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WCH Washington Closure Hanford

Interoffice Memorandum

TO: M. E. Allen, X3-40

DATE: February 19, 2014

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FROM: D. B. Encke
WCH Engineer
L4-45

SUBJECT: **Post-Demolition Summary Report for the 151-D-A4 Electrical Substation Switchyard**

Attached is a Post-Demolition Summary Report for the 151-D-A4 Electrical Substation Switchyard. This report documents the final status of the area after completion of Decontamination, Decommissioning, Deactivation, and Demolition (D4) activities. The information in this report includes references to radiological and industrial hygiene surveys, sample data, waste profiles, nearby waste sites, and other relevant information regarding the "as left" condition of the Switchyard.

Please contact Mark Allen at 509-430-5923 if you have any questions on this information.

DBE:dbe

Attachment: *Post-Demolition Summary Report for 151-D-A4 Electrical Substation Switchyard*

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Date	2-19-14
Initial	MEA

Post-Demolition Summary Report for the 151-D-A4 Electrical Substation Switchyard

January 2014

This post-demolition summary report documents the characterization and final status of the 151-D-A4 Electrical Substation Switchyard at the completion of deactivation, decontamination, decommissioning and demolition (D4) activities.

Site Information

The 151-D Switchyard was used as the primary source of electrical power for all facilities in the 100-D Area. It was first energized in August 1944, and received 230 kV power from the Midway Substation. From the three main transformers in the 151-D Switchyard, power was transmitted primarily via underground cables to thirteen secondary substations and nine distribution substations located throughout the 100-D Area. One 27.5 kVA transformer, located adjacent to the 151-D Substation Switch House, provided service for the building. Three oil circuit breakers were also in service to support the Switchyard operations.

The 151-D Switchyard continued to be used after the 105-D and 105-DR Reactors were shut down in the 1960s to provide power for occupied facilities in the 100D Area and backup power to 100N Area. It also provided power for pumping firewater for the 100D and 100F Areas and for backup export water supply to the 200 Areas.

The 151-D Switchyard included a fenced, gravel surfaced area originally 430-ft by 303-ft and contained wooden frame bus structures, two main 15,000 kVA transformers, three oil circuit breakers and terminal structures. The area was served by rail spur and contained several underground ducts, which connected the Switchyard to the Substation Switch House. Two types of foundations were used for switchyard equipment – reinforced concrete slabs and reinforced concrete piers with spread footings.

The Switchyard was modified in 1949 to support the new 105-DR Reactor Building, including the addition of two 13.8 kV refrigeration feeders. A 13.8 kV crosstie line was installed between the 100-D and 100-H Areas. In 1956, 151-D was expanded to meet the power requirements for the increased production under the project CG-558. A new 230 kV/13.8 kV transformer was installed in the Switchyard, with a capacity of 18,750/31,250 kVA (Figure 1).

Radiological Scoping and IH Baseline Surveys

The 151-D Switchyard demolition was performed by WCH under the River Corridor Closure Contract. The radiological scoping survey is recorded in RSR-100N-13-0047. A Beryllium Facility Assessment Form dated June 6, 2013 characterized the building as a "beryllium clean facility" (BFA-151D-13-001).

Waste Characterization Sampling

The 151-D Switchyard was inspected and sampled for asbestos on July 24, 2013 (CCN 173954). Cloth wire in cabinets was identified as asbestos containing material (ACM) (Attachment 1). Buried cement asbestos pipe was presumed to be ACM based on construction drawings. Six oil and grease samples in three sample delivery groups (J01915, J01935 and J01953) were collected from transformers and bushings for recycling and waste disposal determinations. A table summarizing the results of the sampling effort is in Table 1.

