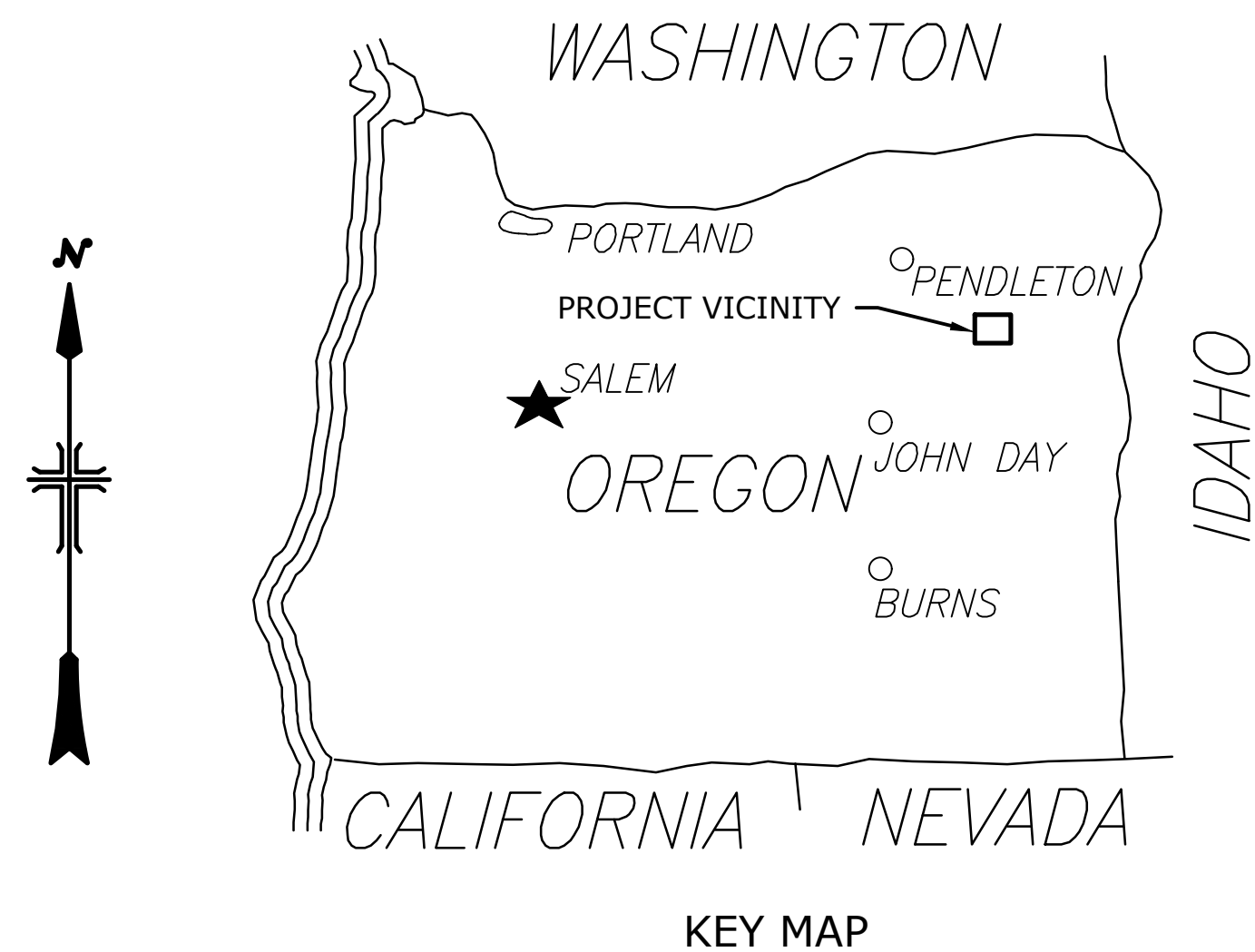


BUFFALO FLATS HABITAT IMPROVEMENT PROJECT

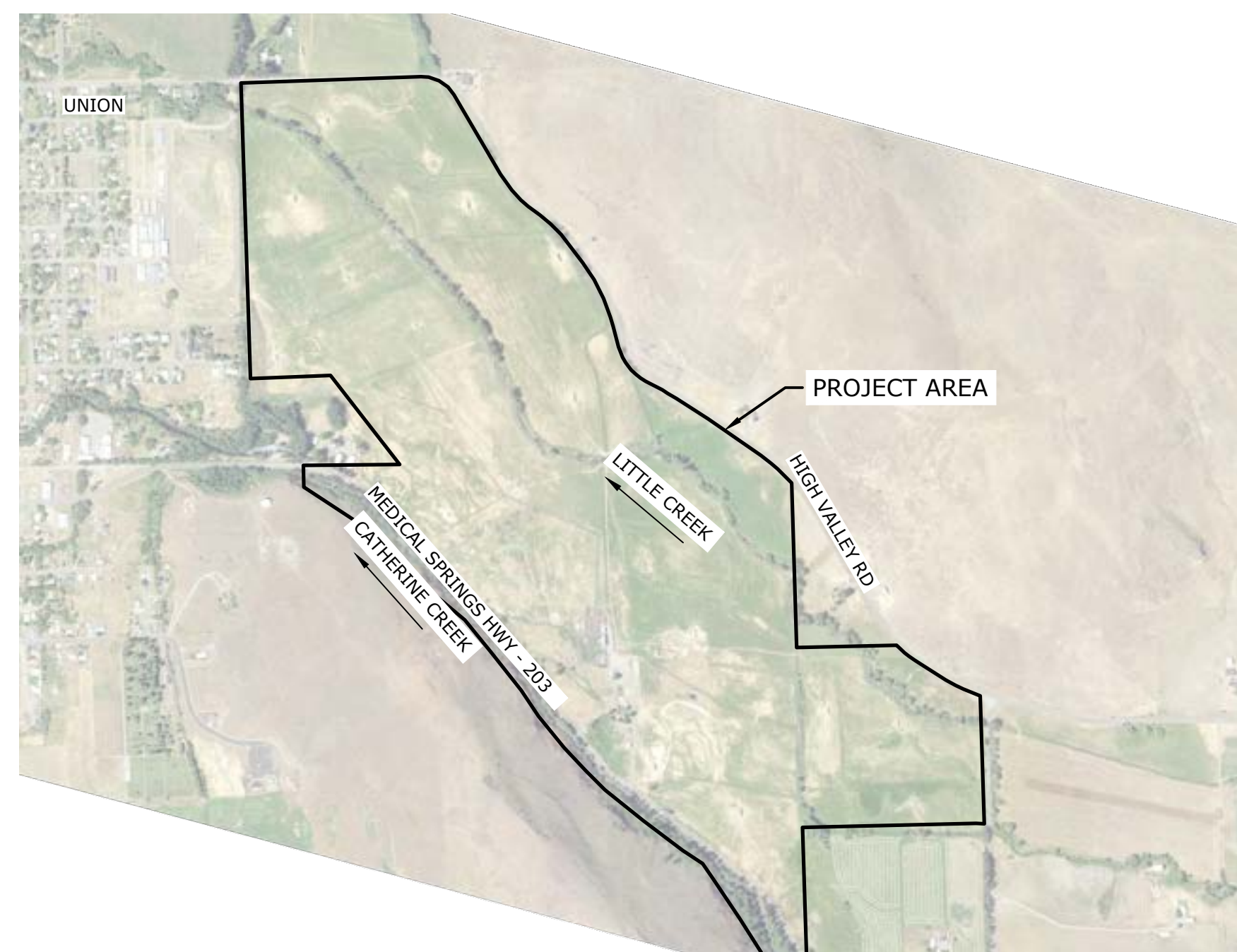
LITTLE CREEK - GRANDE RONDE RIVER SUBBASIN

DRAFT 80% DESIGN DRAWINGS

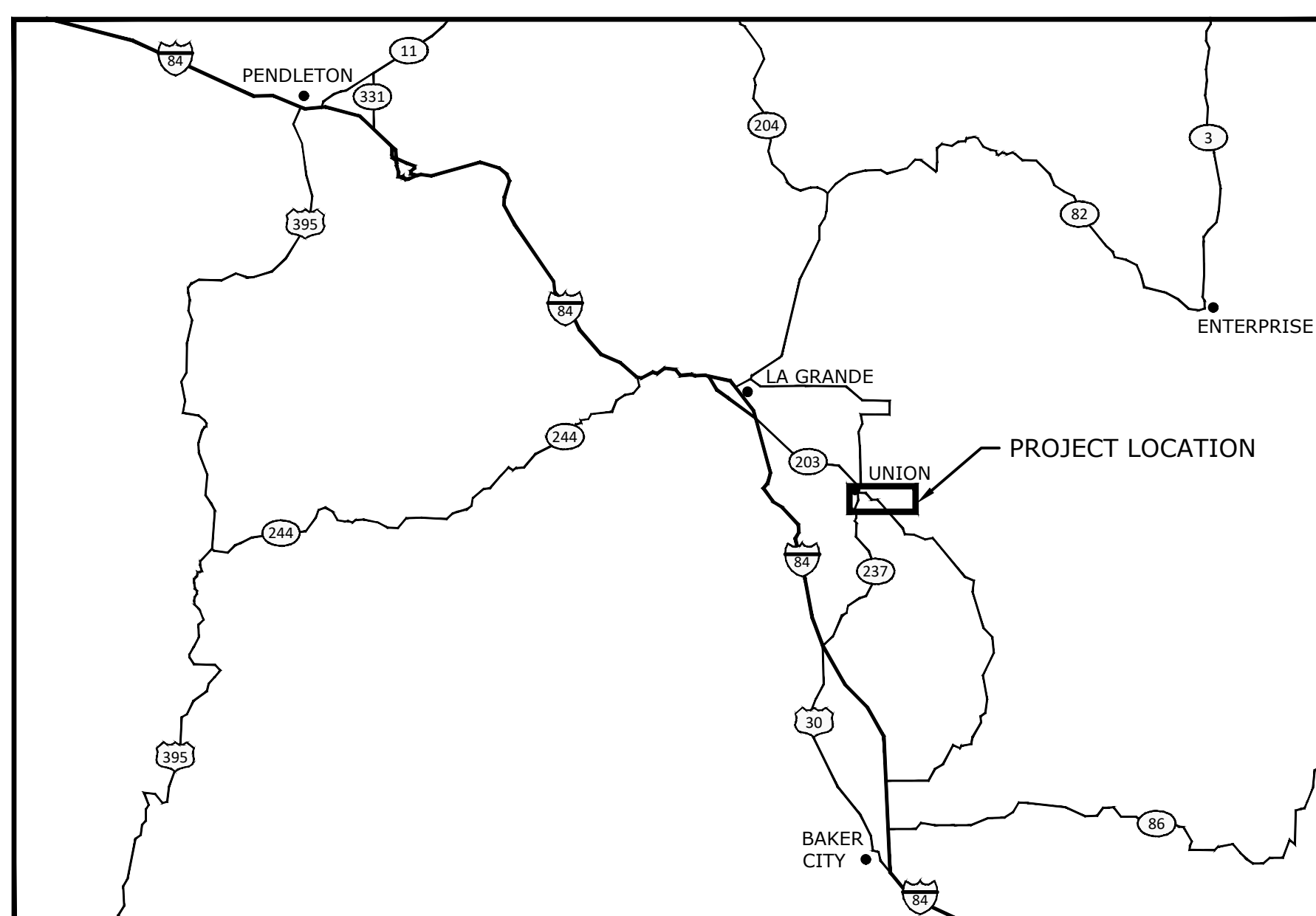
OCTOBER 2024



KEY MAP



LOCATION MAP



VICINITY MAP

PREPARED BY:
INTER-FLUVE
CONTACT: MATTHEW COX, P.E.
501 PORTWAY AVE, SUITE 101
HOOD RIVER, OR 97031
EMAIL: MCOX@INTERFLUVE.COM

