



Sampling and Analysis Plan Ground Water

Safeway Fueling Center #1235

2204 West Nob Hill Boulevard
Yakima, Washington

Facility/Site ID#: 5883805

August 4, 2014

Prepared for:



Attn: Jon Lefferts

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Prepared by:



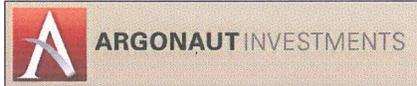
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Project No. 773-13001-03

SAMPLING AND ANALYSIS PLAN

SAFeway FUELING CENTER #1235
2204 WEST NOB HILL BOULEVARD
YAKIMA, WASHINGTON
(FACILITY/SITE ID#: 5883805)

Prepared for:



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Sampling and Analysis Plan

Ground Water

Safeway Fueling Center #1235

Facility/Site ID #5883805

2204 West Nob Hill Boulevard
Yakima, Washington

1.0 INTRODUCTION

EVREN Northwest, Inc. (ENW) has prepared this Ground Water Sampling and Analysis Plan (SAP) for four quarters of confirmational ground water monitoring at the former United Builders site (Safeway Fueling Center #1235) at 2204 West Nob Hill Boulevard, in Yakima, Washington (Figures 1 and 2; subject site). This SAP identifies well selection (compliance points) for fluid level monitoring and sampling; monitoring, purging and sampling methods; analysis plan and analytical protocols; quality assurance/quality control (QA/QC) protocols; cleanup levels; reporting requirements; and waste management procedures.

2.0 SUMMARY OF RECENT FINDINGS

In April 2014, EVREN Northwest, Inc. (ENW) performed a *Focused Subsurface Investigation*¹ at the subject site in general accordance with a *Work Plan*² developed with input from Washington Department of Ecology (Ecology) under their Voluntary Cleanup Program (VCP). The scope of work addressed the area presumed to be hydraulically down-gradient of the independent cleanup action³ conducted at the source area of petroleum impacts at the former United Builders site. The focused subsurface investigation scope of work consisted of fluid level monitoring, purging and sampling ground water at two existing monitoring wells (KMW-04 and EPI-MW-2), and sampling soil and ground water from one direct-push boring (EB1A) located south-adjacent to the source removal area as shown on Figure 2. Fluid level monitoring of wells east of the City's drainage improvement ditch (DID) indicated a southeastward ground water flow direction and gradient as shown on Figure 3. Diesel-range organics (DRO), fluorene, naphthalene, and 1-methylnaphthalene were detected in reconnaissance ground water sample EB1A-GW-13 at concentrations less than Model Toxics

¹ ENW, 2014, May 9, 2014, *Focused Subsurface Investigation*, Safeway Fueling Center #1235, 2204 West Nob Hill Boulevard, Yakima, Washington, Facility/Site ID#: 5883805: Prepared for Argonaut Investments, Attn: Jon Lefferts, 770 Tamalpais Drive, Suite 401B, Corte Madera, California 94925, 8 pages, 5 tables, 5 figures.

² ENW, January 13, 2014, January 2014 *Work Plan, Data Gap Investigation*, Safeway Fueling Center #1235, 2204 West Nob Hill Boulevard, Yakima, Washington, Facility/Site ID#: 5883805: Prepared for Argonaut Investments, Attn: Jon Lefferts, 770 Tamalpais Drive, Suite 401B, Corte Madera, California 94925, 12 pages, 2 tables, 4 figures.

³ Landau Associates, 2004, Cleanup Report, Mercy Development Company Property, 2204 West Nob Hill Boulevard, Yakima, Washington: Prepared for Mercy Development Company, Yakima, Washington, dated April 22, 2004, 8 pages, 3 figures, 1 table, and 4 appendices.

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Control Act (MTCA) Method A Cleanup Levels and/or U.S. Environmental Protection Agency (EPA) Region IX Screening Levels. DRO was not detected above method reporting limits in ground water samples collected from monitoring well KMW-04 or EPI-MW-2 (Safeway well). Residual oil-range organics (RRO) were not detected above method reporting limits in any of the ground water samples.

