

November 3, 2009

Alonzo Hernandez
David Edwards
OXY USA WTP LP
760 Horizon Drive, Ste 101
Grand Junction CO 81506

Subject: **Revised** Investigation Plan
 15-54 Pad
 Walsh Project No. 900248.7830.181

Dear Mr. Hernandez and Mr. Edwards:

Walsh Environmental Scientists and Engineers, LLC (Walsh) is submitting this proposed scope of work to evaluate potential impacts to soil and groundwater from produced water storage at the OXY USA WTP LP (OXY) 15-54 well pad. This scope of work is Walsh's previous investigation plan dated October 2, 2009 modified based on comments received from Mr. Chris Canfield of the Colorado Oil and Gas Conservation Commission dated October 8, 2009 and our conversations.

Task 1 – Soil Investigation

Two trenches will be excavated in the locations of the former reserve pit and pond 1. The trenches will extend the entire length of each installation (Figure 1). Excavations will be of sufficient depth to expose at least two vertical feet of native material beneath the bottom of the deepest part of the reclaimed pit and pond. A geologist will observe the excavation and describe soil characteristics and depths. Discrete samples of each soil type will be obtained from the trenches and described and analyzed as stated below. The excavations will be left open for no more than 48 hours and observed for water. If water collects in a trench, it will be sampled and analyzed as stated below.

Additional pits will be installed at the locations shown on Figure 1. These pits will be excavated to expose at least two vertical feet of native material beneath the bottom of the pit or pond. Samples of the pit content and soil beneath the bottom will be obtained, described, and analyzed as stated below.

At least one background sample of native soil that is similar in color, texture, and structure as the soil encountered beneath the pit and pond will also be obtained, described, and analyzed as stated below. The background sample location(s) will be selected in the field to best represent undisturbed background conditions.

Samples will be obtained from soil in the excavator bucket. The sampler will ensure that only intact, representative soil from the bucket will be described and analyzed. This will be accomplished using a shovel or trowel to remove surficial smearing and mixing to expose intact soil. Encountered soil will be described by a geologist in the field for texture, structure, color, moisture content, odors, percent clasts, and other standard soil descriptors. Soil samples will be

field-screened for volatile organic compounds (VOCs) using a photo-ionizing detector (PID) using headspace methods. Headspace measurements will be obtained by placing a sample of soil into a plastic bag, sealing the bag and warming the soil. The air within the bag will then be measured using a PID equipped with a 10.6 electron-volt lamp capable of non-specific measurement of VOCs normally found in produced water, such as benzene, toluene, ethylbenzene, and total xylenes (BTEX).

Representative samples of each soil type encountered will be placed into laboratory-provided containers, labeled, and placed into an ice-filled cooler. The samples will be delivered under chain-of-custody to Environmental Science Corporation of Mt. Juliet, Tennessee and Servitech Laboratory of Hastings, Nebraska. Split samples will be made available to COGCC or other personnel as directed by OXY. Samples will be obtained from beneath the base of the pit and the pond, from the bottom contents of the pit and pond, and of the backfill material in the pit and pond. The samples from beneath the bottom of the pit and pond, and the samples of the contents of the ponds, will be analyzed by the laboratory for BTEX and gasoline-range organics (GRO) by EPA Method 8021/8015; for diesel-range organics (DRO) by EPA Method 3550/8015; chloride and sulfate by Method 300.0; bicarbonate by Alkalinity Series Method; total K, Na, Ca, and Mg by Method 6010; sodium adsorption ratio (SAR) using saturated paste extract; and saturated paste electrical conductivity (EC) and pH by the lab. The background soil(s) will be analyzed for all the above-listed inorganic analytes. The samples of the backfill will be analyzed for and compared to the COGCC Table 910-1 compounds in effect at the time of pit closure.

Soil samples for BTEX, GRO, and DRO will be grab samples of representative material and will not be composited. Soil samples for inorganic analyses will consist of five equal aliquots of representative material that will be placed into a decontaminated and triple-rinsed stainless steel bowl and homogenized prior to placement into the sampling containers.

Walsh will obtain at least two composite samples of the contents of the reclaimed reserve pit; at least two composite samples of the fill in the reclaimed pond; at least four samples of the material beneath the pit; and at least four samples of the material beneath the pond. Additional samples will be obtained at locations where significant stains or odors are noted, or where the soil characteristics change appreciably. All sampling locations will be described and an explanation provided for their selection.