ON BEHALF OF:
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION,
PACIFIC NORTHWEST REGION
CONTACT: MICHAEL KNUTSON, P.E.
1150 N. CURTIS RD.
BOISE, ID 83706
EMAIL: MKNUTSON@USBR.GOV

PARTNERS:
BONNEVILLE POWER ADMINISTRATION
UNION SOIL AND WATER CONSERVATION DISTRICT
CTUIR
TROUT UNLIMITED
LANDOWNERS

SHEET INDEX	
Sheet Number	Sheet Title
1	COVER, SHEET INDEX & VICINITY MAPS
2	GENERAL NOTES, QUANTITIES & ABBREVIATIONS
3	HIP IV NOTES
4	ESC DETAILS (1 OF 2)
5	ESC DETAILS (2 OF 2)
6	OBJECTIVES NARRATIVE
7	EXISTING CONDITIONS & SURVEY CONTROL
8	ACCESS, STAGING, ESC & SUGGESTED CONSTRUCTION SEQUENCING
9	PROPOSED CONDITIONS SHEET INDEX
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12	PROPOSED CONDITIONS PLAN (3 OF 6)
13	PROPOSED CONDITIONS PLAN (4 OF 6)
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15	PROPOSED CONDITIONS PLAN (6 OF 6)
16	PROPOSED GRADING SECTIONS (1 OF 4)
17	PROPOSED GRADING SECTIONS (2 OF 4)
18	PROPOSED GRADING SECTIONS (3 OF 4)
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28	STATE DITCH PROFILE, TYPICAL SECTION AND DETAILS
29	TYPICAL DETAILS - FLOW SPLITTING LWS, HABITAT LWS
30	TYPICAL DETAILS - CHANNEL SPANNING LWS
31	TYPICAL DETAILS - WILLOW TRENCH, FLOOD FENCE
32	TYPICAL DETAILS - SMALL WHOLE TREE PLACEMENT
33	PLANTING TABLES, SEED MIXES AND TYPICAL DETAILS

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JFL BUFFALOFLATS.DWG

Site Summary
T4S, R40E
Union County, Oregon

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BUREAU OF RECLAMATION
COLUMBIASNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT ENHANCEMENT PROGRAM - OREGON
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COVER, SHEET INDEX & VICINITY MAPS

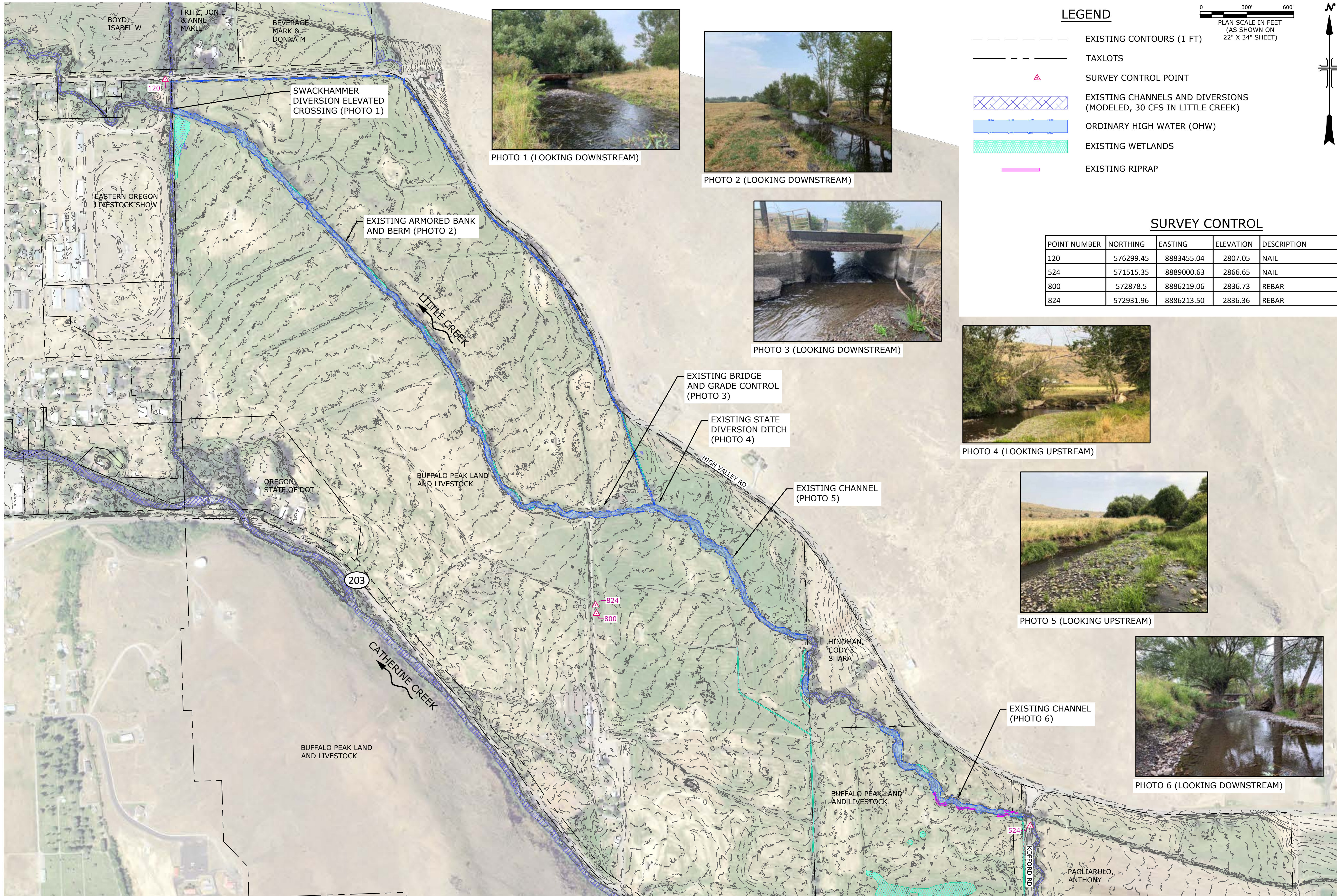


PHOTO 1 (LOOKING DOWNSTREAM)



PHOTO 2 (LOOKING DOWNSTREAM)



PHOTO 3 (LOOKING DOWNSTREAM)



PHOTO 4 (LOOKING UPSTREAM)



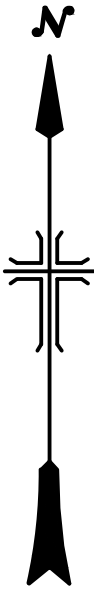
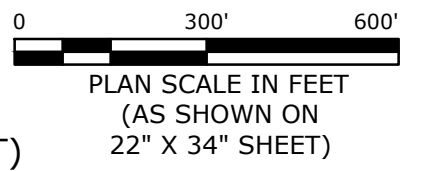
PHOTO 5 (LOOKING UPSTREAM)



PHOTO 6 (LOOKING DOWNSTREAM)

LEGEND

- EXISTING CONTOURS (1 FT)
- - - TAXLOTS
- ▲ SURVEY CONTROL POINT
- [Cross-hatched box] EXISTING CHANNELS AND DIVERSIONS (MODELED, 30 CFS IN LITTLE CREEK)
- [Blue box] ORDINARY HIGH WATER (OHW)
- [Green box] EXISTING WETLANDS
- [Pink box] EXISTING RIPRAP



SURVEY CONTROL

POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
120	576299.45	8883455.04	2807.05	NAIL
524	571515.35	8889000.63	2866.65	NAIL
800	572878.5	8886219.06	2836.73	REBAR
824	572931.96	8886213.50	2836.36	REBAR

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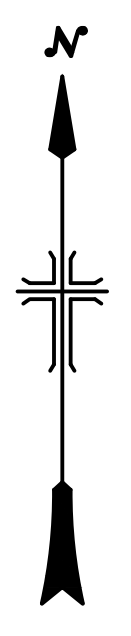
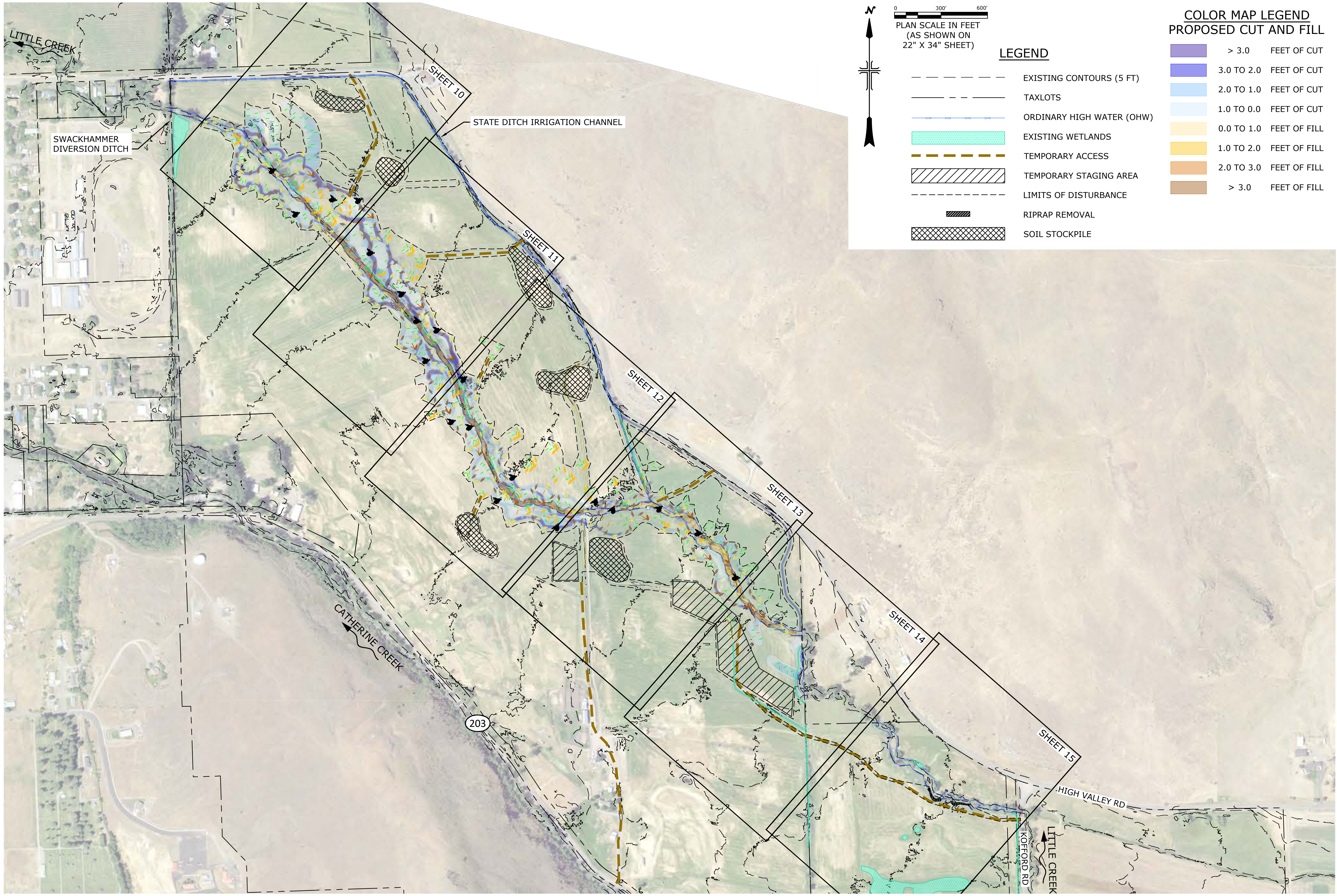
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EXISTING CONDITIONS
& SURVEY CONTROL



