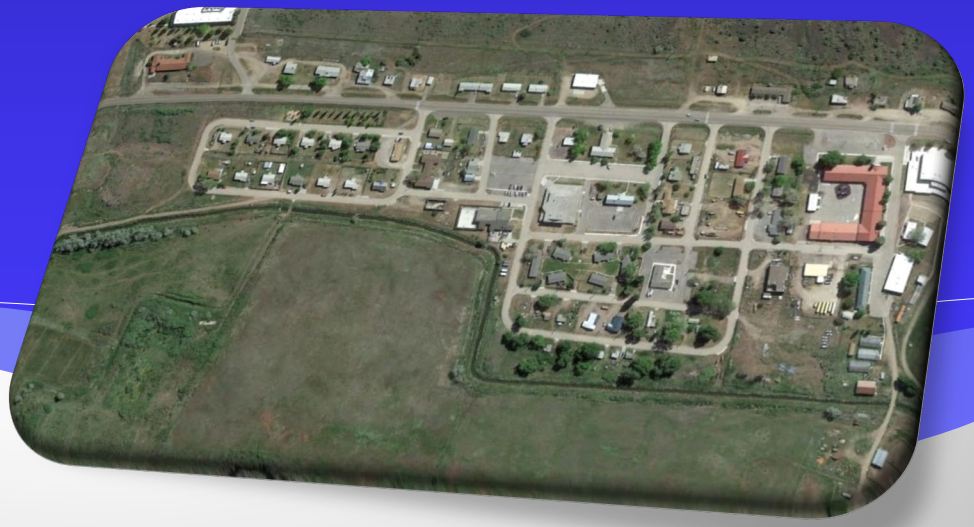
U.S. Bureau of Indian Affairs

Investigation/Monitoring of Petroleum Impacts

SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN

Duck Valley Indian Reservation



AKANA

Investigation/Monitoring of Petroleum Impacts

SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN

Duck Valley Indian Reservation

AGENDA

* Introductions
* Site History
* Planned Work
* Schedule
* Questions
* Lunch (11:30-1:00)
* Site Visit (After Lunch)

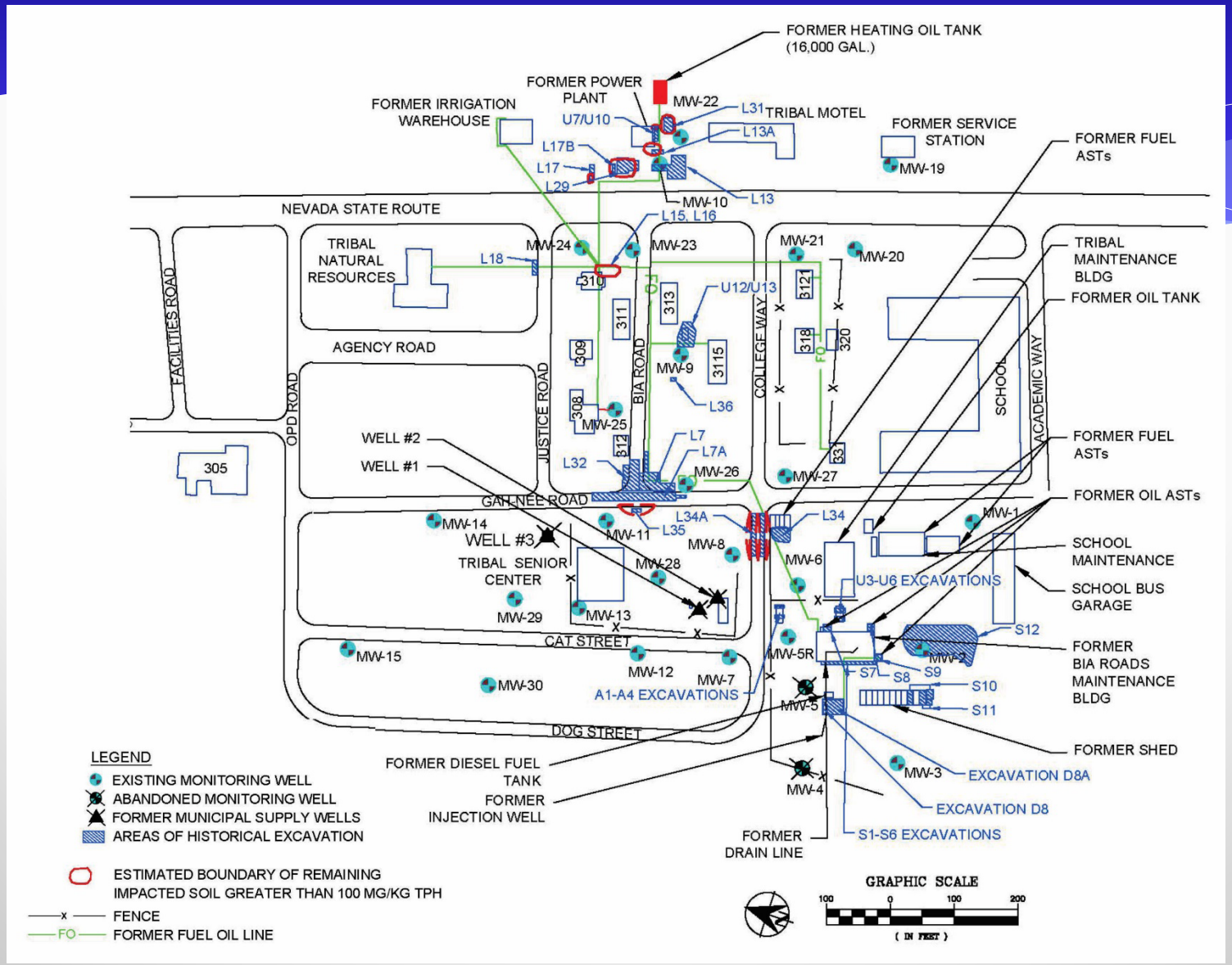
AKANA

Introductions

* Bureau of Indian Affairs
* Shoshone-Paiutes Tribes of the Duck Valley Reservation
* Akana (BIA Technical Consultant)

Site History
Areas of Concern

Contaminant Source and Release



Chronology of Events 1985-1989

* Feb 1985 –Subsurface Distribution Piping Fails Pressure Test and is removed from service. Release of 8000 gallons of Heating Oil Near Old Power Plant.
* Oct 1987 – Oil-Like Odor Reported in Two Municipal Water Wells. Well #1 and #2 Taken Out of Service.
* Mar 1988 – Petroleum taste in water supply. Test Pits 12-15 Feet Deep Made at Nine Locations
  - Free-Phase Hydrocarbons (FPH) Found in trenches North of Tribal Maintenance Bldg. and North of Water Supply Wells #1, #2, and #3.
  - Soils Excavated Along the Buried Pipeline to Groundwater
  - FPH Found Beneath Pipeline Fittings (TPH-diesel = 11,000-12,000 ppm)