If groundwater is encountered in any excavation, it will be sampled by using a bailer or peristaltic pump and placed into laboratory-supplied containers. Groundwater will be field-screened and analyzed as described in Task 2 below. Two-inch well screening and solid casing (as appropriate) will be placed into the excavation prior to backfilling if groundwater is likely to be present at the location. The PVC will be completed as a monitoring well to the extent practical (e.g. screening placed into and somewhat above the water table; solid casing placed from the screen to the surface; a well protector placed on the well casing; and the well developed and sampled as described in Task 2 below).

All soil and water samples will have GPS locations determined as required by Section 215 of the COGCC regulations. The depth of each sample will be measured using a tape measure, and the

GPS location and the depth to sample will be noted in a field notebook. The actual elevation of the samples will be calculated using these data. The trenches and sampling pits will be photographed along their entire lengths and depths and a log describing the excavations will be prepared by the geologist. The photographs will capture soil contacts, sampling locations, and any unusual findings.

Task 2 – Install and Sample Monitoring Wells

A total of three monitoring wells will be installed at the approximate locations shown on Figure 2, concurrently with Task 1. Wells will be installed into the shallow alluvial aquifer using a rotary auger and will be constructed using threaded 2-inch PVC well casing. The saturated interval will be screened. Well installation, construction, development, and sampling will follow standard Walsh and EPA procedures for monitoring well installation. These procedures include logging encountered soil from cuttings, cores, and/or split-spoon samples; field-screening soil for VOCs with a PID; drilling at least five feet deeper than the estimated water table; setting at least ten feet of well screen such that the water table is within the screened interval; placing 10/20 silica sand into the annular space between the PVC screen and the soil bore wall and to a point at least one foot above the screen; placing at least two feet of bentonite pellets on top of the sand pack and hydrating the bentonite to form a seal; placing a locking well protector on the well stick-up; and decontaminating the drill string prior to use.

One soil sample will be obtained from each soil borehole and analyzed for BTEX/GRO, EC, and SAR. The sample will be obtained from at or just above the water table, or from the interval that appears to be most contaminated. The samples will be placed into laboratory-provided unpreserved containers, labeled, placed into an ice-filled cooler, and shipped via overnight courier to the analytical lab under chain-of-custody control.

Encountered water will be field analyzed for dissolved oxygen, pH, conductivity, oxidation/reduction potential (ORP), temperature, and depth to water. Laboratory samples of groundwater will be obtained and analyzed for the following:

1. BTEX/GRO by Method 8021B
2. Anions (Cl, Br, NO₂, NO₃, o-Phosphate, SO₄) by Method 300.0 IC
3. Dissolved Metals (Ca, Fe, Mg, Mn, K, Na) by Method 6010B
4. Dissolved Metals (Se) by Method 6020
5. Fluoride by Method 300.0A
6. Alkalinity Series (Carbonate, Bicarbonate, Hydroxide, and Total Alkalinity) by Method 2320B
7. Total Dissolved Solids by Method 2540C
8. Specific Conductance by Method 2510B
9. pH by Method E150.1

Well sampling procedures will follow those described in the approved plan titled *Water Sampling Plan, Spring 2 Area, OXY 697-15-54 Pad NOAV, DeBeque, Colorado*. The laboratory will be instructed to filter the water for analysis of dissolved metals and ions.

Task 3 – Final Reports

After receipt of laboratory analytical data for each task stated above, Walsh will prepare a report describing field observations, excavation logs, soil sampling forms, soil borehole logs, well construction logs, water sampling forms, field and analytical data, and conclusions based on those results. Figures will be included that will show trench locations, well locations, isolines, and photographs. Analytical results will be tabulated and laboratory analytical data will be included in an appendix.