PLAN SCALE IN FEET
(AS SHOWN ON
22" X 34" SHEET)

LEGEND

- EXISTING CONTOURS (5 FT)
- TAXLOTS
- ORDINARY HIGH WATER (OHW)
- EXISTING WETLANDS
- TEMPORARY ACCESS
- TEMPORARY STAGING AREA
- LIMITS OF DISTURBANCE
- RIPRAP REMOVAL
- SOIL STOCKPILE

**COLOR MAP LEGEND
PROPOSED CUT AND FILL**

	> 3.0	FEET OF CUT
	3.0 TO 2.0	FEET OF CUT
	2.0 TO 1.0	FEET OF CUT
	1.0 TO 0.0	FEET OF CUT
	0.0 TO 1.0	FEET OF FILL
	1.0 TO 2.0	FEET OF FILL
	2.0 TO 3.0	FEET OF FILL
	> 3.0	FEET OF FILL

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PROPOSED CONDITIONS
SHEET INDEX

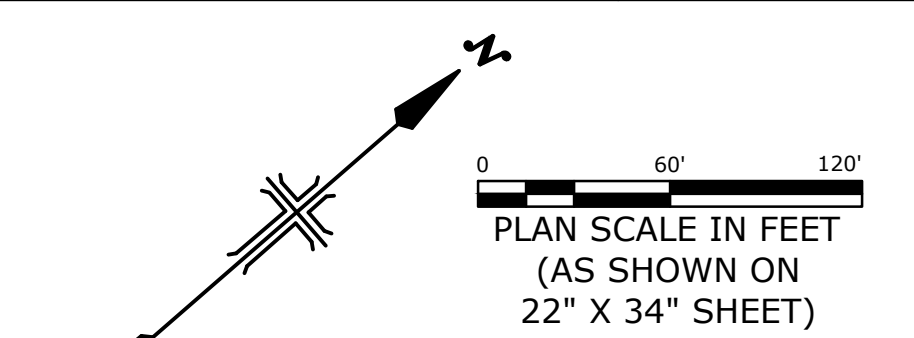
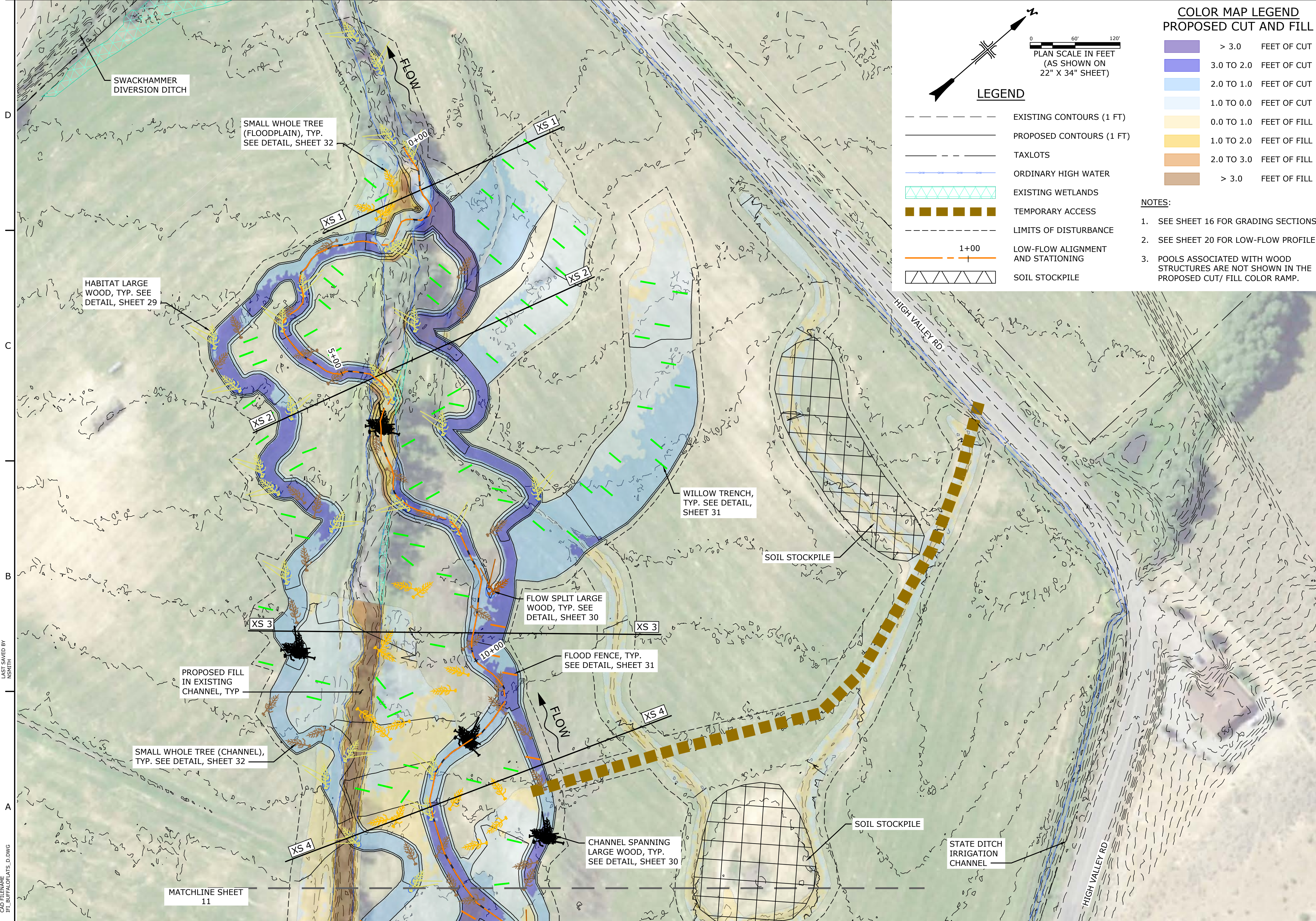
1

2

3

4

5



LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- - - TAXLOTS
- ORDINARY HIGH WATER
- ▨ EXISTING WETLANDS
- TEMPORARY ACCESS
- - - LIMITS OF DISTURBANCE
- 1+00 LOW-FLOW ALIGNMENT AND STATIONING
- ▨ SOIL STOCKPILE

COLOR MAP LEGEND PROPOSED CUT AND FILL

[Purple]	> 3.0	FEET OF CUT
[Dark Blue]	3.0 TO 2.0	FEET OF CUT
[Light Blue]	2.0 TO 1.0	FEET OF CUT
[Very Light Blue]	1.0 TO 0.0	FEET OF CUT
[Yellow]	0.0 TO 1.0	FEET OF FILL
[Orange]	1.0 TO 2.0	FEET OF FILL
[Dark Orange]	2.0 TO 3.0	FEET OF FILL
[Brown]	> 3.0	FEET OF FILL

NOTES:

1. SEE SHEET 16 FOR GRADING SECTIONS.
2. SEE SHEET 20 FOR LOW-FLOW PROFILE.
3. POOLS ASSOCIATED WITH WOOD STRUCTURES ARE NOT SHOWN IN THE PROPOSED CUT/ FILL COLOR RAMP.

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MATCHLINE SHEET
11



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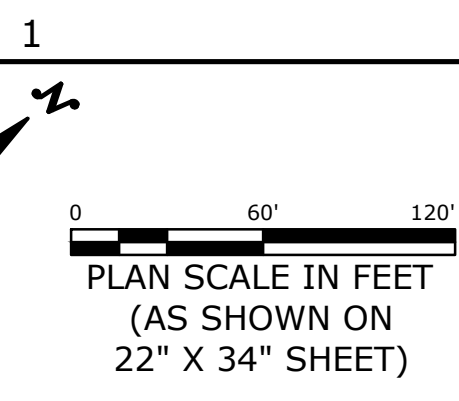
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BUFFALO FLATS HABITAT IMPROVEMENT PROJECT

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PROPOSED CONDITIONS
PLAN (1 OF 6)

