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Hydraulics

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Water Resources

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MAR 12 2010

DEPT. OF WATER RESOURCES
SOUTHERN REGION

March 9, 2010

Jeannie Robertson
IDWR-Southern Region
1341 Fillmore Street, Suite 200
Twin Falls, ID 83301-3380

Re: Sun Valley Ranch LLC and Spring Creek Idaho Ranch LLC AMENDED
Permit and Transfer Applications and Associated Supporting Analysis.

Dear Jeanie:

This letter and the enclosed water right permit and transfer applications are meant to supersede those currently on file with IDWR. Changes to permit 37-22459 and associated transfer applications filed by Sun Valley Ranch LLC and Spring Creek Idaho Ranch LLC have been made at the request and direction of IDWR as a result of multiple meetings (1/14, 1/21, 2/10/10) with yourself, