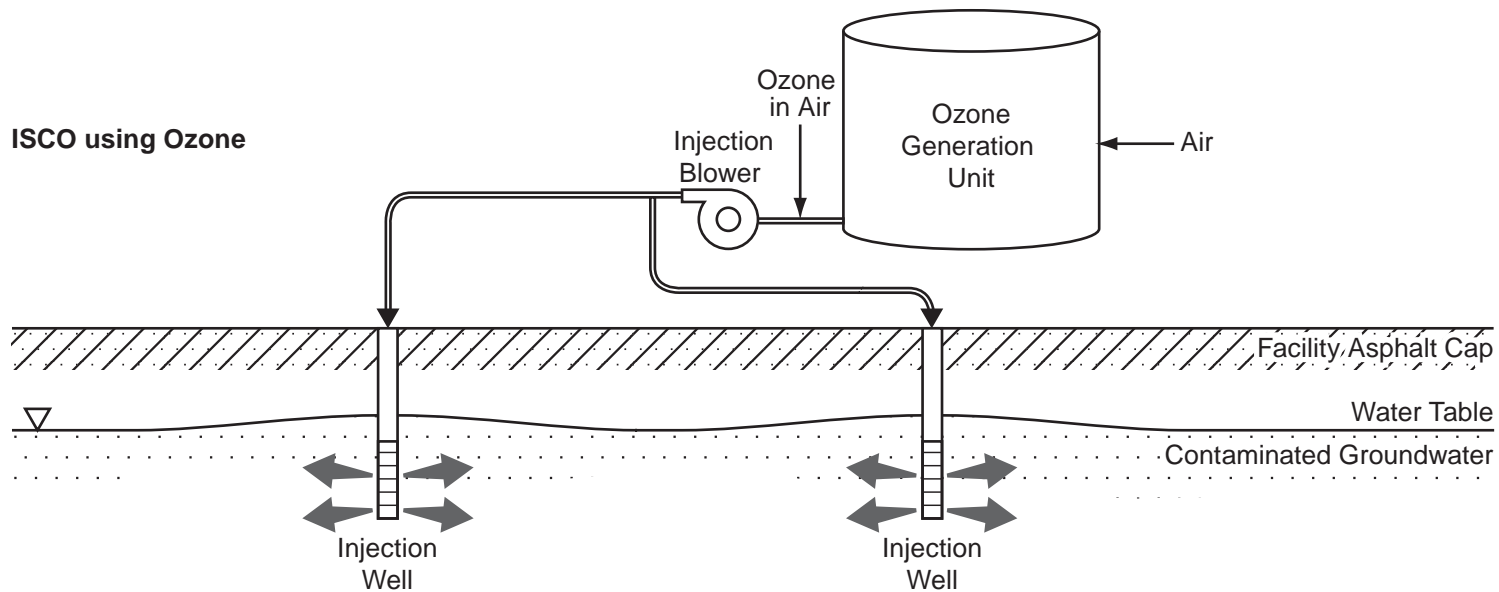
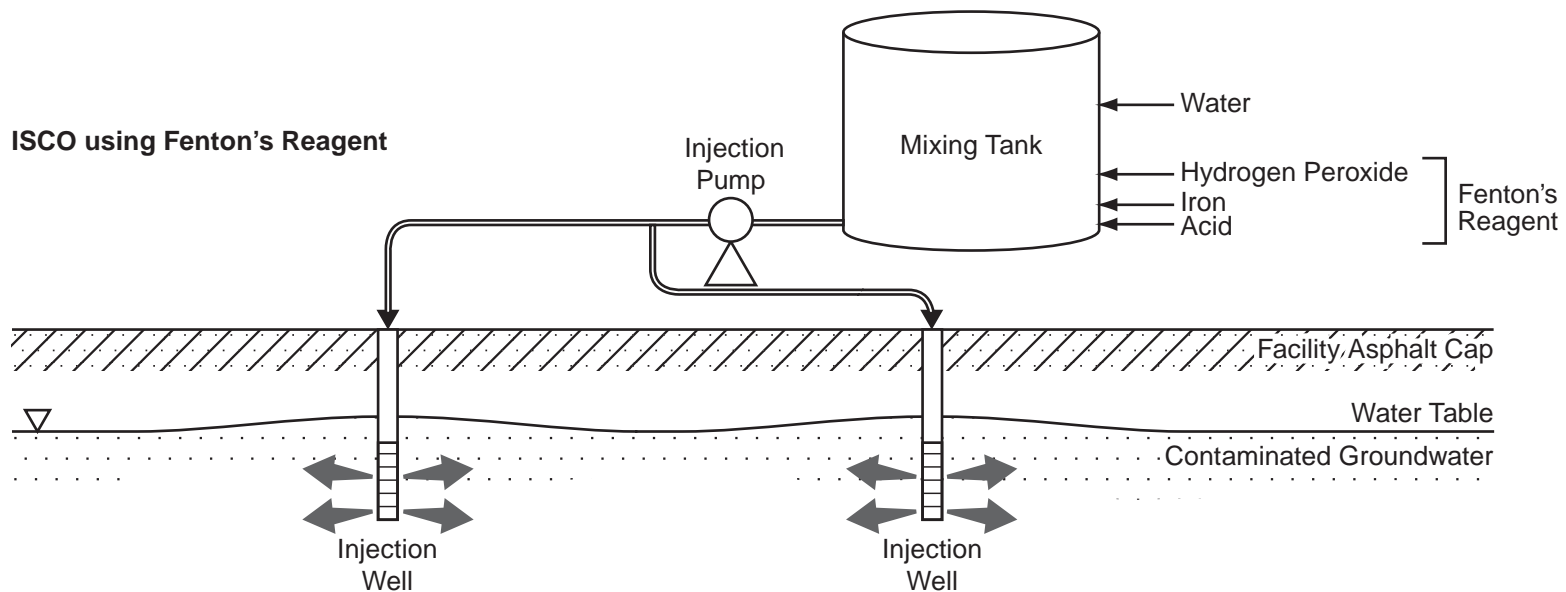


