SITE HAZARD ASSESSMENT

WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Site Name: **BPA Maintenance Facility**
Address: Grand Coulee Dam, Grand Coulee, WA
Ecology Facility Site ID No.: 91286566
Section/Township/Range: Section 1, T. 28 N., R.30 E.
Latitude: 47.95117 Longitude: -118.99250

Site scored/ranked for the August 2016 update
Today's date: 5/17/16

SITE DESCRIPTION:
The BPA Maintenance Facility (Site) is located on the northeastern edge of the Town of Grand Coulee, Washington. The Site is currently occupied by BPA and has active underground storage tanks (USTs). The former tank removal area is approximately 800 feet uphill from the shore of Lake Roosevelt and 450 feet downhill from the head end of the irrigation canal that feeds Banks Lake. Groundwater is at about 60 feet below ground surface (bgs).

The Site previously had a pump island, a 2,000-gallon diesel tank, and a 2,000-gallon gasoline tank. The pump island and tanks were removed in September and October of 1991. During removal it was discovered that there had been a release to the soil in the vicinity of the tanks. A consultant determined that the leak was likely from a gasoline suction line. An estimated 500 cubic yards of soil was removed and transported off-site for disposal. The excavation equipment was stepped down twice to try and reach deeper soils and determine the depth of contamination. Field samples indicated contaminated soil at the maximum excavated depths of 34 feet bgs. The contractor was concerned with the safety of excavating further, so excavation was halted.

Two monitoring wells were installed during excavation activities and soil samples were collected from each boring (see "Well Drilling Samples" in Table 1). Concentrations of benzene exceeded the cleanup level in one boring at 43 feet bgs.

All of the excavated soils were removed from the site and treated. Contaminated soil was still present in the sidewalls of the excavation when the contractor decided the safety concerns and risk to the nearby building were too great. Sample results indicated that contaminated soil above MTCA Method A cleanup levels was still present between 11 and 43 feet bgs (see "Complete Excavation Sidewall Samples" and "Well Drilling Samples" in Table 1). Concentrations of benzene, toluene, ethylbenzene, and xylenes exceeded the cleanup levels in three of the four sidewall samples. Concentrations of gasoline ranged from 80 – 21,000 mg/kg in each of the four sidewall samples, exceeding the cleanup level of 30 mg/kg.

In total, five groundwater monitoring wells were drilled on the Site; however, only three of the five wells had sufficient water that could be sampled. Concentrations of diesel exceeded the cleanup level

in one sample from MW-5. All other results were below cleanup levels. Groundwater results are shown on Table 1.

On January 27, 2015, Todd Phillips of Grant County Health District (GCHD) conducted a site visit with Michael Rosales of BPA. During the site visit it was noted that the monitoring wells were plugged with concrete, the site is paved, and there is a fuel station currently in use at the site.

SPECIAL CONSIDERATIONS (include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):

ROUTE SCORES:

Surface Water/Human Health: NA
Air/Human Health: NA
Groundwater/Human Health: 16.4
Surface Water/Environmental.: NA
Air/Environmental: NA

OVERALL RANK: 5

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE - NOT SCORED**
   a. List those substances to be considered for scoring: Source:

   b. Explain basis for choice of substance(s) to be used in scoring.

   c. List those management units to be considered for scoring: Source:

   d. Explain basis for choice of unit to be used in scoring:

2. **AIR ROUTE - NOT SCORED**
   a. List those substances to be considered for scoring: Source:

   b. Explain basis for choice of substance(s) to be used in scoring:

   c. List those management units to be considered for scoring: Source:

   d. Explain basis for choice of unit to be used in scoring:

3. **GROUNDWATER ROUTE**
   a. List those substances to be considered for scoring: Source: 1,2
      Diesel, gasoline (as benzene).
   b. Explain basis for choice of substance(s) to be used in scoring:
      Confirmed above cleanup levels in groundwater.
   c. List those management units to be considered for scoring: Source: 1,2
      Subsurface soil.
   d. Explain basis for choice of unit to be used in scoring:
      Contaminated subsurface soil due to a leak in the gasoline product line.

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

	Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Diesel	160	4	490	5	.004	3	-	-	-
2	Benzene	5	8	3306	3	-	ND	A	.029	3
3										
4										
5										
6										

* *Potency Factor*

Source:

Highest Value: 8
(Max = 10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 8
(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)

Cations/Anions [Coefficient of Aqueous Migration (K)] OR	Solubility (mg/L)
1=	1= 3.0E+01 = 1
2=	2= 1.8E+03 = 3
3=	3 =
4=	4=
5=	5=
6=	6=

Source:

Value: 3
(Max = 3)

1.3 Substance Quantity:

Explain basis: Estimated 1000 cubic yards of contaminated soil remains.	Source: 1 **Value:3** (Max=10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** Contaminated area paved – scored as Landfill: No liner = 3; maintained cover = 0; no leachate collection system = 2	1,8	**5** (Max = 10)
2.2	**Net precipitation:** 6.4" – 2.5" = 3.9"	5	**1** (Max = 5)
2.3	**Subsurface hydraulic conductivity:** silty sandy soil with pebbles/cobbles	1,3	**3** (Max = 4)
2.4	**Vertical depth to groundwater:** 60 feet	1,2	**4** (Max = 8)

1.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** public supply, alternate sources available	6,7	**4** (Max = 10)
3.2	**Distance to nearest drinking water well:** >5,280 feet	6,7	**1** (Max = 5)
3.3	**Population served within 2 miles:** 926	7	**30** (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** **(0.75)*√ 6** = 1.83	3,6	**2** (Max = 50)

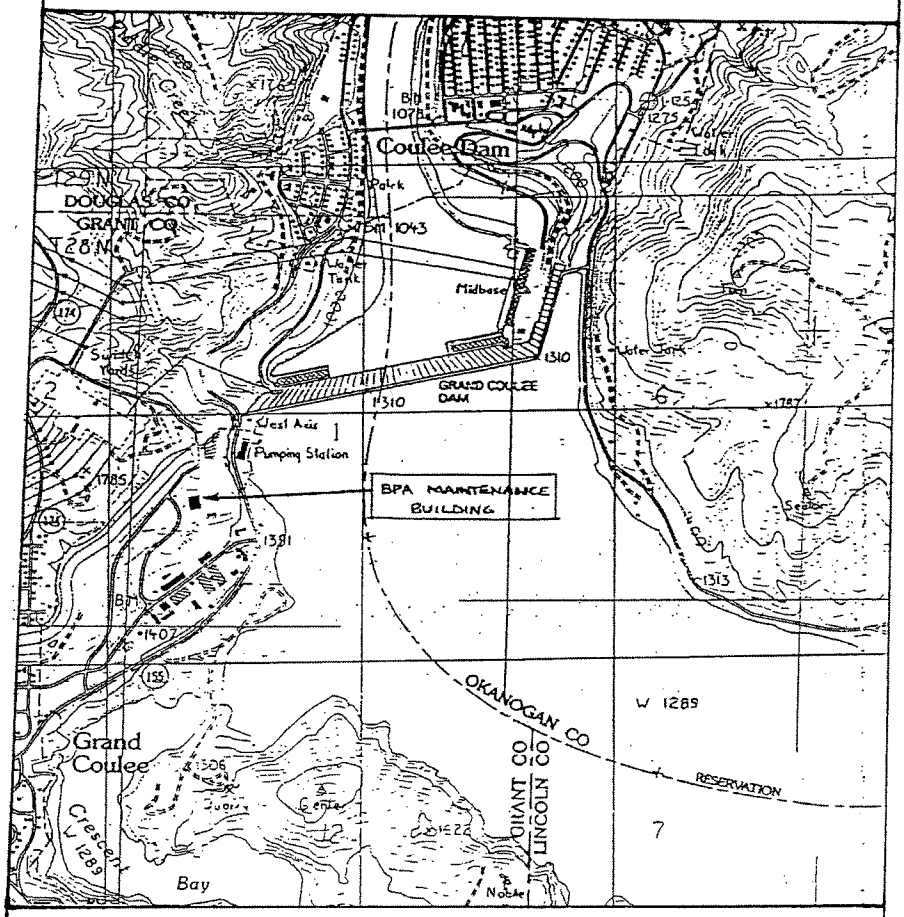
2.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Groundwater sample results confirmed diesel concentrations exceeded cleanup levels.	2	**5** (Max = 5)

