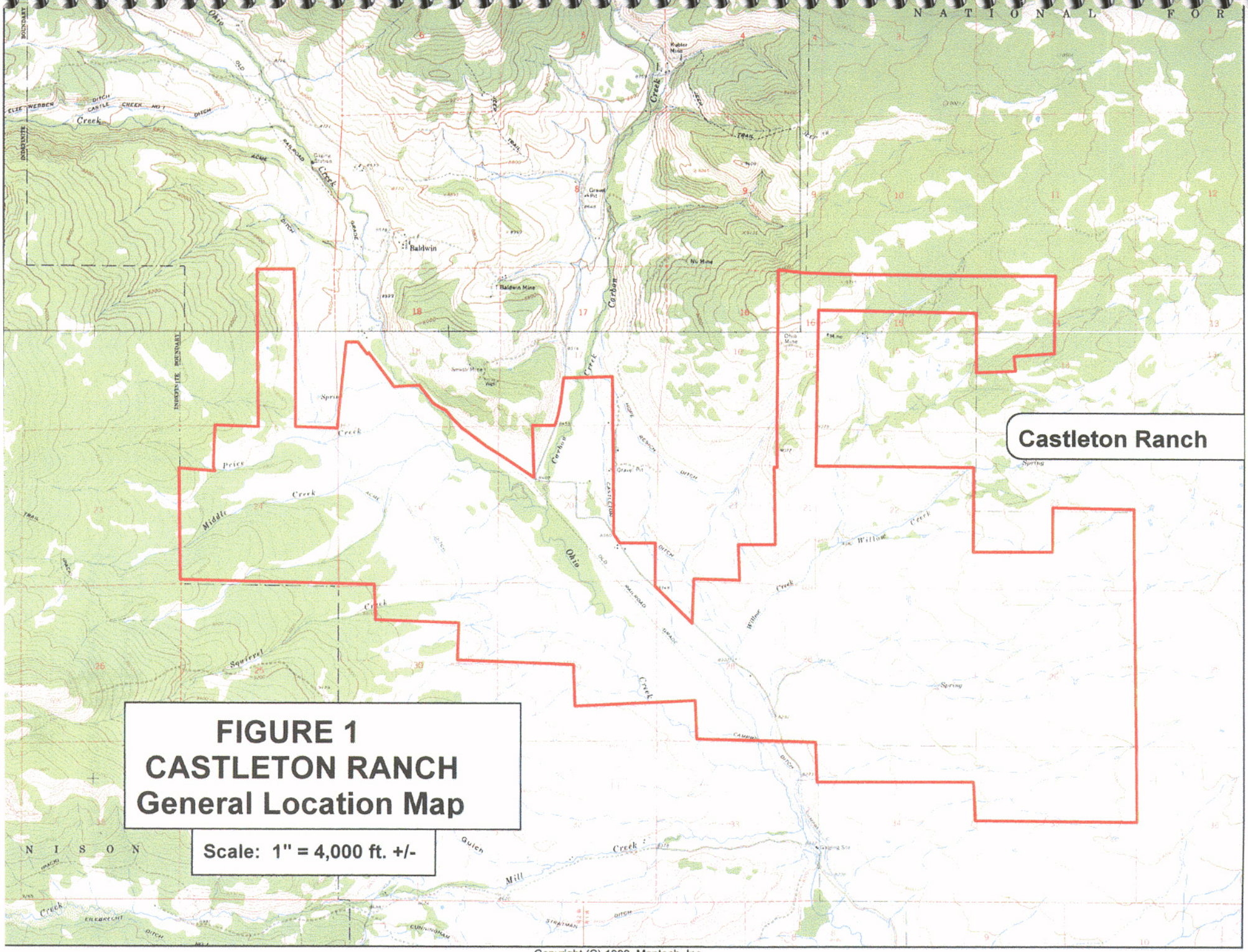


FIGURE 1
CASTLETON RANCH
General Location Map

Scale: 1" = 4,000 ft. +/-

Copyright (C) 1999, Maptech, Inc

n Ranch Boundary
Start Phase 3
Sta. 20+50
Start Phase 1
Sta. 70+50
End Phase 1
Sta. 89+50
Ranch Pond
Mitigation S
End Phase 2
Sta. 96+80
Mitigation Sites
A and P20

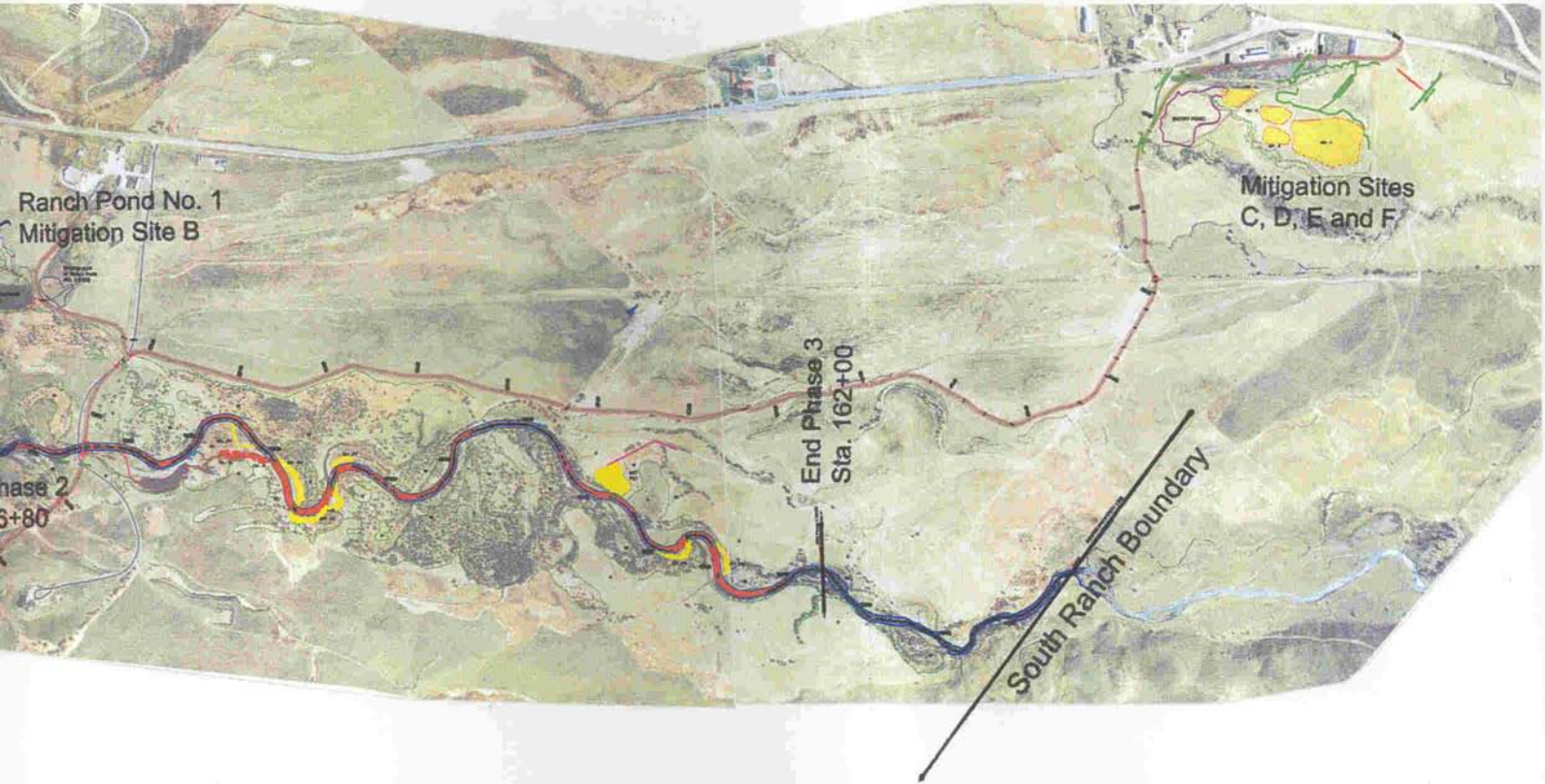

Ranch Pond No. 1
Mitigation Site B
hase 2
6+80
End Phase 3
Sta. 162+00
South Ranch Boundary
Mitigation Sites
C, D, E and F

Table 1
Castleton Ranch - Phase 3 River Restoration (2006)

Proposed Ohio Creek Channel Re-Alignment

Location (Stations)	Reach Length (feet)	Estimated Excavation (Cu. Yd.)	Excavation in Wetlands (Cu. Yd.)	Wetland Impacts (Sq. Ft.)	Wetland Impacts (Acres)
29+00 to 30+30	130	550	550	4,105	0.09
38+00 to 39+80	180	761	761	5,207	0.12
42+50 to 43+50	100	423	423	2,952	0.07
58+00 to 59+00	100	423	423	2,188	0.05
64+10 to 66+20	210	888	755	5,561	0.13
98+20 to 99+15	95	402	402	2,592	0.06
120+75 to 123+25	250	1,058	1,058	8,410	0.19
123+75 to 126+00	225	952	952	8,070	0.19
127+00 to 128+50	150	635	381	3,224	0.07
131+00 to 132+00	100	423	423	3,372	0.08
151+00 to 152+00	100	423	423	3,163	0.07
154+00 to 155+50	150	635	635	4,938	0.11
155+75 to 158+00	225	952	952	6,874	0.16
TOTALS	2,015	8,525	8,138	60,656	1.39

NOTES:

1. Reference Figures 3-1 through 3-12 for subject re-alignment locations.

Table 2
Castleton Ranch - Phase 3 River Restoration (2006)

Proposed Ohio Creek Channel Modification
(Excavation and "Re-distribution" of Fill)

Location (Stations)	Reach Length (feet)	Total Excavation/Fill (Cu. Yd.)	Waters of the U. S.		Wetlands		
			Excavation (Cu. Yd.)	Fill (Cu. Yd.)	Excavation (Cu. Yd.)	Fill (Cu. Yd.)	Impact (Sq. Ft.)
20+50 to 29+00	850	1,675	731	731	106	106	4,314
30+30 to 38+00	770	1,517	610	610	148	148	5,996
39+80 to 42+50	270	532	208	208	59	59	2,373
43+50 to 58+00	1,450	2,857	1,254	1,254	174	174	7,095
59+00 to 64+10	510	1,005	363	363	139	139	5,654
66+20 to 70+50	430	847	366	366	58	58	2,360
96+80 to 98+20	140	276	102	102	36	36	1,467
99+15 to 120+75	2,160	4,255	1,830	1,830	298	298	12,157
123+25 to 123+75	50	99	50	50	-	-	-
126+00 to 127+00	100	197	99	99	-	-	-
128+50 to 131+00	250	493	234	234	13	13	526
132+00 to 151+00	1,900	3,743	1,516	1,516	356	356	14,529
152+00 to 154+00	200	394	168	168	30	30	1,194
155+50 to 155+75	25	49	25	25	-	-	-
158+00 to 162+00	400	788	334	334	61	61	2,468
TOTALS	9,505	18,727	7,890	7,890	1,478	1,478	60,133 **(1.38 Acres)**

Notes:

1. Excavated material "re-distributed" as fill within channel cross-section
2. Wetland impact occurs approximately 50% as excavation activity and 50% as fill activity.

Table 3
Castleton Ranch - Phase 3 River Restoration (2006)

Summary of Proposed Rock Structures (1)

Station (+/-)	Wetlands	Waters of U.S.	Descripton of Structure	Estimated No. of Rocks	Estimated Fill Volume Wetlands (Cu. Yd.)	Estimated Fill Volume Waters of U.S. (Cu. Yd.)	Wetland Impact Area (sq. ft.)
21+20	Y	Y	J-Hook Vane	20	22	22	80
22+00		Y	J-Hook Vane	20	0	44	0
23+10		Y	J-Hook Vane	20	0	44	0
24+10		Y	J-Hook Vane	20	0	44	0
25+10		Y	J-Hook Vane	20	0	44	0
26+00	Y	Y	Modified J-Hook Vane	30	33	33	100
27+10		Y	Log Vane/J-Hook Combo.	15	0	33	0
28+30		Y	J-Hook Vane	20	0	44	0
29+00		Y	Cross Vane	40	0	88	0
30+00	Y		J-Hook Vane	20	44	0	160
31+20	Y	Y	J-Hook Vane	20	22	22	80
32+00	Y	Y	Modified J-Hook Vane	30	33	33	100
34+00		Y	Log Vane/J-Hook Combo.	15	0	33	0
34+70		Y	J-Hook Vane	20	0	44	0
35+70	Y	Y	Modified J-Hook Vane	30	33	33	100
36+50	Y		J-Hook Vane	20	44	0	160
37+00		Y	Cross Vane	40	0	88	0
38+00		Y	J-Hook Vane	20	0	44	0
38+70	Y		Modified J-Hook Vane	30	66	0	200
39+50	Y		Modified J-Hook Vane	30	66	0	200
40+40		Y	Modified J-Hook Vane	30	0	66	0
41+70		Y	Log Vane/J-Hook Combo.	15	0	33	0
42+50	Y		Modified J-Hook Vane	30	66	0	200
43+20	Y		J-Hook Vane	20	44	0	160
44+40		Y	J-Hook Vane	20	0	44	0
45+20		Y	J-Hook Vane	20	0	44	0
45+80		Y	Cross Vane	40	0	88	0
47+10		Y	J-Hook Vane	20	0	44	0
48+50		Y	Log Vane/J-Hook Combo.	15	0	33	0
49+50		Y	Modified J-Hook Vane	30	0	66	0
51+40		Y	J-Hook Vane	20	0	44	0
53+00		Y	Cross Vane	40	0	88	0
55+00	Y		Log Vane/J-Hook Combo.	15	33	0	80
56+00	Y	Y	Modified J-Hook Vane	30	33	33	100
58+10		Y	J-Hook Vane	20	0	44	0
59+00		Y	Cross Vane	40	0	88	0
60+70		Y	J-Hook Vane	20	0	44	0
62+00		Y	Log Vane/J-Hook Combo.	15	0	33	0
63+00		Y	J-Hook Vane	20	0	44	0
64+00	Y	Y	Cross Vane	40	44	44	170
64+60	Y		J-Hook Vane	20	44	0	160
65+50	Y		J-Hook Vane	20	44	0	160
66+00	Y	Y	Cross Vane	40	44	44	170
67+00		Y	J-Hook Vane	20	0	44	0
67+70		Y	Log Vane/J-Hook Combo.	15	0	33	0
68+40		Y	Cross Vane	40	0	88	0
69+20	Y		J-Hook Vane	20	44	0	160
Sta. 70+50 to Sta. 89+75 Phase 1 Construction (2004)							0
Sta. 89+75 to Sta. 96+50 Phase 2 Construction (2005)							
97+10	Y		J-Hook Vane	20	44	0	160
98+30	Y		Modified J-Hook Vane	30	66	0	200
99+50		Y	Log Vane/J-Hook Combo.	15	0	33	0
102+00		Y	J-Hook Vane	20	0	44	0
103+00		Y	J-Hook Vane	20	0	44	0
103+50		Y	J-Hook Vane	20	0	44	0
104+50		Y	Log Vane/J-Hook Combo.	15	0	33	0
106+00		Y	J-Hook Vane	20	0	44	0
106+90		Y	J-Hook Vane	20	0	44	0