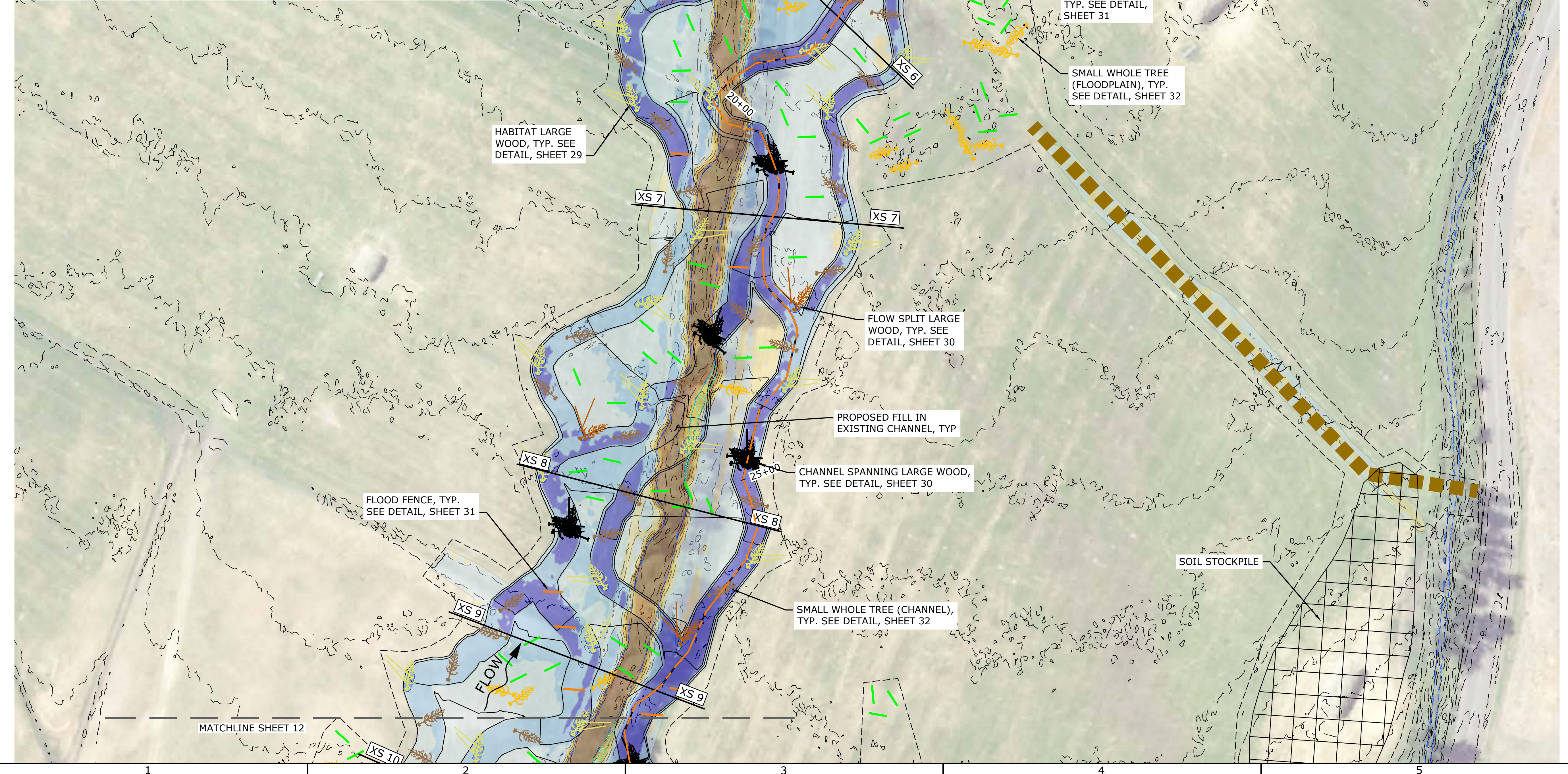


COLOR MAP LEGEND
PROPOSED CUT AND FILL

[Dark Purple]	> 3.0	FEET OF CUT
[Medium Purple]	3.0 TO 2.0	FEET OF CUT
[Light Blue]	2.0 TO 1.0	FEET OF CUT
[Very Light Blue]	1.0 TO 0.0	FEET OF CUT
[Light Yellow]	0.0 TO 1.0	FEET OF FILL
[Yellow]	1.0 TO 2.0	FEET OF FILL
[Orange]	2.0 TO 3.0	FEET OF FILL
[Brown]	> 3.0	FEET OF FILL

- LEGEND**
- EXISTING CONTOURS (1 FT)
 - PROPOSED CONTOURS (1 FT)
 - - - TAXLOTS
 - ORDINARY HIGH WATER
 - [Green X's] EXISTING WETLANDS
 - [Brown Dashed] TEMPORARY ACCESS
 - - - LIMITS OF DISTURBANCE
 - [Orange Line] 1+00 LOW-FLOW ALIGNMENT AND STATIONING
 - [Triangle Pattern] SOIL STOCKPILE

- NOTES:**
- SEE SHEET 16 & 17 FOR GRADING SECTIONS.
 - SEE SHEET 20 FOR LOW-FLOW PROFILE.
 - POOLS ASSOCIATED WITH WOOD STRUCTURES ARE NOT SHOWN IN THE PROPOSED CUT/ FILL COLOR RAMP.



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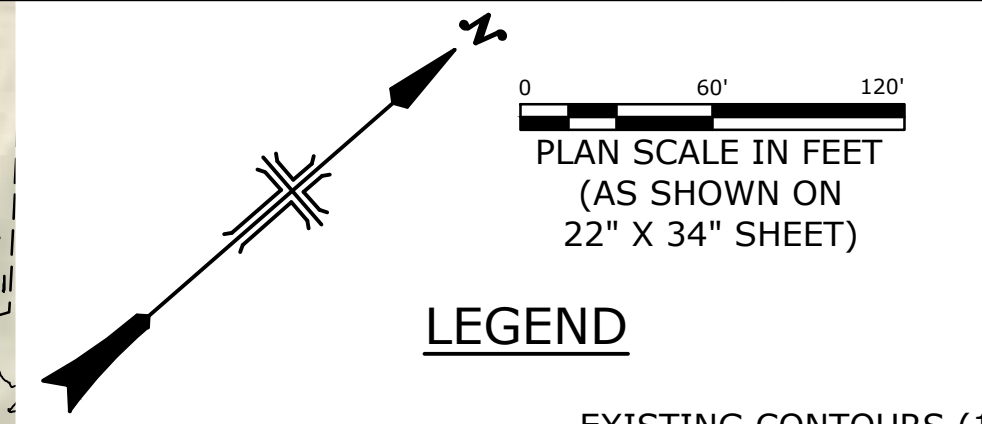
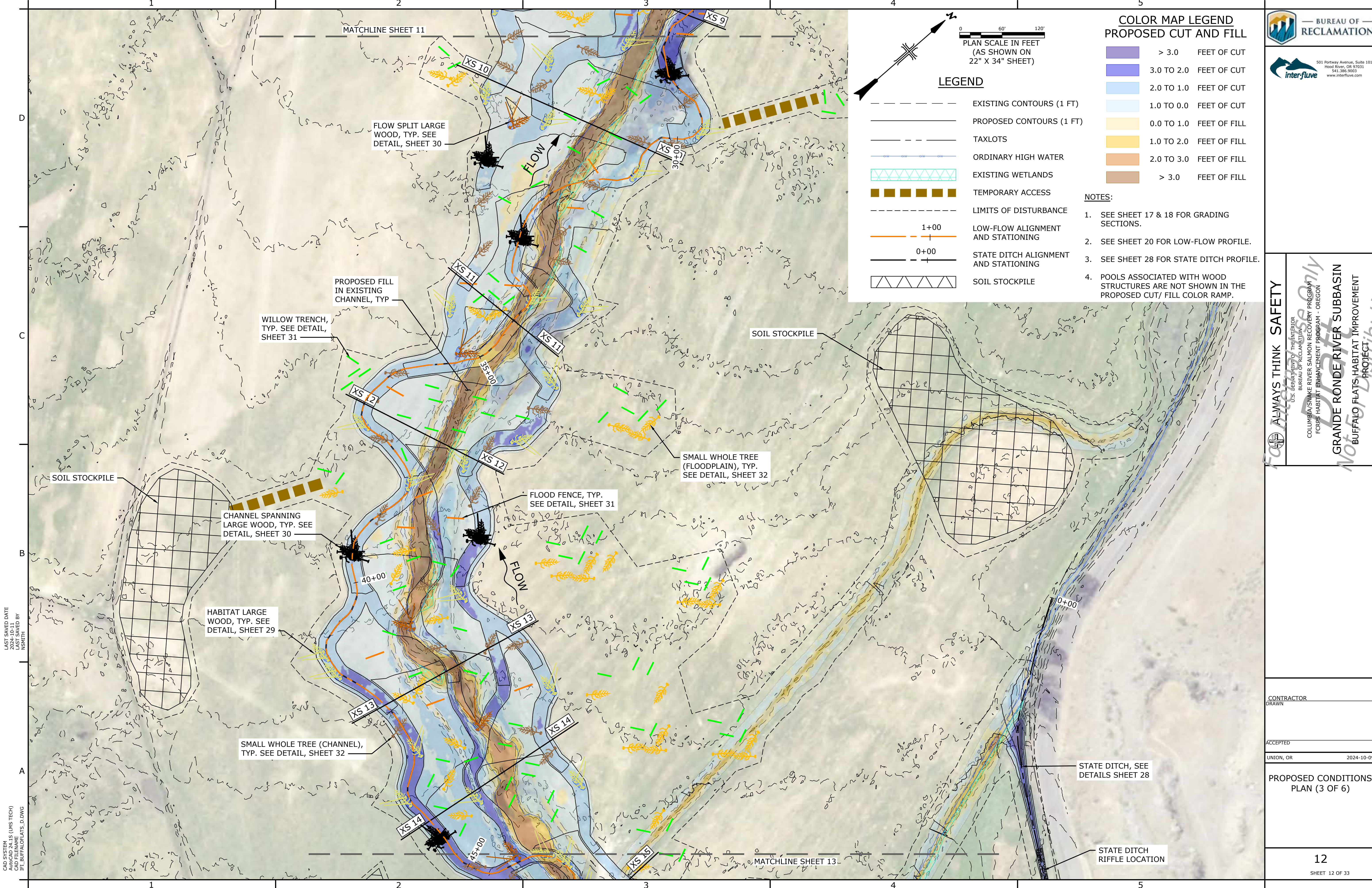
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PROPOSED CONDITIONS
PLAN (2 OF 6)



PLAN SCALE IN FEET
(AS SHOWN ON
22" X 34" SHEET)

LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- ORDINARY HIGH WATER
- EXISTING WETLANDS
- TEMPORARY ACCESS
- LIMITS OF DISTURBANCE
- 1+00
LOW-FLOW ALIGNMENT AND STATIONING
- 0+00
STATE DITCH ALIGNMENT AND STATIONING
- SOIL STOCKPILE

COLOR MAP LEGEND
PROPOSED CUT AND FILL

	> 3.0	FEET OF CUT
	3.0 TO 2.0	FEET OF CUT
	2.0 TO 1.0	FEET OF CUT
	1.0 TO 0.0	FEET OF CUT
	0.0 TO 1.0	FEET OF FILL
	1.0 TO 2.0	FEET OF FILL
	2.0 TO 3.0	FEET OF FILL
	> 3.0	FEET OF FILL

NOTES:

1. SEE SHEET 17 & 18 FOR GRADING SECTIONS.
2. SEE SHEET 20 FOR LOW-FLOW PROFILE.
3. SEE SHEET 28 FOR STATE DITCH PROFILE.
4. POOLS ASSOCIATED WITH WOOD STRUCTURES ARE NOT SHOWN IN THE PROPOSED CUT/ FILL COLOR RAMP.

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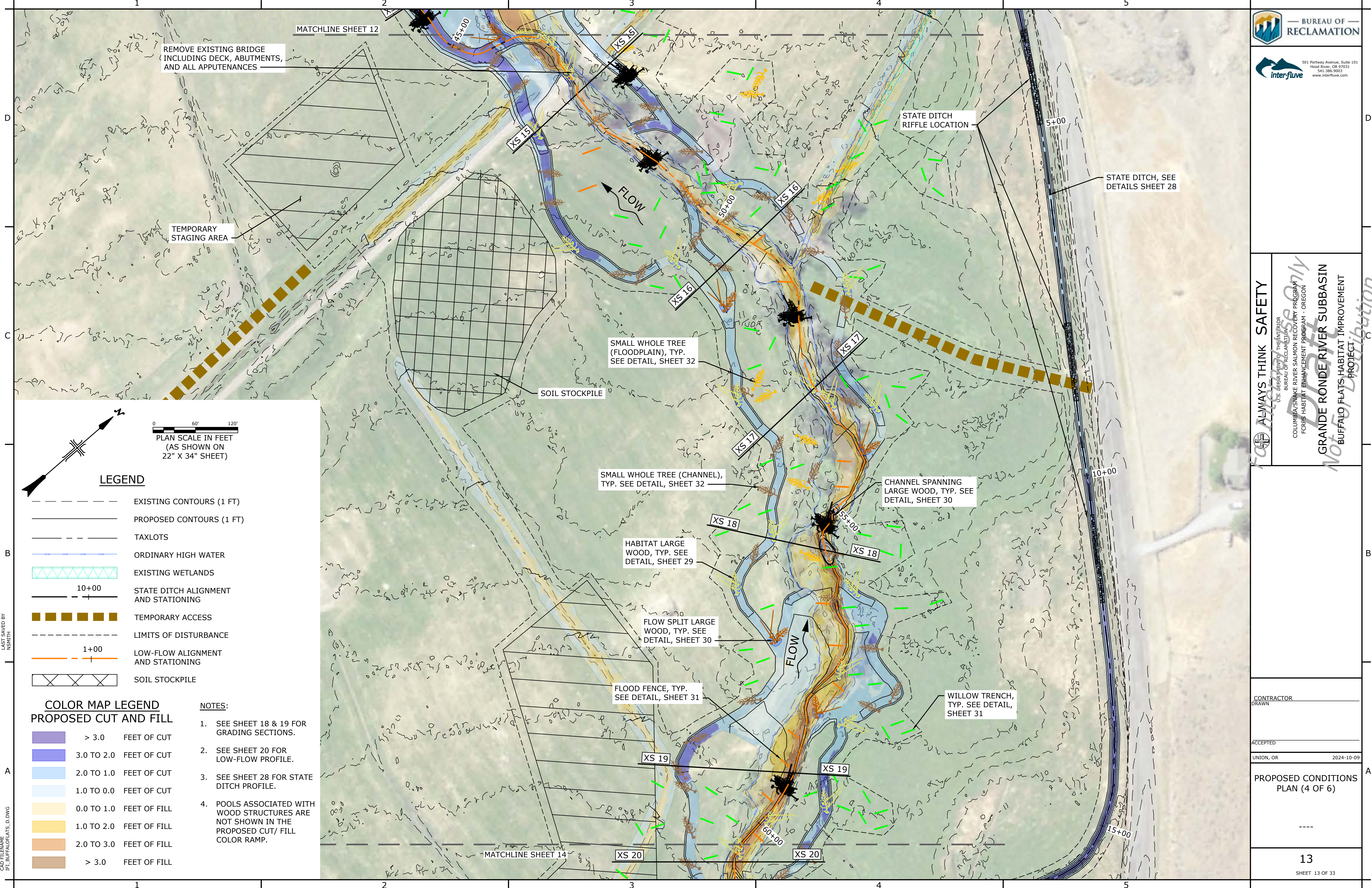
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PROPOSED CONDITIONS
PLAN (3 OF 6)