Table 1: Summary of Baseline and Characterization Surveys at 151-D

Type	Date	Documented In	Results Summary
Radiological Surveys	January 15, 2013	RSR-100N-13-0047	No contamination identified.
IH Surveys and Beryllium Characterization	June 6, 2013	BFA-151D-13-001	Assessment documents the building is Be clean.
Asbestos	July 24, 2013	CCN# 173954	ACM indentified on cloth covered wires in cabinets & conduits. Buried cement asbestos pipe presumed to be ACM

Waste Profile

The 151-D Switchyard demolition was completed by WCH on January 6, 2014 under the RCC Contract. One of the objectives of the D4 Project is to support recycling and waste minimization. Being a radiological-clean facility, metals and oils from the 151-D Switchyard were recycled. The WCH subcontractor Transformer Technologies recycled 607,000-lbs of transformers, transformer bushings, and metal; and, 1,500-gal of transformer oil. Another DOE Contractor, Mission Support Alliance (MSA), recycled 205,060-lbs of metal: beams, components and wire. The remaining 3,084.7 tons of demolition debris was shipped in 219 roll-off containers to the Environmental Restoration Disposal Facility (ERDF). The waste profile used was Waste Profile Number RCCIF001.

Global Positioning Environmental Radiological Surveyor (GPERS)

A GPERS survey was not conducted at the151-D Switchyard, because the facility was not contaminated.

Civil Survey Information

A pre-demolition GPS survey of the Switchyard and Building was conducted February 11, 2013 (CCN 0655993). A post-demolition GPS survey of the former Switchyard was conducted January 20, 2014 (CCN 0655994) and is included as Attachment 2.

WIDS Sites Associated with the Building Site

WIDS sites associated with the 151-D Switchyard include:

100-D-75:1, 151-D Primary Electrical Substation

Anomalies

No anomalies were encountered during the demolition of the 151-D Switchyard.

Work Packages

The following work package was used:

100-13-05-07-001, Rev 1, Demolition of 151-D-A4 Electrical Substation Switchyard.

Radiological Down-Posting Survey

No radiological down-posting was required for 151-D Switchyard, because the facility was not contaminated.

Cost Performance Information

As of February 4, 2014, $474,643 had been charged to the 151-D Switchyard cost accounts.

Lessons Learned

There were no identified lessons learned from the demolition of this facility.

Final Building Status

All D4 activities were completed in accordance with applicable environmental documentation, including the Removal Action Work Plan for River Corridor General Decommissioning Activities (DOE/RL-2010-34, Rev. 2).

Demolition of the above and below-grade structures, down to 3 feet below-grade, was completed January 6, 2014 using excavation permit DAN12-0096. An ecological and cultural resources review aided preparation of the permit (CCN 165592). Two hundred and nineteen containers (3,085-tons) of demolition debris were shipped to ERDF. Backfill will be deferred to facilitate remediation of WIDS Site 100-D-75:1; however, some backfill material was imported from a nearby barrow pit to eliminate safety concerns associated with steepened edges (Figure 2).

Documentation

Documents referenced in this summary are available through the Document Control organization. Additionally, photographs of this facility prior to, during, and following demolition activities are maintained in the working files of D4's Characterization group and referenced in this Post Demolition Summary Report in Figure 1 and 2.

References

BFA-151D-13-001, 2013, "Beryllium Facility Assessment Form, 151-D-A4", June 6, 2013, Washington Closure Hanford, Richland, WA

CCN 0655993, *GPS Pre Demo Survey Report for 151D Building, Project 100D-020713,* February 11, 2013, Washington Closure Hanford, LLC., Richland, WA

CCN 0655994, *GPS Post Demo Survey Report for 151-D Switch Yard, Project Post-substation, Job 1264*, January 20, 2014, Washington Closure Hanford, LLC., Richland, WA

CCN 165592, *Ecological and Cultural Resources Reviews for Demolition of the 151D Building in the 100D Area (12-ER-009, HCRC #2011-100-056)*, May 8, 2012, Washington Closure Hanford, Richland, WA

CCN 173954, 2013, "Asbestos Inspection and Sampling Report for the 151B and 151D Switchyards", November 13, 2013, Washington Closure Hanford, Richland, WA.

DAN12-0096, *Hanford Site Excavation Permit, 100D SE of 105-D, Hazardous Material Removal and Demolition of 151D Electrical substation, Which Includes a Basement,* February 7, 2013, Washington Closure Hanford, LLC, Richland, WA

DOE/RL-2010-34, 2013, "Removal Action Work Plan for River Corridor General Decommissioning Activities", Rev. 2, April 2013, United Stated Department of Energy, Richland, WA.