Station (+/-)	Wetlands	Waters of U.S.	Descripton of Structure	Estimated No. of Rocks	Estimated Fill Volume Wetlands (Cu. Yd.)	Estimated Fill Volume Waters of U.S. (Cu. Yd.)	Wetland Impact Area (sq. ft.)
107+80		Y	Cross Vane	40	0	88	0
110+00	Y	Y	Cross Vane	40	44	44	170
111+00	Y		J-Hook Vane	20	44	0	160
111+70		Y	J-Hook Vane	20	0	44	0
112+80	Y	Y	Modified J-Hook Vane	30	33	33	100
114+10		Y	Log Vane/J-Hook Combo.	15	0	33	0
114+90		Y	J-Hook Vane	20	0	44	0
115+60	Y		J-Hook Vane	20	44	0	160
116+50	Y		J-Hook Vane	20	44	0	160
117+50	Y		Log Vane/J-Hook Combo.	15	33	0	80
118+30	Y	Y	Modified J-Hook Vane	30	33	33	100
119+30		Y	J-Hook Vane	20	0	44	0
120+20		Y	J-Hook Vane	20	0	44	0
123+30	Y		J-Hook Vane	20	44	0	160
124+20	Y		Log Vane/J-Hook Combo.	15	33	0	80
125+00	Y		Cross Vane	40	88	0	340
126+50		Y	Modified J-Hook Vane	30	0	66	0
127+60	Y		J-Hook Vane	20	44	0	160
128+50		Y	Cross Vane	40	0	88	0
130+80		Y	J-Hook Vane	20	0	44	0
131+80	Y		Log Vane/J-Hook Combo.	15	33	0	80
132+70		Y	J-Hook Vane	20	0	44	0
133+50		Y	J-Hook Vane	20	0	44	0
134+60		Y	J-Hook Vane	20	0	44	0
135+80	Y		J-Hook Vane	20	44	0	160
136+90	Y	Y	Modified J-Hook Vane	30	33	33	100
139+00		Y	Modified J-Hook Vane	30	0	66	0
140+50		Y	Log Vane/J-Hook Combo.	15	0	33	0
141+90		Y	Cross Vane	40	0	88	0
143+90		Y	J-Hook Vane	20	0	44	0
144+90		Y	J-Hook Vane	20	0	44	0
146+00	Y		Cross Vane	40	88	0	340
147+10	Y		J-Hook Vane	20	44	0	160
148+00		Y	Cross Vane	40	0	88	0
149+40		Y	J-Hook Vane	20	0	44	0
150+40		Y	Log Vane/J-Hook Combo.	15	0	33	0
151+50	Y		Cross Vane	40	88	0	340
152+70	Y	Y	J-Hook Vane	20	22	22	80
153+40	Y		J-Hook Vane	20	44	0	160
154+40	Y		Cross Vane	40	88	0	340
155+50	Y		J-Hook Vane	20	44	0	160
156+40	Y		Log Vane/J-Hook Combo.	15	33	0	80
157+10	Y		J-Hook Vane	20	44	0	160
158+40	Y	Y	Cross Vane	40	44	44	170
160+60		Y	J-Hook Vane	20	0	44	0
161+50		Y	Log Vane/J-Hook Combo.	15	0	33	0
			TOTALS	2,465	2,002	3,421	6,900 (0.16 acres)

Notes:

1. Actual location of structures may vary slightly depending on final field layout conditions.
2. Type of structure at each location may vary depending on final field layout conditions.
3. Wetland impact area estimated as footprint of structure within defined wetland boundaries.

Table 4
Castleton Ranch - Phase 3 River Restoration (2006)

Summary of Proposed Oxbow Pond Construction

Oxbow No.	Location (Stations)	Water Surface Area (Sq. Ft.)	Water Surface Area (Acre)	Excavation Quantities: Total (Cu. Yd.)	Excavation Quantities: Waters of U. S. (Cu. Yd.)	Excavation Quantities: Wetlands (Cu. Yd.)	Wetland Impacts (Sq. Ft.)	Wetland Impacts (Acre)
OX-1	29+25	3,957	0.091	1,319	1,215	104	312	0.007
OX-2	30+00	4,878	0.112	1,626	1,162	464	1,392	0.032
OX-3	42+75	6,081	0.140	2,027	1,658	369	1,106	0.025
0X-4	43+25	3,606	0.083	1,202	849	353	1,058	0.024
OX-5	64+50	6,199	0.142	2,066	1,317	750	2,249	0.052
OX-6	65+25	5,760	0.132	1,920	1,359	561	1,683	0.039
OX-7	66+00	3,168	0.073	1,056	675	381	1,144	0.026
(OX-8 and OX-9 constructed during Phase 2)								
OX-10	118+00	5,917	0.136	1,972	988	984	2,953	0.068
OX-11	119+50	2,866	0.066	955	478	477	1,431	0.033
	TOTALS	42,432	0.974	14,144	9,701	4,443	13,328	0.306

NOTES:

1. Referenced Figures 3-2, 3-3, 3-4, and 3-9 for specific locations of oxbow ponds.

TABLE 5

CASTLETON RANCH - Phase 3 River Restoration Project (2006)
WETLAND MITIGATION

Existing Mitigation Areas

(Constructed in Fall of 2004 and Spring of 2005)

Parcel ID	Surface Area (Sq. Ft.)	(Acres)
MIT - A	32,582	0.75
MIT - B	15,328	0.35
MIT - C	13,799	0.32
MIT - D	12,475	0.29
MIT - E	10,775	0.25
MIT - F	79,653	1.83
Subtotal	164,612	3.78
Proposed Mitigation Areas		
(Meander "Conversions")		
MIT - P1	7,467	0.17
MIT - P2	7,673	0.18
MIT - P3	3,083	0.07
MIT - P4	2,036	0.05
MIT - P5	8,469	0.19
MIT - P6	11,357	0.26
MIT - P7	2,794	0.06
MIT - P8	5,242	0.12
MIT - P9	3,866	0.09
Subtotal	51,987	1.19
("Creation Sites")		
MIT - P20	47,096	1.08
MIT - P21	20,225	0.46
Subtotal	67,321	1.55
TOTAL MITIGATION	283,920	6.52

NOTES:

1. Reference Figure 2 for locations of existing mitigation areas.
2. Reference Figures 3-1 through 3-12 for locations of proposed "meander conversion" sites.
3. Reference Figure 2 for location of "creation" site MIT-P20 and MIT-P21.

Table 6
Castleton Ranch - Phases 1 - 3 River Restoration (2004-06)

Summary of Proposed Oxbow Pond Construction

Oxbow No.	Location (Stations)	Water Surface Area		Excavation Quantities			Wetland Impacts	
				Total	Waters of U. S.	Wetlands		
		(Sq. Ft.)	(Acre)	(Cu. Yd.)	(Cu. Yd.)	(Cu. Yd.)	(Sq. Ft.)	(Acre)
OX-1	29+25	3,957	0.091	1,319	1,215	104	312	0.007
OX-2	30+00	4,878	0.112	1,626	1,162	464	1,392	0.032
OX-3	42+75	6,081	0.140	2,027	1,658	369	1,106	0.025
0X-4	43+25	3,606	0.083	1,202	849	353	1,058	0.024
OX-5	64+50	6,199	0.142	2,066	1,317	750	2,249	0.052
OX-6	65+25	5,760	0.132	1,920	1,359	561	1,683	0.039
OX-7	66+00	3,168	0.073	1,056	675	381	1,144	0.026
Upper	77+00	11,385	0.261	3,795	3,127	668	2,005	0.046
Homesite	83+00	8,137	0.187	2,712	1,841	871	2,614	0.060
OX-8	94+00	12,160	0.279	4,053	3,591	462	1,387	0.032
OX-9	95+50	15,554	0.357	5,185	3,902	1282	3,847	0.088
OX-10	118+00	5,917	0.136	1,972	988	984	2,953	0.068
OX-11	119+50	2,866	0.066	955	478	477	1,431	0.033
	SUBTOTALS	89,668	2.058	29,889	22,162	7,727	23,181	0.532
Ranch Pond No. 1		77,683	1.783					
(2006 Enlargment)		16,997	0.390					
Entry Pond		66,886	1.535					
	SUBTOTAL	161,566	3.709					
		251,234	5.768					

Map Legend

Proposed River Alignment

Wetland Boundary

Proposed Rock Structure

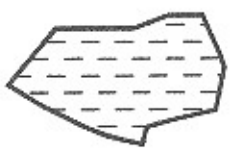
"J-Hook" Vane

Cross Vane

Modified "J-Hook" Vane

Log Vane / J-Hook Combo

Wetlands Impacted by Proposed Restoration



Existing / Proposed Wetland Mitigation

Proposed "Oxbow Pond"

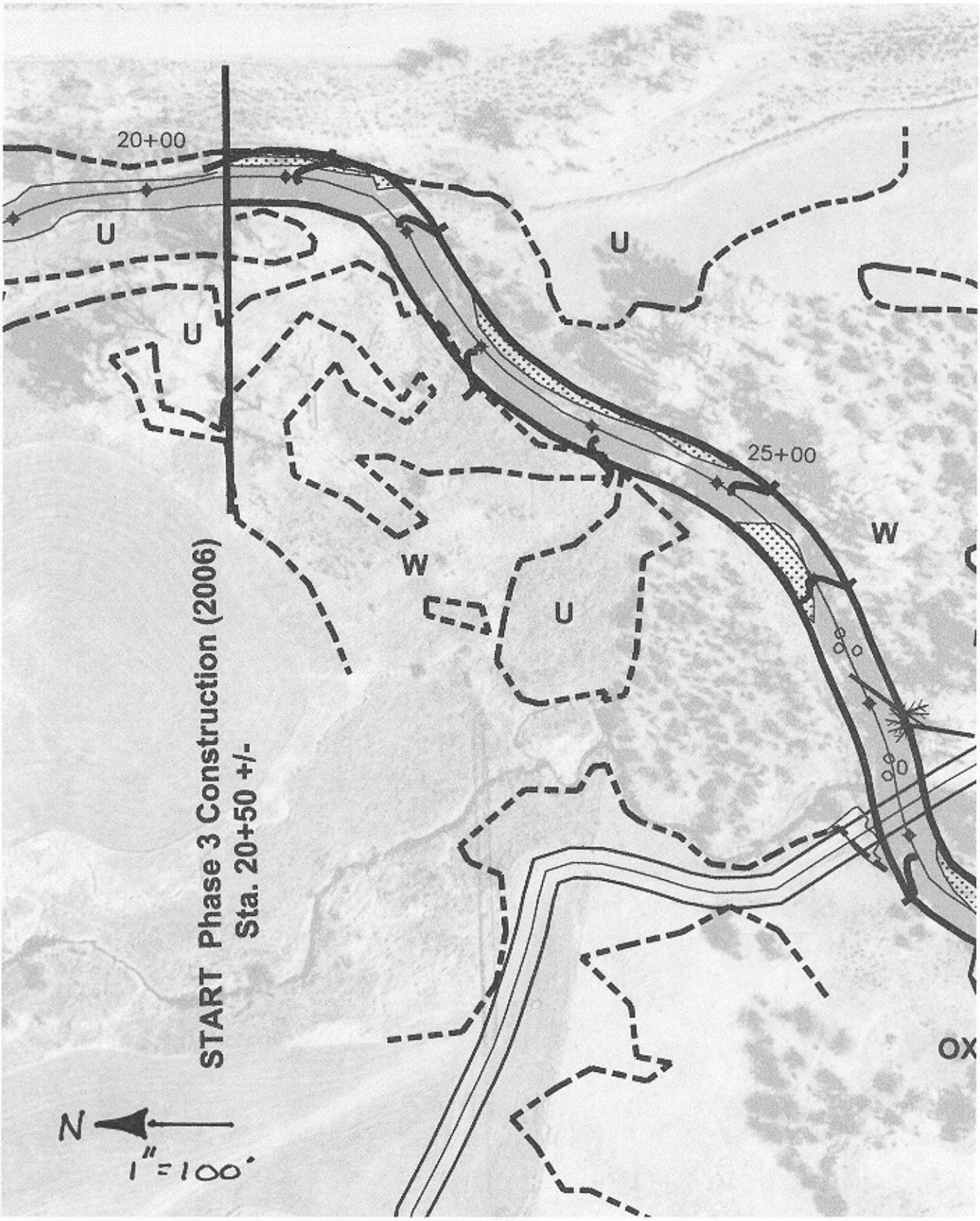

START Phase 3 Construction (2006)
Sta. 20+50 +/-
20+00
25+00
U
U
U
U
W
W
OX
N
1" = 100'