ENW on behalf of Argonaut Investments asked Ecology for an opinion on their independent cleanup. Ecology drafted a conditional *No Further Action* (NFA) letter in which Ecology determined that no further remedial action is necessary to clean up contamination at the site. Ecology's opinion was conditional on the continued performance and effectiveness of the post-cleanup controls and monitoring as determined through four (4) quarters of confirmational monitoring.

3.0 POINTS OF COMPLIANCE

Fluid level monitoring of the following wells (see Table 3-1) located at or east of the DID will be performed to determine ground-water flow direction and gradient.

Table 3-1. Monitoring Well Construction

Monitoring Well Designation	WDOE Designation (Well Tag)	Depth of Well* (ft)	Well Casing Material and Diameter (in)	Monitored Depth Interval (ft)	Top of Casing (ft amsl)
KMW-01	BHT401	20.60	PVC/2 inch	5' - 20'	1083.16
KMW-04	BHT404	17.10	PVC/2 inch	5' - 20'	1082.45
KMW-05	BHT405	18.95	PVC/2 inch	5' - 20'	1082.78
KMW-14	BHT414	18.72	PVC/2 inch	5' - 20'	1082.39
KMW-15	BHT415	19.60	PVC/2 inch	5' - 20'	1083.39
KMW-16	BHT416	20.35	PVC/2 inch	5' - 20'	1083.29
KMW-18	BHT418	19.05	PVC/2 inch	5' - 20'	1085.35
EPI-MW-2	ALB480	19.01	PVC/2 inch	5' - 20'	1082.25

* Depth of well measured in feet below top of casing (btoc) on 4/9/14
amsl = above mean sea level

The above wells, along with temporary well point EB1A, are the standard points of compliance for the site. Additional ground water purging and sampling under this SAP will be restricted to KMW-04 and EP1-MW-2. It is presumed that the data from these two monitoring wells and the one-time data from temporary well point EB1A will be representative of ground water in the area likely to have been affected by the release. Monitoring well locations are shown on Figure 3.

4.0 METHODS AND PROCEDURES

This section describes the methods that will be used to conduct confirmational ground water monitoring at the subject site. Work is not anticipated to interfere with Safeway Fueling Center and store operations. All work will be performed by employees trained and licensed to work

with hazardous materials. Safety procedures will be strictly enforced through the use of a Health and Safety Plan.

Records shall be kept of all field activities and observations. Records shall include water-level measurements, samples collected, samplers involved with each sample, time, weather, and observations concerning materials textures, colors, odors, and other relevant data. All record-keeping shall be performed in appropriate field books or clipboards with appropriate forms. All field records will be kept secure at all times. **All data is confidential until released by Client.**

4.1 Equipment Calibration

Monitoring equipment used during sampling (e.g., photo ionization detector [PID], specific conductance and pH meters) will be calibrated according to manufacturer's specifications at the beginning of each sample day. Meter calibration will be checked at any time during the day if meter drift is suspected. The meters will be calibrated with gases or buffered solutions closest to known field parameters (usually this is pH = 7, specific conductivity = 240 μ S and VOC concentration = 100 μ g/M³ methane or heptane for PID calibration).

4.2 Decontamination Procedures

Before collecting any sample, collection tools will be decontaminated using a sequential wash of Alconox or trisodium phosphate solution, rinsed in tap water from a known source (e.g., municipal water), and subjected to a final rinse with distilled water. Wash and rinsate fluids will be collected, if possible, and appropriately disposed. Fresh nitrile gloves will be worn during any sample collection and when handling tools which are to be inserted into sampling areas. Solid waste generated during sampling activities (gloves, foil, paper towels, etc.) will be appropriately disposed.

4.3 Ground-Water Sampling

Ground-water sampling tools will consist of:

- Clean polyethylene tubing
- Peristaltic pump with low-flow capability
- Water quality parameter monitoring equipment (temperature, conductivity, pH, oxygen-reducing potential [ORP], dissolved oxygen [DO])
- Water-Level Indicator

Ground water sample will be collected from monitoring wells KMW-04 and EPI-MW-2. A water-level meter will be inserted in KMW-04, EPI-MW-2, and six east-side wells (KMW-01, KMW-05, KMW-14, KMW-15, KMW-16, and KMW-18) to determine static water levels to within 0.01-foot. This information will be recorded on the sample collection form for ground-water sampling.