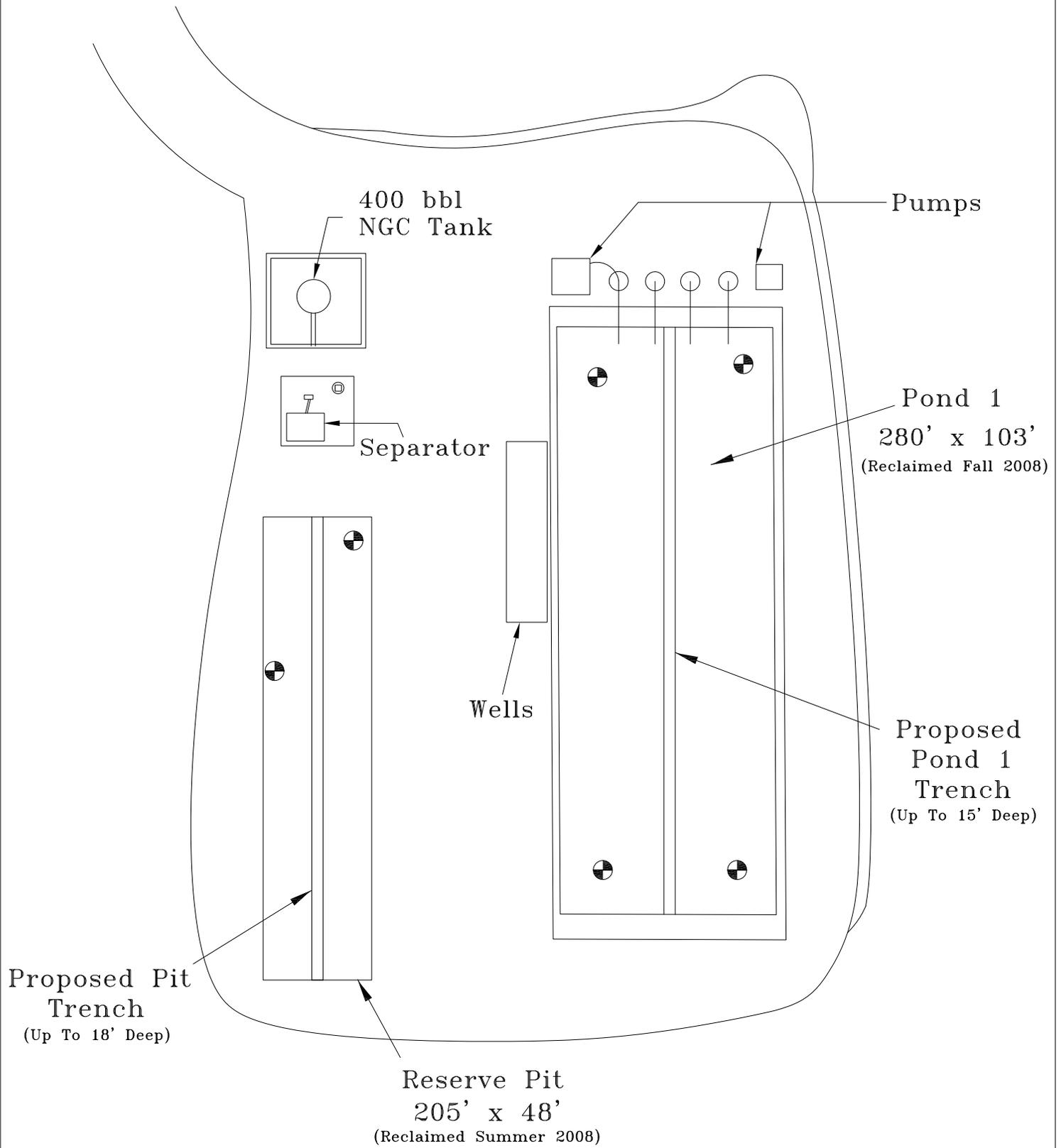
Please contact me if you have comments to this proposed plan or wish to pursue this investigation. Walsh recommends that you obtain concurrence from the COGCC prior to implementing this plan. Thank you for the opportunity to present this proposed scope of work, and for considering Walsh for your project.