FIGURE **7-3**
PROCESS SCHEMATIC FOR
IN-SITU CHEMICAL OXIDATION (ISCO)
 SEATAC DEVELOPMENT SITE/RI/FS/WA

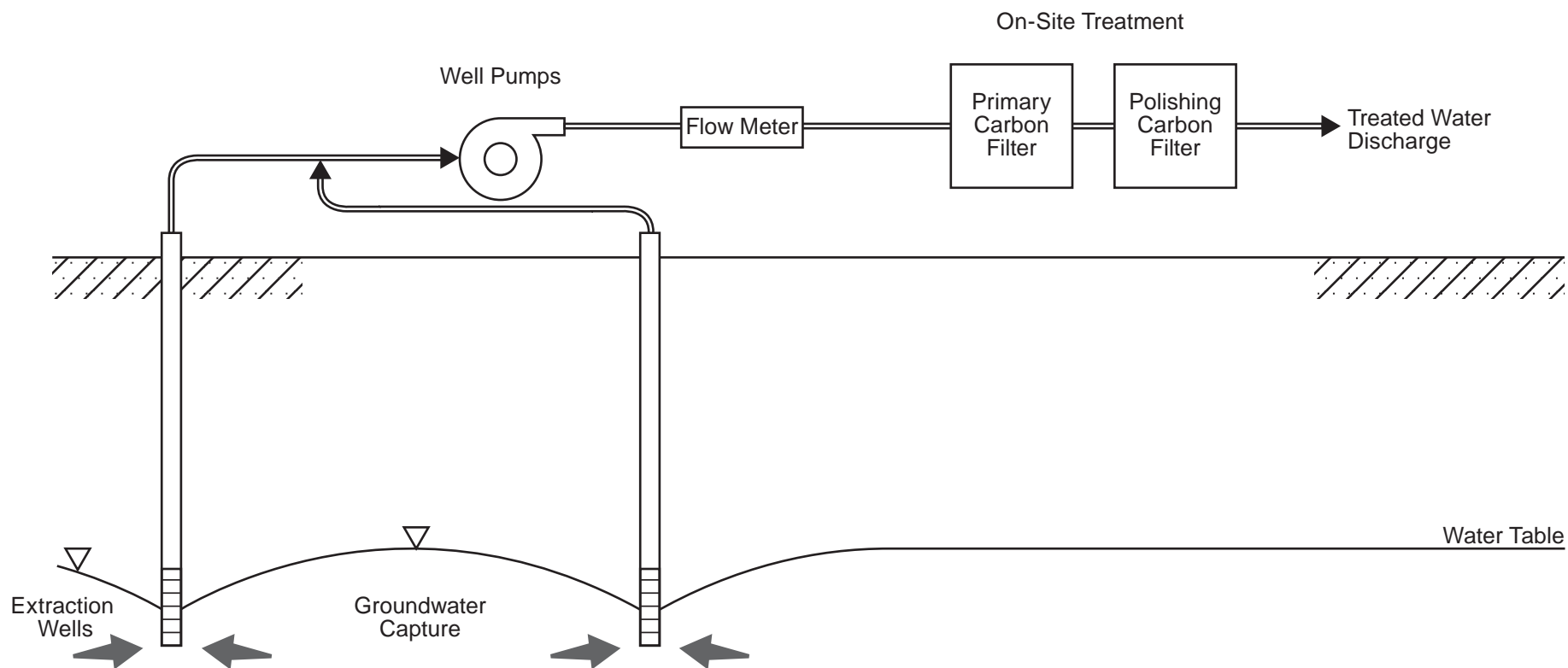
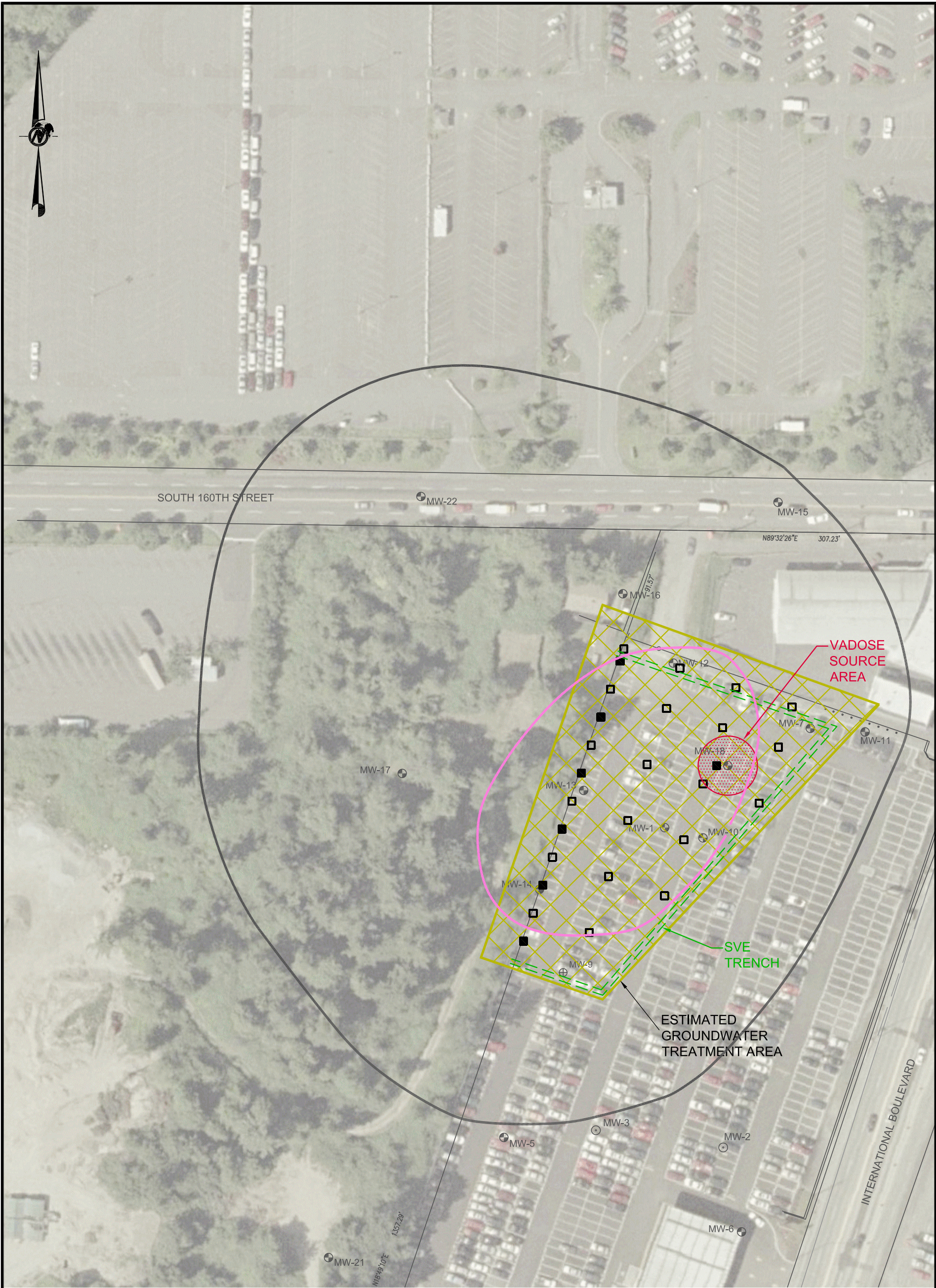


FIGURE **7-4**
PROCESS SCHEMATIC FOR
PUMP-AND-TREAT
 SEATAC DEVELOPMENT SITE/RI/FS/WA



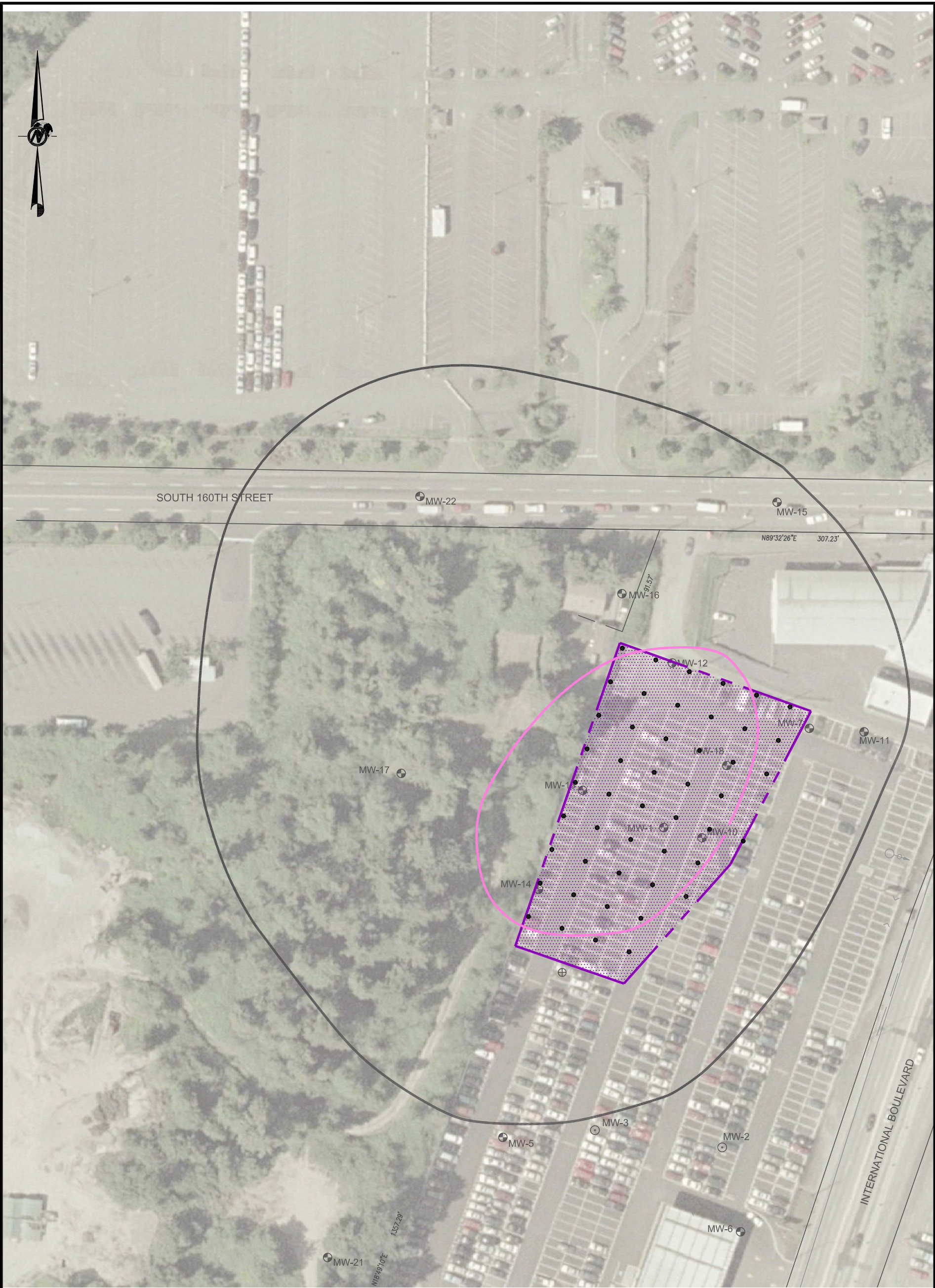
LEGEND:

- | | |
|--|--|
| | AIR SPARGE POINT |
| | SOIL VAPOR EXTRACTION POINT |
| | APPROXIMATE GROUNDWATER HOT SPOT BOUNDARY |
| | APPROXIMATE ENTIRE PLUME BOUNDARY |
| | SVE TRENCH |
| | GROUNDWATER TREATMENT AREA |
| | QVA AQUIFER MONITORING WELL LOCATIONS |
| | MONITORING WELLS SCREENED IN PERCHED AQUIFER |

NOTES:
PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A
CLEANUP LEVEL FOR GASOLINE RANGE PETROLEUM HYDROCARBONS (800ug/L)



FIGURE **7-5**
FOCUSED IAS-SVE
LAYOUT FOR ALTERNATIVE A
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND:

- ISCO INJECTION POINT
- ISCO INJECTION AREA
- APPROXIMATE GROUNDWATER HOT SPOT BOUNDARY
- APPROXIMATE PLUME BOUNDARY
- QVA AQUIFER MONITORING WELL LOCATIONS
- MONITORING WELLS SCREENED IN PERCHED AQUIFER

NOTES:

PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A CLEANUP LEVEL FOR GASOLINE RANGE PETROLEUM HYDROCARBONS (800ug/L)