SOURCES USED IN SCORING

1. Grand Coulee Underground Storage Tank Removal and Remediation (Riedel Environmental Services, January 1992).
2. Grand Coulee Maintenance Facility Quarterly reports (BPA, November 1997, January 1998, March 1998).
3. WA Department of Ecology, WARM Scoring Manual, April 1992.
4. WA Department of Ecology Toxicology Database for used in Washington Ranking Method Scoring, January 1992.
5. Washington Climate – Net Rainfall Table.
6. WA Department of Ecology, Water Rights Information website.
7. WA Department of Health Sentry Internet Drinking Water Data website.
8. Site visit by Todd Phillips (GCHD), January 2015.

FIGURE 1



VICINITY MAP
GRAND COULEE
MAINTENANCE BUILDING
SCALE 1:24,000

FIGURE 2

BPA Maintenance Facility

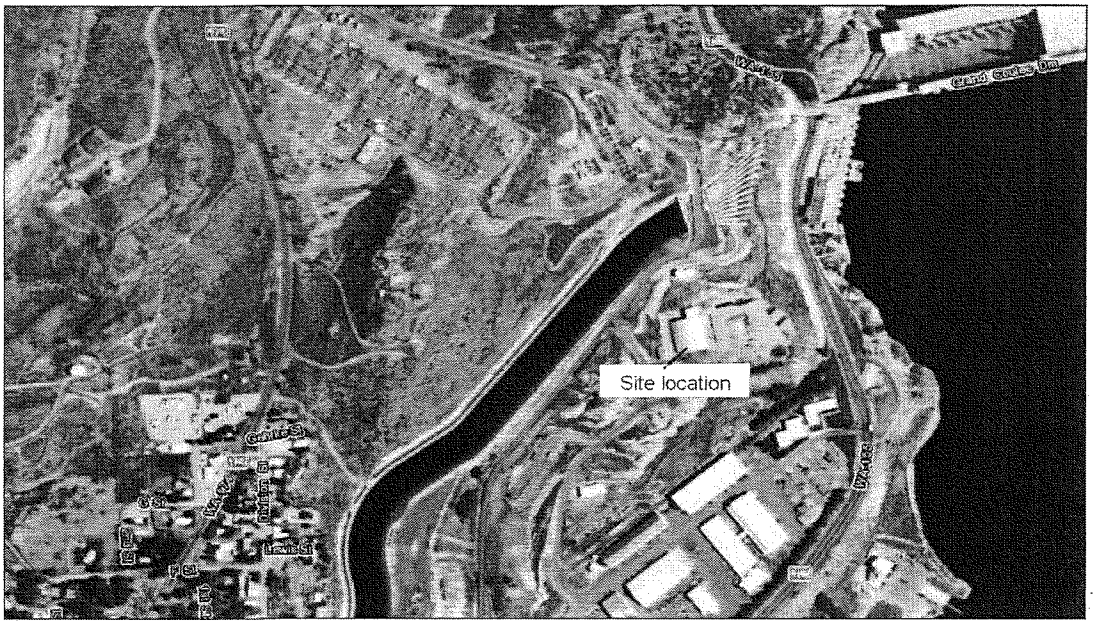
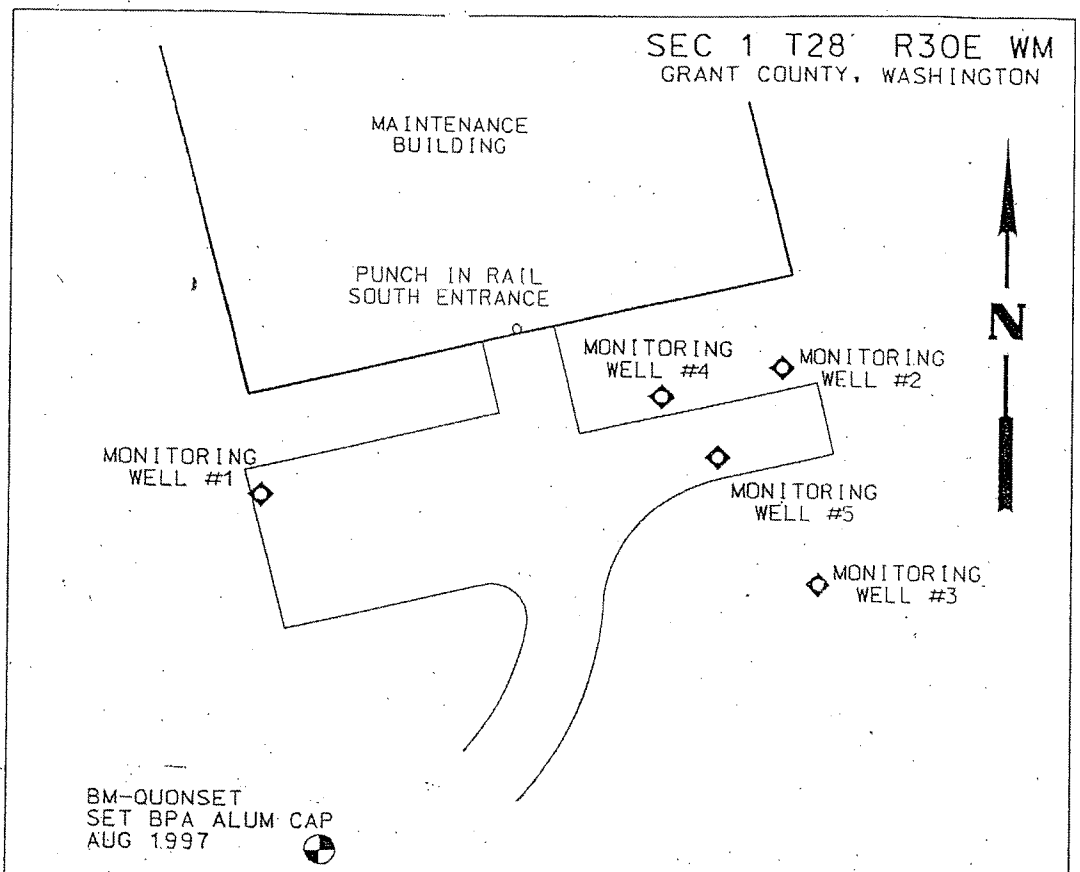