Fig. 3-1 (1/12)

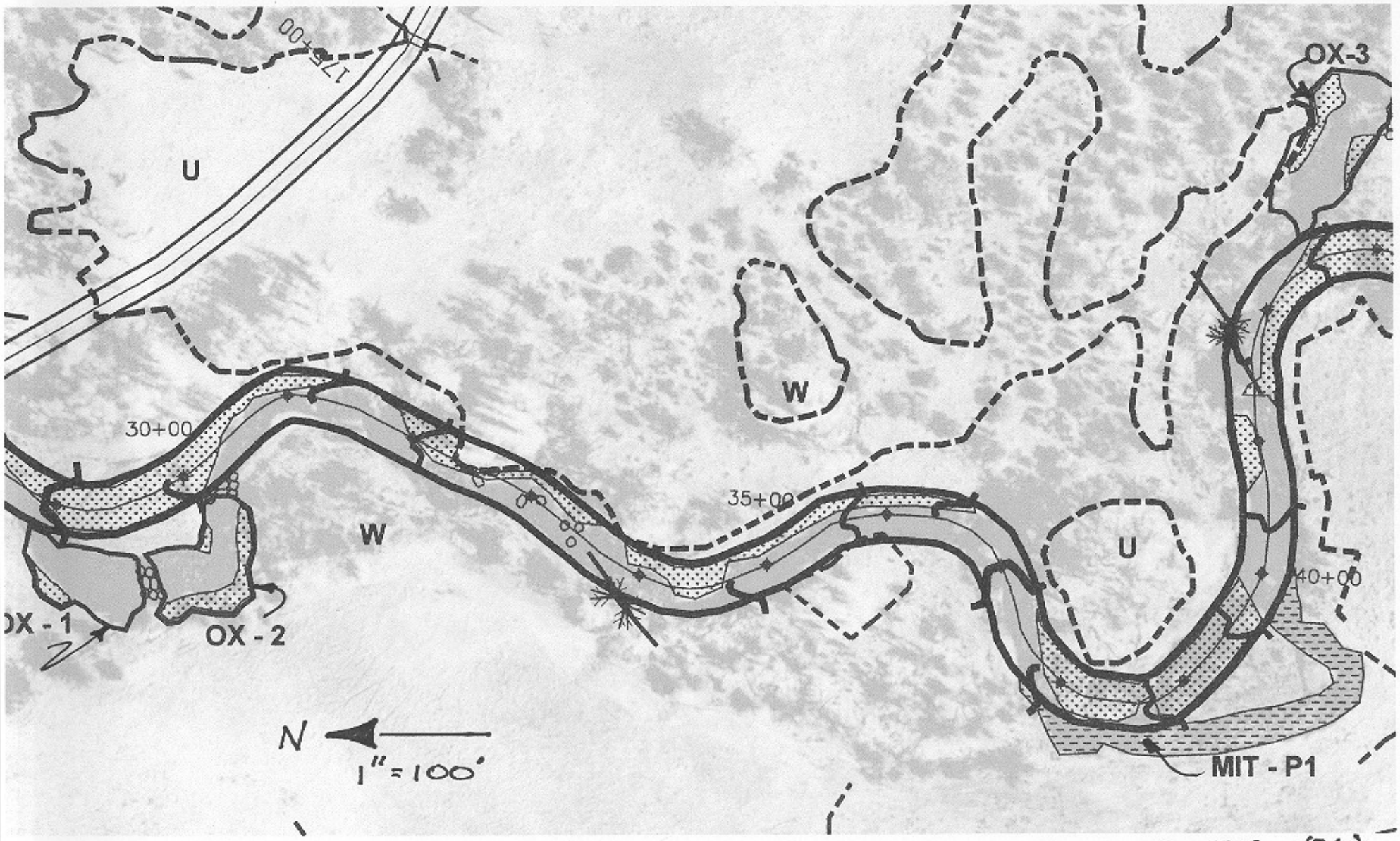


Fig. 3-2 (2/12)

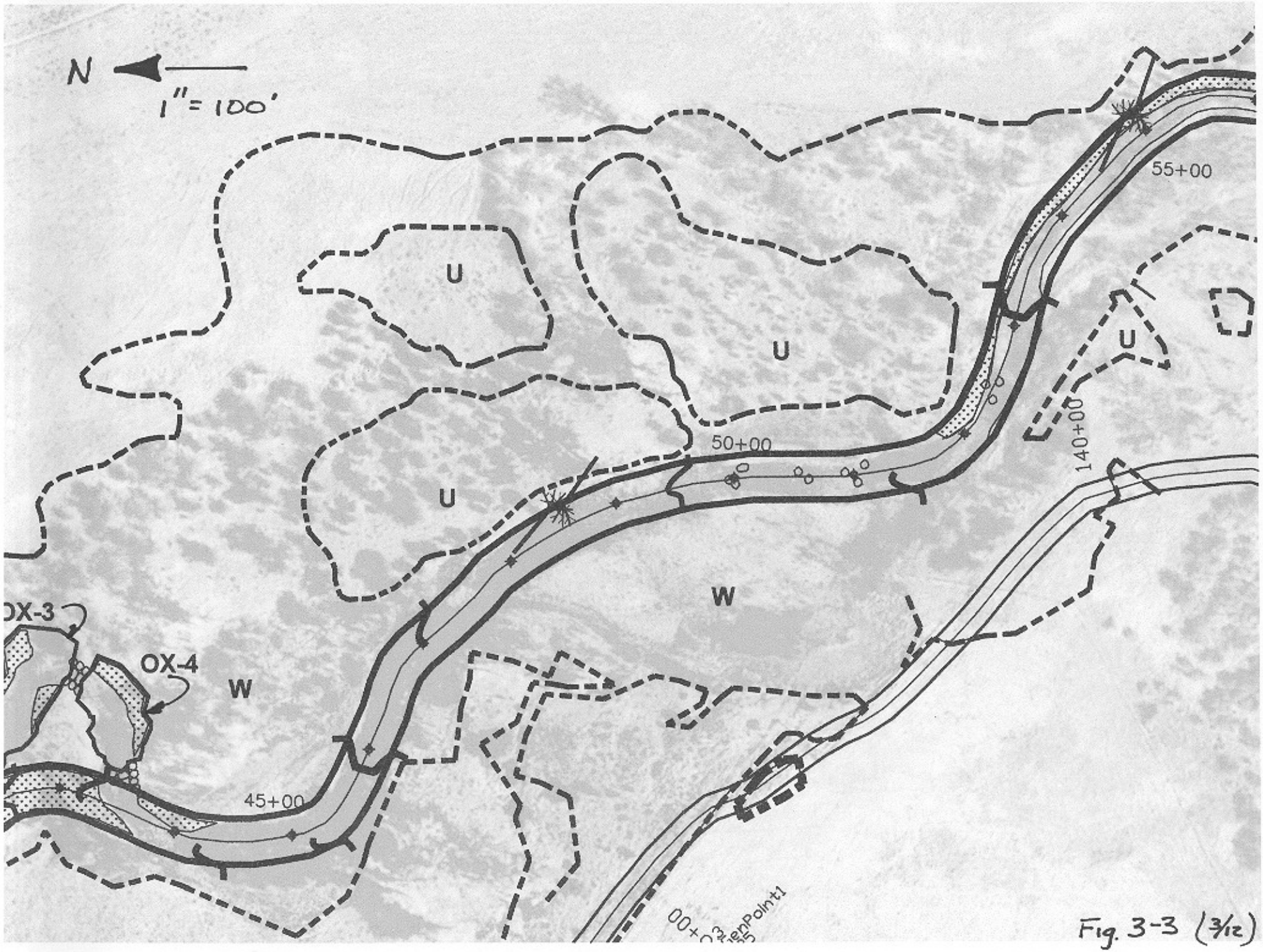


Fig. 3-3 (3/12)

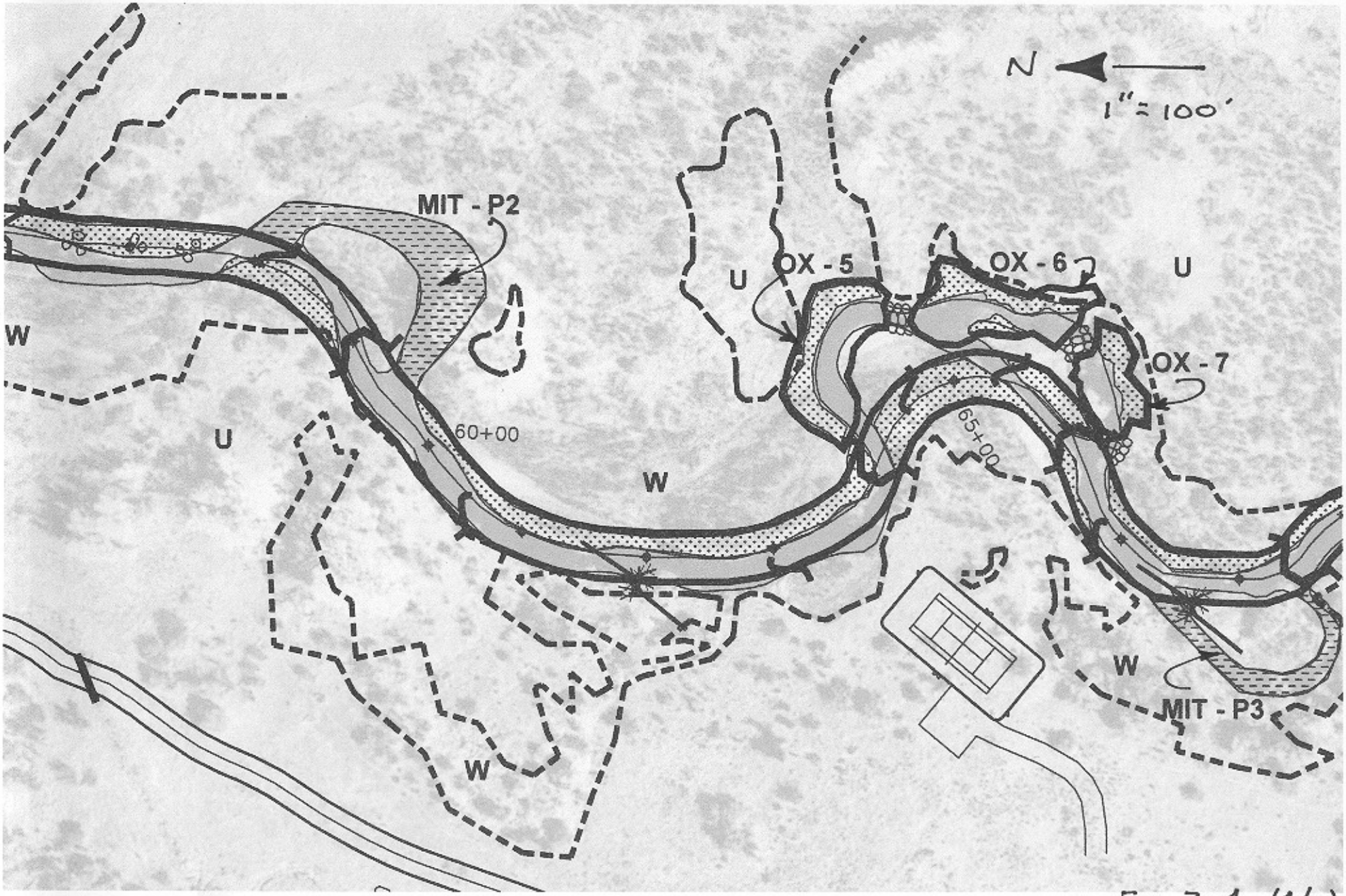


Fig. 3-4 (4/12)