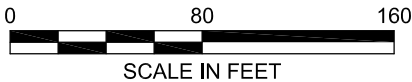
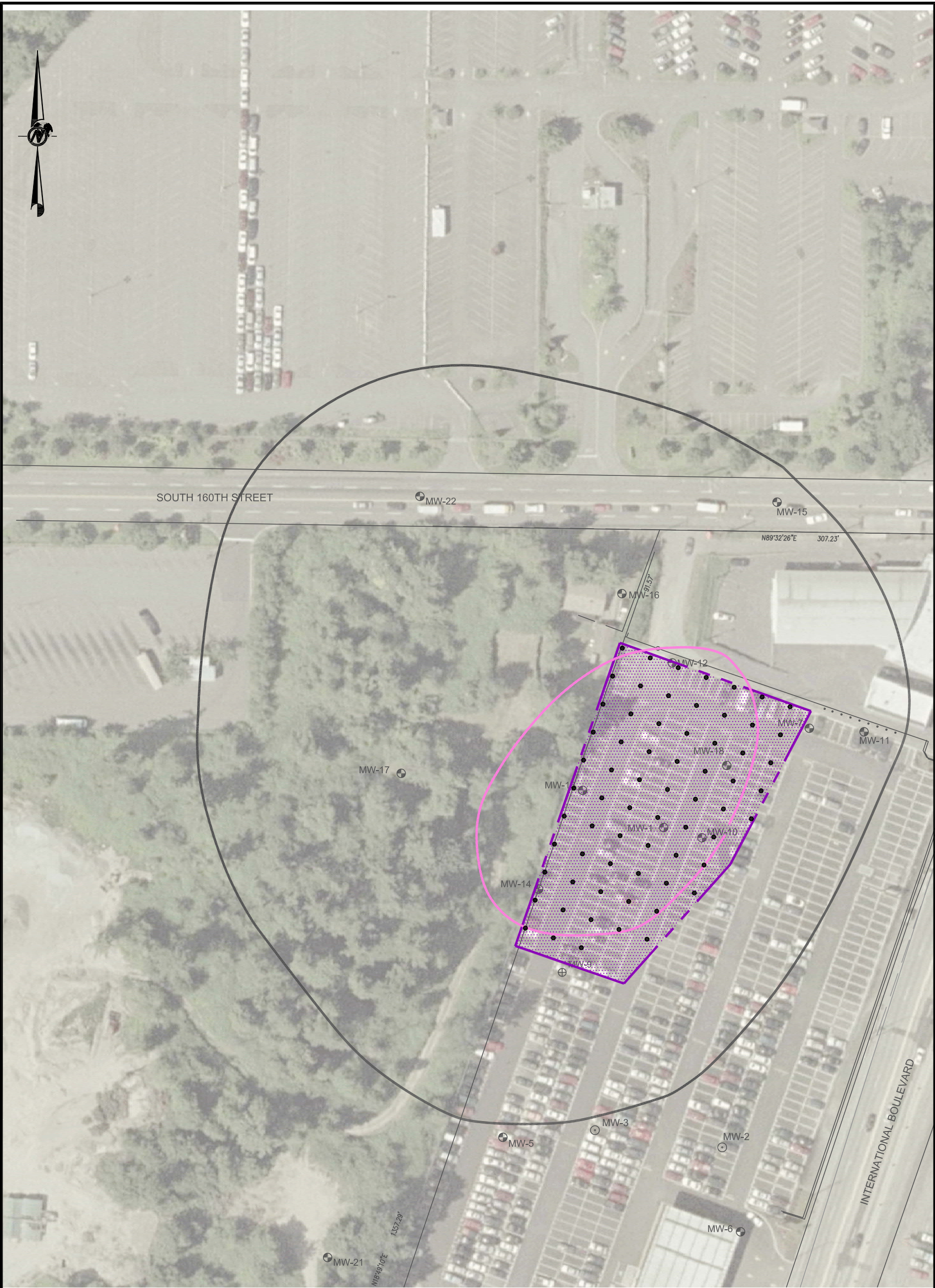