4.3.1 Low-Flow Purging

Prior to sampling ground water, the well will be purged using the peristaltic pump and disposable polyethylene tubing. Water quality parameters (observations/measurements regarding color, turbidity, temperature, specific conductance, pH, or other factors that may be important in evaluation of sample quality) will be recorded on the sample collection form during purge. Monitoring well KMW-4 and EPI-MW-2 will be purged using low-flow methodology to prevent further development of the well. Generally, the following protocol will be followed:

- The volume of water in the monitoring well will be calculated and recorded on a Field Sampling Data Sheet (FSDS). For reference, the following formula is used to calculate the well volume:

$$1 \text{ well volume (gallons)} = \pi r^2 h \times 7.48 \text{ gal/ft}^3,$$

where $\pi = 3.14$, $r = \text{radius of well casing in feet}$, and $h = \text{height of water column from the bottom of the well in feet}$.

- After the pump and support equipment are placed at the wellhead, the pump and tubing will be slowly lowered into the monitoring well until the pump intake is at the center of the screened portion of the monitoring well.
- The water level will be measured and recorded on the FSDS.
- The discharge line from the pump will be connected to a flow-through cell. The discharge line from the flow-through cell will be directed to a container to contain the purge water during the purging and sampling of the monitoring well.
- The well will be pumped starting at a low flow rate (0.2 to 0.5 liters per minute [L/min]), and the pumping speed will slowly be increased. The water level will be checked to ensure total drawdown is less than 10 cm (or 0.3 feet); otherwise, the pump speed will be lowered.
- The discharge rate of the pump will be measured using a graduated cylinder and a stop watch. Both depth to water and flow rate will be recorded on the FSDS every three to five minutes.
- A minimum of one tubing volume (including volume of water in pump and flow cell) will be purged prior to recording water-quality indicator parameters (dissolved oxygen, specific electrical conductance, pH, oxidation-reduction potential [ORP] and temperature). Note that ORP may not always be an appropriate stabilization parameter, and will depend on site-specific conditions. However, readings will be recorded as a double check for oxidizing conditions. The stabilization criterion is based on three successive readings of water quality field parameters, as referenced below:

- pH +/- 0.1 pH units,
- Spec electrical conductance +/- 3% $\mu\text{S}/\text{cm}$,
- Temp +/- 0.1 °C.
- DO +/- 10%,
- ORP +/- 10mVs

4.3.2 Low-Flow Ground Water Sampling

Sampling of monitoring well KMW-4 and EPI-MW-2 will begin immediately following purging. Sample data will be recorded on the FSDS, including sample number and time collected, the observed physical characteristics of the sample (e.g., color, visual turbidity, etc.), field parameters (pH, specific conductance, temperature, ORP, and DO), and other data that may be important in the evaluation of sample quality. The pumping rate for sampling will be the same or lower than that used for purging (generally between 0.2 to 0.5 L/min) to minimize disturbance of the water column.

Ground water samples will be collected using a peristaltic pump and dedicated polyethylene tubing. Clean Nitrile gloves will be worn when collecting each sample.

Volatile Organic Constituents (DRO-related VOCs, specifically BTEX): Samples for BTEX (benzene, toluene, ethylbenzene, total xylenes) will be discharged at or below the purge rate directly into volatile organic analysis (VOA) containers prepared with aliquots of hydrochloric acid (as preservative), carefully preventing aeration. Each VOA will be completely filled so that no headspace remains after sealing. VOA sample containers will be checked for air bubbles by turning the bottle upside down, tapping it lightly to make air bubbles move to the bottom of the sample bottle. If air bubbles are observed in any of the VOA containers, the container will be re-topped off with fresh sample (refilled, once only, or a new container used).

Semi-Volatile Organic Constituents (DRO, RRO, VOCs, PAHs): At each location, the water sample will be discharged slowly and carefully into two one (1)-liter amber bottles with a Teflon-lined lid, filled with minimal air space. One of the amber bottles will be preserved, as indicated in Table 4-2.

The samples will be labeled as follows:

- Sample Designation, or Identification
- Location
- Date and time of collection
- Medium
- Project number
- Name of sampler(s)

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- Analysis required
- Preservation (if applicable).