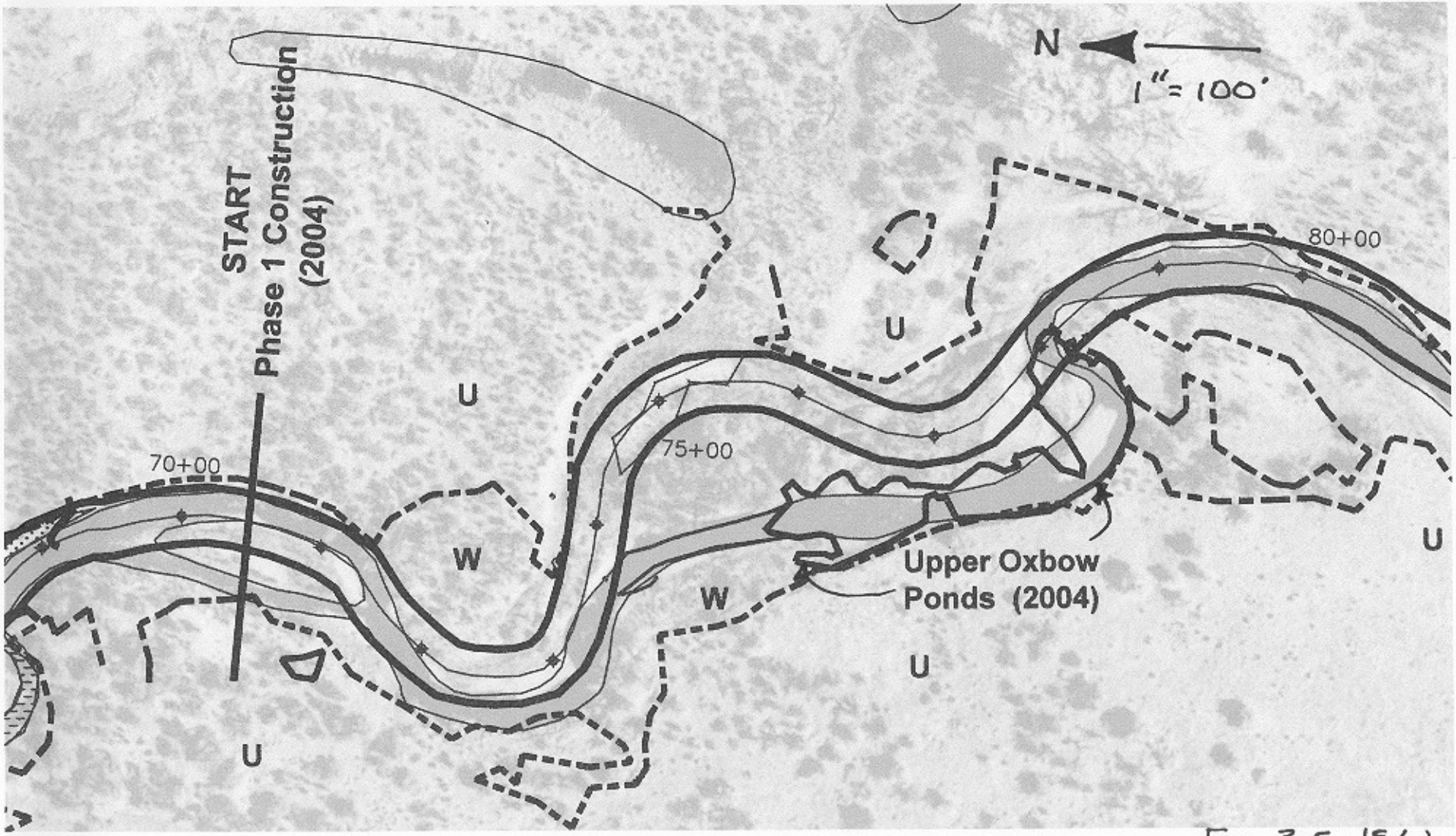

N
1" = 100'
START
Phase 1 Construction
(2004)
70+00
75+00
80+00
U
W
Upper Oxbow
Ponds (2004)

Fig. 3-5 (5/12)

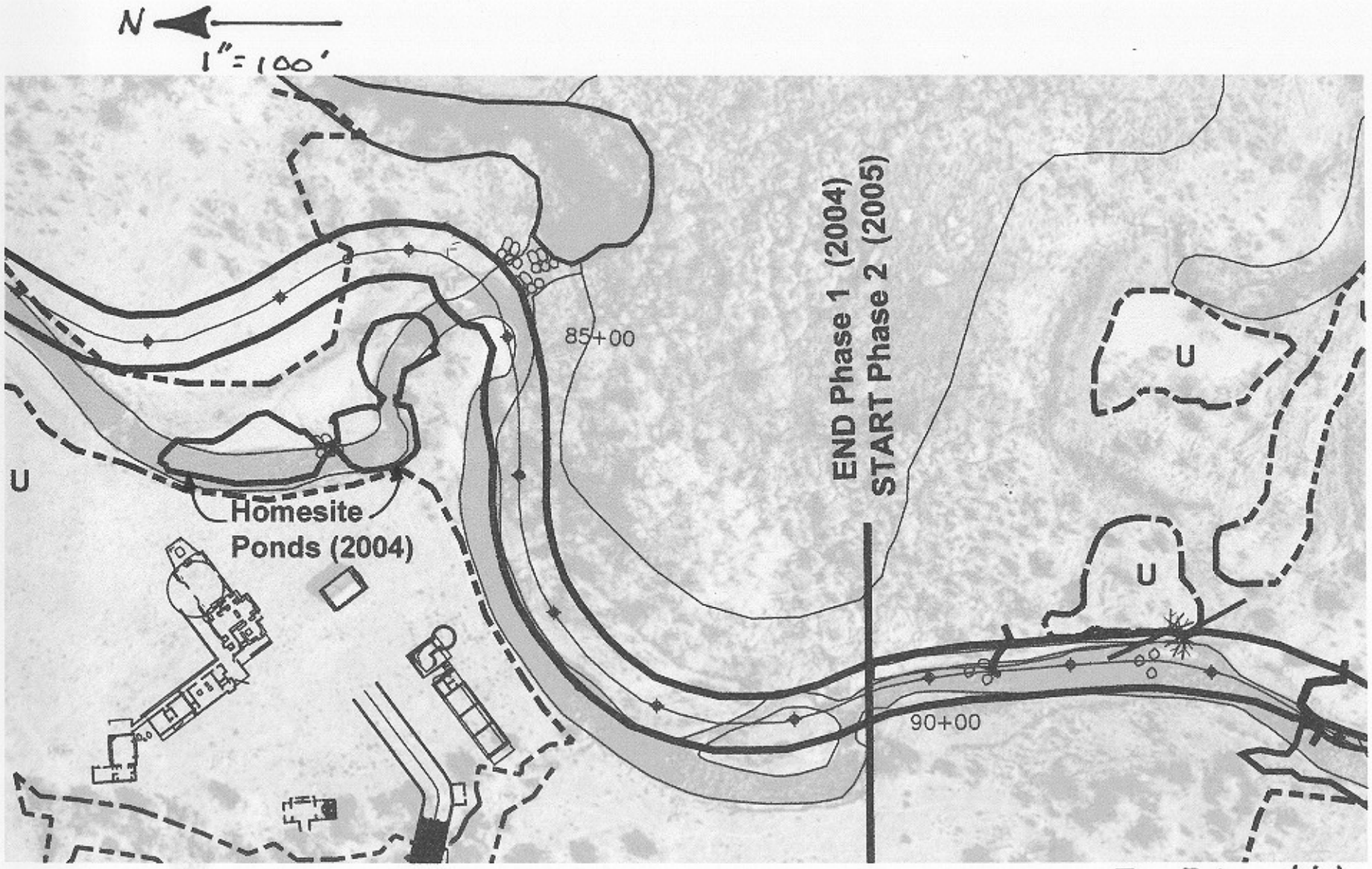

N
1" = 100'
U
Homesite
Ponds (2004)
85+00
END Phase 1 (2004)
START Phase 2 (2005)
U
U
90+00

Fig. 3-6 (6/12)

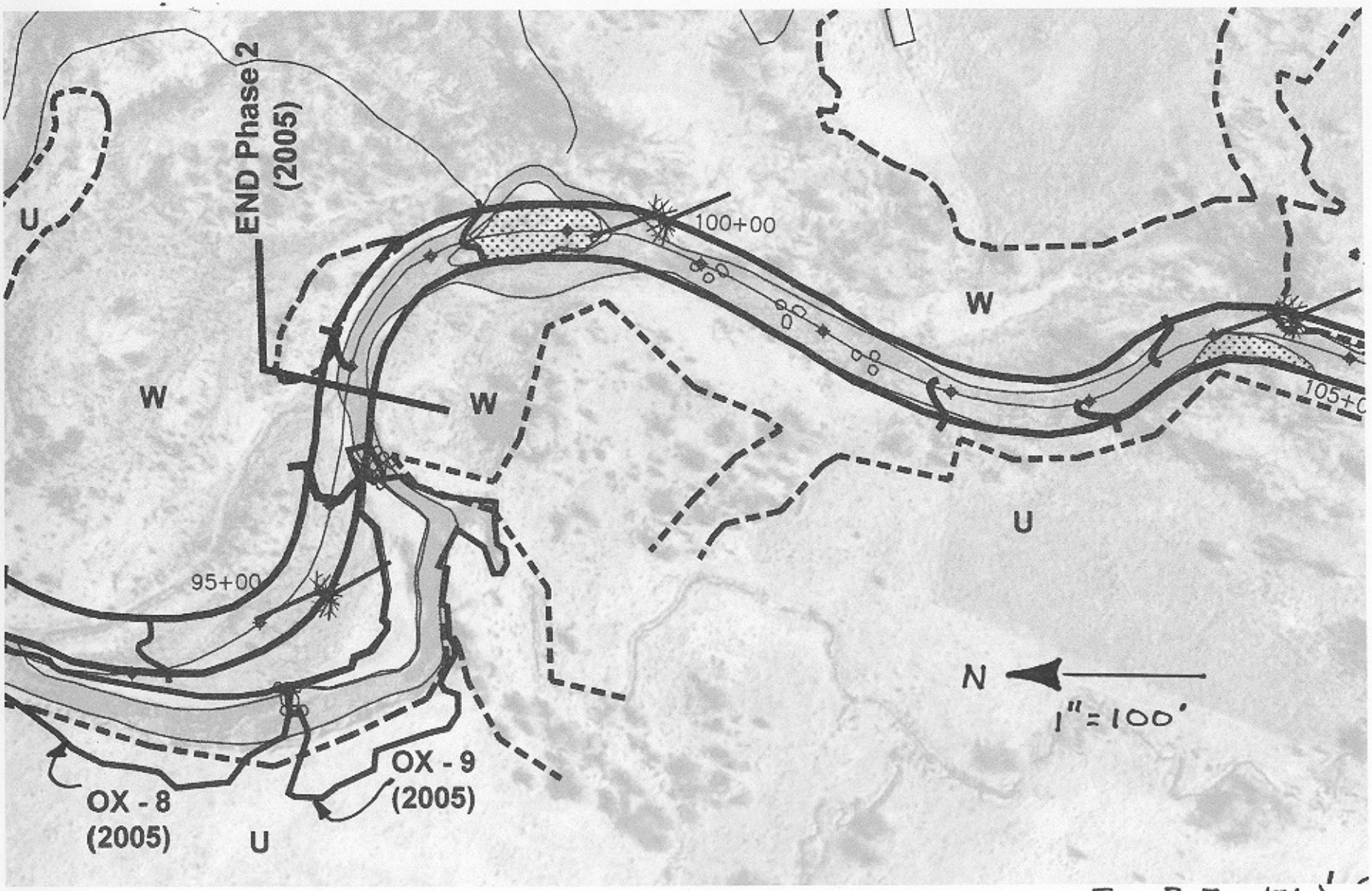

END Phase 2
(2005)
U
W
W
W
U
U
100+00
95+00
105+0
N
1" = 100'
OX - 8
(2005)
OX - 9
(2005)

Fig. 3-7 (7/12)

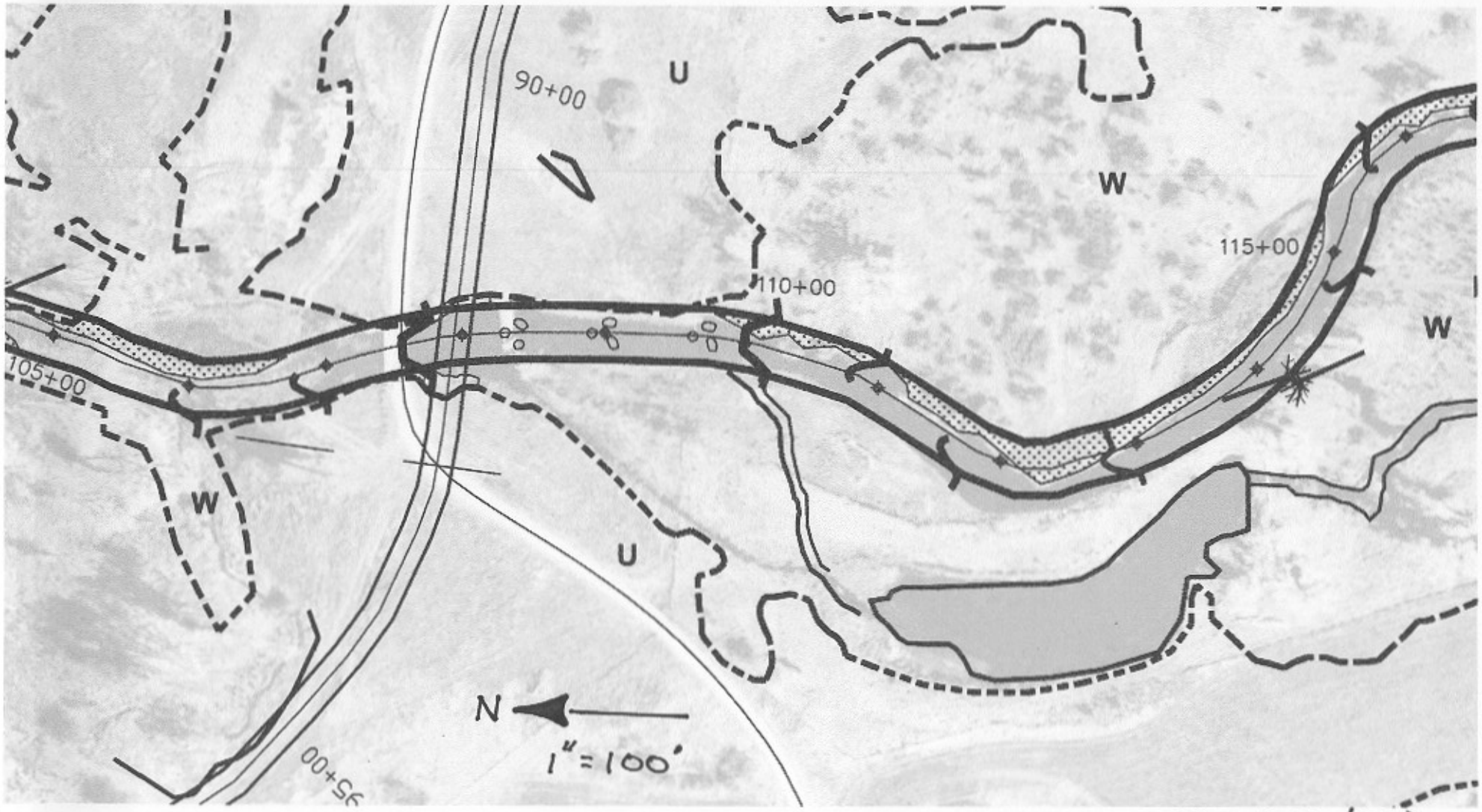


Fig. 3-8 (8/12)