RSR-100N-13-0047, 2013, "Characterization Survey, Primary Substation 151D Switchyard", January 8, 2013, Washington Closure Hanford, Richland, Washington.

WP RCCIF001, 2012, "Environmental Restoration Disposal Facility Waste Profile Datasheet, This Revision Adds 151-B, 151D, 183-D and 1724-N, See Designation for Full List of Facilities", Rev 3, December 6, 2012, Washington Closure Hanford, Richland, WA

Figure 1. Aerial View of 151-D Switchyard Before Demolition

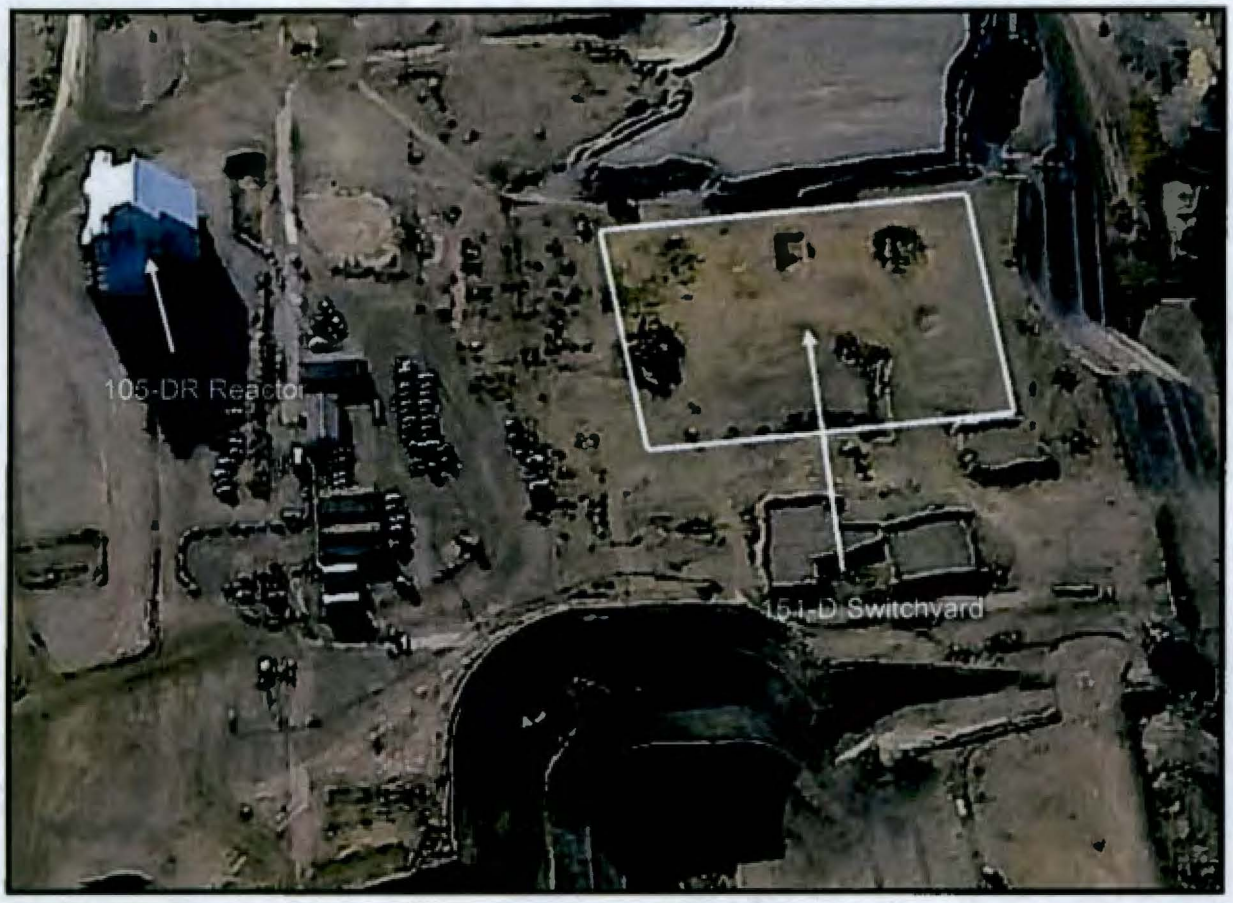

Figure 2. Aerial view of 151-D Switchyard After Demolition

Attachment 1 – Asbestos Results

Asbestos Sample Summary 151-D-A4 Electrical Substation Switchyard			
HEIS Sample Number	**Sample Description**	**Sample Location**	**Percent Asbestos**
J1RVR1	White cloth insulated wire ends	151-D Middle Breaker Cabinet	**55% Chrysotyle**
J1RVR2	White cloth insulated wire ends	151-D West Breaker Cabinet	**45% Chrysotyle**

GPS Post Demo Survey Report for the 151-D Switch Yard

Project : Post-substation

Job 1264

User name	maaye	**Date & Time**	4:22:40 PM 1/20/2014
Coordinate System	US State Plane 1983	**Zone**	Washington South 4602
Project Datum	NAD 1983 (Conus)		
Vertical Datum		**Geoid Model**	Not selected
Coordinate Units	Meters		
Distance Units	Meters		
Height Units	Meters		

Survey Project Name: 151D Switch Yard
Date: 1/20/2014
Equipment: 5800
Survey Purpose: Map the post demo excavation
Requested By: Mark Allen
Location: 100D
Charge Code:
Field Surveyor: Margo Aye
Survey Software Used: Trimble Geomatics V1.63
Survey Equipment Used: 5800