Samples will be labeled consistent with the protocol previously provided for soil samples and immediately placed in cooled storage until they are delivered to Friedman & Bruya, Inc. (F&BI) of Seattle, Washington. The samples will be analyzed according to the Analysis Plan shown in Table 4-1, below. Sample containers, preservatives, and holding times for each analytical method are provided on Table 4-2. Chain-of-custody protocols will be followed. All sampling will be conducted in accordance with the appropriate provisions of the project Health and Safety Plan.

4.4 Analysis Plan

Samples collected during this investigation will be analyzed according to the plan and protocol described in the following tables.

Table 4-1. Proposed Analysis Plan¹

Analytical Method	Constituents	Ground Water
NWTPH-Dx	Total Petroleum Hydrocarbons (TPH)–Diesel-range quantification (DRO) and Residual oil-range quantification (RRO)	All
EPA 8260 (M)	Volatile Organic Constituents related to DRO impacts (benzene, toluene, ethylbenzene, and total xylenes [BTEX])	All
EPA 8270-SIM	Naphthalenes: Naphthalene, 1 methyl-naphthalene and 2 methyl-naphthalene	All
EPA 8270-SIM	Carcinogenic Polycyclic Aromatic Hydrocarbons (CPAHs)	All
¹ Additional analytical methods may be required that are not specifically listed herein, based on analytical results and field observations. ² EPA 8260 modified to only analyze for constituents indicated in MTCA Table 830-1 “Required Testing for Petroleum Releases”. NA = not applicable		

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Safeway Fueling Center #1235, Yakima, WA

Table 4-2. Analytical Protocol

Analyte(s)	Analytical Method	Container and preservative	Holding time	Preservation
Ground Water:				
DRO	NWTPH-Dx	1 Liter amber bottle	14-days	Ice & HCl
VOCs	EPA 8260	40 ml VOA Vials	14-days	Ice & HCl
Naphthalenes and CPAHs	EPA Method 8270	1 Liter amber bottle	7-days*	Ice
	ORP	per instrument instructions	Field	
Indicators	Dissolved Oxygen	per instrument instructions	Field	
(data collected during temporary well-point purge)	pH	per instrument instructions	Field	
	Temperature	per instrument instructions	Field	
	Conductivity	per instrument instructions	Field	
*days for extraction; 40 days after extraction for analysis				

5.0 INVESTIGATION-DERIVED WASTE STORAGE AND DISPOSAL

Potentially impacted investigation-derived waste may be generated during this investigation. At this time, it is assumed that this waste may be impacted with petroleum-related constituents.

Decontamination and Purge Water. Water associated with purging and sampling monitoring wells will be drummed, sealed, and labeled.

Upon receipt of analytical data, the disposal requirements of the drummed fluid investigation-derived waste will be evaluated. It is anticipated that all waste generated will be handled as a hazardous material, and will not be characteristic of hazardous waste. However, water waste determined to be impacted with contaminants at levels regulated under Resource Conservation and Recovery Act (RCRA) rules as characteristic (hazardous waste) must be disposed or treated in a manner consistent with RCRA regulation.

Spent personal protective equipment (PPE) and sampling materials, i.e., nitrile gloves, paper towels, sample tubing, etc., generated during ground water sampling activities will be properly disposed of as solid waste.

6.0 DATA EVALUATION AND SCREENING

Ground water cleanup levels provided by Ecology are the concentration of a hazardous substance in these media that is determined to be protective of human health and the environment under specified exposure conditions. Cleanup levels, in combination with points of compliance, define the area or volume of water that must be addressed by the cleanup action. At the subject site, no conditional points of compliance have been established, and based on recent and historical data collected in this area do not appear to be warranted. Therefore, standard points of compliance throughout the site will be used. Recent data collected from temporary well-point EB1A sited proximate to the former petroleum-impacted soil excavation, and monitoring wells KMW-04 and EPI-MW-2 will be assumed to provide data representing conditions throughout the site as well as ground-water conditions in the presumed down-gradient direction of the historical release area. Therefore, sampling under this SAP will be restricted to KMW-04 and EP1-MW-2. It is presumed that the data from these two monitoring wells will be representative of ground water in the area likely to have been affected by the release, that being the area required to be remediated by a MTCA cleanup.

Proposed ground water cleanup levels are identified in this section.