Chronology of Events 1985-1989 (Con't)

* March 1988 – Diesel USTs Removed From East Side of Former Road Shop and South of Former Power Plant
  * Operations of Drinking Water Wells #1 and # 2 were discontinued

Chronology of Events
1985- 1989 (Con't)

* Gasoline AST at Road Shop Vandalized
  * 200-300 Gallons of Gasoline Released to the Ground Surface

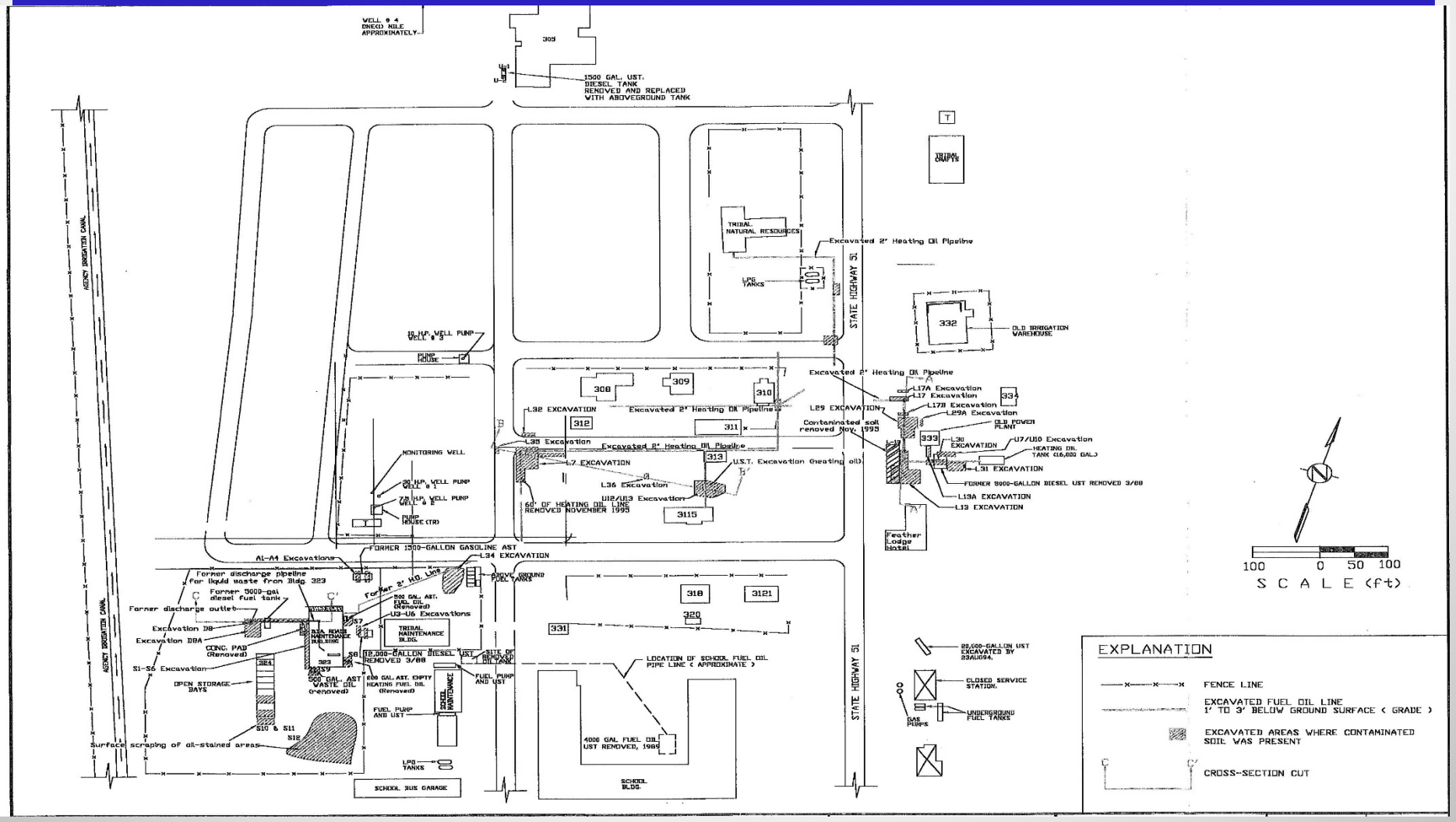
Chronology of Events
1995

* June 1995; EPA Issues Administrative Order - Safe Drinking Water Act
* Cease Use of Injection Well and Abandon It
* BIA Developed Plan to Investigate Contamination at the Site

