Data Evaluation of Materials Related to the Subsurface Environmental Closure of Western Forge & Flange, 540 Cleveland Ave., Albany CA

Prepared for Chemical Data Management Systems, Inc., Dublin, CA (CDMS)

December 18, 2008

Fredric Hoffman
CA Professional Geologist No. 3929
CA Certified Hydrogeologist No. 83

This evaluation is based on the review of documentation of a 1985 investigation and cleanup of the Western Forge and Flange (WFF) facility in Albany, CA found on the California Department of Toxic Substances Control (CADTSC) Envirostor Website, a Brown and Caldwell report from 1984, and on the geologic and chemical information from 17 hydropunch borings performed in October and November 2008.

Executive Summary

In the early 1980s Western Forge and Flange process cooling water and storm water runoff containing metals and oils contaminated the shallow subsurface and was discharging to a nearby storm drain. In response and in consort with the environmental regulatory agencies, WFF sampled and removed 200 cubic yards of contaminated sediment from inside and outside the facility and instituted engineering controls at the surface and on their roof to prevent a reoccurrence. (CADOHS. 1987) Verification sampling in January 1985 demonstrated that remaining contaminants in the sediments were below residential standards. (CADTSC. 2002).

In October and November of 2008, CDMS sampled the shallow subsurface both inside and outside the building at 17 locations approved by the Alameda County Environmental Health Department. This investigation found that there is a shallow perched water bearing clay zone beginning between 4 and 6 feet below ground surface (bgs) perched on a dense clay at 10 to 12 feet bgs. This clay is underlain by a dry poorly cemented sand at approximately15 feet bgs. Samples of soil and the perched water were analyzed for metals and total petroleum hydrocarbons (residual fuels) and were found to be very similar to the verification levels found in 1985. There is one relatively small shallow area in the southwestern portion of the building where single samples in two borings exceed the SFRWQCB Environmental Screening Levels in soil for TPH and is a candidate for additional cleanup.

1983 Environmental Release

In September 1983, a Department of Fish and Game Pollution Warden reported oil on the ground at WFF and in water discharging to a storm drain. The CA Department of Health Services (CADOHS), the predecessor of the CADTSC, began an enforcement action and Western Forge contracted with Brown and Caldwell to conduct their investigation. Sampling at the site revealed elevated concentrations of lead, nickel, copper, zinc, and oil and grease in soils outside the building and on the floor of the interior. WFF was fined for the discharge, agreed to cleanup the site, and agreed to a corrective action plan that included cleanup and engineering controls on its process. (CADOHS. 1987).

The Brown and Caldwell subsurface investigation found that the local stratigraphy beneath the site consists of a sandstone that slopes from the east to the west and is overlain by a one foot thick clay bed east of the site and thickening to 14 feet to the west. Water levels, beneath the western part of the facility, were at 5 to 6 feet below ground surface. (Brown and Caldwell. 1984).

Cleanup consisted of the sampling, excavation, and removal of 200 cubic yards of contaminated sediments. Engineering controls included surface and roof collection of contaminated process water and berms and gutters to segregate clean storm runoff from process water. A steam trap and condenser was mounted on the roof, condensate was directed to a separator, and waste oil was collected for disposal. (CADOHS. 1987)

Following the cleanup, sediment verification sampling was conducted in January 1985. The results of this sampling are included in Table 1, which was extracted from (CADOHS. 1987).

Table 1 Western Forge & Flange Albany Site Verification Sample Results, Concentration in Milligrams per Kilogram