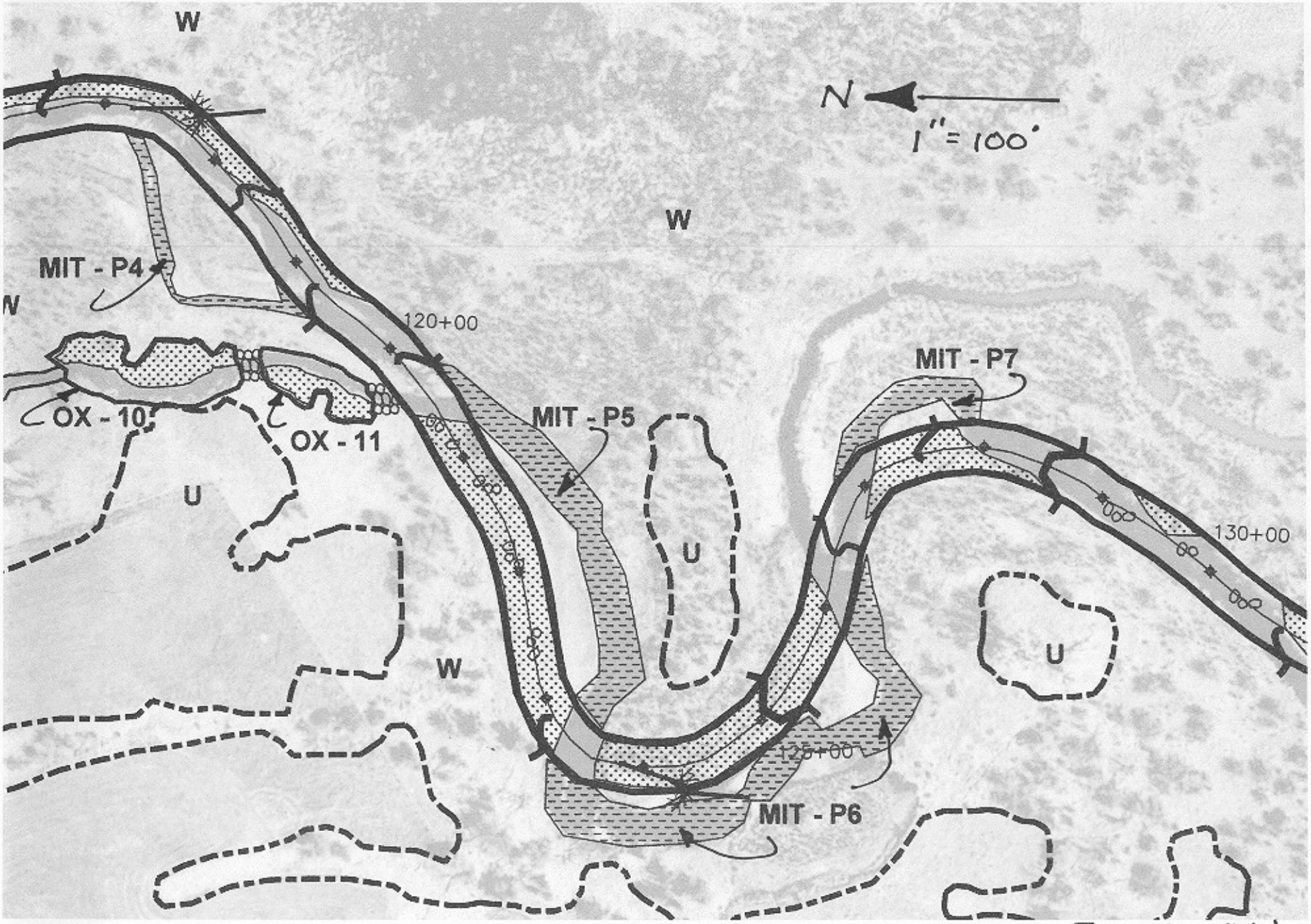

W
N
1" = 100'
W
MIT - P4
W
120+00
MIT - P7
OX - 10
OX - 11
MIT - P5
U
U
130+00
U
W
125+00
MIT - P6

Fig. 3-9 (9/12)

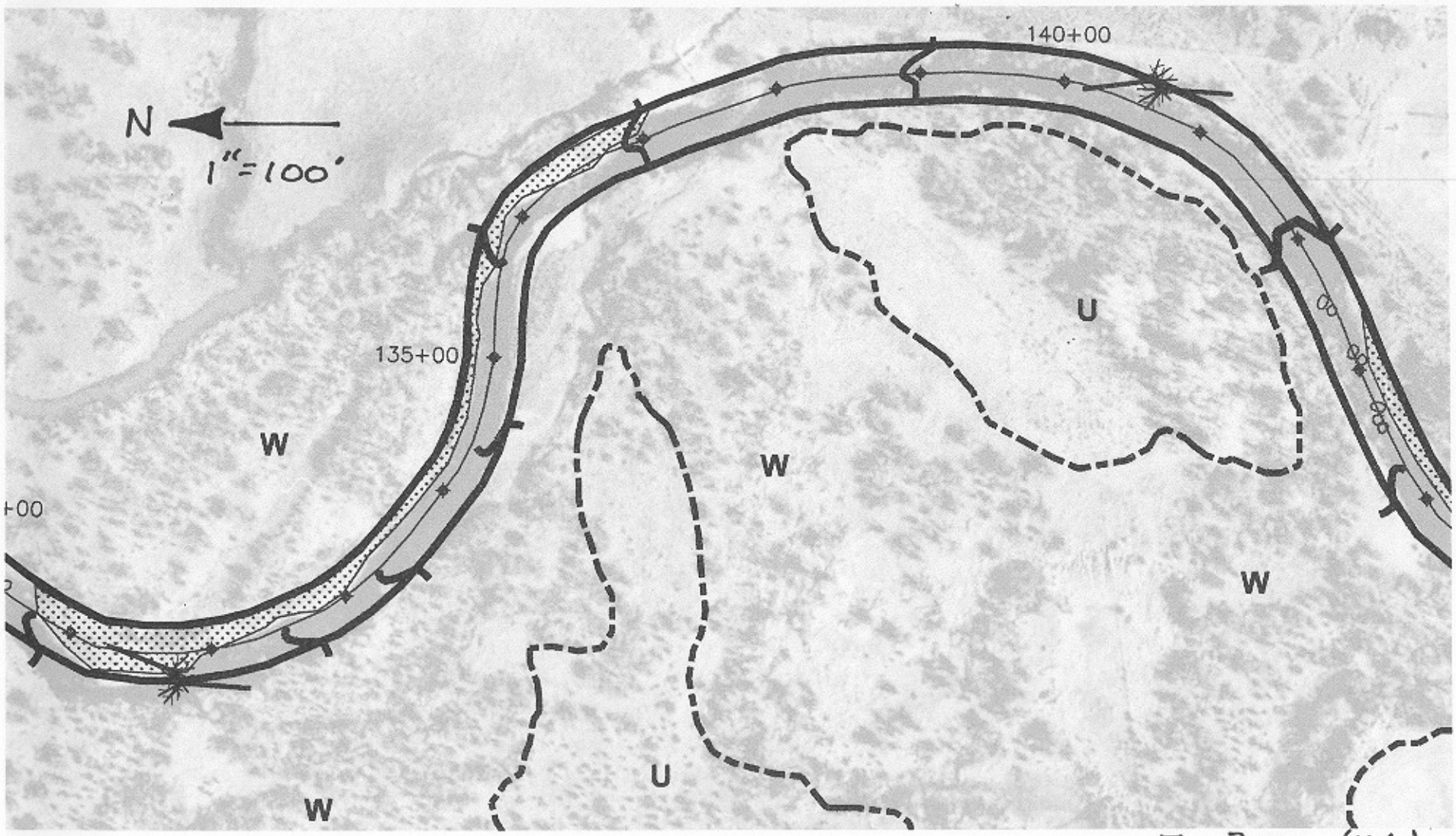


Fig. 3-10 (10/12)

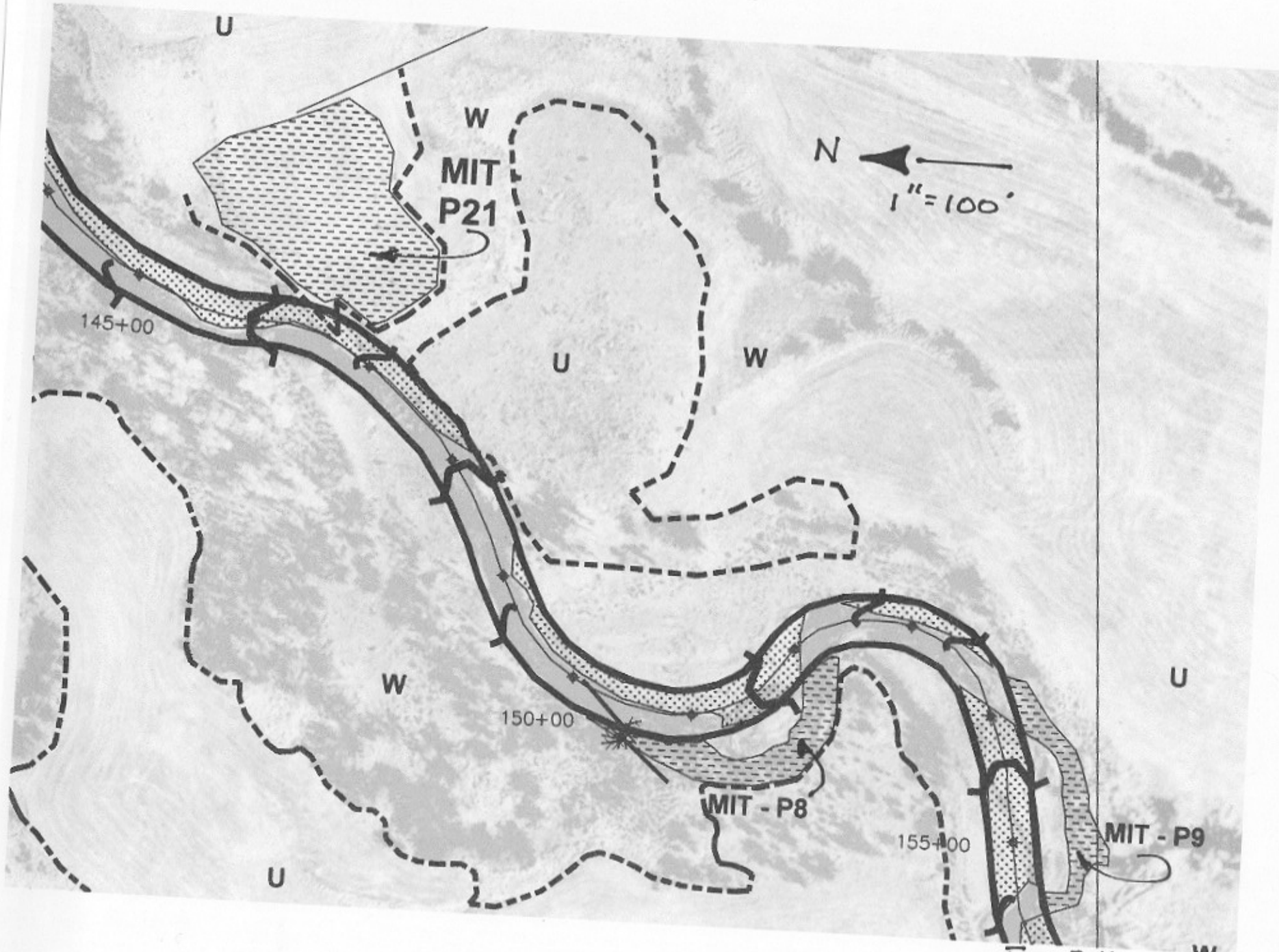


Fig. 3-11 (1/12)