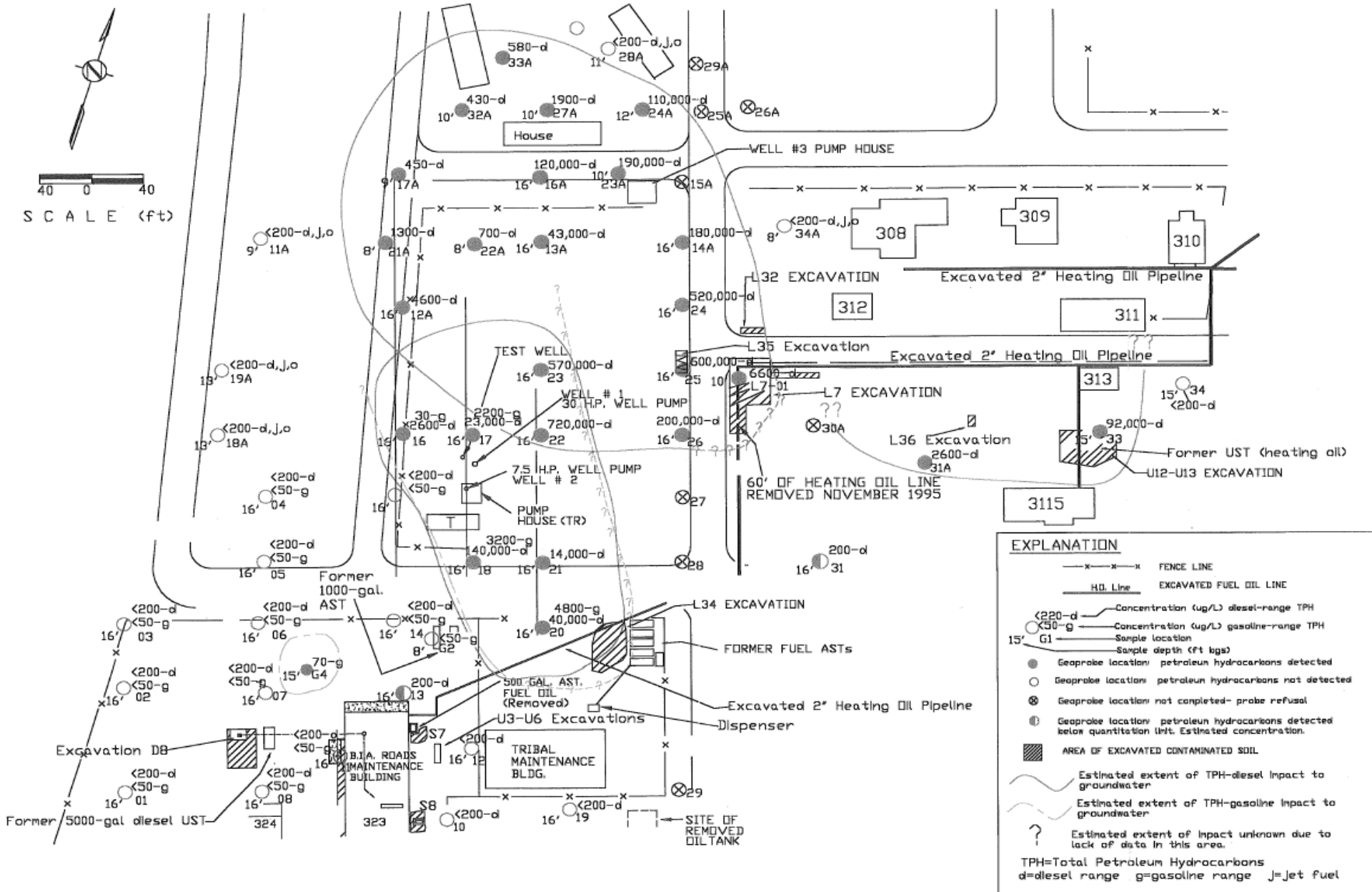
Chronology of Events 1995-1996

* Removal of 60 Feet of Heating Oil Pipeline NE of Tribal Maintenance Bldg, Near Intersection of BIA Road and Gah-Nee Road (L7 excavation)
* Contaminated Soil Along the Entire Length of Pipeline
* BIA Abandoned Use of Disposal Well
* Leaking Drums at Roads Yard Containing Used Motor Oil, Road Sealant, and Herbicides Removed and Disposed Of
* 40 Yd^3 of Herbicide-Contaminated Soil Excavated to 7 Feet

Former Excavations 1999



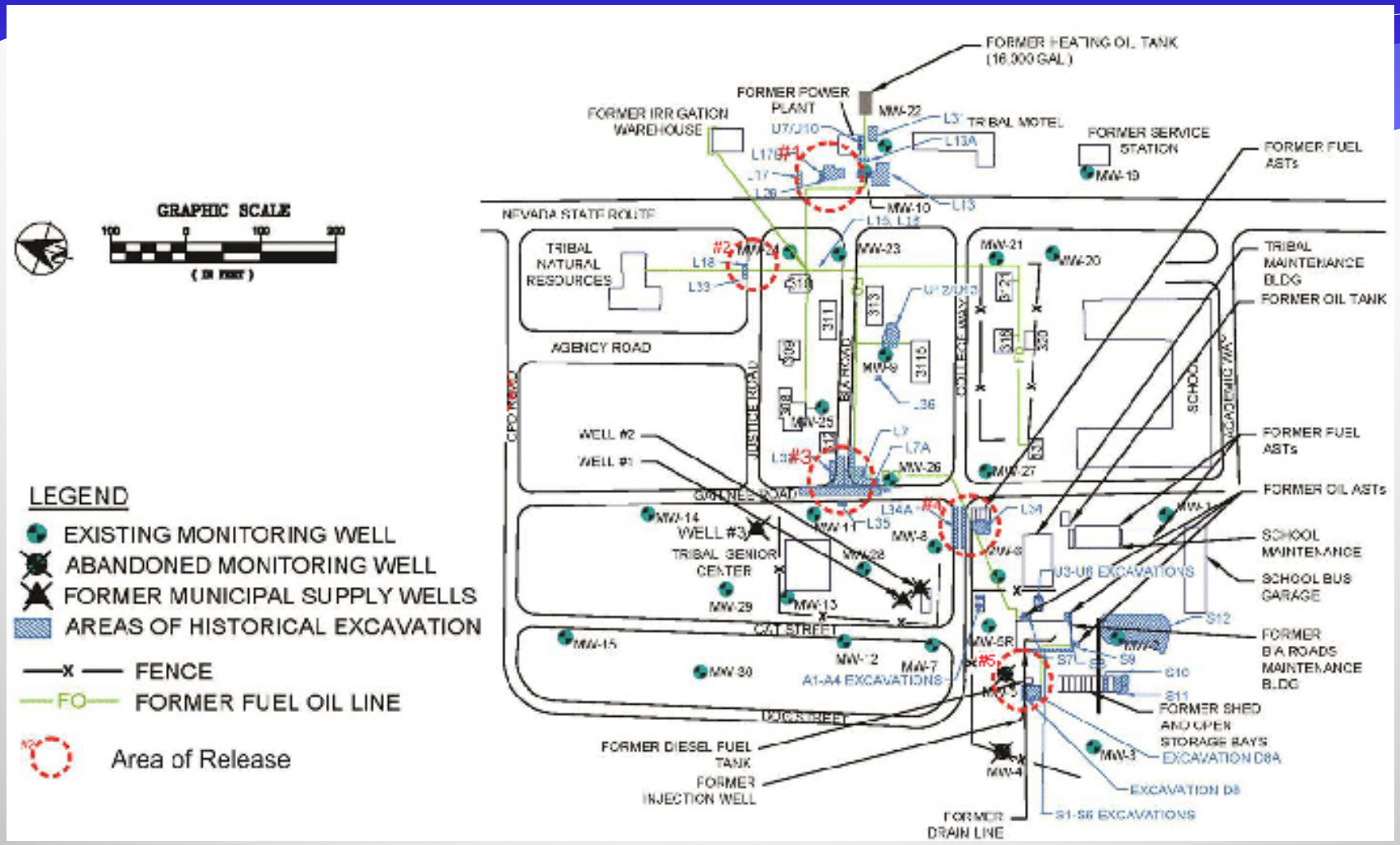
GW Probes & GW TPH Contours



Chronology of Events
1999

* Most of Remaining Heating Oil Pipeline and Significant Quantities of Contaminated Soil Were, Where Feasible, Removed
* Sampling Showed Four Major Releases (1-4) and One Moderate Release (5) of Hydrocarbons
    1. Along Pipeline East of Highway 225
    2. At Former Heating Oil UST, 200 Feet West of Highway 225
    3. At 90 Degree Turn in Pipeline, 475 Feet West of Highway 225
    4. Along Pipeline Near the ASTs in the NE Corner of the Tribal Maintenance Yard
    5. At Discharge Pipe Outlet in the BIA Road Shop Yard.