REMOVE EXISTING BRIDGE (INCLUDING DECK, ABUTMENTS, AND ALL APPURTENANCES)

TEMPORARY STAGING AREA

STATE DITCH RIFFLE LOCATION

STATE DITCH, SEE DETAILS SHEET 28

SMALL WHOLE TREE (FLOODPLAIN), TYP. SEE DETAIL, SHEET 32

SOIL STOCKPILE

SMALL WHOLE TREE (CHANNEL), TYP. SEE DETAIL, SHEET 32

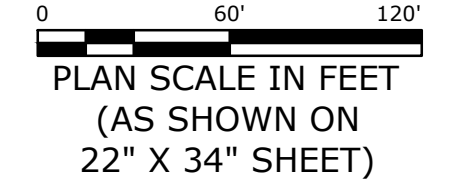
CHANNEL SPANNING LARGE WOOD, TYP. SEE DETAIL, SHEET 30

HABITAT LARGE WOOD, TYP. SEE DETAIL, SHEET 29

FLOW SPLIT LARGE WOOD, TYP. SEE DETAIL, SHEET 30

FLOOD FENCE, TYP. SEE DETAIL, SHEET 31

WILLOW TRENCH, TYP. SEE DETAIL, SHEET 31



PLAN SCALE IN FEET (AS SHOWN ON 22" X 34" SHEET)

LEGEND

- EXISTING CONTOURS (1 FT)
PROPOSED CONTOURS (1 FT)
TAXLOTS
ORDINARY HIGH WATER
EXISTING WETLANDS
STATE DITCH ALIGNMENT AND STATIONING
TEMPORARY ACCESS
LIMITS OF DISTURBANCE
LOW-FLOW ALIGNMENT AND STATIONING
SOIL STOCKPILE

COLOR MAP LEGEND PROPOSED CUT AND FILL

- > 3.0 FEET OF CUT
3.0 TO 2.0 FEET OF CUT
2.0 TO 1.0 FEET OF CUT
1.0 TO 0.0 FEET OF CUT
0.0 TO 1.0 FEET OF FILL
1.0 TO 2.0 FEET OF FILL
2.0 TO 3.0 FEET OF FILL
> 3.0 FEET OF FILL

NOTES:

- 1. SEE SHEET 18 & 19 FOR GRADING SECTIONS.
2. SEE SHEET 20 FOR LOW-FLOW PROFILE.
3. SEE SHEET 28 FOR STATE DITCH PROFILE.
4. POOLS ASSOCIATED WITH WOOD STRUCTURES ARE NOT SHOWN IN THE PROPOSED CUT/ FILL COLOR RAMP.

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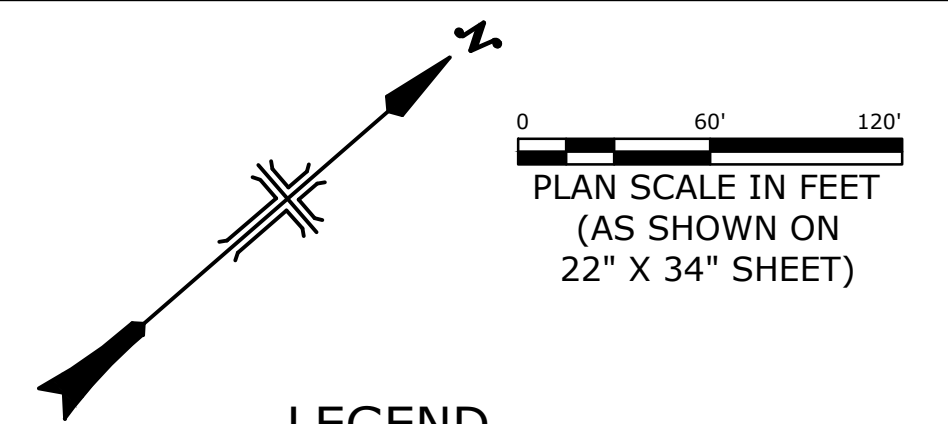
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PROPOSED CONDITIONS PLAN (4 OF 6)



LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- ORDINARY HIGH WATER
- EXISTING WETLANDS
- TEMPORARY ACCESS
- STATE DITCH ALIGNMENT AND STATIONING
- LIMITS OF DISTURBANCE
- LOW-FLOW ALIGNMENT AND STATIONING

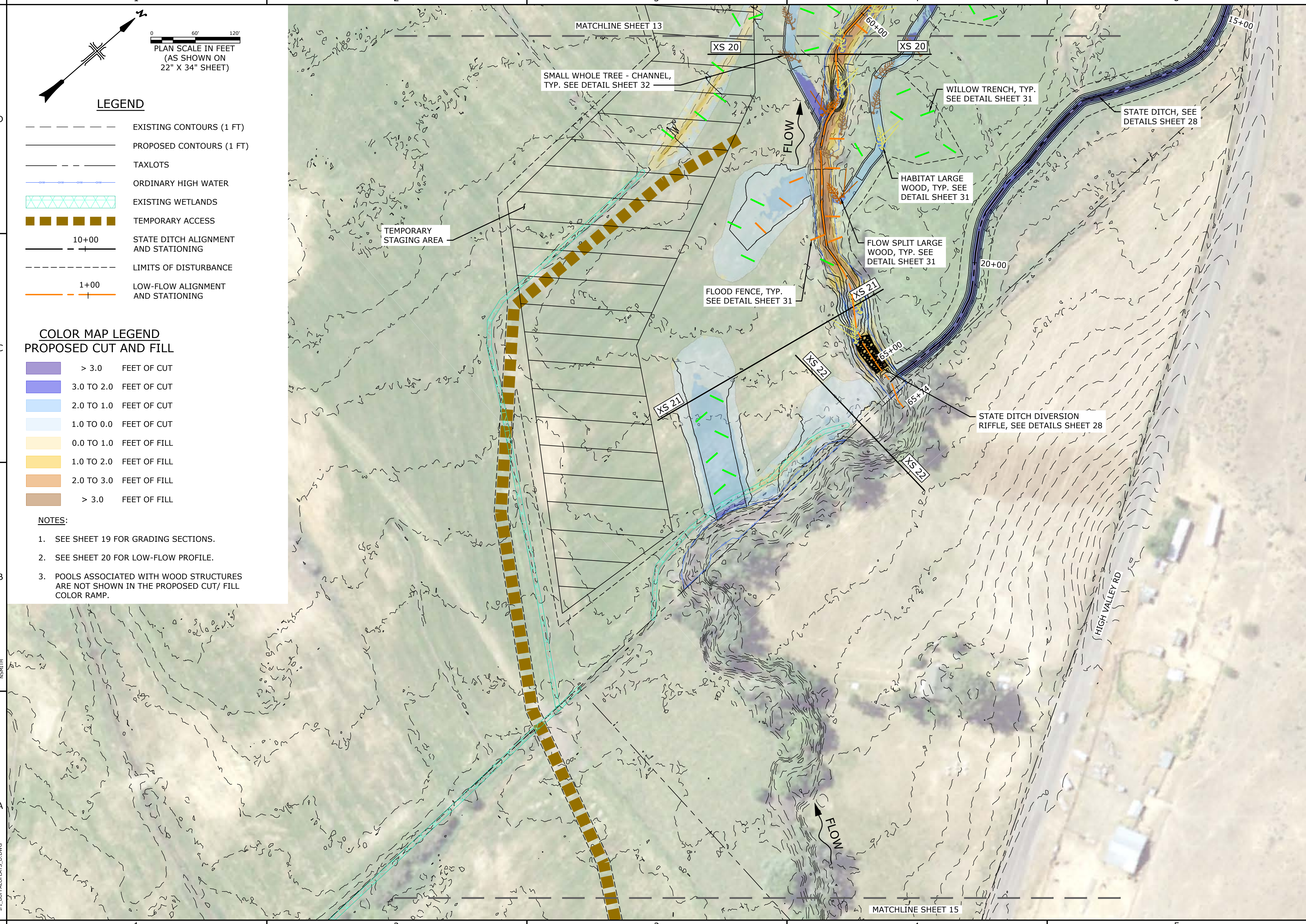
COLOR MAP LEGEND

- PROPOSED CUT AND FILL
- > 3.0 FEET OF CUT
 - 3.0 TO 2.0 FEET OF CUT
 - 2.0 TO 1.0 FEET OF CUT
 - 1.0 TO 0.0 FEET OF CUT
 - 0.0 TO 1.0 FEET OF FILL
 - 1.0 TO 2.0 FEET OF FILL
 - 2.0 TO 3.0 FEET OF FILL
 - > 3.0 FEET OF FILL

- NOTES:
- SEE SHEET 19 FOR GRADING SECTIONS.
 - SEE SHEET 20 FOR LOW-FLOW PROFILE.
 - POOLS ASSOCIATED WITH WOOD STRUCTURES ARE NOT SHOWN IN THE PROPOSED CUT/ FILL COLOR RAMP.

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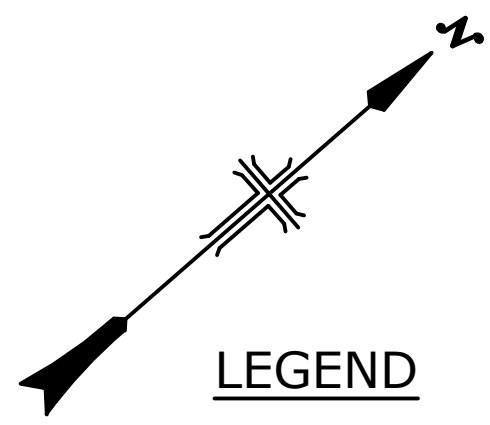
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PROPOSED CONDITIONS PLAN (5 OF 6)











14

SHEET 14 OF 33



0 60' 120'
PLAN SCALE IN FEET
(AS SHOWN ON
22" X 34" SHEET)

LEGEND

-  EXISTING CONTOURS (1 FT)
-  PROPOSED CONTOURS (1 FT)
-  TAXLOTS
-  ORDINARY HIGH WATER
-  EXISTING WETLANDS
-  TEMPORARY ACCESS
-  STATE DITCH ALIGNMENT AND STATIONING
10+00
-  LIMITS OF DISTURBANCE
-  EXISTING RIPRAP TO REMAIN
-  EXISTING RIPRAP TO BE REMOVED

MATCHLINE SHEET 14

HIGH VALLEY RD

KOFFORD RD

REMOVE RIPRAP FROM CHANNEL BANK

FLOW

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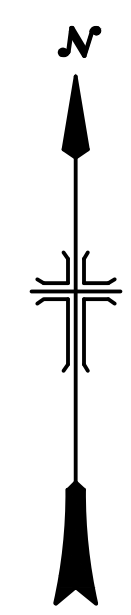
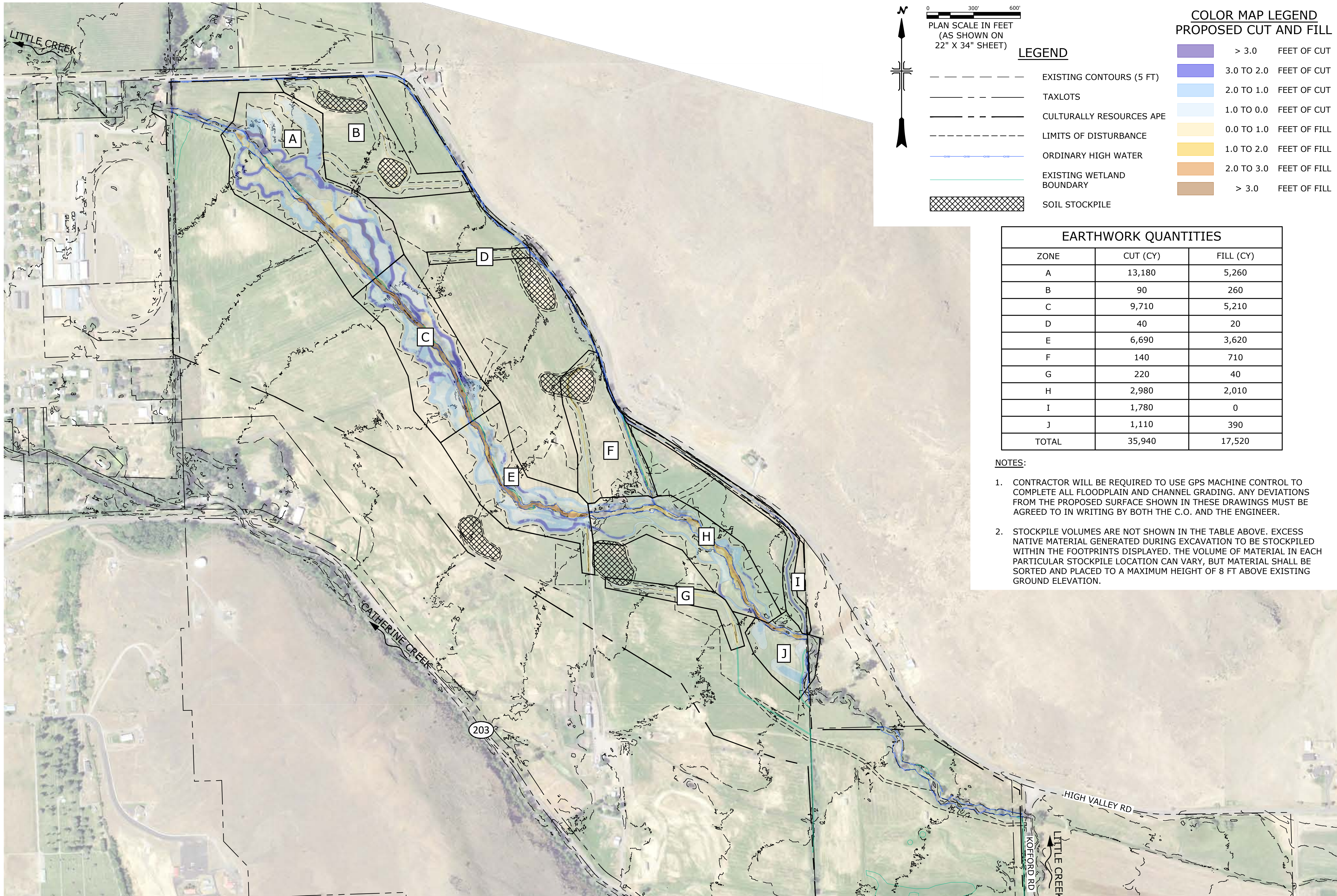
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PROPOSED CONDITIONS
PLAN (6 OF 6)



0 300' 600'
 PLAN SCALE IN FEET
 (AS SHOWN ON
 22" X 34" SHEET)

LEGEND

- EXISTING CONTOURS (5 FT)
- TAXLOTS
- CULTURALLY RESOURCES APE
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER
- EXISTING WETLAND BOUNDARY
- SOIL STOCKPILE

**COLOR MAP LEGEND
 PROPOSED CUT AND FILL**

- > 3.0 FEET OF CUT
- 3.0 TO 2.0 FEET OF CUT
- 2.0 TO 1.0 FEET OF CUT
- 1.0 TO 0.0 FEET OF CUT
- 0.0 TO 1.0 FEET OF FILL
- 1.0 TO 2.0 FEET OF FILL
- 2.0 TO 3.0 FEET OF FILL
- > 3.0 FEET OF FILL

EARTHWORK QUANTITIES

ZONE	CUT (CY)	FILL (CY)
A	13,180	5,260
B	90	260
C	9,710	5,210
D	40	20
E	6,690	3,620
F	140	710
G	220	40
H	2,980	2,010
I	1,780	0
J	1,110	390
TOTAL	35,940	17,520

NOTES:

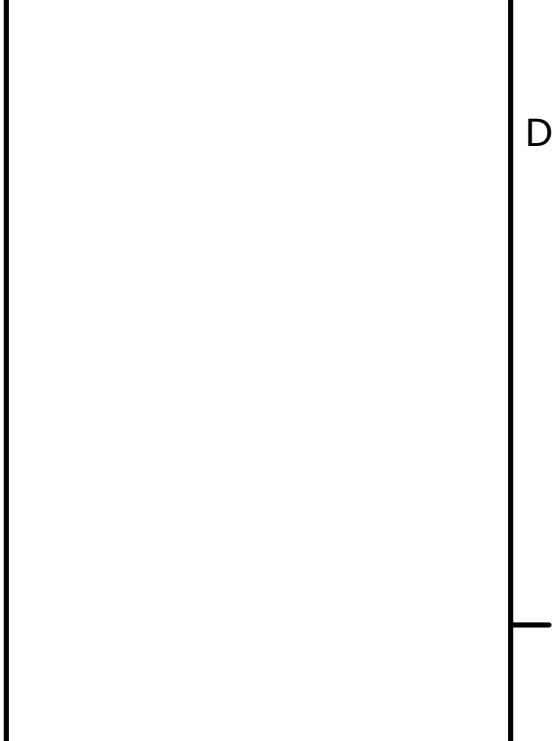
- CONTRACTOR WILL BE REQUIRED TO USE GPS MACHINE CONTROL TO COMPLETE ALL FLOODPLAIN AND CHANNEL GRADING. ANY DEVIATIONS FROM THE PROPOSED SURFACE SHOWN IN THESE DRAWINGS MUST BE AGREED TO IN WRITING BY BOTH THE C.O. AND THE ENGINEER.
- STOCKPILE VOLUMES ARE NOT SHOWN IN THE TABLE ABOVE. EXCESS NATIVE MATERIAL GENERATED DURING EXCAVATION TO BE STOCKPILED WITHIN THE FOOTPRINTS DISPLAYED. THE VOLUME OF MATERIAL IN EACH PARTICULAR STOCKPILE LOCATION CAN VARY, BUT MATERIAL SHALL BE SORTED AND PLACED TO A MAXIMUM HEIGHT OF 8 FT ABOVE EXISTING GROUND ELEVATION.

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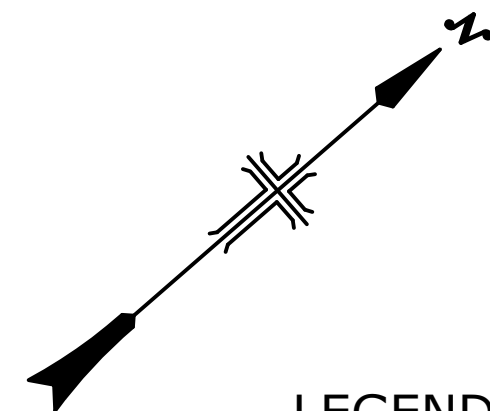
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GRANDE RONDE RIVER SUBBASIN
 BUFFALO FLATS HABITAT IMPROVEMENT PROJECT
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UNION, OR 2024-10-09

PROPOSED GRADING
 CUT & FILL MAP



PLAN SCALE IN FEET
(AS SHOWN ON
22" X 34" SHEET)

LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- LIMITS OF DISTURBANCE
- █ RIPARIAN REVEGETATION ZONE
- █ TRANSITIONAL REVEGETATION ZONE
- █ UPLAND REVEGETATION ZONE

NOTES:
1. SEE SHEET 33 FOR PLANTING DETAILS, TABLES AND SEED MIXES.

