

Appendix C. Ground Level Photographs

Photo 1. Looking north from Sample Plot 1 (PP1, Figure 5B)



Source: HDR, June 2016

Photo 2. Soil profile for Sample Plot 1 (SP1, Figure 5B)



Source: HDR, June 2016

Photo 3. Looking southeast towards SE Jennings Avenue (upstream) at Boardman Creek (PP2, Figure 5B)



Source: HDR, June 2016

Photo 4. Looking northwest (downstream) at Boardman Creek (PP3, Figure 5B)



Source: HDR, June 2016

Photo 5. Looking east from Sample Plot 2 (PP4, Figure 5B)



Source: HDR, June 2016

Photo 6. Iron deposits on surface water at Sample Plot 2 (SP2, Figure 5B)



Source: HDR, June 2016

Photo 7. Water table at surface of soil pit, Sample Plot 2 (SP2, Figure 5B)



Source: HDR, June 2016

Photo 8. Looking southeast from Sample Plot 3 (SP3, Figure 5E)



Source: HDR, June 2016

Photo 9. Looking northwest from Sample Plot 3 (SP3, Figure 5E)



Source: HDR, June 2016

Photo 10. Water table at surface of soil pit Sample Plot 3 (SP3, Figure 5C)



Source: HDR, June 2016

Photo 11. Looking northwest at stormwater drainage ditch east of SE Lucas Court (PP7, Figure 5C)



Source: HDR, June 2016

Photo 12. Looking south from Sample Plot 4 (SP4, Figure 5C)



Source: HDR, June 2016

Photo 13. Water table in soil pit at Sample Plot 4 (SP4, Figure 5C)



Source: HDR, June 2016

Photo 14. Looking southwest from Sample Plot 5 (PP9, Figure 5D)



Source: HDR, June 2016

Photo 15. Soil profile for Sample Plot 5 (SP5, Figure 5D)



Source: HDR, June 2016

Photo 16. Look east from Sample Plot 6 (PP10, Figure 5D)



Source: HDR, June 2016

Photo 17. Soil profile for Sample Plot 6 (SP6, Figure 5D)



Source: HDR, June 2016

Photo 18. Excavated soil profile for Sample Plot 7 (SP7, Figure 4D)



Source: HDR, June 2016

Photo 19. Looking north toward SE Cook Street at ponded area (PP11, Figure 5B)



Source: HDR, June 2016

Photo 20. Looking northwest from Sample Plot 8 (PP12, Figure 5C)



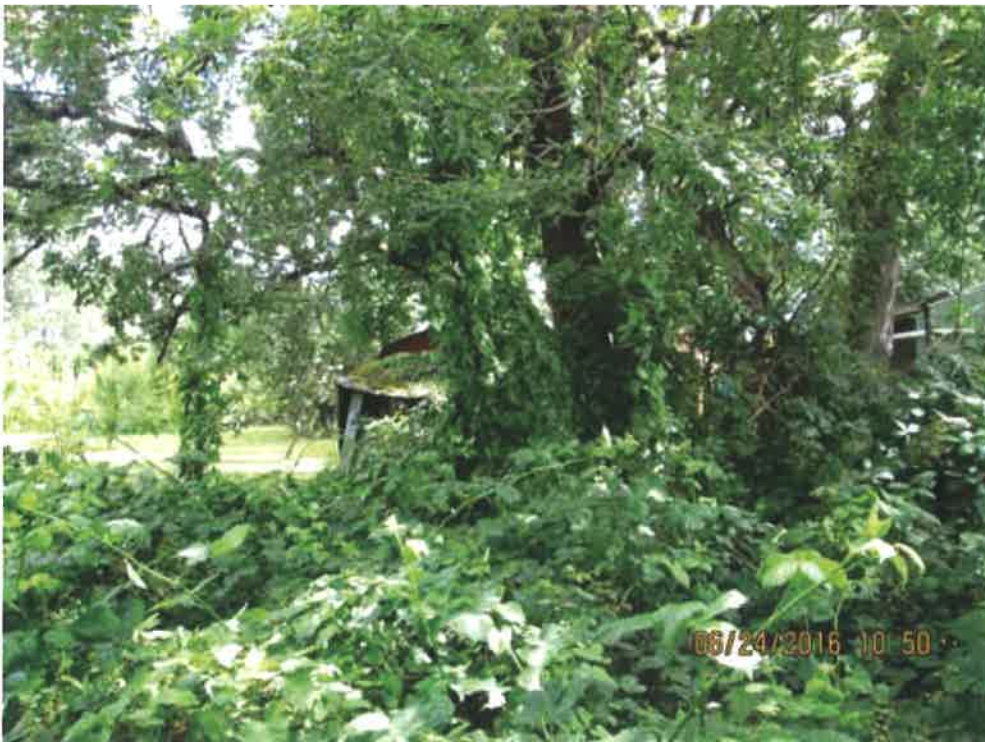
Source: HDR, June 2016

Photo 21. Looking west from Sample plot 9 (PP13, Figure 5C)



Source: HDR, June 2016

Photo 22. Looking northeast from Sample Plot 9 (PP14, Figure 5C)



Source: HDR, June 2016

Photo 23. Soil profile for Sample Plot 9 (SP9, Figure 5C)



Source: HDR, June 2016

Photo 24. Looking southwest from Sample Plot 10 (PP15, Figure 5C)



Source: HDR, June 2016

Photo 25. Soil profile for Sample Plot 10 (SP10, Figure 5C)



Source: HDR, June 2016

Photo 26. Looking upstream of stormwater drainage occurring along southern boundary of SE Briar Court development (PP16, Figure 5C)



Source: HDR, June 2016

Photo 27. Looking southwest from Sample Plot 11 (PP17, Figure 5C)



Source: HDR, June 2016

Photo 28. Soil profile for Sample Plot 11 (SP11, Figure 5C)



Source: HDR, June 2016

Photo 29. Looking northwest at ponded water (PP18, Figure 5C)



Source: HDR, June 2016

Photo 30. Looking southwest from Sample Plot 12 (PP19, Figure 5C)



Source: HDR, June 2016

Photo 31. Soil profile for Sample Plot 12 (SP12, Figure 5C)



Source: HDR, June 2016

Photo 32. Looking west from Sample Plot 12 (PP20, Figure 5C)



Source: HDR, June 2016

Photo 33. Looking north at wetland boundary (PP21, Figure 5C)



Source: HDR, June 2016

Photo 34. Test pit at PP21 to confirm wetland boundary (PP21, Figure 5C)



Source: HDR, June 2016

Photo 35. Test pit soil profile (P21, Figure 5C)



Source: HDR, June 2016

Photo 36. Looking north at Boardman Creek wetland area (P22, Figure 5B)



Source: HDR, June 2016

Photo 37. Looking north from Sample Plot 13 (PP25, Figure 5E)



Source: HDR, June 2016

Photo 38. Looking west from Sample Plot 13 (PP26, Figure 5E)



Source: HDR, June 2016

Photo 39. Soil profile for Sample Plot 13 (SP13, Figure 5E)



Source: HDR, June 2016

Photo 40. Looking north near Sample Plot 14 (PP27, Figure 5E)



Source: HDR, June 2016

Photo 41. Looking north near Sample Plot 14 (PP28, Figure 5E)



Source: HDR, June 2016

Photo 42. Soil profile for Sample Plot 14 (SP14, Figure 5E)



Source: HDR, June 2016

Photo 43. Looking north from Sample Plot 15 (PP23, Figure 5E)



Source: HDR, June 2016

Photo 44. Looking southwest from Sample Plot 15 (PP24, Figure 5E)



Source: HDR, June 2016

Photo 45. Soil profile for Sample Plot 15 (SP15, Figure 5C)



Source: HDR, June 2016



Appendix D. WETS Table

USDA Field Office Climate Data

WETS Station : OREGON CITY, OR6134 Creation Date: 09/13/2016
 Latitude: 45.01 Longitude: 122.36 Elevation: 00167
 State FIPS/County(FIPS): 41005 County Name: Clackamas
 Start yr. = 1971 End yr. = 2000