FIGURE 3



	NORTHING	EASTING	ELEVATION
Monitoring Well No. 1	352437.28	2091486.88	1519.17
Monitoring Well No. 2	352473.57	2091625.94	1512.17
Monitoring Well No. 3	352414.31	2091635.72	1513.19
Monitoring Well No. 4	352465.30	2091594.55	1511.91
Monitoring Well No. 5	352448.98	2091609.02	1513.29
BM-Station "Quonset"	352339.49	2091502.76	1515.90

20 0 40 80

NOTE:
ASPHALT LOCATION
BASED ON
DRAWING SERIAL No. 204115

COMPUTER REVISION ONLY

RIGHT OF WAY | DESIGN

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

GRAND COULEE MAINTENANCE FACILITY
MONITORING WELL LOCATIONS

FBJ | A1 | 0

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Table-1. Pertinent Sample, Location and Results

Groundwater Samples

Sample Date/ location	Units	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH-G	TPH-D	Lead	Applicable Standard	Applicable Concentration Respectively
10/16/1991 MW-5 (VRW-2)	ug/L	1.18	0.18	0.06	0.48	-	-	-	2	5/1000/700/1000/ 800/500/15
5/21/1997 MW-5	ug/L	ND	ND	ND	1.26	ND	**720**	4.53	2	5/1000/700/1000/ 800/500/15
8/14/1997 MW-5	ug/L	ND	ND	ND	1.73	73.7	ND	ND	2	5/1000/700/1000/ 800/500/15
12/3/1997 MW-5	ug/L	ND	0.98	ND	7.55	94.8	ND	ND	2	5/1000/700/1000/ 800/500/15
3/4/1998 MW-5	ug/L	ND	ND	ND	2.66	59.6	ND	ND	2	5/1000/700/1000/ 800/500/15
5/21/1997 MW-3	ug/L	ND	ND	ND	ND	ND	281.0	ND	2	5/1000/700/1000/ 800/500/15
8/14/1997 MW-3	ug/L	ND	ND	ND	ND	ND	ND	ND	2	5/1000/700/1000/ 800/500/15
12/3/1997 MW-3	ug/L	ND	ND	ND	ND	ND	-	ND	2	5/1000/700/1000/ 800/500/15
3/4/1998 MW-3	ug/L	ND	ND	ND	ND	ND	ND	ND	2	5/1000/700/1000/ 800/500/15
5/21/1997 MW-2	ug/L	ND	ND	ND	ND	ND	258.0	ND	2	5/1000/700/1000/ 800/500/15
8/14/1997 MW-2	ug/L	ND	ND	ND	1.13	ND	ND	ND	2	5/1000/700/1000/ 800/500/15
12/3/1997 MW-2	ug/L	ND	ND	ND	ND	ND	ND	ND	2	5/1000/700/1000/ 800/500/15
3/4/1998 MW-2	ug/L	ND	ND	ND	ND	ND	ND	ND	2	5/1000/700/1000/ 800/500/15