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Hood River, OR 97031
541.386.9003
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CAD SYSTEM
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MATCHLINE SHEET 23

SOIL STOCKPILE,
NO PLANTING

STATE DITCH
IRRIGATION
CHANNEL

HIGH VALLEY RD

HIGH VALLEY RD

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REVEGETATION
PLAN (1 OF 6)

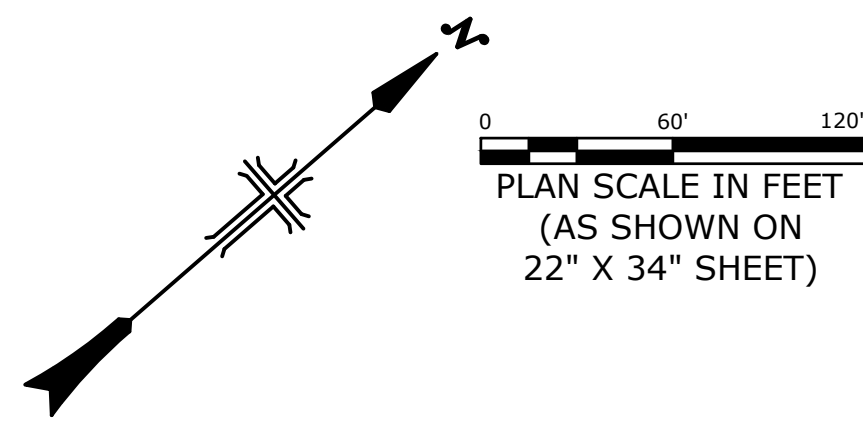
1

2

3

4

5



LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- TAXLOTS
- LIMITS OF DISTURBANCE
- RIPARIAN REVEGETATION ZONE
- TRANSITIONAL REVEGETATION ZONE
- UPLAND REVEGETATION ZONE

NOTES:

1. SEE SHEET 33 FOR PLANTING DETAILS, TABLES AND SEED MIXES.



MATCHLINE SHEET 24

MATCHLINE SHEET 22

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1

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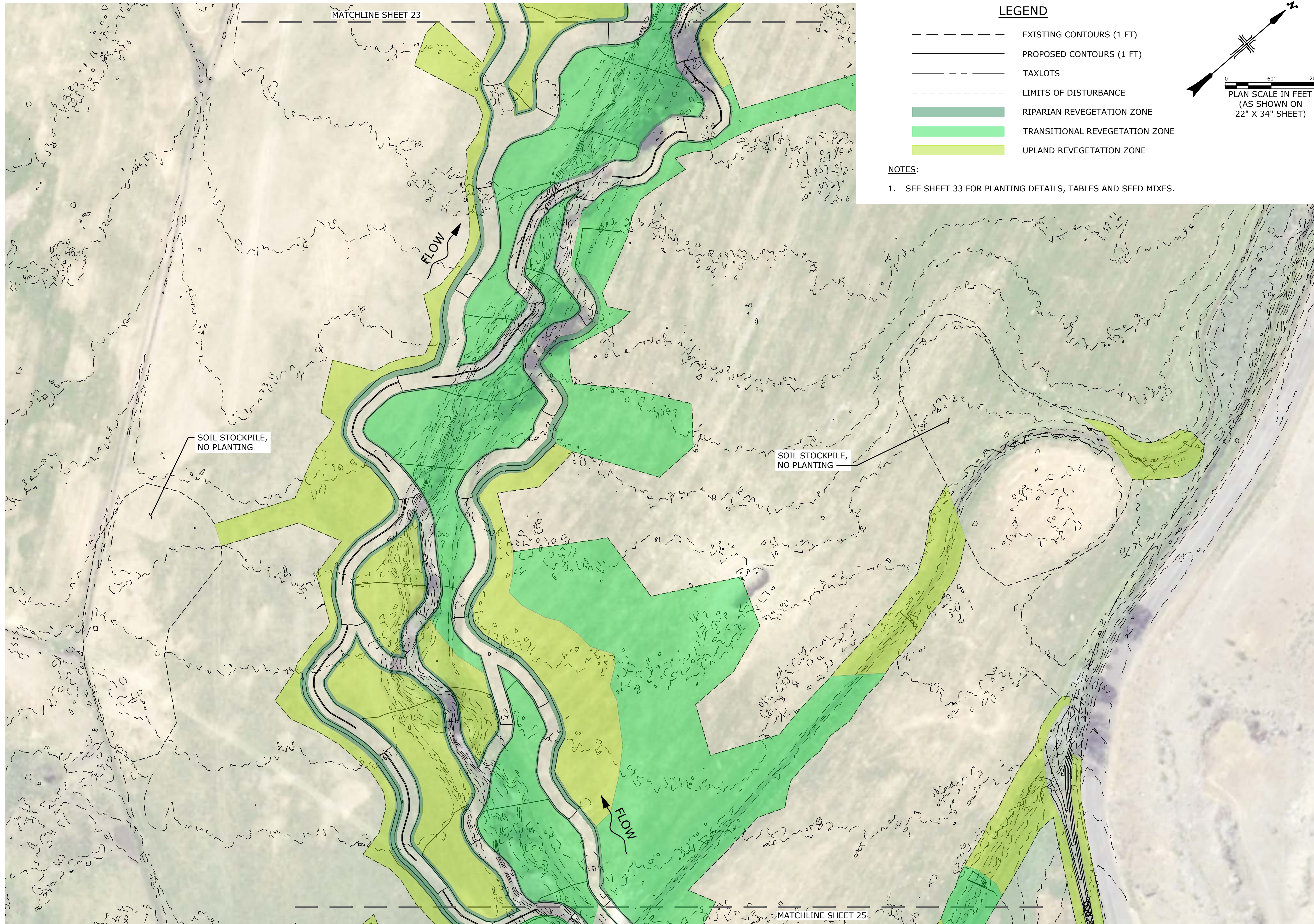
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REVEGETATION
PLAN (2 OF 6)

23

SHEET 23 OF 33

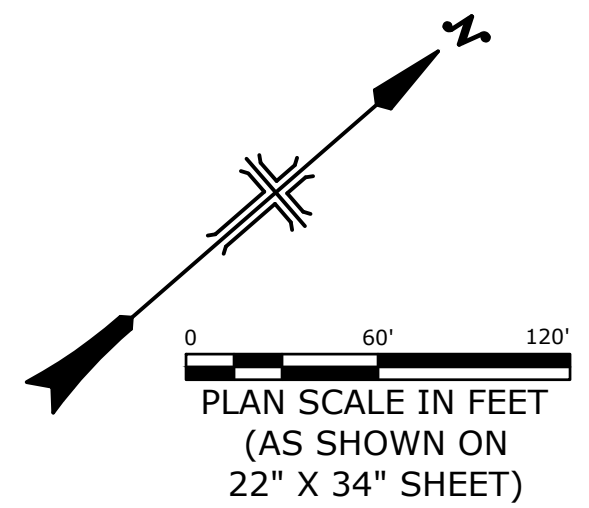


MATCHLINE SHEET 23

MATCHLINE SHEET 25

LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- - - TAXLOTS
- - - LIMITS OF DISTURBANCE
- █ RIPARIAN REVEGETATION ZONE
- █ TRANSITIONAL REVEGETATION ZONE
- █ UPLAND REVEGETATION ZONE



NOTES:

1. SEE SHEET 33 FOR PLANTING DETAILS, TABLES AND SEED MIXES.

SOIL STOCKPILE,
NO PLANTING

SOIL STOCKPILE,
NO PLANTING

FLOW

FLOW

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REVEGETATION
PLAN (3 OF 6)

MATCHLINE SHEET 24

TEMPORARY STAGING AREA

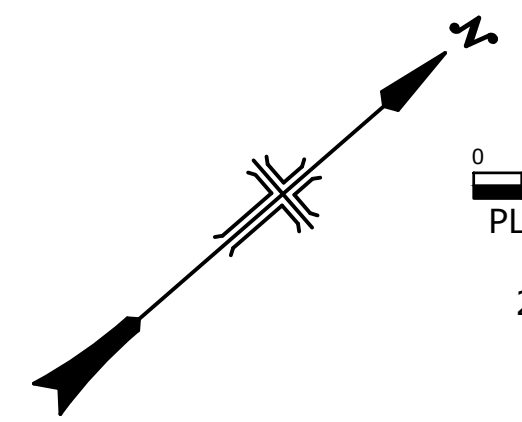
FLOW

STATE DITCH

SOIL STOCKPILE, NO PLANTING

MATCHLINE SHEET 26

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0 60 120
PLAN SCALE IN FEET
(AS SHOWN ON
22" X 34" SHEET)

LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- - - TAXLOTS
- - - LIMITS OF DISTURBANCE
- █ RIPARIAN REVEGETATION ZONE
- █ TRANSITIONAL REVEGETATION ZONE
- █ UPLAND REVEGETATION ZONE

NOTES:

1. SEE SHEET 33 FOR PLANTING DETAILS, TABLES AND SEED MIXES.

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A



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REVEGETATION
PLAN (4 OF 6)

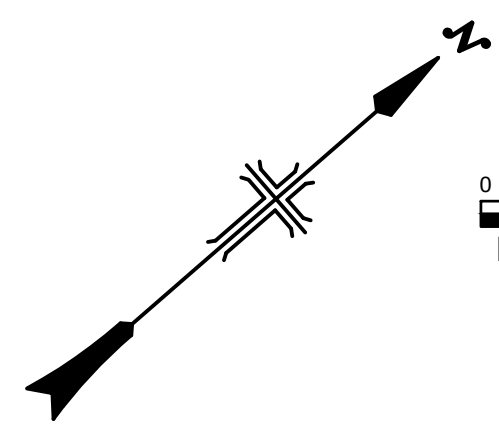
1

2

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4

5



PLAN SCALE IN FEET
(AS SHOWN ON
22" X 34" SHEET)

LEGEND

- EXISTING CONTOURS (1 FT)
- PROPOSED CONTOURS (1 FT)
- - - TAXLOTS
- - - LIMITS OF DISTURBANCE
- █ RIPARIAN REVEGETATION ZONE
- █ TRANSITIONAL REVEGETATION ZONE
- █ UPLAND REVEGETATION ZONE

NOTES:

1. SEE SHEET 33 FOR PLANTING DETAILS, TABLES AND SEED MIXES.

MATCHLINE SHEET 26

FLOW

HIGH VALLEY RD

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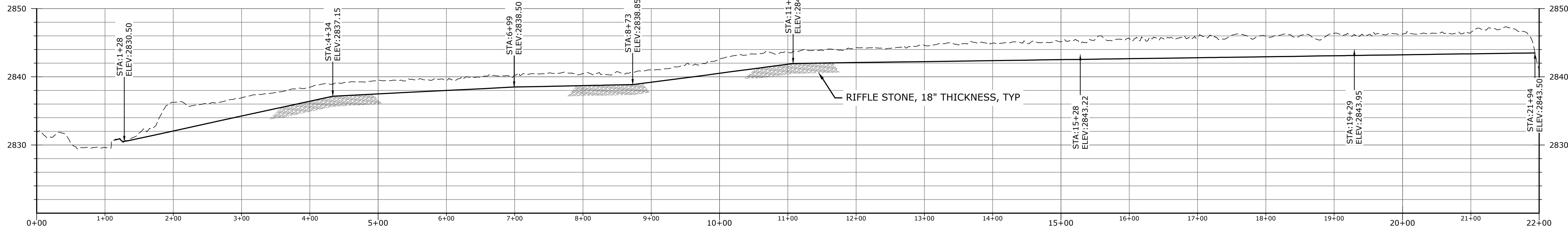
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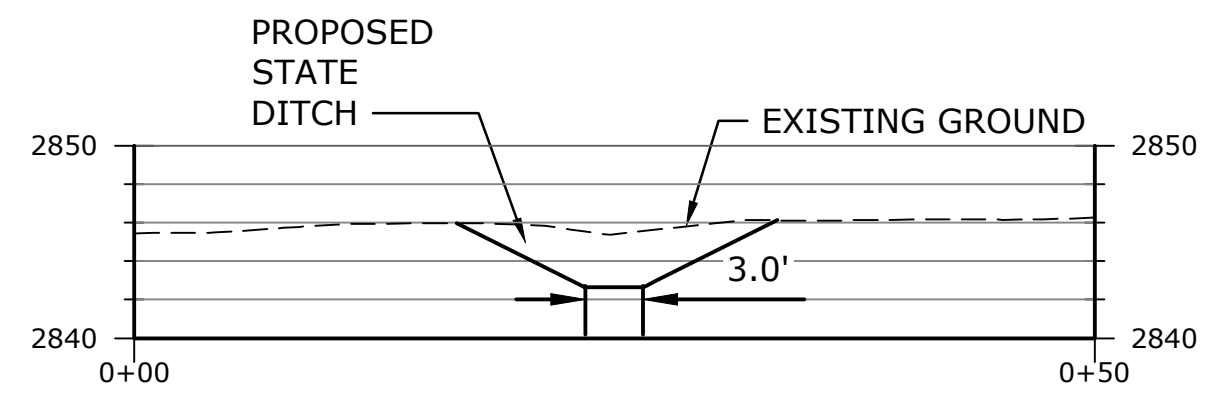
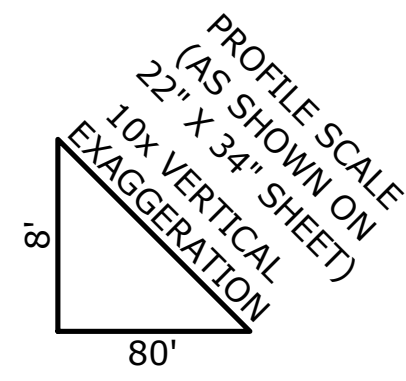
REVEGETATION
PLAN (6 OF 6)