Month	Temperature (Degree F.)				Precipitation (Inches)			
	avg daily max	avg daily min	avg	avg	30% chance will have			total snow fall
					less than	more than	(w/.) days	
January	42.9	35.7	41.8	6.59	4.22	7.94	11	0.6
February	52.8	37.2	45.1	5.51	3.83	6.56	12	1.2
March	58.0	39.7	48.9	4.70	3.54	5.19	12	0.0
April	63.4	42.6	53.0	3.46	2.44	4.10	9	0.0
May	70.0	47.6	58.8	2.79	1.72	3.26	7	0.0
June	75.8	52.1	64.0	1.83	1.11	2.22	5	0.0
July	82.6	56.0	69.3	0.83	0.29	1.00	2	0.0
August	83.0	56.1	69.6	1.00	0.21	1.16	3	0.0
September	77.7	52.1	64.9	1.93	0.86	2.41	4	0.0
October	65.9	45.6	55.8	3.48	1.85	4.25	8	0.0
November	53.4	40.2	46.8	5.79	4.43	6.16	13	0.1
December	47.0	35.9	41.5	7.23	4.85	8.60	17	0.6
Annual					40.45	50.63	--	--
Average	64.6	45.1	56.0				--	--
Average				46.05			98	1.7

GROWING SEASON DATES

	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	3/26 to 11/7 246 days	4/15 to 10/4 282 days	5/24 to 11/11 232 days
70 percent *	> 365 days > 365 days	2/7 to 12/12 307 days	3/18 to 11/19 248 days



* Percent chance of the growing season occurring between the Beginning and Ending dates.

Total 1911-2016 prep

Station : 0R6334, GREGON CITY
----- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
11											3.49	4.82	8.31
12	9.10	5.27	2.15	2.69	2.17	4.12	0.61	5.16	1.26	4.19	6.71	7.11	50.74
13	8.18	1.28	5.79	4.11	2.36	4.23	0.67	0.74	3.01	4.50	7.50	3.79	45.16
14	12.79	5.07	4.07	4.26	2.11	2.55	0.17	0.00	3.85	4.50	5.07	3.16	47.60
15	6.74	4.40	2.83	2.11	2.78	1.64	1.94	0.00	0.67	2.31	M11.04	10.24	47.30
16	5.44	11.42	12.06	4.21	3.09	1.86	2.90	0.26	1.95	1.64	8.18	4.40	58.41
17	4.21	3.72	8.22	6.97	3.67	1.48	0.01	0.00	2.24	0.03	4.23	18.71	53.49
18	6.40	8.06	5.50	1.22	1.16	0.01	0.62	0.74	0.38	5.07	5.06	4.99	39.26
19	19.91	8.96	6.01	4.42	2.56	1.04	0.06	0.05	3.91	1.73	9.73	6.79	56.17
20	5.84	0.40	4.36	5.62	1.25	3.03	1.18	1.39	5.76	5.01	7.18	9.79	50.80
21	8.92	7.67	5.74	2.17	2.06	1.50	0.03	0.16	2.89	3.32	12.12	1.32	49.50
22	4.04	4.24	7.82	2.94	1.24	0.23	0.00	2.28	1.66	5.63	2.66	9.87	42.20
23	13.00	2.55	3.14	2.10	1.68					0.38	4.77	7.00	34.62
24	3.27	8.87	1.93	1.24						6.58	8.29	5.10	32.28
25	8.80	8.87	2.94	3.81						0.05	5.71	5.55	35.72
26	3.46		1.01	1.50						6.01	9.93	5.39	26.30
27	8.67	8.11	3.65	1.50						4.47	10.19	2.66	39.65
28	5.63	1.76	8.96	6.00						1.52	6.26	8.72	39.25
29	3.50	1.24	3.27	4.37						1.29	0.70	11.34	25.71
30	4.40	6.81	2.07	3.12						2.49	3.05	3.13	25.07
31	M3.29	3.07	6.00	4.50						5.42	6.22	9.15	40.45
32	6.41	M3.65	0.25	3.81						4.83	9.41	2.82	43.16
33	8.48	4.49	6.22	1.01									20.21
34													
35													
36													
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48	0.11	3.57	4.70	4.27	4.73	1.15	0.91	2.67	2.46	2.70	0.46	M10.26	50.45
49	1.48	13.09	3.34	1.16	2.69	1.25	0.94	0.22	2.60	3.17	6.92	6.50	43.36
50	11.44	M6.97	M6.29	3.15	1.89	2.05	1.35	0.45	2.26	10.34	12.70	7.48	65.55
51	10.50	5.93	5.63	1.06	2.58	0.09	0.16	0.34	3.71	5.55	6.25	7.20	49.09
52	6.20	4.72	4.51	1.75	0.89	3.30	0.00	0.09	0.42	0.87	1.32	1.70	31.77
53	16.77	4.76	4.96	2.52	M4.35	1.50	0.04	2.53	1.40	3.39	7.40	9.04	58.52
54	11.25	5.06	3.46	3.88	2.17	3.76	0.69	2.18	1.01	3.91	5.61	6.49	49.47
55	3.62	3.62	5.32	6.30	1.45	1.37	1.39	0.00	3.48	7.68	9.71	11.20	54.52
56	14.25	4.44	7.61	0.88	2.30	1.99	0.02	3.57	1.67	7.69	1.81	4.53	50.56
57	3.20	4.81	0.43	1.00	3.10	1.95	M0.43	0.37	0.08	3.97	4.02	M10.60	44.20
58	9.43	6.93	2.67	5.38	0.61	3.26	0.00	0.04	1.40	1.73	6.21	7.12	46.76
59	10.41	5.75	5.07	1.65	3.76	2.00	0.83	0.17	3.81	4.17	3.34	3.86	44.82
60	4.91	4.94	6.64	4.09	5.80	0.64	0.60	1.33	1.20	3.49	12.68	4.18	49.90