Sincerely,
Walsh Environmental Scientists & Engineers, LLC



Edward M. Baltzer, CHMM, CPG
Project Manager

Attachments: Figures 1 and 2



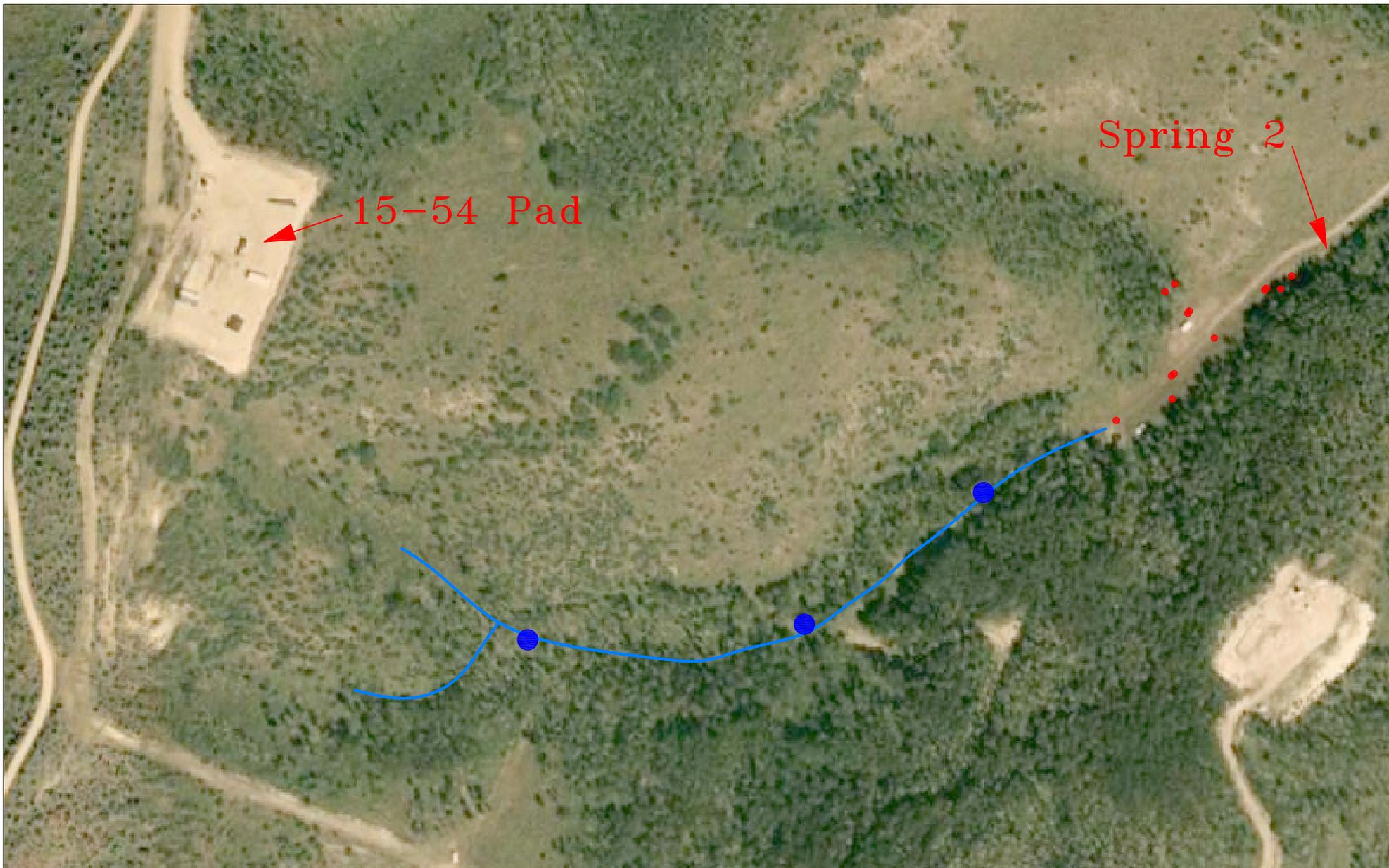
Explanation

- ⊕ Proposed Sampling Pit
- Dimensions are Approximate
- As-Built Conditions as of Spring 2008

Walsh
Environmental Scientists and Engineers, LLC

Proposed Soil Sample Locations
697-15-54 Pad
Garfield County, Colorado

0 60
Approximate Scale (Feet)



Explanation

- Existing Monitoring Well
- Proposed Monitoring Well
- ~ Valley Floor & Presumed Alluvial Aquifer



Environmental Scientists and Engineers, LLC

Proposed Well Locations
 OXY 697-15-54 NOAV
 Garfield County, Colorado



Job 900248.7830.181

Date 9/09

Figure 2