Sample number	Sample depth, inches	Copper	Lead	Nickel	Oil and grease
Inside soils					
V1	18 - 24	20	17	15	<50
V2	6 - 12	66	240	48	240
V3	12 - 18	62	14	95	<50
V4	6 - 12	75	38	88	380
V5	6 - 12	42	64	51	2,180
V8	12 - 18	470	100	820	3,510
V9	16 - 22	140	97	350	1,290
V13	24 - 30	-	-	-	170
V6	6 - 12	110	150	130	640
V7	6 - 12	240	99	560	<50
V10	10 - 16	320	87	210	120
V11	10 - 16	2,000	82	2,100	10,700
V15	10 - 24	150	37	460	240
V12	10 - 16	580	50	190	<50
V14	10 - 16	300	180	250	240
V16	18 - 24	27	<13	100	120
V17	6 - 12	110	18	1,900	2,470
Outside soils					
SV1	12 - 18	8.7	13	32	270
SV2	12 - 18	22	23	63	94
SV3	17 - 23	32	22	210	<50
SV4	6 - 12	29	40	58	<50
SV5	24 - 30	26	15	62	133
TTLC[a]		2,500	1,000	2,000	-
Cleanup level[b]		1,250	500	1,000	1,000

[a]Total threshold limit concentration in milligrams per kilogram 22 CAC 66699 January 11, 1985.
[b]Approved by State.

Note: Underline indicates concentration exceeding cleanup level.

On August 16, 1985, upon review of the verification sampling report, the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) expressed their satisfaction with the soil cleanup activities. In addition, their review of ground water data

from up and down-gradient monitor wells concluded that WFF had not had a significant impact on the underlying shallow aquifer and therefore no further ground water monitoring was needed. In the same letter, the Regional Board also commended WFF for its plan to prevent future releases of waste oil and other contaminants. (CADOHS. 1987)

In a letter dated January 15, 1986, to WFF, the SFRWQCB reiterated their conclusion that the shallow perched groundwater at the site is too saline to be of beneficial use, that the low permeability of the clays containing the ground water would limit the spread of any pollutants, that the pollution problem has been adequately mitigated, and that the site does not pose a significant threat to the beneficial uses of the waters of the State. (SFRWQCB. 1984). In 1987, the CADOHS also concluded that no further removal/remedial action is necessary. (CADOHS. 1987).

Finally, in 2002, in what appears to be a review of the cleanup and ongoing operations by WFF, CADTSC specified the cleanup levels for the site at that time as 1250 ppm for copper, 500 ppm for lead, 1000 ppm for nickel, 2500 ppm for zinc, and 1000ppm for oil and grease. They also indicated that these cleanup levels were below residential standards. This report also indicated that the site then generated waste oil and sludge with metals and was regularly inspected by the Alameda County Environmental Health Department. (CADTSC. 2002).

Current (2008) Investigation

Within the past year, WFF suspended its operations at its Albany facility and removed all of its equipment from the building and the site. The Alameda County Environmental Health Department is currently overseeing the investigation of the site to determine is suitability for sale.

WFF has contracted with CDMS to manage the environmental investigation, mange any necessary cleanup, and to shepherd the site through the environmental certification process. At the time of this writing, CDMS has conducted some cleaning of the building and has completed the subsurface investigation.

The sampling locations were established in collaboration with representatives of the Alameda County Environmental Health Department (Figure 1). There are several concrete and steel lined pits at the facility that extend to 10 feet below the ground surface, and served as foundations for large hydraulic metal working hammers, rollers, and presses. The County was concerned that the pits could be a source of release of hydraulic fluids. Sample locations were established around each of the pits jointly by a representative of Alameda County Environmental Health Department and CDMS, and at additional locations selected by CDMS based upon surface staining and the locations of other operations. Four inch holes were sawn through the 6 – 9 inches of concrete, and the samples were taken with a hydropunch rig. Core tubes were lined with clear liners and were advanced three feet at a time. At water sampling locations, slotted PVC well screens were inserted into the borehole, and water samples were taken with a bailer. Cement grout was tremied through the well screens to seal the holes upon completion.

The first two borings were made around the pit on the north side of the building (SB101 & SB102). The initial intent was to advance the borings to below the bottom of the pits. After penetrating the initial 6 -9 inches of concrete, the cone penetrometer moved through unsaturated sediment and encountered ground water in a dark gray plastic clay 4-6 feet below ground surface (bgs). At 12 to 14 bgs a dense dry clay marked the

bottom of the perched water zone. The clay was underlain at 14 to 16 feet by a dry poorly cemented tan-colored sand. The third boring was pushed in the southwest corner of the building (SB103) and the same materials were encountered at about the same depths. Water samples were bailed from these three borings and in each case, water level recovery was very slow indicating that the saturated clay has a low hydraulic conductivity.