Complete Excavation Sidewall Samples

Sample Date/ location	Units	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH-G	TPH-D	Lead	Applicable Standard	Applicable Concentration Respectively
9/25/1991 W @ 11'	mg/Kg	**170**	**1000**	**240**	**4500**	**21000**	**2000**	-	1	.03/7/6/9/30/2000/ 250
9/26/1991 W@22'	mg/Kg	**157**	**941**	**198**	**3700**	**17800**	1290	-	1	.03/7/6/9/30/2000/ 250
9/25/1991 E@ 11'	mg/Kg	**22**	**136**	**25**	**460**	**2200**	800	-	1	.03/7/6/9/30/2000/ 250
9/26/1991 E@22'	mg/Kg	-	-	-	-	**80**	74	-	1	.03/7/6/9/30/2000/ 250

Well Drilling Samples

Sample Date/ location	Units	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH-G	TPH-D	Lead	Applicable Standard	Applicable Concentration Respectively
10/16/1991 VRW-1@43'	ug/Kg	**74**	1520	140	422	NA	NA	NA	1	30/7000/6000/ 9000
10/16/1991 VRW-1@43'	mg/Kg	NA	NA	NA	NA	<10	14	<5	1	30/2000/250
10/16/1991 VRW-1@49'	ug/Kg	<8	87	4	32	NA	NA	NA	1	30/7000/6000/ 9000
10/16/1991 VRW-2@10'	ug/Kg	<9	78	6	76	NA	NA	<5 mg/Kg	1	30/7000/6000/ 9000/250
10/16/1991 VRW-2@15'	ug/Kg	<2	108	<2	50	NA	NA	NA	1	30/7000/6000/ 9000
10/16/1991 VRW-2@15'	mg/Kg	NA	NA	NA	NA	<10	<10	NA	1	30/2000
10/16/1991 VRW-2@33'	ug/Kg	<12	96	5	26	NA	NA	NA	1	30/7000/6000/ 9000
10/16/1991 VRW-2@33'	mg/Kg	NA	NA	NA	NA	<10	<10	NA	1	30/2000
10/16/1991 VRW-2@39'	ug/Kg	4	1050	134	626	NA	NA	NA	1	30/7000/6000/ 9000

10/16/1991 VRW-2@39'	mg/Kg	NA	NA	NA	NA	2.6	27	NA	1	30/2000
10/16/1991 VRW-2@45'	ug/Kg	<14	1020	78	393	NA	NA	<5 mg/Kg	1	30/7000/6000/ 9000/250
10/16/1991 VRW-2@57'	ug/Kg	<22	90	5	46	NA	NA	NA	1	30/7000/6000/ 9000
10/16/1991 VRW-2@57'	mg/Kg	NA	NA	NA	NA	<10	<10	NA	1	30/2000
10/16/1991 VRW-2@63'	ug/Kg	<7	110	13	52	NA	NA	NA	1	30/7000/6000/ 9000
10/16/1991 VRW-2@63'	mg/Kg	NA	NA	NA	NA	<10	<10	NA	1	30/2000
10/16/1991 VRW-2@63'	ug/L	1.18	.1	.08	.48	NA	NA	NA	2	5/1000/700/1000

Results Key: MTCA Method A Soil Unrestricted Land Use=**1**; MTCA Method A Groundwater=**2**
MW= Monitoring Well, NA=Not Applicable
Results for excavated material are not included
Bolded values are exceedances