Chronology of Events 1999 (Cont'd)



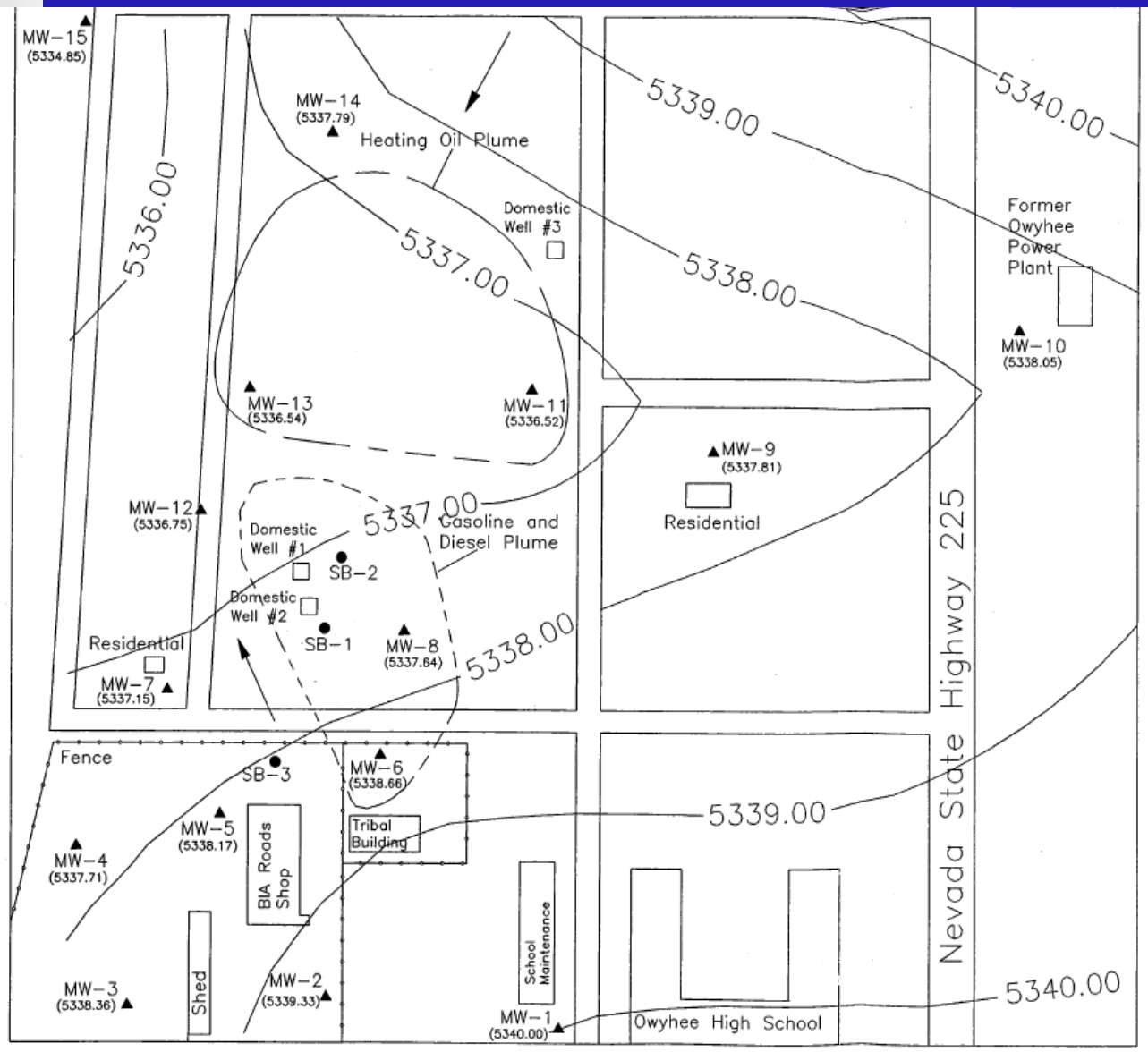
Chronology of Events 1999 (Cont'd)

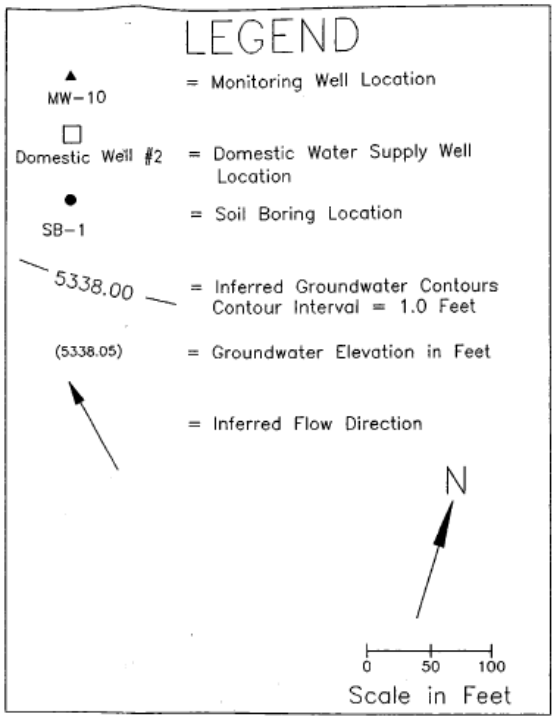
* In 1999 Almost 3,000 yd^3 Contaminated Soil was Excavated From the Site.
* Contaminated Soil Could Not Be Excavated From 18 Areas Due to the Presence of Buildings, Other Structures, Roads, and Utilities.