6.1 Ground Water Cleanup Levels

The ground water data derived from this investigation will be compared to MTCA Method A CULs for ground water (Table 720-1). The constituents of possible concern in ground water include:

- PAHs (carcinogenic)
- Naphthalenes
- DRO/RRO
- BTEX

7.0 REPORT PREPARATION

Three (3) quarterly ground water monitoring reports will be prepared documenting the first three quarters of confirmational ground water monitoring described in Section 4. Upon completion of the fourth quarter of monitoring, a final report will be submitted along with a request for Ecology's opinion for reaching an unconditional NFA determination.

7.1 Report Preparation

The results of the work proposed above will be described in three quarterly reports and a final report, which will:

- Document investigative methods used, and present findings and conclusions of the field work and analytical data.
- Present laboratory analytical reports and chain-of-custody documentation.

- Present any disposal receipts.
- Provide a site plan and ground water contour map.
- Provide a tabulation of fluid level monitoring data and ground water analytical data.
- Present our arguments for requesting an NFA determination from Ecology.

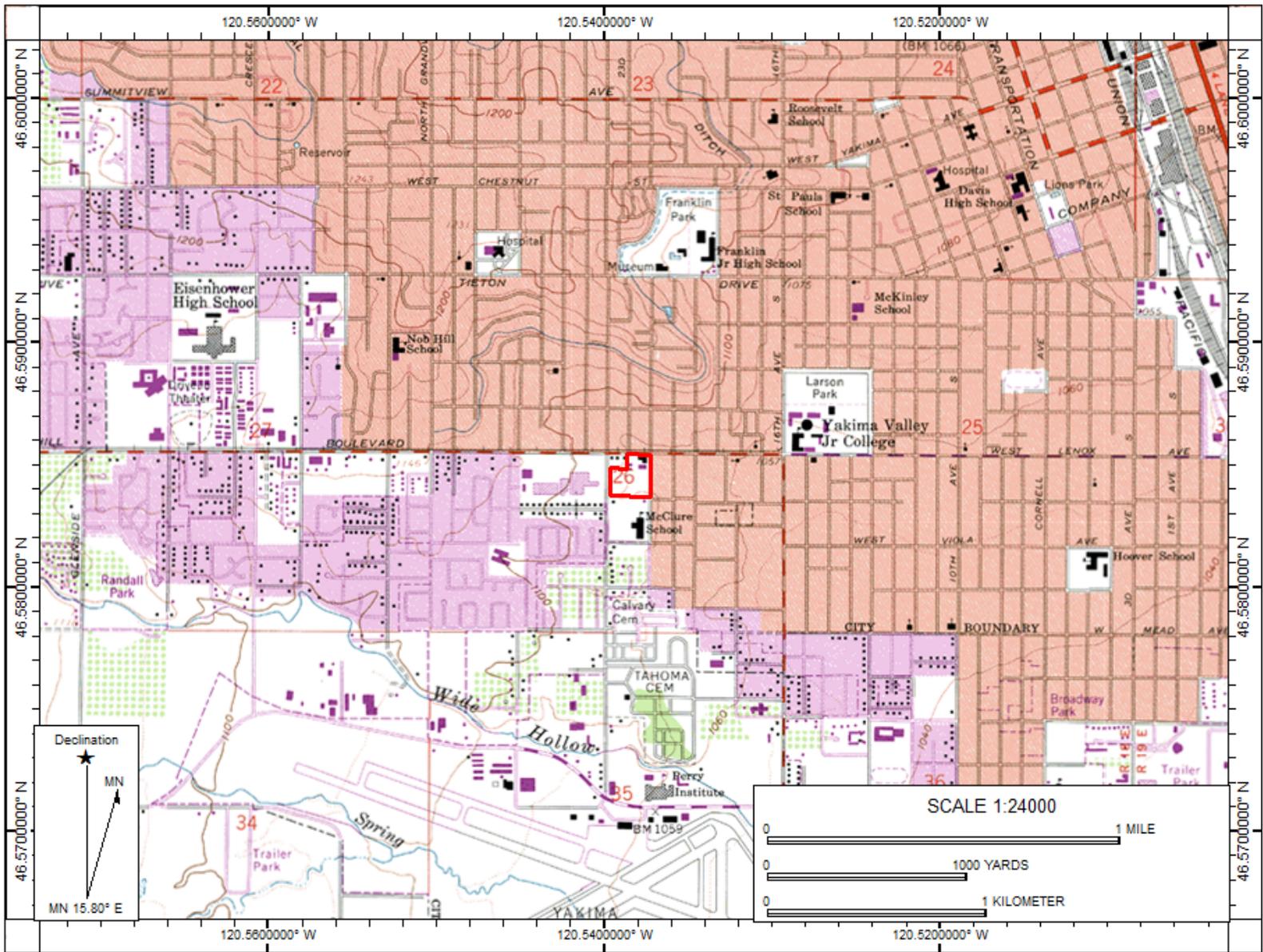
7.2 EIM Data Entry

The four quarters of data included in the final report will be entered into Ecology's Environmental Information Management (EIM) database.

8.0 PROPOSED SCHEDULE

The first quarter of confirmational ground water monitoring can begin upon receiving an opinion from Ecology's Project Manager regarding the suitability of the proposed SAP. Then, monitoring will be conducted once per quarter thereafter, until the fourth and final monitoring event has been completed.

FIGURES



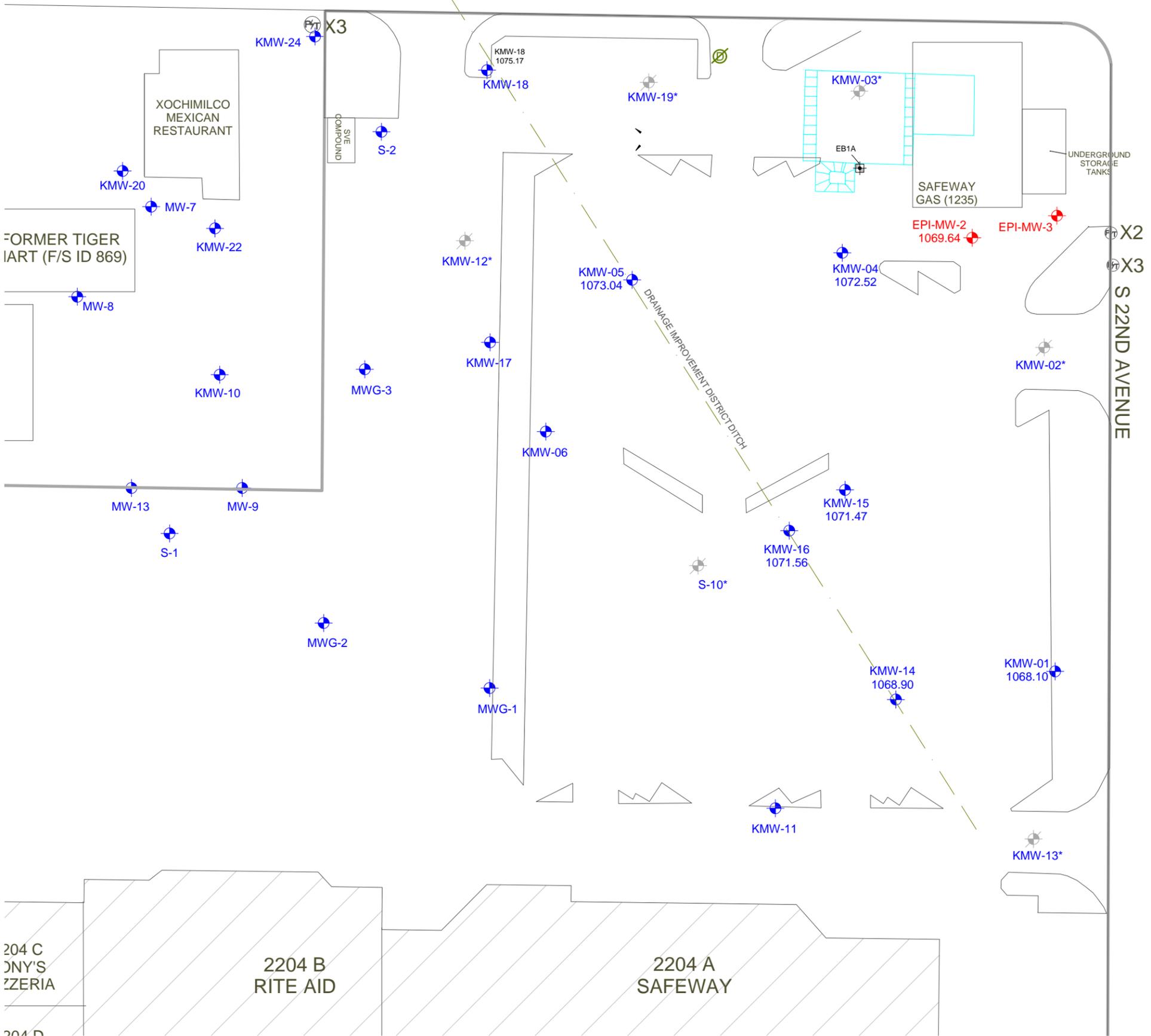
Map Name: YAKIMA WEST Quadrangle
 Date: 1958 / Photorevised: 1985