Control Monuments Used: D-Hanford Monument (at Gravel pit)
Survey Method: RTK
Horizontal Precision: .020m
Vertical Precision: .050m
Fieldwork Start Date: 11/16/14
Fieldwork Completion Date: 11/16/14
Notes: Because the excavation was so shallow and flat, most points are considered "daylight". The 151D (building) post demo survey was done prior to this , however I recorded the area again as conditions had changed in the building area.

Name	Northing	Easting	Elevation	Feature Code	Description
1	151313.222m	573607.532m	142.693m	top	
2	151338.171m	573605.237m	142.769m	top	
3	151350.498m	573605.020m	142.472m	top	
4	151366.103m	573607.753m	142.619m	top	
5	151376.016m	573606.520m	142.817m	top	
6	151375.606m	573597.146m	142.795m	top	
7	151367.098m	573596.318m	142.647m	top	
8	151358.716m	573594.989m	142.672m	top	
9	151348.925m	573593.389m	142.673m	top	
10	151329.144m	573591.777m	142.633m	top	
11	151322.231m	573592.438m	142.504m	top	
12	151318.136m	573598.823m	142.458m	top	
13	151314.335m	573602.595m	141.902m	top	
14	151320.037m	573603.550m	141.956m	top	
15	151318.679m	573601.195m	141.915m	top	
16	151316.497m	573601.478m	141.948m	top	
17	151306.884m	573597.934m	142.272m	top	
18	151300.618m	573607.660m	142.754m	top	
19	151293.190m	573598.214m	142.539m	top	
20	151283.190m	573597.333m	142.621m	top	
21	151276.997m	573606.462m	142.640m	top	
22	151279.481m	573586.888m	142.635m	top	
23	151291.630m	573586.021m	142.680m	top	
24	151287.105m	573577.706m	142.711m	top	
25	151282.528m	573563.375m	142.716m	top	
26	151292.171m	573563.734m	142.622m	top	
27	151294.071m	573571.624m	142.590m	top	