WETS Table

61	5.22	11.74	7.01	3.47	4.14	0.60	0.57	0.85	0.84	4.04	6.01	6.65	51.14
62	2.13	4.33	5.88	4.05	3.62	1.15	0.06	1.37	2.43	4.36	11.78	3.00	44.16
63	1.96	4.99	6.33	5.06	4.36	1.74	1.30	0.54	1.46	3.68	7.73	4.22	43.37
64	13.64	1.22	4.43	1.85	1.07	2.90	0.76	0.95	1.72	1.22	9.65	14.78	54.19
65	10.67	1.99	1.47	3.42	1.91	0.75	0.24	1.50	0.03	2.54	7.28	8.87	40.67
66	9.75	2.19	6.43	1.29	1.31	1.67	1.26	0.31	1.72	3.32	6.60	8.29	44.14
67	8.65	2.76	6.08	3.54	2.52	1.17	0.00	0.00	0.81	6.36	2.74	M6.24	40.87
68	5.53	8.87	3.60	1.95	3.23	3.44	0.50	4.95	3.83	7.09	7.89	14.56	65.44
69	M10.47	3.92	2.99	9.44	2.23	4.48	0.09	0.11	4.50	5.00	3.77	9.15	56.15
70	14.05	6.09	3.01	9.76	1.81	0.69	0.09	0.00	2.15	3.59	8.69	9.36	53.23
71	10.06	4.50	6.27	4.33	2.41	3.16	0.37	1.50	3.79	4.37	7.66	10.25	56.69
72	9.17	6.71	6.53	4.81	2.87	0.73	0.50	0.71	4.41	1.04	6.47	9.79	53.74
73	5.90	2.34	4.00	1.79	1.62	2.23	0.08	1.40	3.18	M4.00	14.21	11.93	52.68
74	9.57	6.70	8.04	2.81	2.63	1.18	2.62	0.06	0.40	2.44	7.21	6.87	50.73
75	8.28	5.51	5.67	2.44	1.93	2.12	0.74	3.41	0.00	6.25	5.51	7.79	49.56
76	6.33	8.11	3.64	M3.55	2.12	0.67	0.87	2.30	1.25	1.20	0.93	1.69	32.66
77	1.65	3.52	4.20	0.77	4.31	1.41	0.68	3.01	4.41	2.92	M7.17	11.49	44.54
78	5.96	4.53	1.88	5.84	4.45	1.71	1.53	2.36	2.88	0.61	4.73	3.27	39.75
79	2.90	8.99	3.40	3.94	2.49	0.70	0.52	0.98	M3.14	5.70	3.75	7.73	44.14
80	11.38	4.38	3.71	3.91	1.30	3.79	0.18	0.22	1.65	1.56	7.60	12.61	52.29
81	1.84	4.51	3.13	2.55	1.83	4.52	0.28	0.00	2.84	4.79	5.49	11.42	43.20
82	7.78	M8.22	5.18	0.37	1.66	1.05	0.22	1.27	3.76	4.25	5.42	10.39	53.55
83	8.70	8.99	7.87	2.50	2.11		4.24	2.57	M9.53	2.16	9.82	7.18	56.21
84	3.29	5.53		3.82	5.19	4.60	0.00	0.03		6.24	10.34	4.27	45.31
85	0.46	M3.64	4.39	1.38	0.93	M2.51	0.43	0.52	2.65	3.59	6.47	M3.05	30.92
86	M6.56	7.99	3.19	2.40	M2.89	0.57	1.92	M0.00	M0.93	M2.08	M6.93		35.46
87	7.92	4.44	6.00	2.71	M2.11	M0.49	M1.62	0.23	0.84	0.29	2.25	M10.77	39.67
88	9.17	2.04	4.91	5.85	M3.58	1.94	0.59	0.08	M1.51	0.18	11.24	3.43	44.52
89	5.16	3.18	M7.08	2.02	M2.22	1.05	0.58	1.45	1.10	M2.25	3.69	3.90	33.79