Location: 046.5625000° N, 120.5624999° W
 Contour Intervals: 20 Feet

	<p>Date Drawn: 7/23/2014 CAD File Name: 773-13001- svmap(Fig1).docx Drawn By: PMT Approved By: LG</p>	<p>Nob Hill Shopping Center 2204 West Nob Hill Blvd. Yakima, Washington</p>	<p>Site Vicinity Map</p>	<p>Project No. 773-13001 Figure No. 1</p>
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DRAWING NUMBER 773-13001(v01)
 APPROVED BY P. TRONE 07/23/2014
 CHECKED BY L. GREEN 07/31/2013
 DRAWN BY K. CLINE 07/24/2013

WEST NOB HILL BOULEVARD

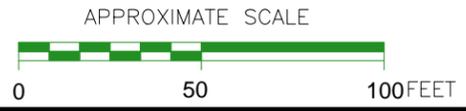


LEGEND:

- APPROXIMATE BUILDING LOCATIONS
- APPROXIMATE SUBJECT PROPERTY BOUNDARIES
- APPROXIMATE SUBJECT BUILDINGS
- POLE-MOUNTED TRANSFORMER
- PAD-MOUNTED TRANSFORMER
- DECOMMISSIONED DRY WELL
- APPROXIMATE LOCATION OF GROUND-WATER MONITORING WELL (* INDICATES ABANDONED)
- APPROXIMATE LOCATION OF SAFEWAY GROUND-WATER MONITORING WELLS
- 1069.64 OR 1072.52 GROUND WATER SURFACE ELEVATION CALCULATED FROM WATER LEVELS MEASURED ON 4/9/2014
- INDEPENDENT CLEANUP ACTION SOIL REMOVAL AREA (FEB 2004)
- DRAINAGE IMPROVEMENT DISTRICT DITCH

NOTES:

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2012 AND ENW FIELD NOTES.