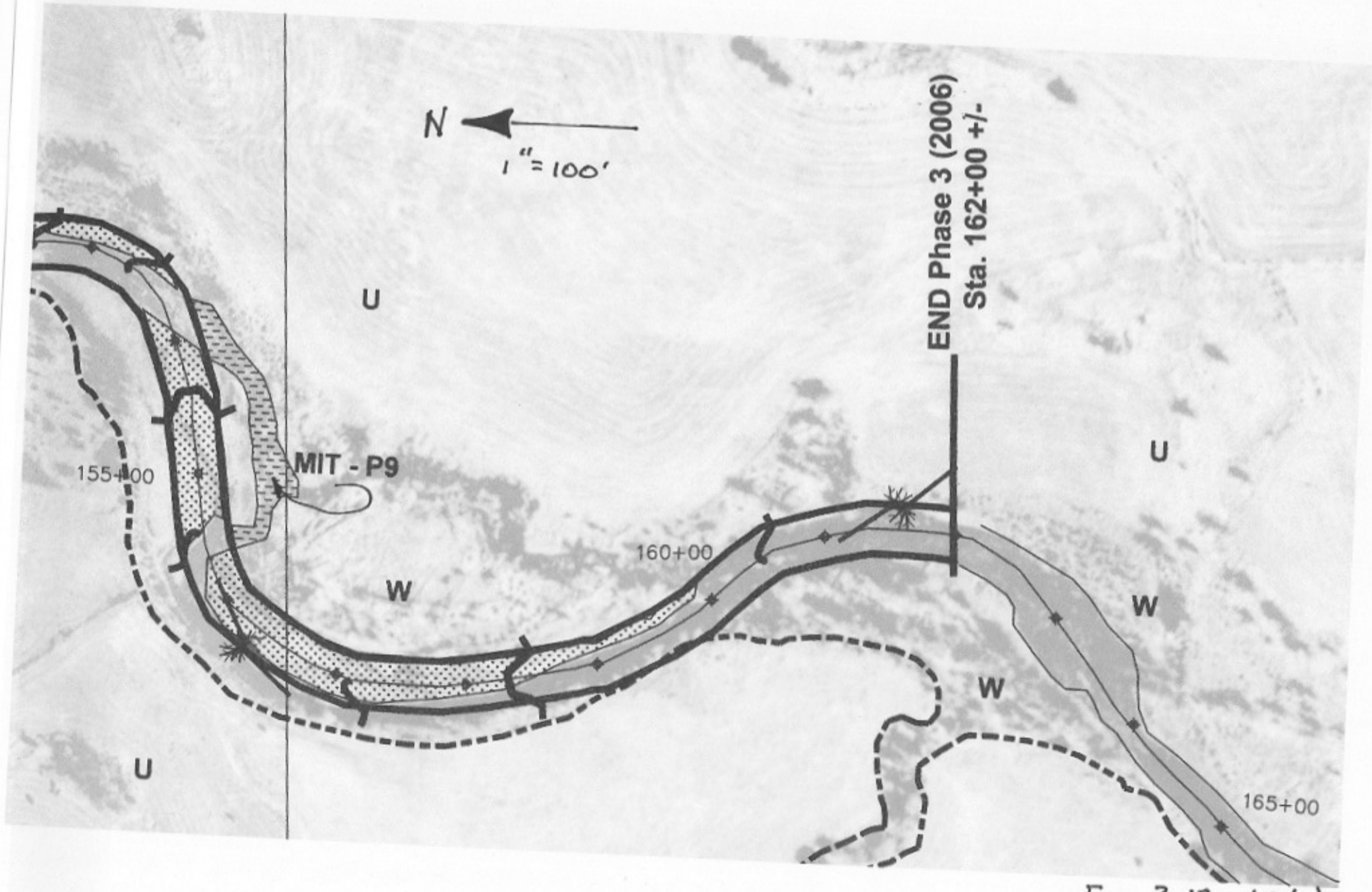

N
1" = 100'
U
U
U
W
W
W
155+00
160+00
165+00
MIT - P9
END Phase 3 (2006)
Sta. 162+00 +/-

Fig. 3-12 (12/12)

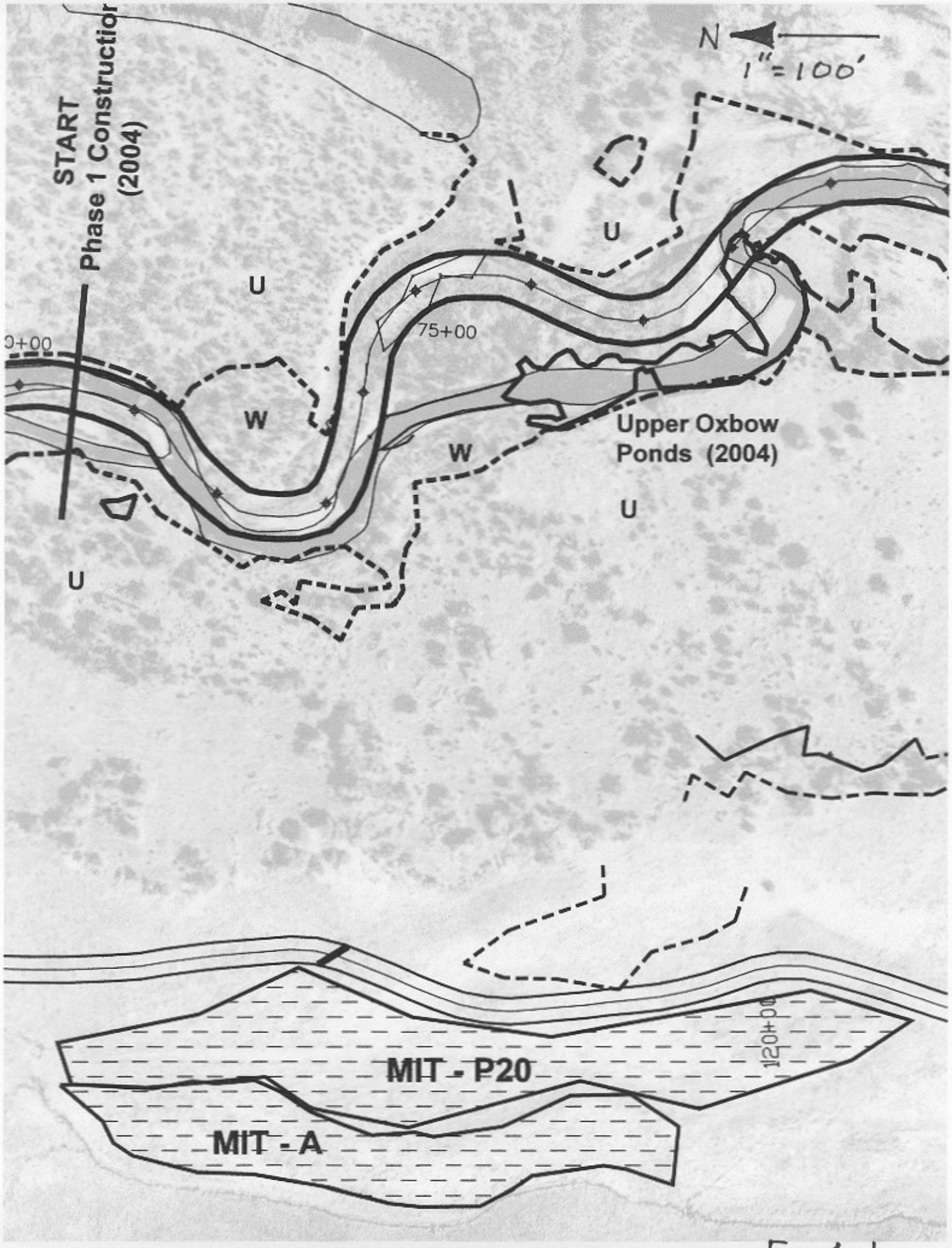

N
1" = 100'
START
Phase 1 Construction
(2004)
0+00
75+00
U
U
U
U
W
W
Upper Oxbow
Ponds (2004)
120+00
MIT - P20
MIT - A