90	M9.65	M4.58	2.78	2.69	M1.92	M2.46	0.48	1.00	0.47	M5.94	4.94	3.31	40.12
91	3.50	4.26	3.71	4.63	4.40	2.32	0.06	1.61	0.15	2.98	7.85	5.99	41.26
92	5.24	4.40	1.12	5.10	0.16	0.41	0.26	0.76	1.86	4.19	4.46	M6.51	34.55
93	3.74	1.11	M5.24	6.15	4.24	M1.73	M2.23	M0.23	0.00	M1.43	1.91	M6.48	34.49
94	M5.38	M6.33	4.12	2.14	1.71	1.53	0.08	0.00	1.10	M7.22	M8.74	6.62	44.97
95	7.61	5.44	4.23	3.08	1.54	M1.97	0.76	1.62	M2.92	4.82	M11.00	M8.30	54.16
96	9.17	12.05	3.86	5.63	M5.00	0.91	0.63	0.11	M2.25	M5.33	M9.96	M16.13	71.03
97	M0.45	M2.20	6.63	4.91	M2.37	M2.38	1.01	1.54	4.02	M5.70	M3.57	3.47	40.65
98	M6.91	M4.86	4.68	M1.19	4.99	M1.03	0.43	0.07	1.13	M4.21	11.32	9.74	52.51
99	9.14	10.01	5.60	3.43	3.41	1.76	0.20	0.84	0.19	M2.70		M5.01	42.31
0M4.06	M6.29	M3.08	M2.26	M2.25	M1.41	M0.46	0.02	M0.48	M3.88	M2.50	M2.90	31.47	
1M1.25	M1.33	M5.02	M2.62	1.60	M1.61	M0.73	1.05	M0.80	M2.85	M6.52	M9.54	34.92	
2M0.03	3.96	M5.55	M3.58	M1.50	M2.09	0.37	0.29	M0.49	0.47	M2.81	M10.18	40.12	
3M7.69	M3.00	M7.65	M5.58	M0.52	M0.70	0.00			1.02	M3.02	M6.20	9.30	45.74
4M5.98	0.39		M1.74	M2.38	2.15	0.15		3.20	M2.27	M5.62	1.99	4.35	33.06
5M2.26	0.78	M5.43	M3.13	M4.57	M2.06	0.57	M0.50	M1.58	M3.19	M6.91	9.91	40.80	
6M13.20	M2.90	M4.17	6.28			1.01	M0.09	M0.06	M1.75	M1.59	M12.41	M2.54	45.00
7M1.01	M2.13	M1.69	M1.59	0.61	M0.49	M0.32	0.00	0.32	M6.14	M5.90	M9.50	29.70	
8M7.92	M3.53	M6.13	M0.30		M1.44			M1.52	M0.45		M7.34	M3.43	35.15
9	6.06	M3.22	4.00	1.30	0.98	1.05	M0.17	0.69	1.60	M2.01	M6.70	M5.23	35.57
10	M5.39	3.65	M6.04	M8.16	M3.52	M3.72	0.22	0.17	M2.94	M5.73	7.91	11.43	54.88
11	M5.35	5.17	M8.25	M5.58	3.32	M1.48	1.19	M0.00	M1.04		M9.14	M4.30	44.73
12	M9.24	M3.11	M9.43	4.84	M3.16	M3.54	M0.79	M0.00	M0.09	M7.92	M9.00	M9.74	60.86
13	M3.56	2.40	M1.95		M2.69	M0.12	M0.00		M5.56	M1.05	M3.94	M2.08	23.43
14	M3.21	M3.83	M9.02	3.93	M2.59	M1.33	0.61	M0.77	1.56	M6.66	M3.39	M5.08	42.48
15	M3.08	M3.99	5.52	2.35	M1.00	0.32	0.26	0.60	0.96	M4.31	M7.50	M14.15	44.44
16	M7.35	M3.43	M5.47	3.45	1.12	M1.45	M0.43	M0.07					22.81