From the data from these three borings and the information from the Brown and Caldwell investigation (Brown and Caldwell. 1984), it is clear that the site is underlain by a low permeability clay saturated above a dry dense clay above a poorly cemented sand. The clay contains a thin perched ground water zone between 6 to 12 feet below the ground surface in the southwestern portion of the facility. Since the concrete and steel lined pits are all dry, extend well below the perched water bearing zone, and no water is seeping into the pits, it is also reasonable to conclude that no liquid contaminants would have seeped out of the pits to the subsurface environment.

The remaining borings were advanced only to nine feet bgs to avoid any further penetration of the dry clay responsible for the perched water zone and for the protection of the deeper aquifer.

Soil sample analyses are included in Table 2A and water sample analyses are in Table 2B. (TestAmerica. 2008a, 2008b, and 2008c).

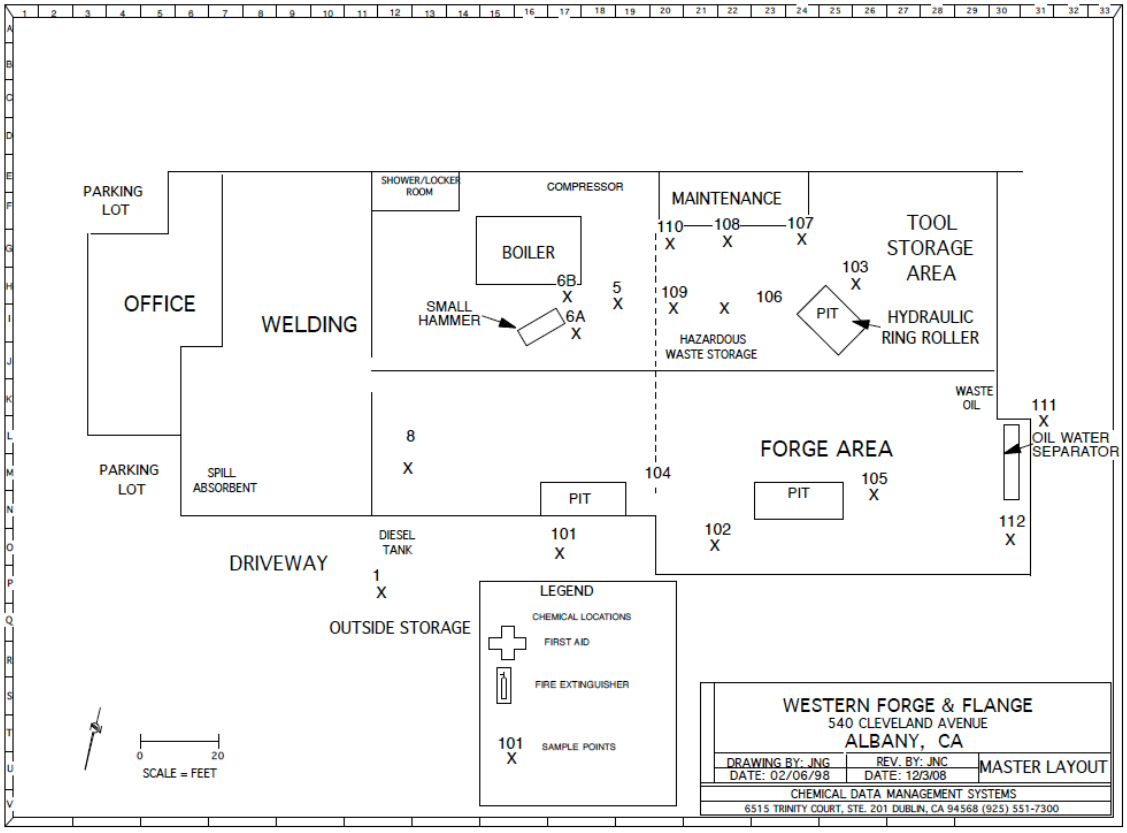


Figure 1. Location of 2008 subsurface sampling events.