28	151291.644m	573576.328m	142.680m	top
29	151295.118m	573582.568m	142.478m	top
30	151302.922m	573583.318m	142.422m	top
31	151308.157m	573579.554m	142.331m	top
32	151310.000m	573574.228m	142.563m	top
33	151304.634m	573569.549m	142.590m	top
34	151299.750m	573569.610m	142.555m	top
35	151304.807m	573577.555m	141.802m	top
36	151300.550m	573576.280m	141.775m	top
37	151294.361m	573576.789m	142.108m	top
38	151297.072m	573564.379m	142.598m	top
39	151310.767m	573563.279m	142.617m	top
40	151323.787m	573563.072m	142.674m	top
41	151338.315m	573562.939m	142.588m	top
42	151353.453m	573563.052m	142.740m	top
43	151369.314m	573561.881m	142.694m	top
44	151381.796m	573561.518m	142.599m	top
45	151383.597m	573548.428m	142.136m	top
46	151374.094m	573547.342m	142.287m	top
47	151361.950m	573545.687m	142.662m	top
48	151347.699m	573542.833m	142.685m	top
49	151332.189m	573540.969m	142.496m	top
50	151317.524m	573539.155m	142.677m	top
51	151309.236m	573540.044m	142.580m	top
52	151301.772m	573541.568m	142.675m	top
53	151294.527m	573541.710m	142.498m	top
54	151290.606m	573540.365m	142.468m	top
55	151290.541m	573530.462m	142.662m	top
56	151297.349m	573529.643m	142.575m	top
57	151306.548m	573530.514m	142.631m	top
58	151302.178m	573532.366m	141.622m	top
59	151296.331m	573532.280m	141.530m	top
60	151291.758m	573532.179m	141.801m	top
61	151292.461m	573537.790m	141.653m	top
62	151298.481m	573537.941m	141.628m	top
63	151303.084m	573537.870m	141.610m	top
64	151298.288m	573534.655m	141.492m	top
65	151280.866m	573533.536m	142.743m	top
66	151281.031m	573520.558m	142.752m	top
67	151294.942m	573520.008m	142.578m	top
68	151309.566m	573519.912m	142.640m	top
69	151323.902m	573520.138m	142.657m	top
70	151334.526m	573520.453m	142.537m	top
71	151339.385m	573526.077m	142.410m	top
72	151345.693m	573526.420m	142.673m	top
73	151355.949m	573527.521m	142.625m	top
74	151349.269m	573520.944m	142.715m	top
75	151350.784m	573519.101m	142.695m	top
76	151355.601m	573518.348m	142.677m	top
77	151361.781m	573517.429m	142.645m	top
78	151368.910m	573519.388m	142.990m	top
79	151368.623m	573524.217m	142.626m	top
80	151367.332m	573532.118m	142.696m	top
81	151367.745m	573542.275m	142.727m	top
82	151368.763m	573547.001m	142.802m	top
83	151372.523m	573547.011m	142.723m	top
84	151373.760m	573542.456m	141.249m	toe
85	151374.685m	573538.838m	140.744m	toe
86	151375.378m	573533.065m	140.975m	toe
87	151375.637m	573527.102m	140.794m	toe
88	151381.165m	573526.438m	141.709m	top
89	151386.035m	573526.312m	141.272m	top
90	151390.763m	573526.539m	141.486m	top
91	151385.528m	573530.100m	141.611m	top
92	151378.523m	573529.451m	141.587m	top
93	151378.961m	573536.717m	141.823m	top
94	151378.001m	573543.174m	141.721m	top
95	151395.323m	573534.154m	142.668m	top
96	151399.741m	573525.662m	143.130m	top
97	151393.973m	573522.221m	142.038m	top
98	151390.126m	573524.131m	140.309m	toe