Product generated by ACTS - NOAA Regional Climate Centers



Appendix E. Historic Aerial Imagery



Project Study Area (USACE Image, July 1936)



Project Study Area (USACE Image, May 1944)



Project Study Area (USACE Image, April 1956)



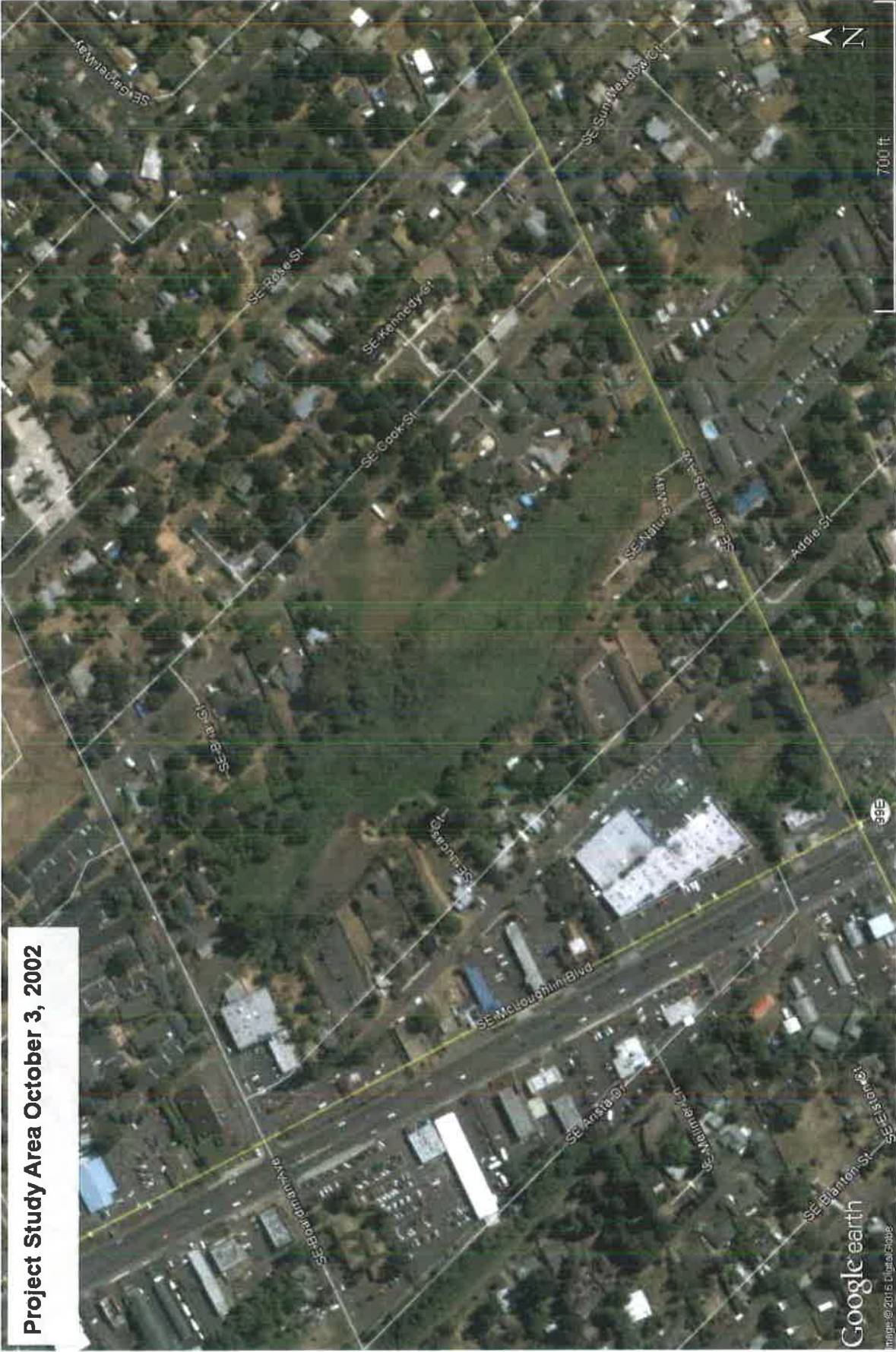
Project Study Area (USACE Image, February 1966)