FIGURE **7-6a**

**FOCUSED ISCO USING OZONE
LAYOUT FOR ALTERNATIVE B**
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND:

ISCO INJECTION POINT

ISCO INJECTION AREA

APPROXIMATE GROUNDWATER HOT SPOT BOUNDARY

APPROXIMATE PLUME BOUNDARY

MW-5
QVA AQUIFER MONITORING WELL LOCATIONS

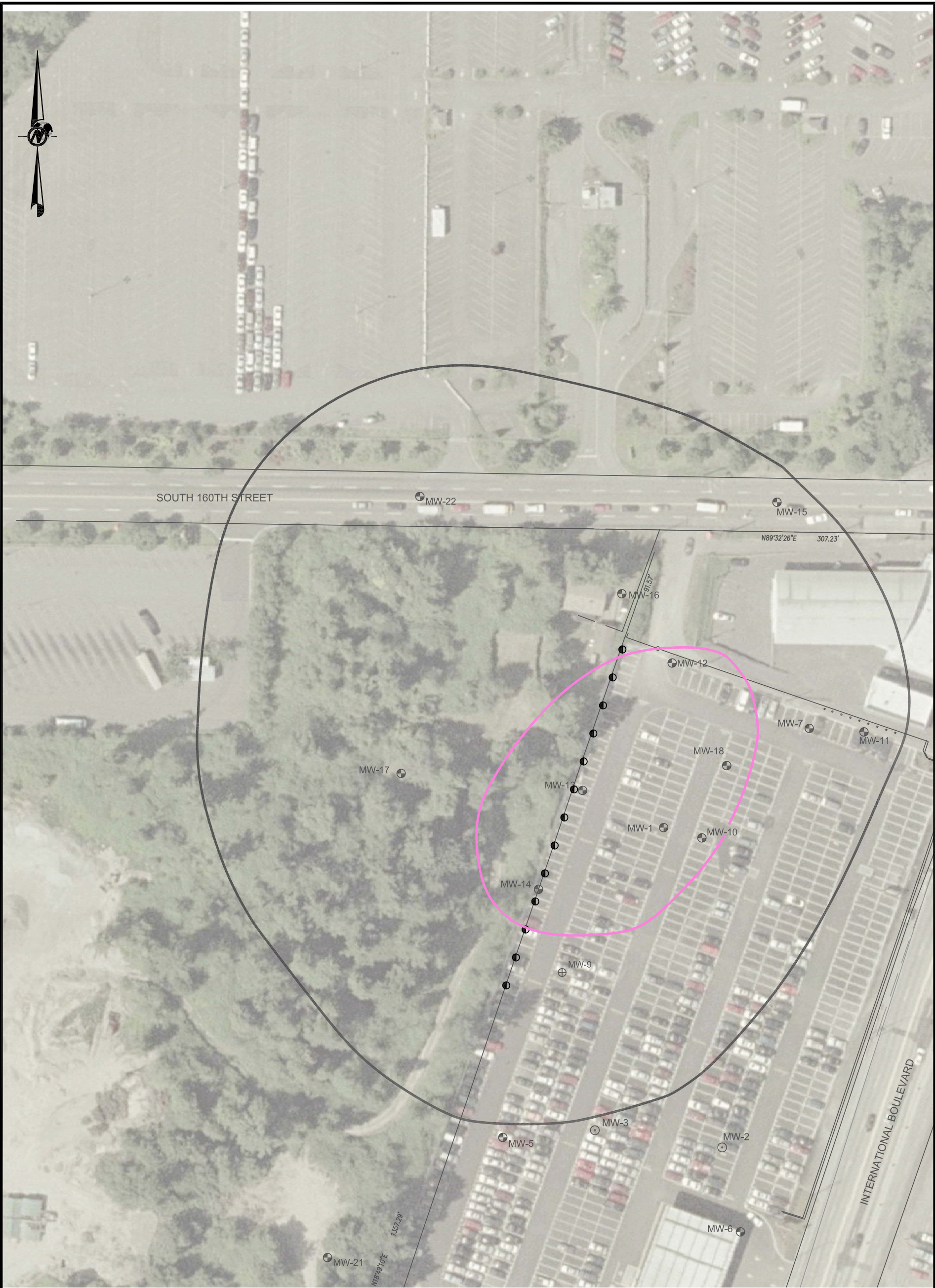
MW-2
MONITORING WELLS SCREENED IN PERCHED AQUIFER

NOTES:
PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A
CLEANUP LEVEL FOR GASOLINE RANGE PETROLEUM HYDROCARBONS (800ug/L)

FIGURE **7-6b**
FOCUSED ISCO WITH FENTON'S REAGENT
LAYOUT FOR ALTERNATIVE B
SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\3\073_93368_05_03_F7-5 to F7-10r3.dwg | Fig 7-6b | Mod: 06/08/2010, 09:33 | Plotted: 06/08/2010, 11:14 | aforcier