Table 2A WFF Data		**Soil in mg/kg**				
Boring #	Depth (Center) ft	Cr	Ni	Pb	Zn	TPH (Residual Fuels)
SB101	3.5	17	22	12	26	150
	7.5	14	8.2	5.2	9.4	ND
	11.5	8.8	10	3.7	14	ND
	15.5	16	20	6.2	23	ND
SB102	3.5	45	60	15	33	ND
	7.5	16	7.8	110	70	52
	11.5	13	9.4	5.0	13	ND
	15.5	11	15	7.1	26	ND
SB103	3.5	67	85	11	52	210
	7.5	18	9.7	150	110	110
	11.5	18	23	3.7	12	ND
	15.5	18	23	3.9	12	ND
SB104	1.5	32	35	10	34	ND
	3.5	16	11	75	120	ND
	7.5	12	8.3	13	17	ND
SB105	1.5	70	82	9.0	62	ND
	3.5	17	12	44	62	ND
	7.5	14	10	17	35	ND
SB106	2	53	64	11	46	ND
	4.5	54	79	31	67	2800
	7.5	12	24	210	200	ND
SB107	1.5	72	72	260	580	15000
	3.5	14	10	23	49	700
	7.8	14	11	5.2	12	ND
SB108	1.5	52	59	12	41	ND
	4.5	25	24	65	100	150
	7.5	14	10	4.8	9.3	ND
SB109	1.5	14	12	160	210	ND
	4.5	19	14	120	200	ND
	7.5	13	10	4.8	10	ND
SB110	1.5	25	19	87	290	ND
	4.5	17	11	10	26	ND
	7.5	13	8.4	5.3	7.8	ND
SB111	0.5	37	180	19	920	360
	3.5	50	69	6.6	44	60
	5.5	26	21	29	62	ND
	7.5	15	12	49	50	87
	9.5	14	8.8	10	13	ND
SB112	3.5	13	26	13	29	63
	7.5	70	86	7.7	42	ND
#5	0.75	51	140	30	73	
	3.5	16	20	81	110	

Table 2A (cont) WFF Data	**Soil in mg/kg**					
Boring #	Depth (Center) ft	Cr	Ni	Pb	Zn	TPH (Residual Fuels)
#6A	2.75	54	67	110	140	
	3.5	14	8.3	7.1	16	
#6B	2	5.2	83	7.9	81	
	3.75	15	9.2	56	76	
#8	1.25	18	14	180	130	
	3.5	73	180	140	90	
#9	1	15	14	23	56	
	3.5	20	24	15	29	

Table 2B WFF Perched Water Data ug/L Boring #	Cr	Ni	Pb	Zn	TPH (Residual Fuels)
SB101	ND	120	6.5	56	ND
SB102	14	140	770	1200	ND
SB103	26	380	61	1400	ND
SB105	ND	52	9.4	930	ND
SB107	22	480	120	1300	ND
SB108	25	76	5600	970	ND
SB109	ND	ND	ND	18	ND
SB111	ND	420	ND	8400	ND
1-6 (unfiltered)	1100	5800	1100	1900	

Interpretation of Chemical Data

With the exception of the two shallow soil samples in SB106 and SB107 all of the soil samples are very similar and in most cases lower than the concentrations that were certified as being below residential standards in 1985. This would indicate that the engineering controls WFF installed in 1985 were successful in preventing any further releases of contaminants to the ground. While there is no information as to the origin of the contaminants in the soil in the small area of the southwest corner of the building where SB106 and SB107 are located, this area is a candidate for some additional contaminated soil removal.

In addition to comparing the 2008 analytical results to the 1985 verification results and cleanup standards, the results were also compared to the 2008 Environmental Screening Levels (ESL) established by the SFRWQCB and accepted by the California State Water Resources Control Board. To select the appropriate ESL, the land use was considered Commercial or Industrial, the Depth to Impacted Soil was Shallow Soil, and the Groundwater use of the regional Aquifer was considered a Drinking Water Resource. Because the exterior soil had been replaced with clean soil in 1985 and the interior of the building has 6 to 9 inches of concrete over the soil, there is an assumption of no direct exposure, and no terrestrial ecological impacts. Given these assumptions the appropriate Soil Tier 1 ESL is the Gross Contamination ESL. For water, the contaminants are in a shallow perched zone, are not in the regional shallow aquifer, and there are no impacts to aquatic organisms. For Groundwater Tier 1 the Gross Contamination is the appropriate ESL. The selected appropriate ESLs for the contaminants of concern are shown in Table 3. (SFRWQCB. 2008).