Project Study Area (USACE Image, December 1977)

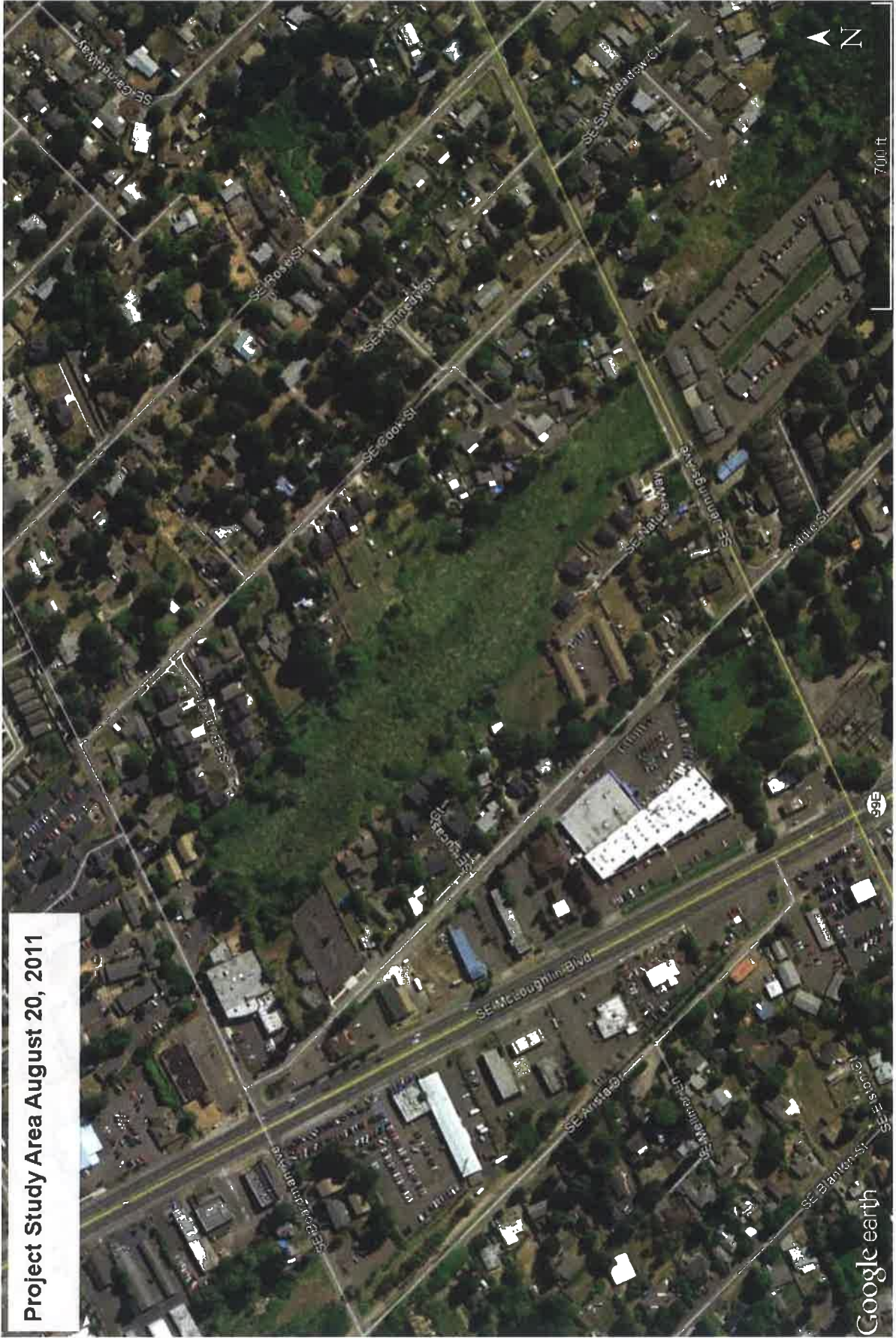


Project Study Area (USACE Image, June 1989)



Project Study Area October 3, 2002





Project Study Area April 17, 2015





Appendix C. Civil Design Plans