Chronology of Events
2000

* Removal and Closure of Injection Well
* No Heavy Metals Found in GW
* VOCs in GW Less Than Federal Drinking Water Standards
* No Pesticides or Herbicides Detected in GW
* Two USTs and One AST Removed From IHS Hospital Site
  * TPH-diesel in Excavated Soil = 560 -6,100 ppm
* Three Monitoring Wells Installed at Former HIS Hospital Site. Low Levels of Naphthalene, a Degradation Product of Diesel, Found in GW

Groundwater Flow Direction and Potentiometric Surface Map - November 2000



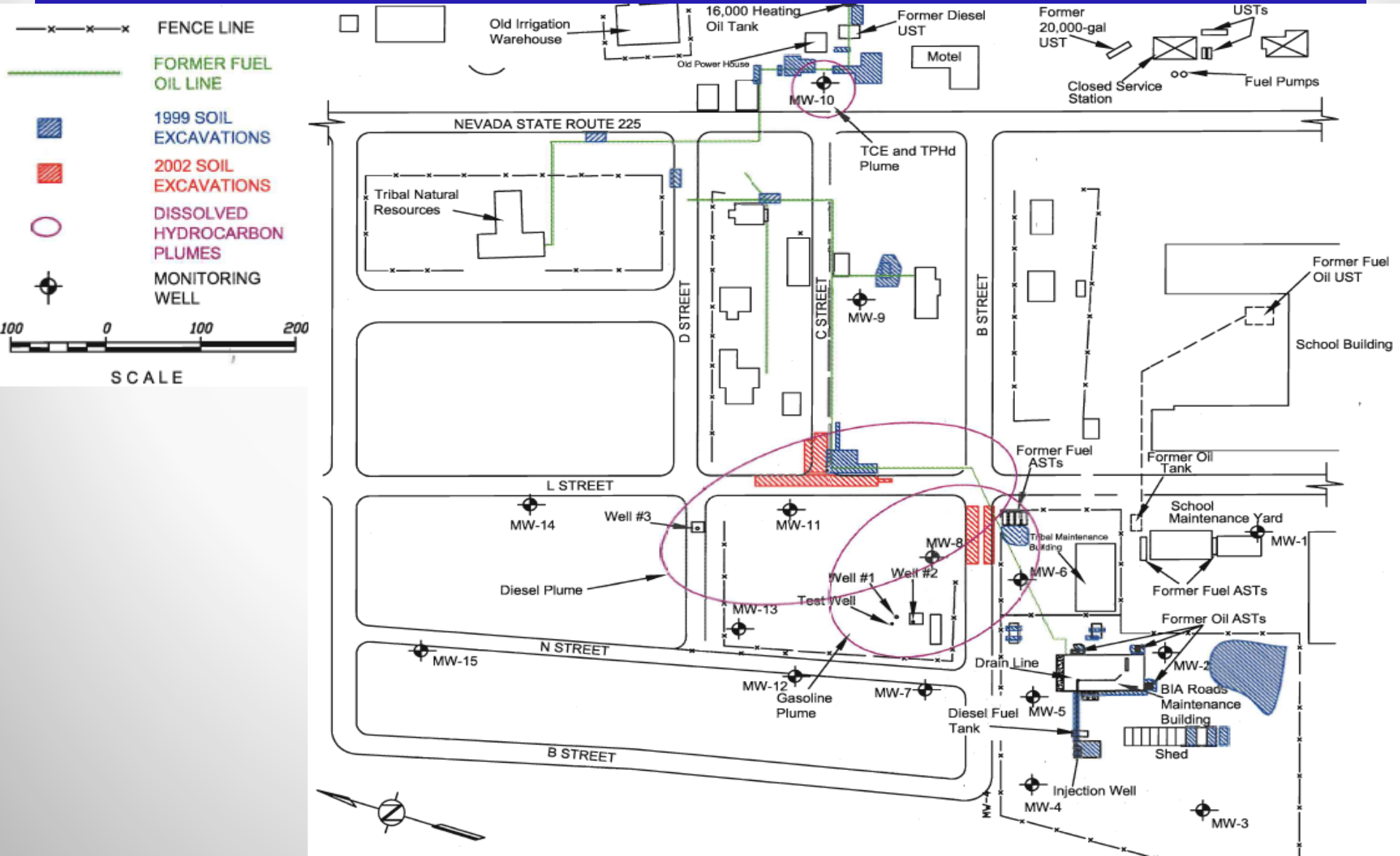


SRK Consulting
Engineers and Scientists

Chronology of Events
2002

* Additional TPH impacted soils (2000 cubic yards) from beneath the roads were excavated and removed during a BIA road project.

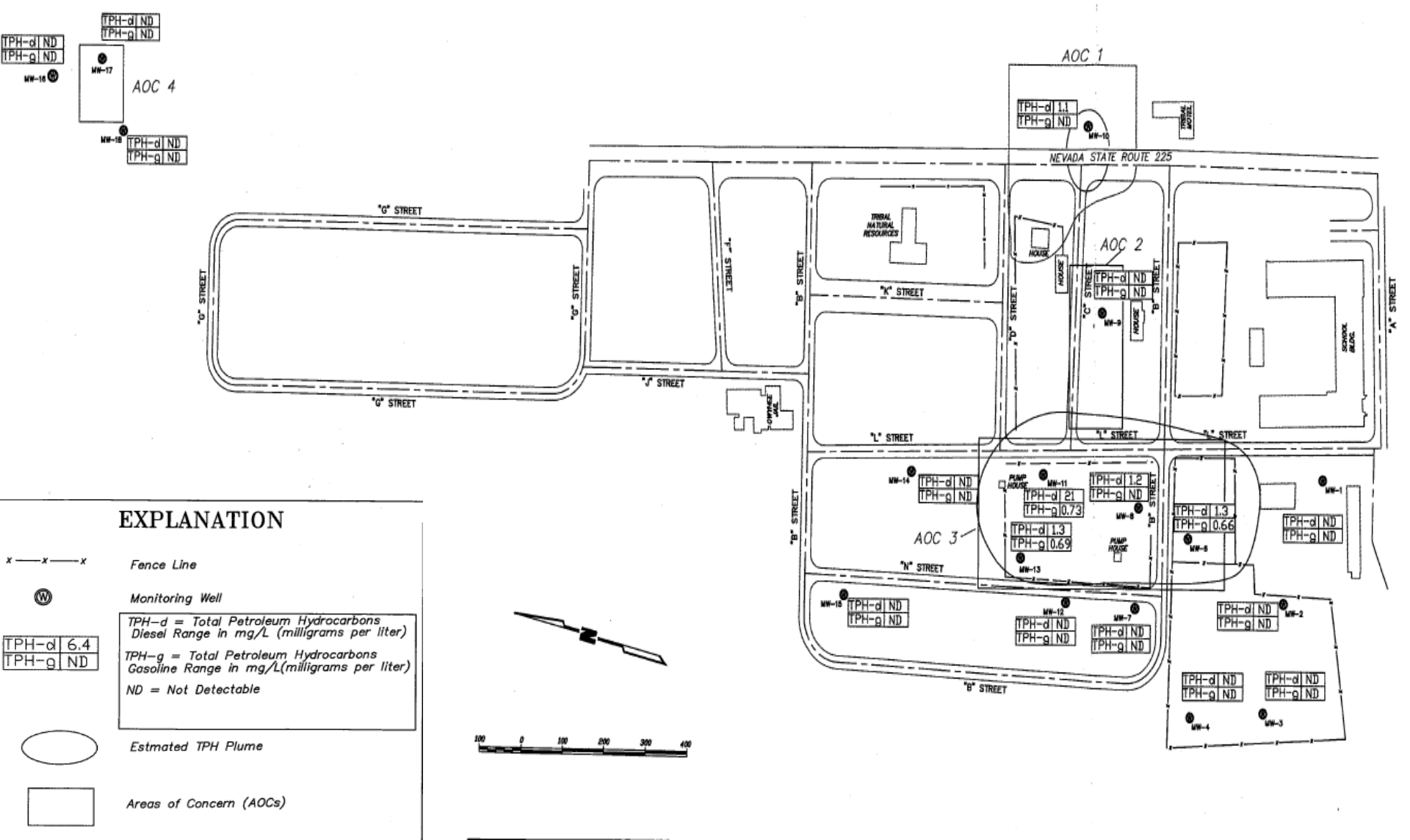
Excavations Through 2002 and Monitoring Wells