Golder Associates



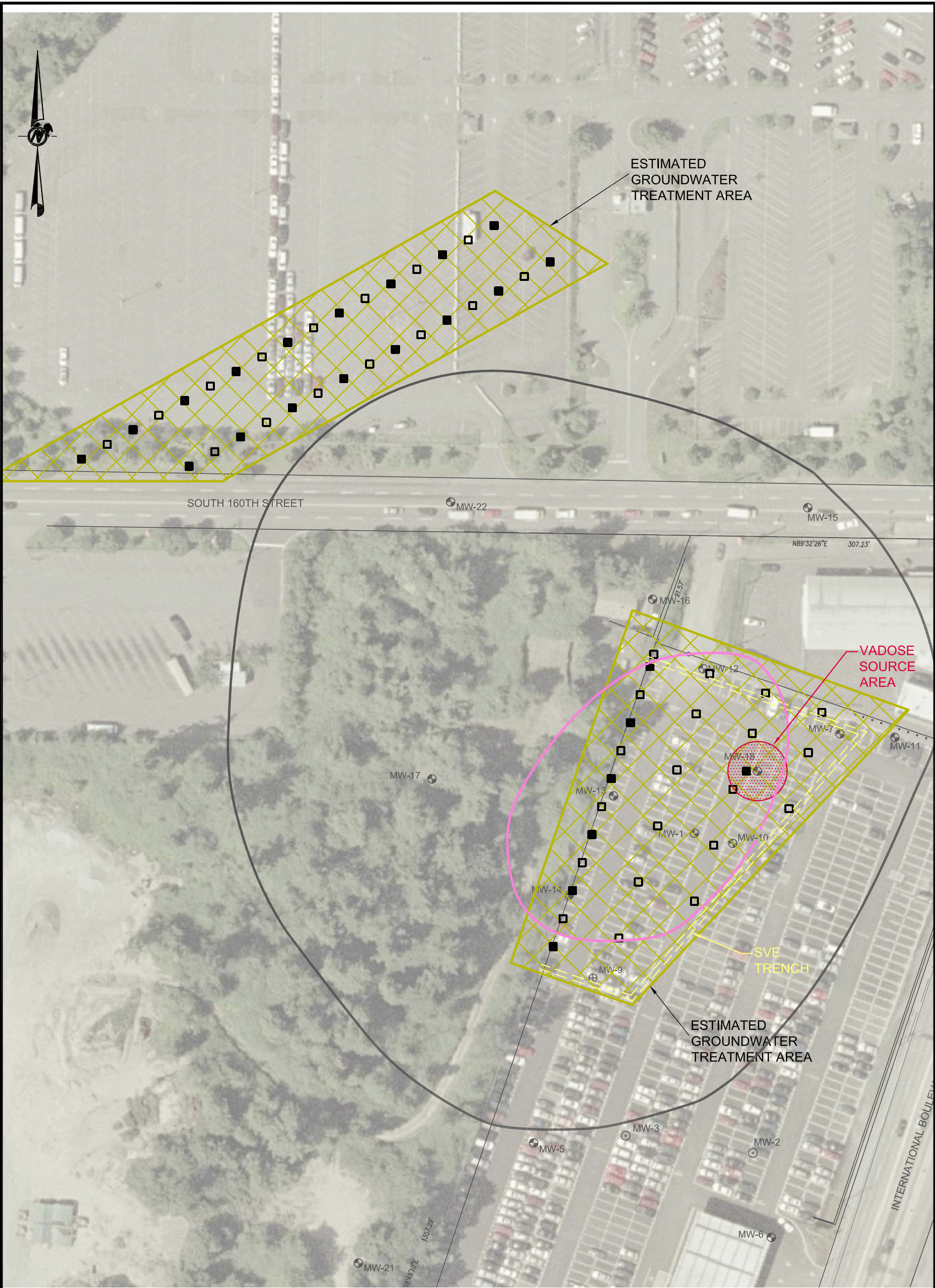
LEGEND:

- GROUNDWATER EXTRACTION WELL
- APPROXIMATE GROUNDWATER HOT SPOT BOUNDARY
- APPROXIMATE PLUME BOUNDARY
- MW-5 QVA AQUIFER MONITORING WELL LOCATIONS
- MW-2 MONITORING WELLS SCREENED IN PERCHED AQUIFER

NOTES:
PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A
CLEANUP LEVEL FOR GASOLINE RANGE PETROLEUM HYDROCARBONS (800ug/L)