Fig. 4-1

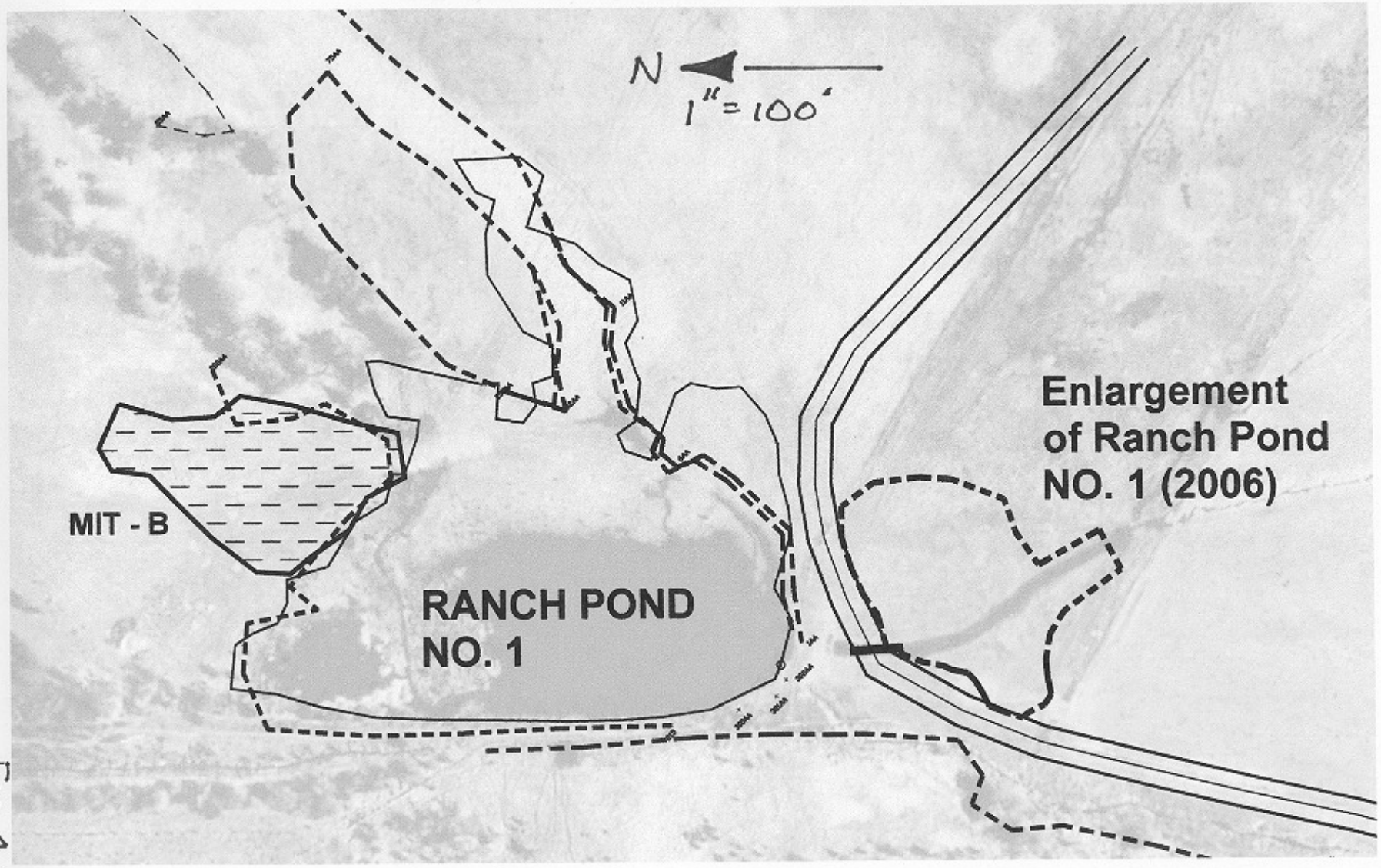

N
1" = 100'
Enlargement
of Ranch Pond
NO. 1 (2006)
MIT - B
RANCH POND
NO. 1

Fig. 4-2

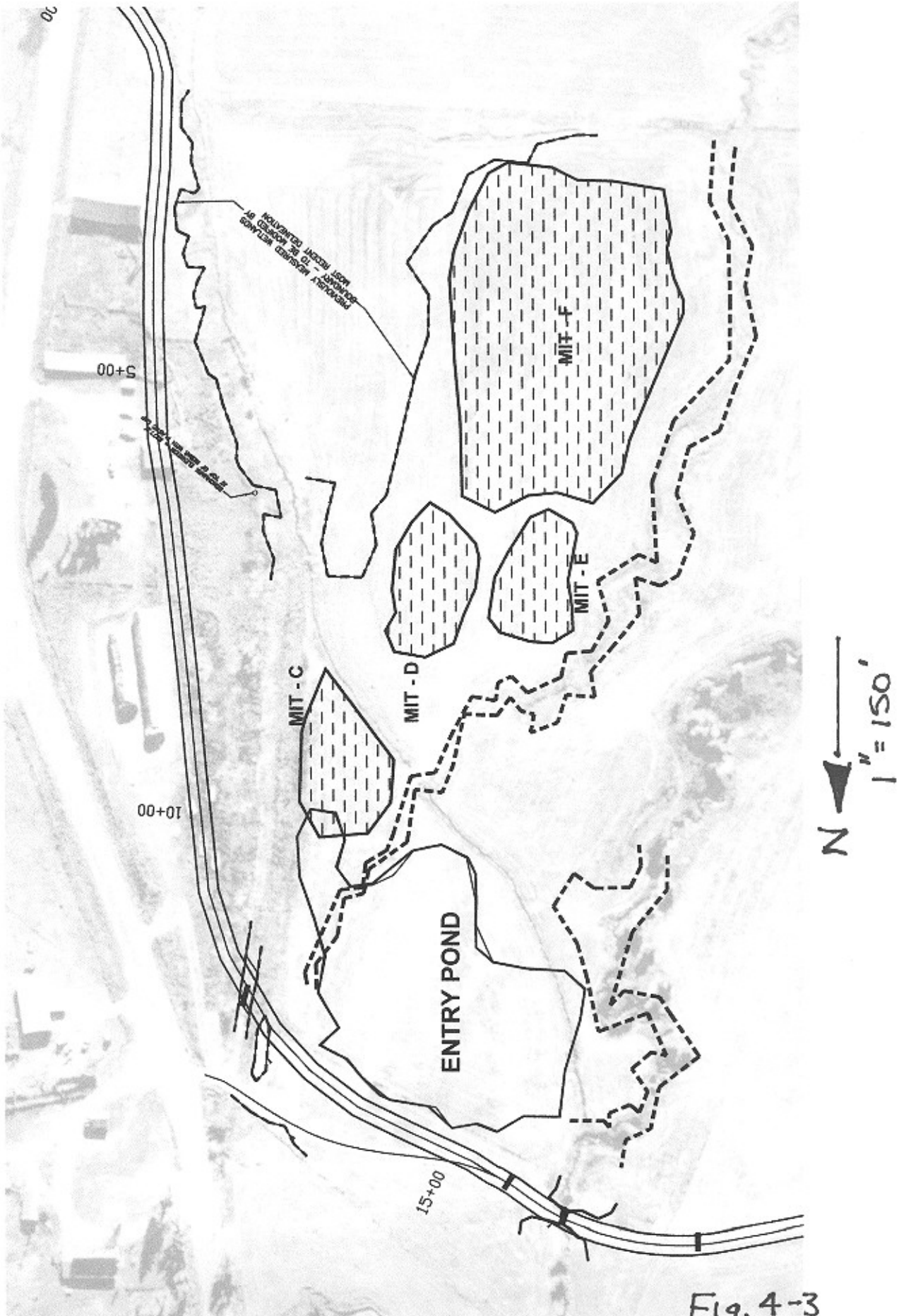
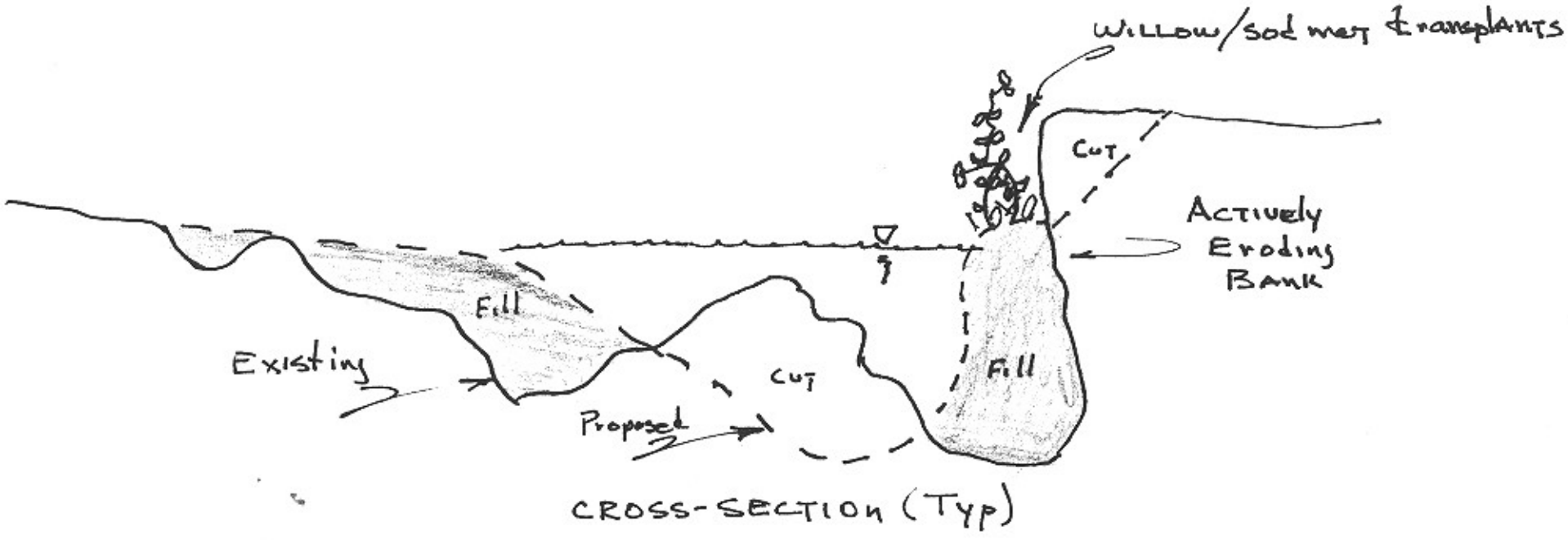


Fig. 4-3

APPENDIX A

Details of Proposed River Improvements

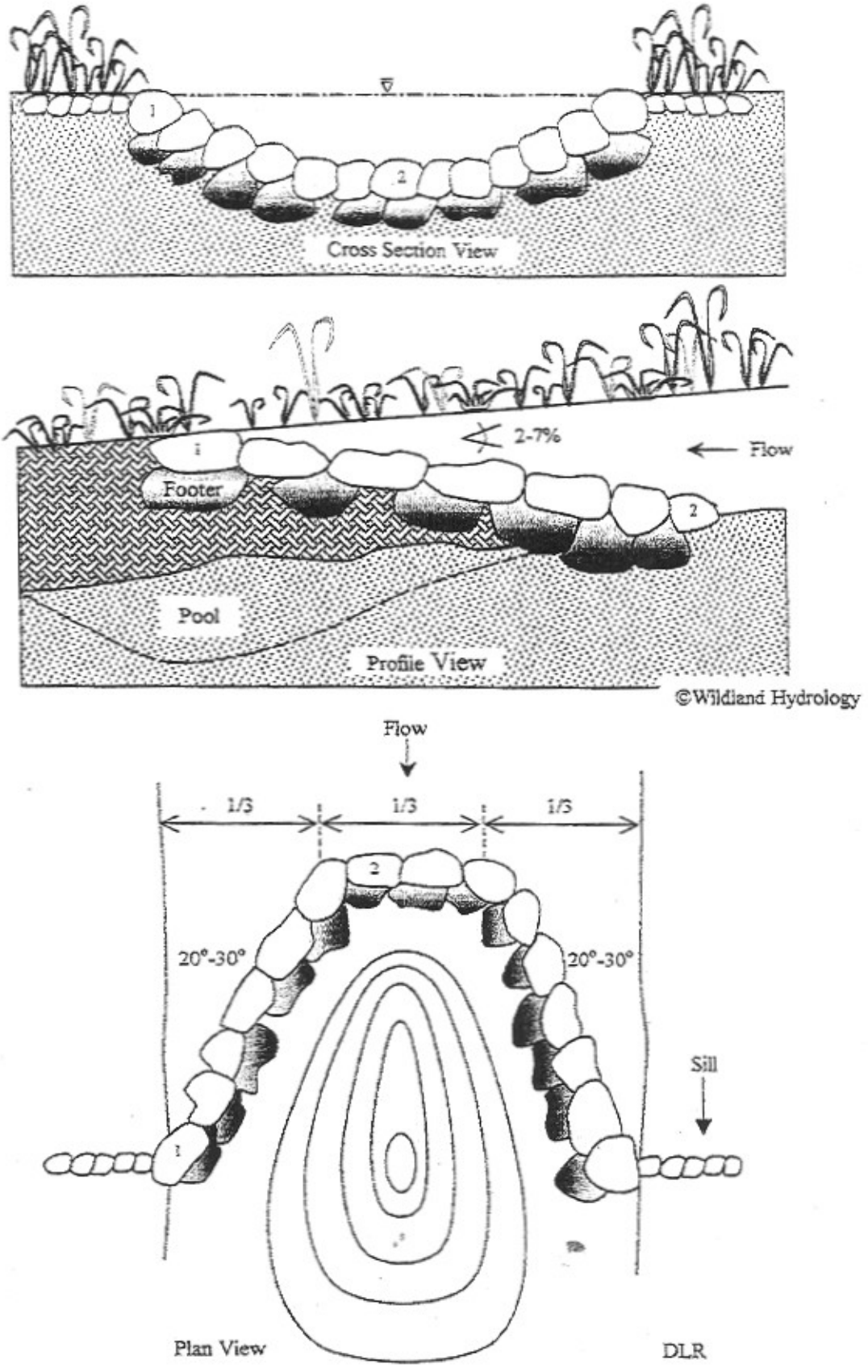


CROSS-SECTION (Typ)

CROSS-SECTION (Typ)