Chronology of Events 2004-2005

* Quarterly Groundwater Sampling
* Continued Presence of Hydrocarbons in GW
* First Detection of TCE Solvent (very low level) in GW at MW-10
* Petroleum Hydrocarbons Found in Unexcavated Soil
  * Utility Corridors
  * Inside Right-of-Ways
  * On Top of Groundwater

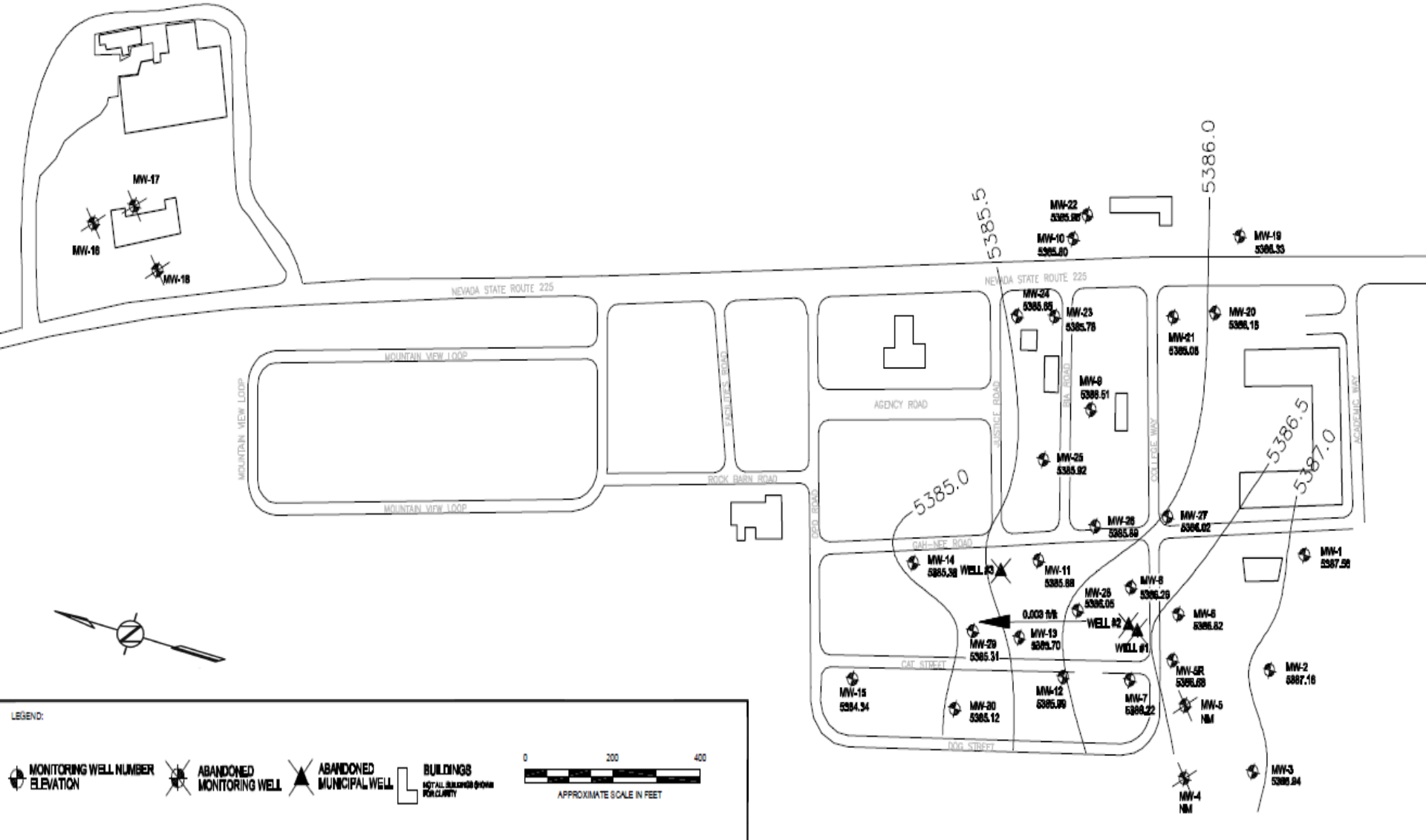
Hydrocarbon Concentration Map
June 2005



Chronology of Events 2008-2009

* Installation of Monitoring Wells MW-5R and MWs-19-30
* Abandonment of 5 Monitoring Wells
* Abandonment of 3 Municipal Water Supply Wells
* Groundwater monitoring for:
  * Petroleum Hydrocarbons (TPHg and TPHd)
  * BTEX
  * TCE