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FIGURE 2
 SITE PLAN

SAFEWAY FUELING CENTER #1235
 2204 NOB HILL BOULEVARD
 YAKIMA, WASHINGTON

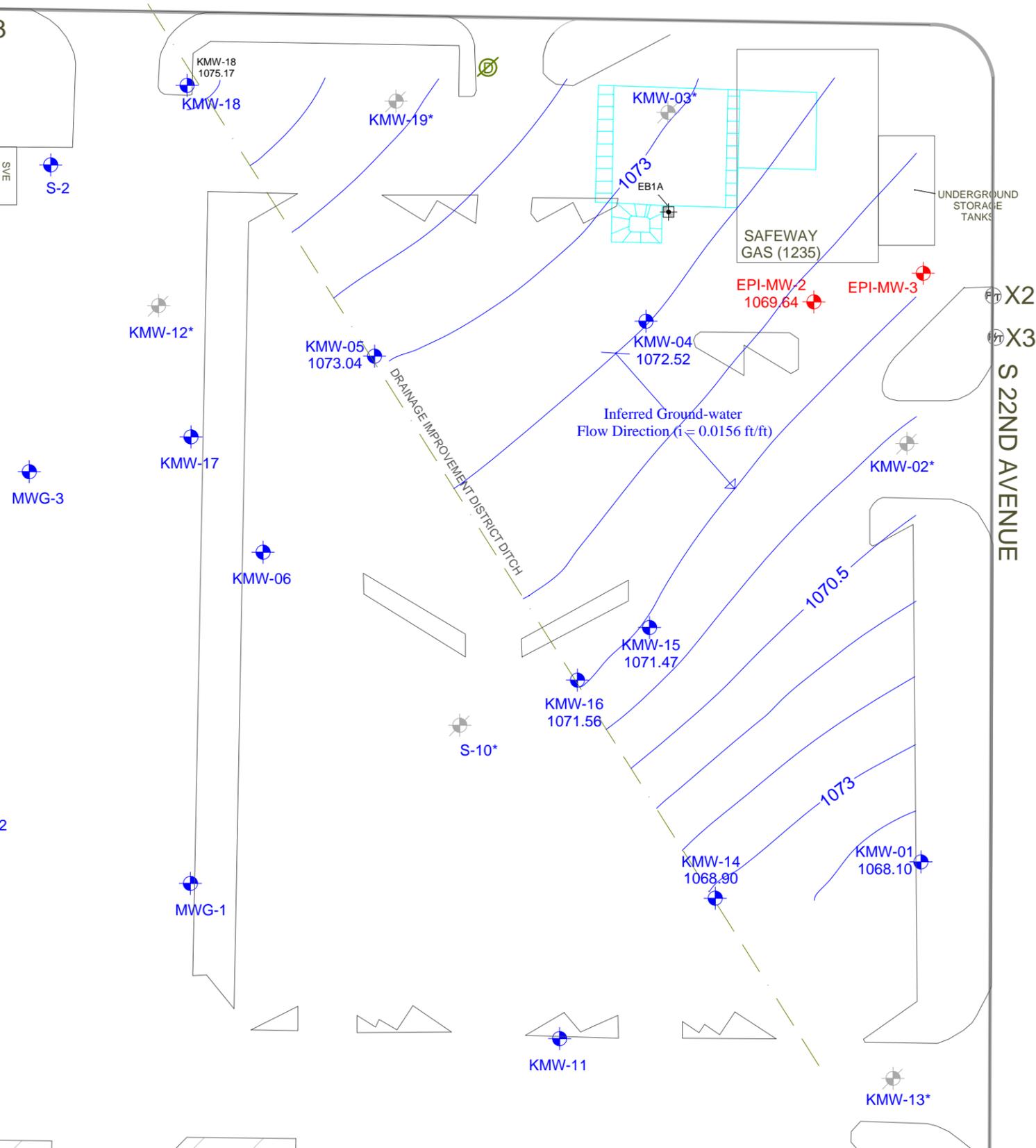
204 C
 DNY'S
 PIZZERIA

2204 B
 RITE AID

2204 A
 SAFEWAY

DRAWING 773-13001(v04)
 DRAWN BY: K. CLINE 04/28/2014 P. TRONE 07/23/2014 L. GREEN 07/31/2014
 CHECKED BY: P. TRONE 07/23/2014 L. GREEN 07/31/2014
 APPROVED BY: L. GREEN 07/31/2014
 NUMBER

WEST NOB HILL BOULEVARD

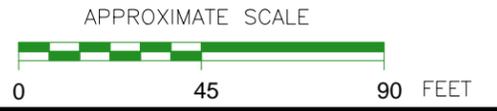


LEGEND:

- SUBJECT BUILDINGS
- SUBJECT PROPERTY BOUNDARIES
- BUILDING LOCATIONS
- POLE TRANSFORMER
- INDEPENDENT CLEANUP ACTION SOIL REMOVAL AREA (FEB 2004)
- MONITORING WELL (GREY COLOR INDICATES WELL IS ABANDONED)
- GROUND WATER CONTOUR LINE WITH ELEVATION (FT) BASED ON ARBITRARY DATUM (APRIL 2014)
- ENW BORING
- DECOMMISSIONED DRY WELL
- DRAINAGE IMPROVEMENT DISTRICT DITCH
- SAFEWAY MONITORING WELLS

NOTES:

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2009 AND EAI FIELD NOTES.
2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.
3. GROUND WATER CONTOURS BASED ON MEASUREMENTS BY ENW (APRIL 2014)



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FIGURE 3
GROUND-WATER CONTOUR DIAGRAM
 (APRIL 2014)

SAFeway FUELING CENTER #1235
 2204 NOB HILL BOULEVARD
 YAKIMA, WASHINGTON