FIGURE 7-7
FOCUSED GROUNDWATER PUMP-AND-TREAT
LAYOUT FOR ALTERNATIVE C
SEATAC DEVELOPMENT SITE/RI/FS/WA



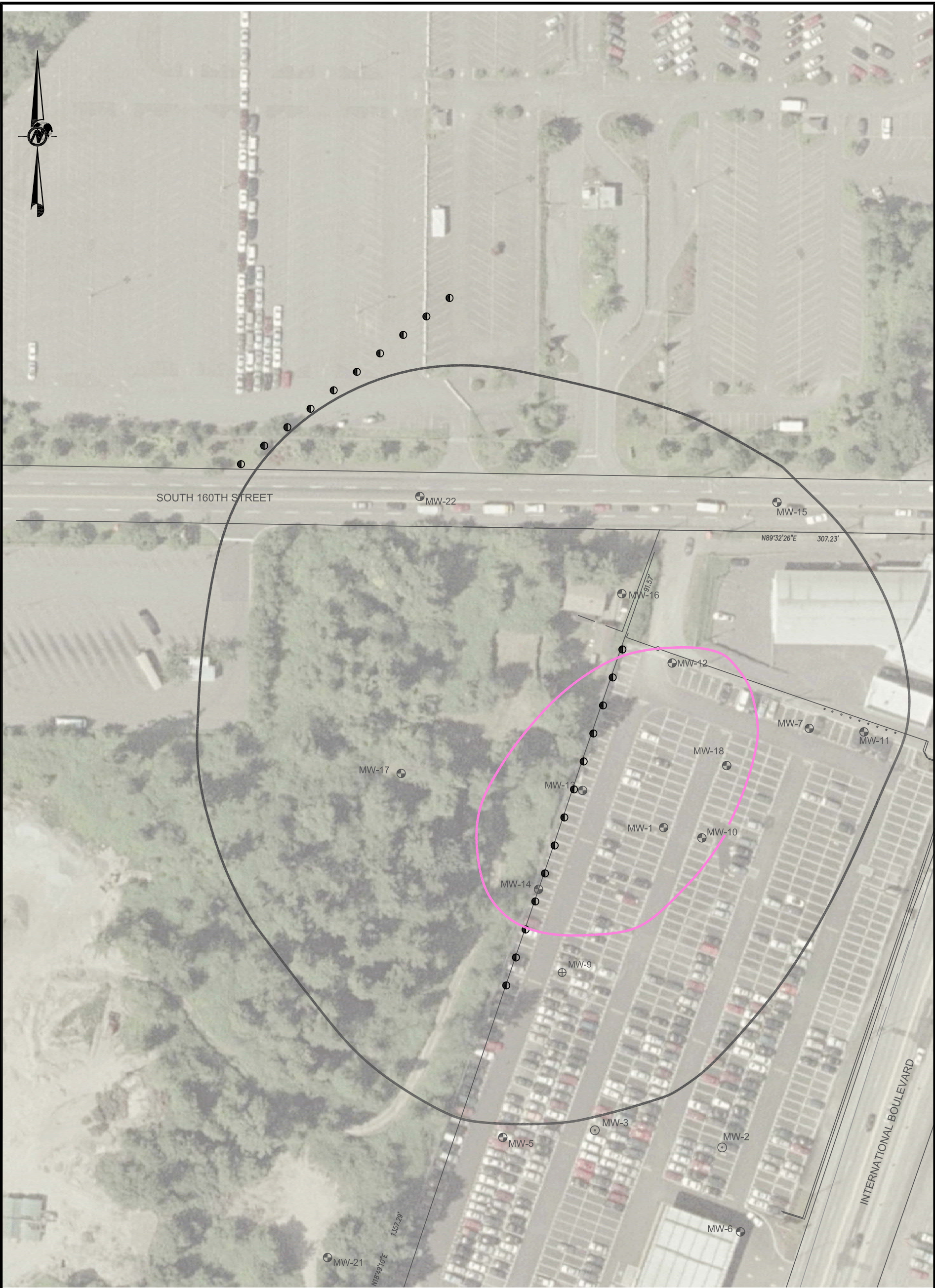
LEGEND:

- | | |
|--|--|
| | AIR SPARGE POINT |
| | SOIL VAPOR EXTRACTION POINT |
| | APPROXIMATE GROUNDWATER HOT SPOT BOUNDARY |
| | APPROXIMATE ENTIRE PLUME BOUNDARY |
| | QVA AQUIFER MONITORING WELL LOCATIONS |
| | MONITORING WELLS SCREENED IN PERCHED AQUIFER |






NOTES:

PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A CLEANUP LEVEL FOR GASOLINE RANGE PETROLEUM HYDROCARBONS (800ug/L)

FIGURE **7-8**
IAS-SVE FOR ENTIRE PLUME
LAYOUT FOR ALTERNATIVE D
SEATAC DEVELOPMENT SITE/RI/FS/WA



LEGEND:

-  GROUNDWATER EXTRACTION WELL
-  APPROXIMATE GROUNDWATER HOT SPOT BOUNDARY
-  APPROXIMATE PLUME BOUNDARY
-  MW-5 QVA AQUIFER MONITORING WELL LOCATIONS
-  MW-2 MONITORING WELLS SCREENED IN PERCHED AQUIFER

NOTES:
PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A CLEANUP LEVEL FOR GASOLINE RANGE PETROLEUM HYDROCARBONS (800ug/L)

FIGURE 7-9
GROUNDWATER PUMP-AND-TREAT FOR ENTIRE PLUME LAYOUT FOR ALTERNATIVE E
SEATAC DEVELOPMENT SITE/RI/FS/WA