Potentiometric (Groundwater) Surface May 2009



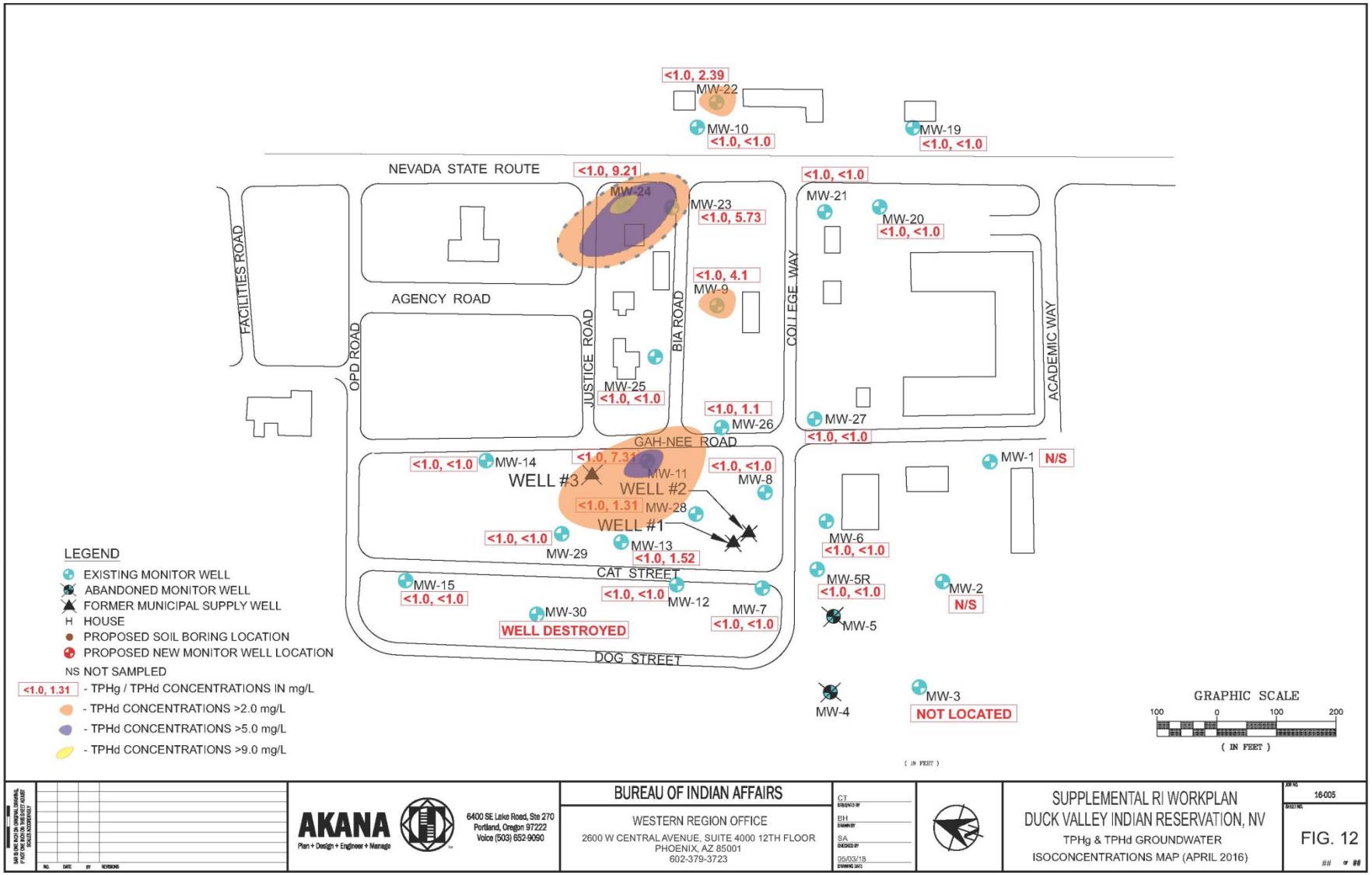
2013 Groundwater Event

* In 2013 DSE sampled 23 monitor wells
* Benzene detected above the Regional Screening Level (RSL) in MW-24
* TCE not analyzed
* TPH-DRO plume still prevalent across the site