27

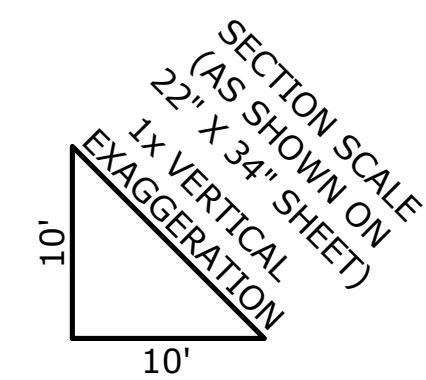
SHEET 27 OF 33



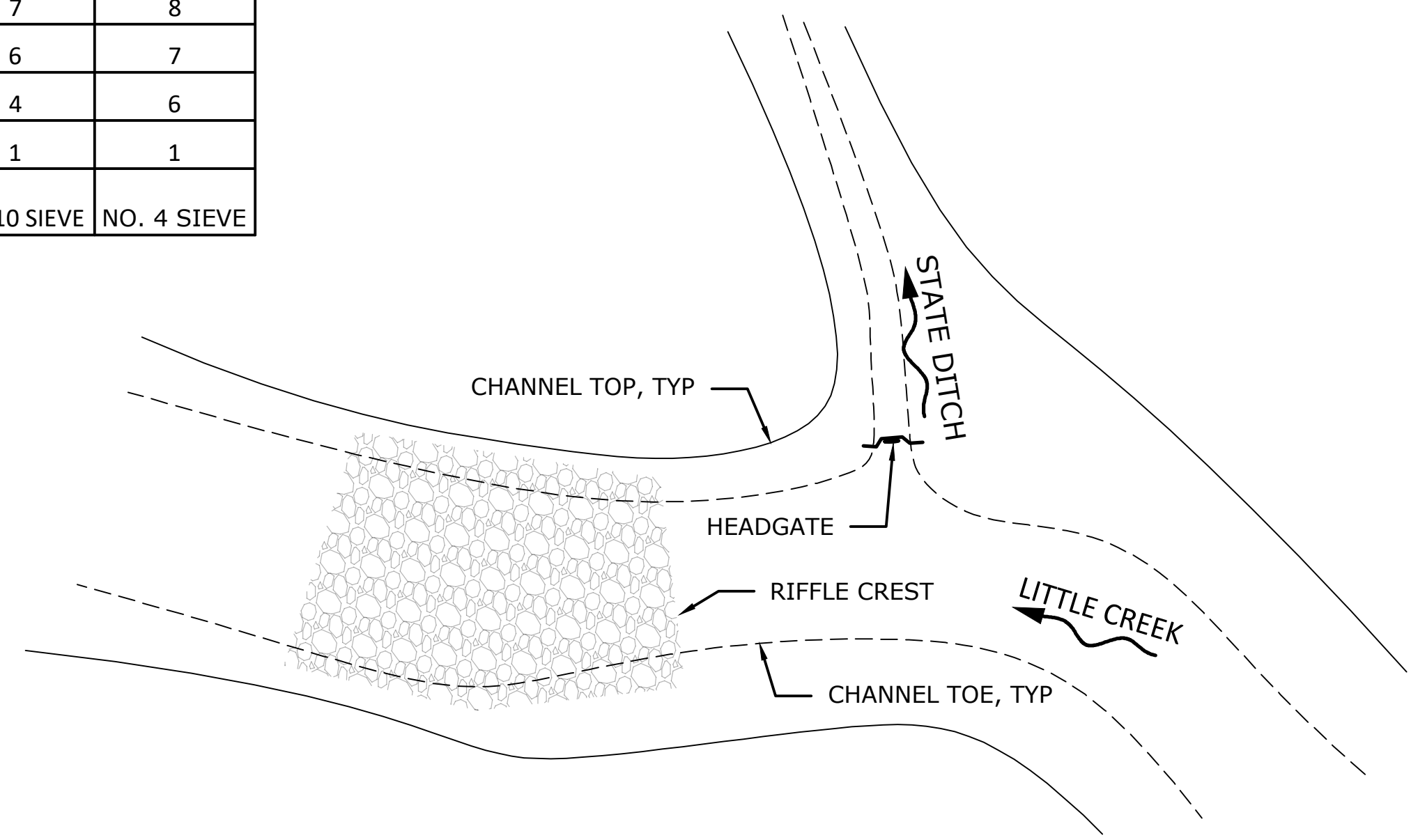
PROFILE - STATE DITCH



TYPICAL SECTION - PROPOSED STATE DITCH



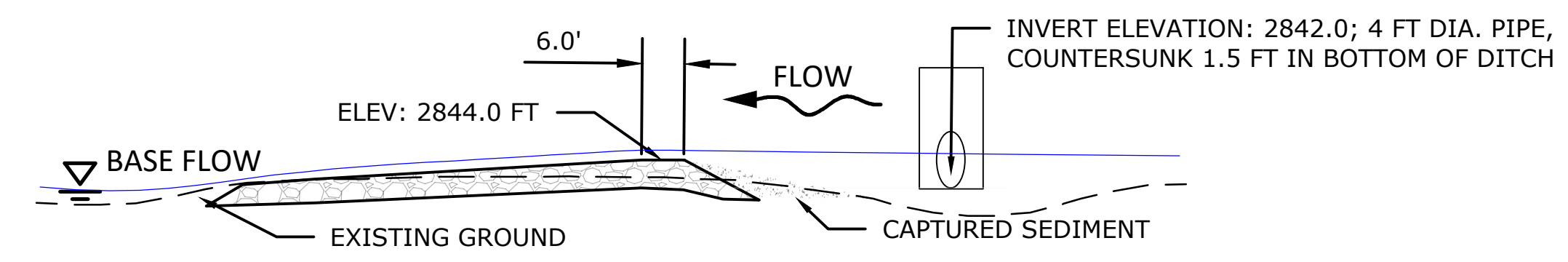
STONE GRADATION		
% PASSING	DIA. MIN.	DIA. MAX.
100	7	8
84	6	7
50	4	6
16	1	1
5	NO. 10 SIEVE	NO. 4 SIEVE



PLAN
1" = 20'

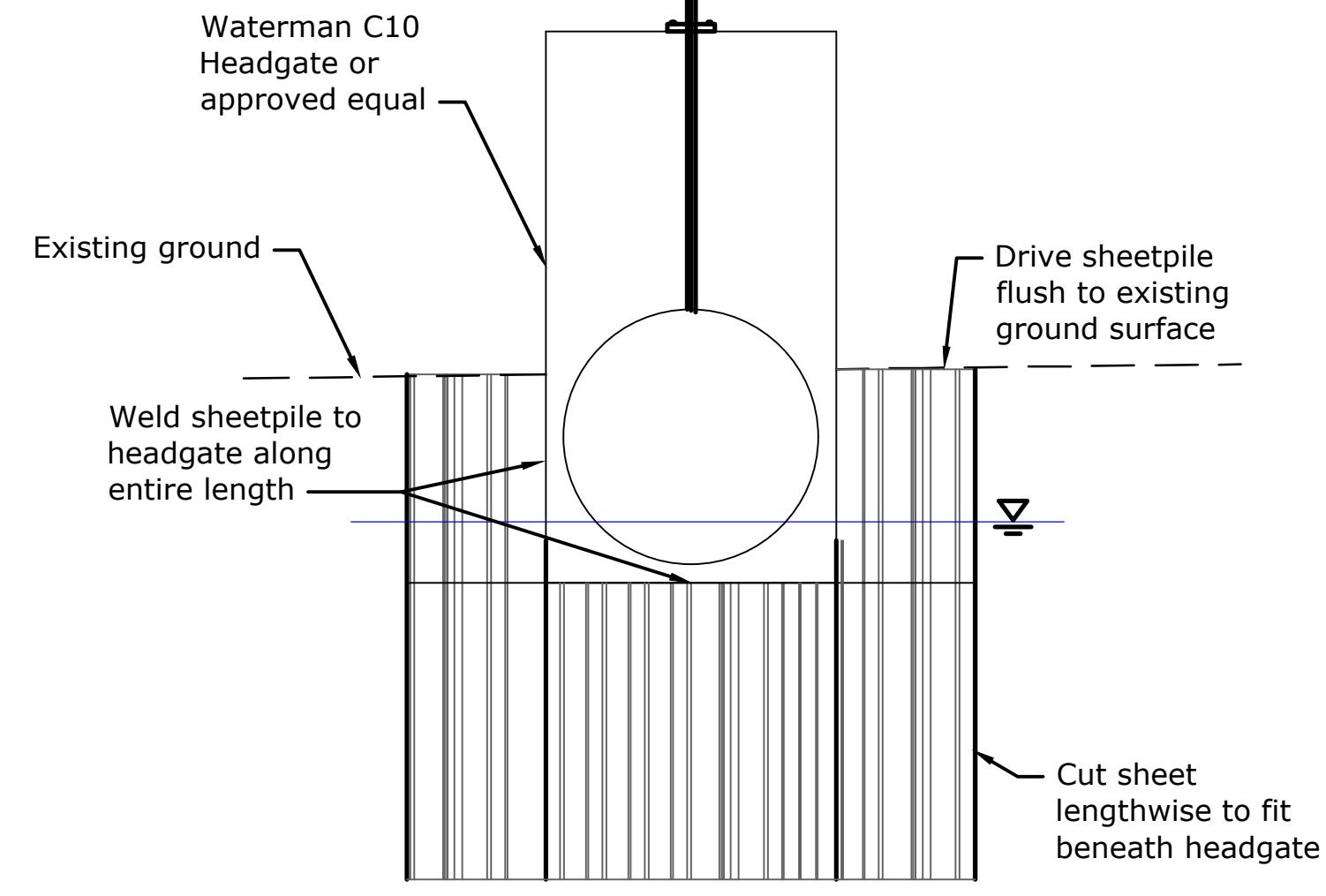
NOTE:

- 1. FISH SCREEN ON IRRIGATION DITCH TO BE DESIGNED BY OTHERS.



PROFILE
HORIZONTAL: 1" = 20'
VERTICAL: 1" = 10'

TYPICAL DETAIL - CONSTRUCTED RIFFLE
1" = 20'



SECTION VIEW



TYPICAL PHOTO

TYPICAL DETAIL - HEADGATE
NOT TO SCALE

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CONTRACTOR DRAWN
 ACCEPTED
 UNION, OR 2021-06-17

STATE DITCH PROFILE, TYPICAL SECTION AND DETAILS