TYPICAL Channel MODIFICATIONS

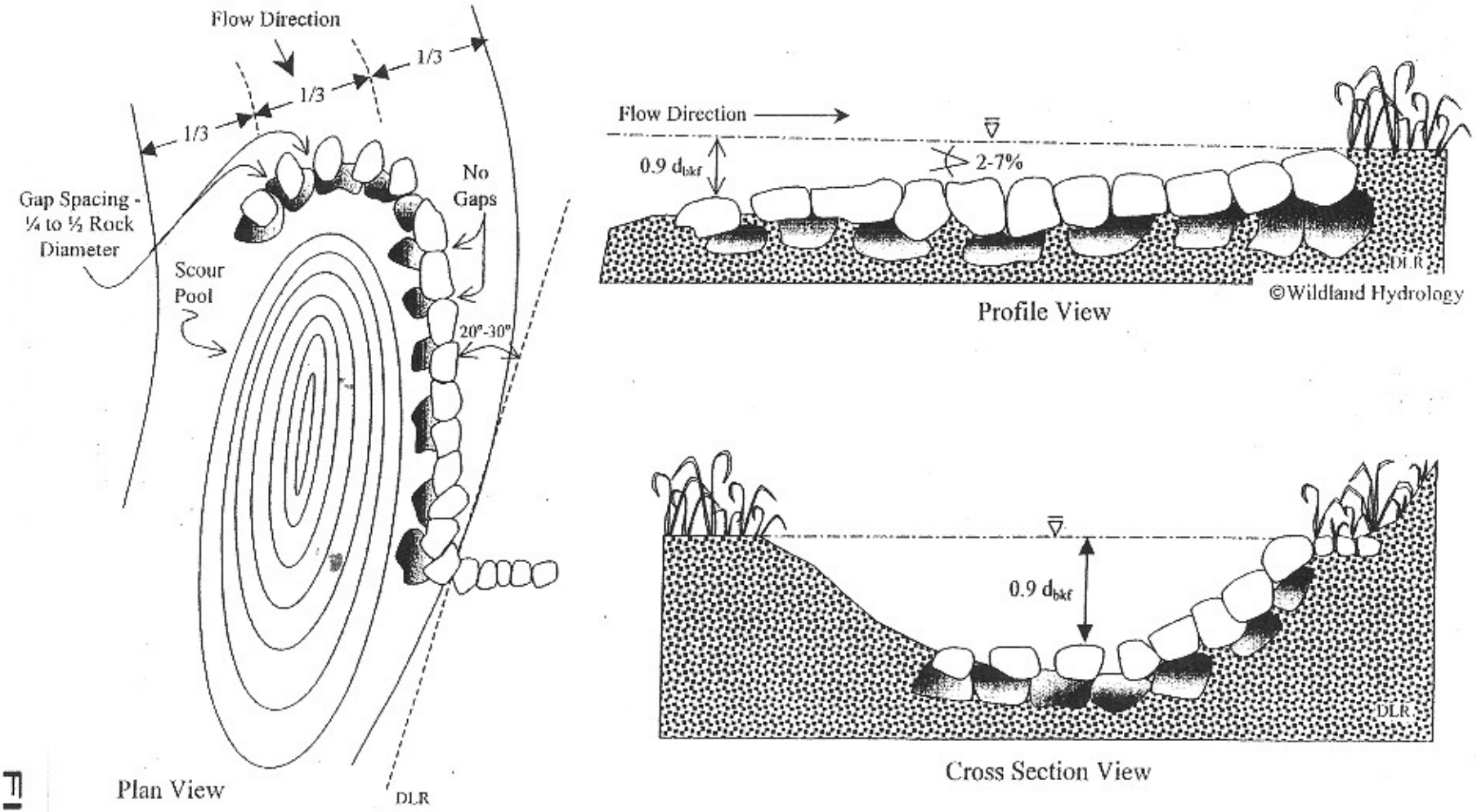
FIGURE A1



Cross section, profile and plan view of a cross vane

FIGURE A2

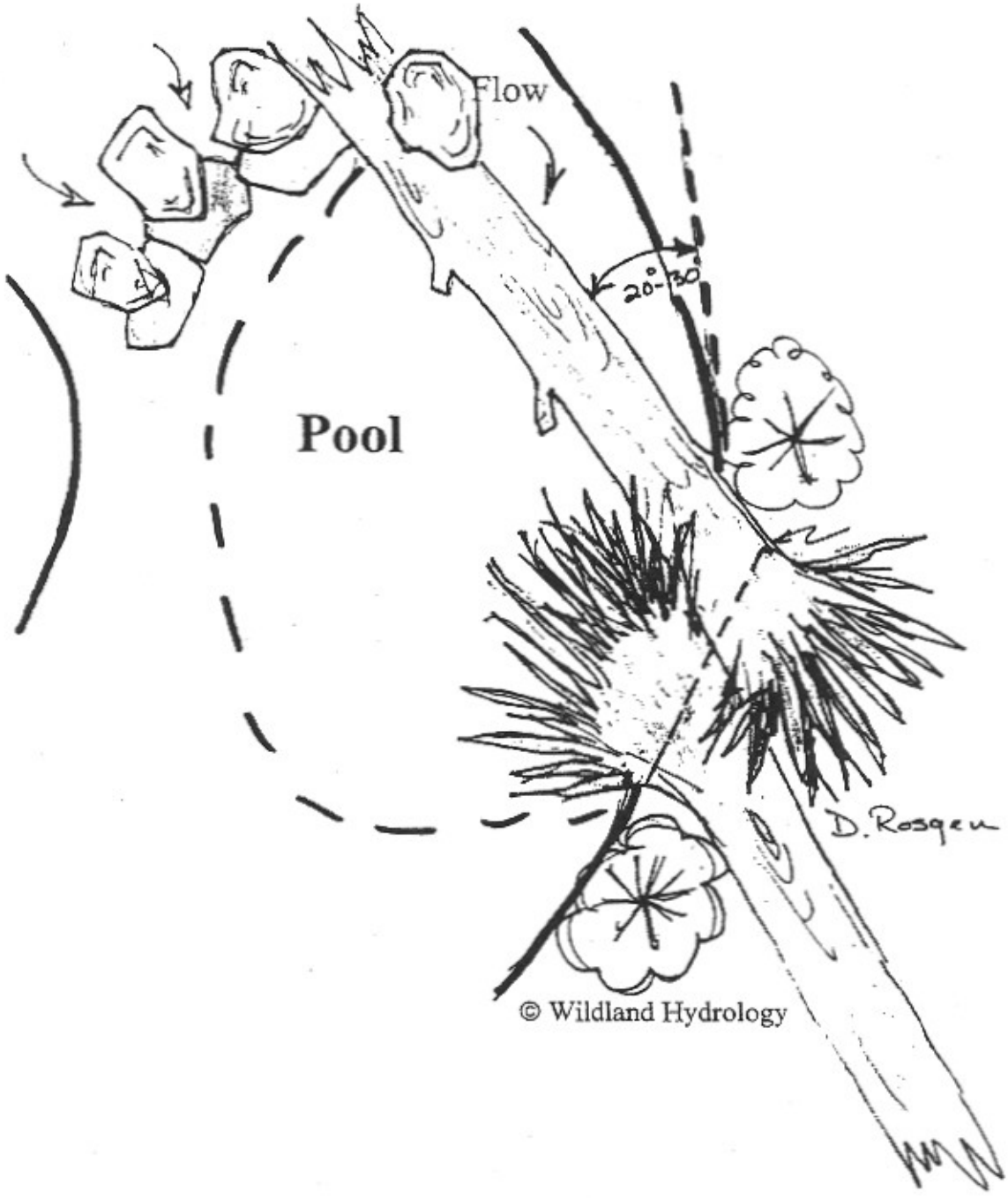
© Wildland Hydrology 2001



Plan, profile, and section view of the J-Hook vane

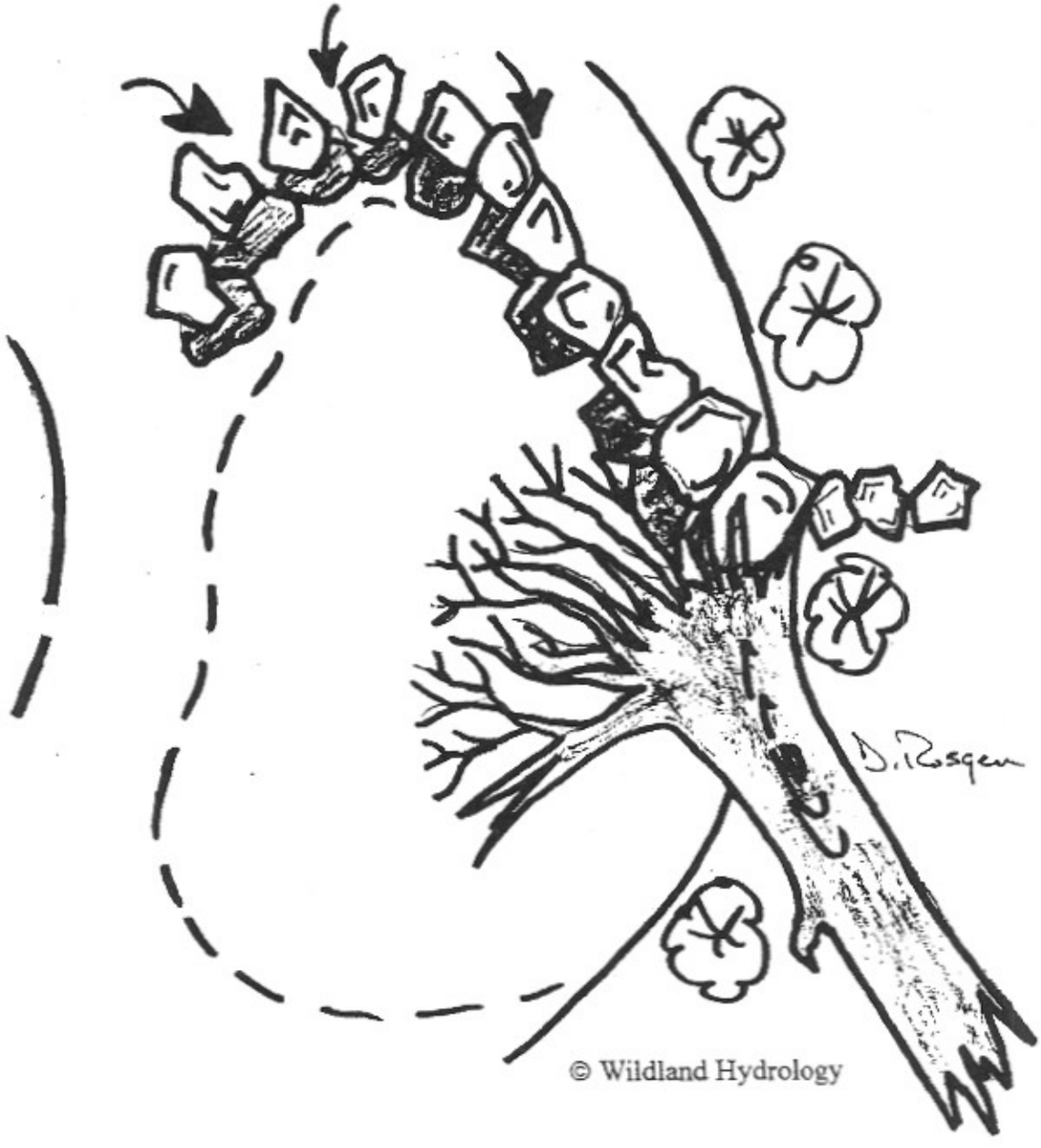
FIGURE A3

© Wildland Hydrology
\\Mother\mother's_c_S\Design documents\ClassManual\SectionE\planprofile2.doc



Log Vane/J-Hook Combo with Root Wad

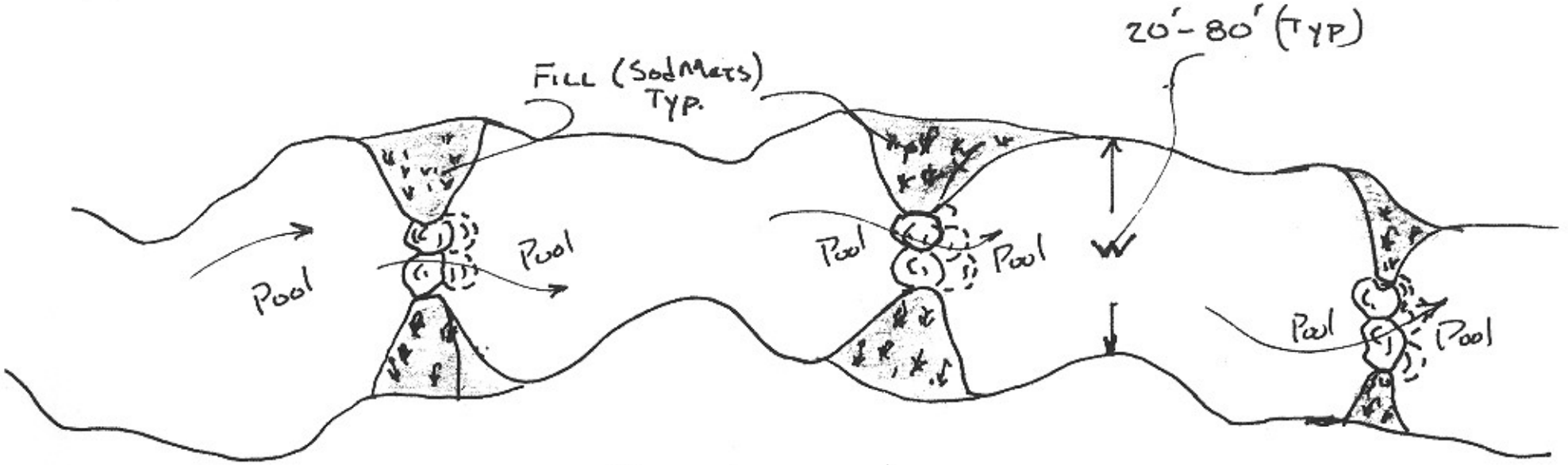
FIGURE A4



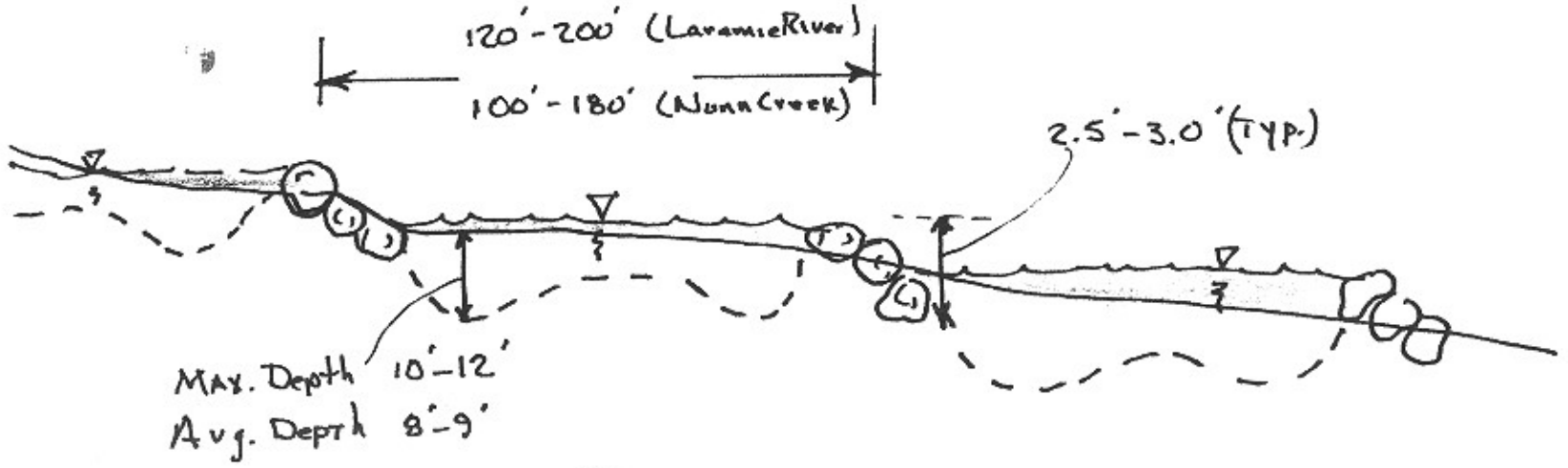
Root Wad/J-Hook Vane
Bank Stabilization and Fish Habitat Structure

© Wildland Hydrology
\\Mother\mother's_c_S\Design documents\ClassManual\SectionE\rootwad-jhook.do

FIGURE A5



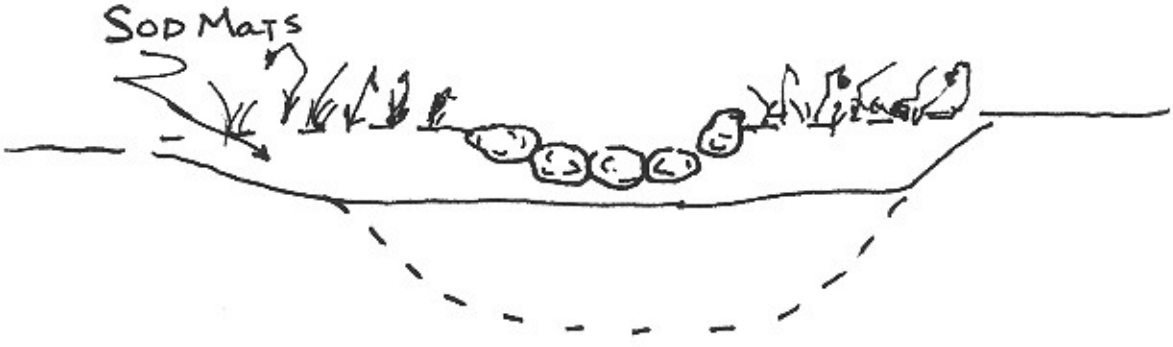
PLAN



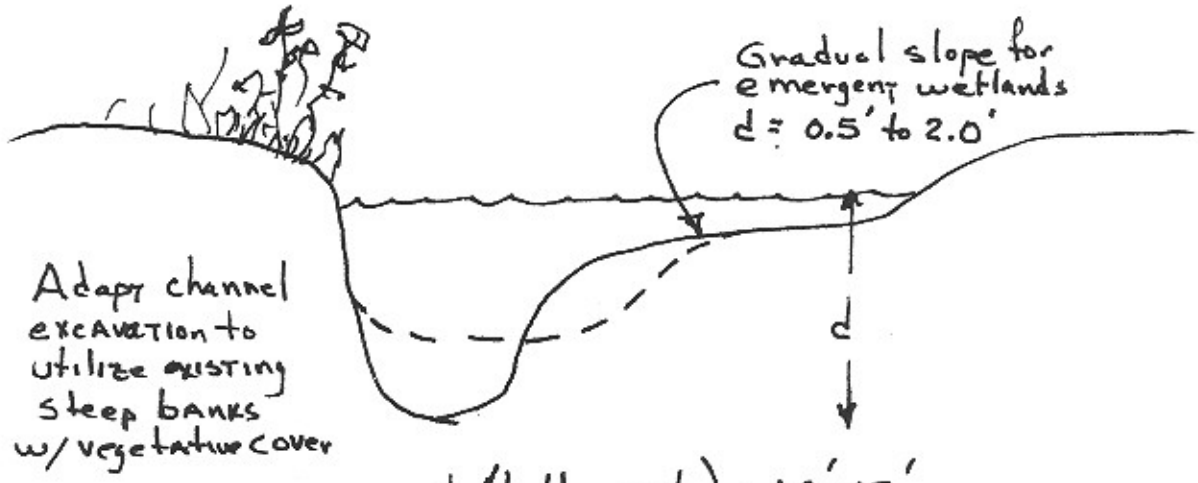
PROFILE

Oxbow Channel

FIGURE A6



CROSS-SECTION
STEP POOL PLUGS



d (holding pools) = 10'-12'
d (Average) = 8'-9'

Oxbow Pond/Channel
TYPICAL SECTION

Oxbow Channels & Step Pool Plugs

FIGURE A7