Table 3 Environmental Screening Levels for Gross Contamination

	Soil mg/kg	Water ug/L
Cr (Total)	2,500	50,000
Ni	2,500	50,000
Pb	2,500	50,000
Zn	2,500	5,000
TPH (Residual Fuels)	2,500	1,000

Conclusions

With the exception of the two shallow soil samples taken from SB106 and SB107 in the southwest portion of the building, all soil and water samples taken in the 2008 subsurface investigation are below the SFRWQCB's 2008 Environmental Screening Levels and below the more stringent cleanup levels prescribed in 1985. The soil concentrations are also very similar to the concentrations that caused the regulatory agencies to declare the pollution at the site adequately mitigated in the mid 1980s. Upon cleanup of the area including the SB106 and SB107 locations and verification sampling, the WFF Albany site will be ready for certification as meeting the appropriate environmental conditions for no further cleanup action.

Documents Reviewed and/or Cited

Brown and Caldwell. 1984. Western Forge and flange, Albany Facility – Problem Definition Report. Submitted to Western Forge and Flange on July 10, 1984.

California Department of Toxic Substances Control (CADTSC). September 2002. Site Screening Form. Available on the DTSC Envirostor Website: http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/5681241691/western%20forge%20site%20screening.pdf

California Department of Health Services (CADOHS). March 1987. Remedial Action Certification Form. Contains: Ltr from the SFRWQCB. August 16, 1985; Brown and Caldwell. May 10, 1985. Correction documentation Report for the Western Forge & Flange Company, Albany, California; California Department of Health Services. November 25, 1985. Memorandum: SPRL Deletion recommendation for Western Forge and Flange.
Available on the DTSC Envirostor Website:
http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/8748310685/cert.pdf

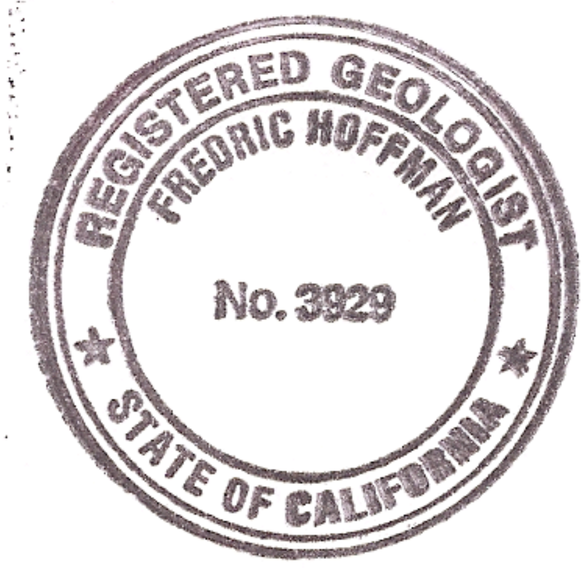
SFRWQCB. 1986. Status of water quality concerns at Western Forge and Flange's Albany facility. Letter to Western Forge and Flange dated January 15, 1986.

SFRWQCB. 2008. Environmental Screening Levels Surfer. EXCEL Spreadsheet for access to screening level guidance. May 2008.

TestAmerica. 2008a. Analytical Report, Job Number 720-16304-1, Job Description: Western Forge. October 10, 2008.

TestAmerica. 2008b. Analytical Report, Job Number 720-16931-1, Job Description: Western Forge, Albany. November 21, 2008.

TestAmerica. 2008b. Analytical Report, Job Number 720-17028-1, Job Description: Western Forge, Albany. December 2, 2008.



12/18/08

Fredric Hoffman
CA Professional Geologist No. 3929
CA Certified Hydrogeologist No. 83