99	151385.943m	573525.208m	140.624m	toe
100	151381.849m	573523.879m	141.652m	top
101	151387.384m	573515.102m	142.691m	top
102	151380.041m	573519.044m	142.517m	top
103	151380.709m	573513.935m	142.698m	top
104	151378.822m	573511.838m	142.615m	top
105	151372.016m	573510.305m	142.690m	top
106	151364.289m	573510.279m	142.583m	top
107	151356.546m	573510.135m	142.624m	top
108	151344.728m	573507.021m	142.624m	top
109	151342.811m	573514.820m	142.287m	top
110	151339.582m	573522.289m	141.489m	toe
111	151340.051m	573523.298m	141.380m	toe
112	151341.886m	573524.410m	141.624m	toe
113	151344.792m	573523.968m	141.707m	toe
114	151343.071m	573521.637m	141.602m	toe
115	151344.786m	573521.154m	141.128m	toe
116	151348.708m	573516.326m	141.394m	toe
117	151356.214m	573515.906m	141.391m	toe
118	151363.210m	573515.999m	141.822m	toe
119	151369.513m	573515.653m	141.830m	toe
120	151374.398m	573515.901m	141.507m	toe
121	151376.209m	573518.251m	141.144m	toe
122	151378.051m	573517.793m	141.220m	toe
123	151377.316m	573514.642m	141.177m	toe
124	151378.155m	573514.665m	141.842m	conc-top
125	151378.310m	573516.431m	141.835m	conc-top
126	151374.982m	573513.518m	141.479m	toe
127	151368.748m	573512.772m	141.763m	toe
128	151362.329m	573512.592m	141.737m	toe
129	151356.781m	573513.035m	141.594m	toe
130	151351.544m	573513.506m	141.349m	toe
131	151346.462m	573512.149m	141.595m	toe
132	151346.533m	573509.058m	141.903m	toe
133	151350.450m	573509.799m	141.929m	toe
134	151335.959m	573505.237m	142.653m	top
135	151322.563m	573503.684m	142.618m	top
136	151309.069m	573503.759m	142.642m	top
137	151300.448m	573505.475m	142.552m	top
138	151292.973m	573503.953m	142.580m	top
139	151290.703m	573495.100m	142.458m	top
140	151291.074m	573488.330m	142.706m	top
141	151298.730m	573486.018m	142.548m	top
142	151305.987m	573487.868m	142.574m	top
143	151310.459m	573494.468m	142.507m	top
144	151305.780m	573501.763m	141.928m	top
145	151299.145m	573502.305m	141.969m	top
146	151293.673m	573500.740m	142.135m	top
147	151293.602m	573498.749m	142.112m	top
148	151299.545m	573498.829m	142.145m	top
149	151305.462m	573498.941m	142.064m	top
150	151302.773m	573496.787m	141.220m	toe
151	151302.132m	573491.592m	141.490m	toe
152	151297.831m	573492.297m	141.435m	toe
153	151298.749m	573496.938m	141.322m	toe
154	151294.425m	573496.123m	141.334m	toe
155	151294.652m	573492.627m	141.485m	toe
156	151276.818m	573491.835m	142.907m	top
157	151274.322m	573477.610m	142.889m	top
158	151273.411m	573467.424m	142.965m	top
159	151287.209m	573465.722m	142.963m	top
160	151288.111m	573478.580m	142.605m	top
161	151302.253m	573478.464m	142.605m	top
162	151302.315m	573467.144m	142.846m	top
163	151315.304m	573467.683m	142.827m	top
164	151316.034m	573481.672m	142.611m	top
165	151317.943m	573491.284m	142.649m	top
166	151324.930m	573493.345m	142.604m	top
167	151331.117m	573496.363m	142.584m	top
168	151338.339m	573493.475m	142.456m	top
169	151334.980m	573486.858m	142.522m	top

170	151327.470m	573485.383m	142.574m	top
171	151329.776m	573492.129m	141.925m	top
172	151335.253m	573492.562m	141.834m	top
173	151334.615m	573480.412m	142.645m	top
174	151328.082m	573467.975m	142.825m	top
175	151345.847m	573467.692m	142.929m	top
176	151346.050m	573481.948m	142.538m	top
177	151346.685m	573495.718m	142.653m	top
178	151360.311m	573498.356m	142.513m	top
179	151373.575m	573498.222m	142.542m	top
180	151387.746m	573498.272m	142.755m	top
181	151400.841m	573496.562m	143.220m	top
182	151370.751m	573491.490m	142.279m	top
183	151370.700m	573484.526m	142.291m	top
184	151356.293m	573484.614m	142.612m	top
185	151356.266m	573467.673m	142.960m	top
186	151372.525m	573466.165m	142.917m	top
d-han-mon1	150848.702m	573855.276m	143.923m	cp

Back to top

Attachment 2 – Post-Demolition Survey Report