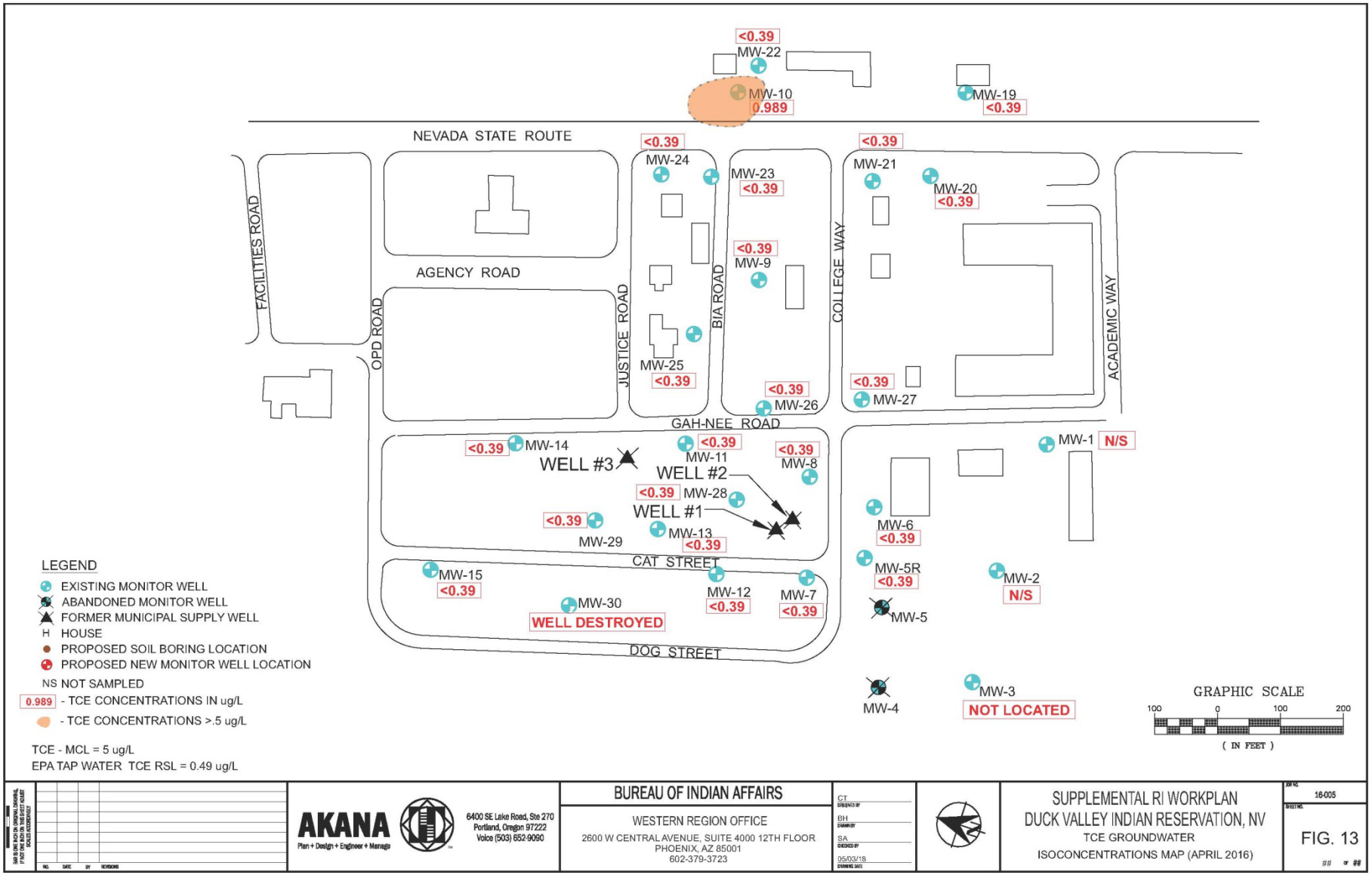
Most Current Data - 2016

* BIA contracted Akana to Review the Agreed Order and continue the investigation
* Groundwater Sampling Performed
* Groundwater Contamination Mapped

Diesel and Gasoline Hydrocarbons - 2016



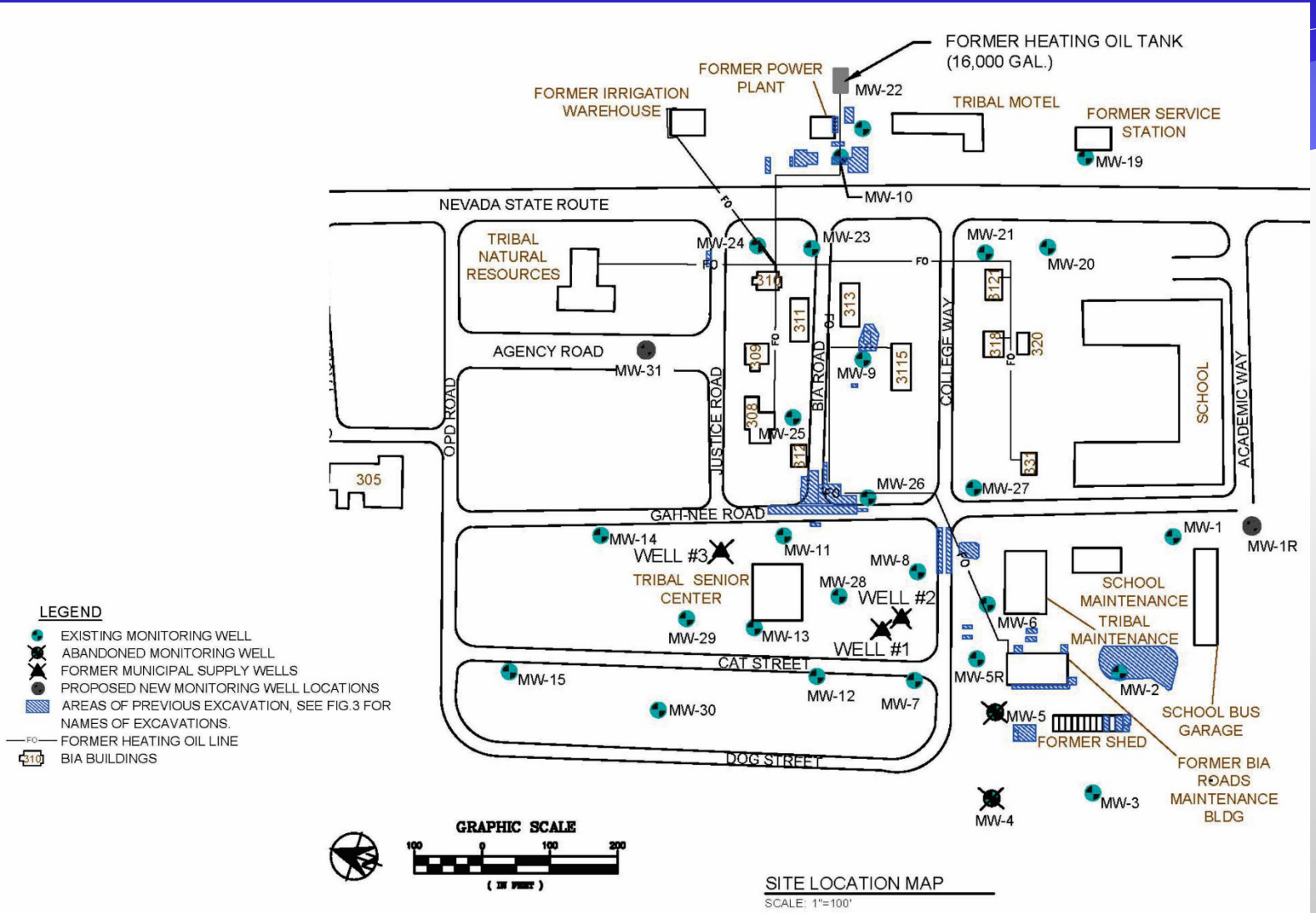
TCE Solvent - 2016



2018 Status of Compliance With EPA Order

* May 2018-BIA Has Satisfied All Items in the Order
* Akana Work Plan for Phase II Work
* Install New Groundwater Monitoring Wells
* Collect Soil and Groundwater Samples
* Prepare Clean-Up Plan

Phase II Monitoring Well Locations



Quarterly Groundwater Monitoring

* Sample Groundwater for Petroleum Hydrocarbons and Volatile Compounds
* Collect Water Quality Data in Field
  * Odor
  * Turbidity (clarity)
  * Dissolved oxygen

Remedial Investigation Results

* Issued At End of Phase II Investigation
* Results Used to Develop Remedial Action Plan

Phase II Schedule

* June/ July 2018 – Monitor Well Installation and Soil Sampling, quarterly groundwater event
* 2018-19 – Two Quarterly Groundwater Sampling
* Annual Groundwater Report to Follow 4th Quarter Event

Remedial Design Plan

* Remedy will be protective of Residents and Workers
* Key Contaminants and Clean-Up Targets
* Remedial Alternatives

BIA Consultant – Akana

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Questions?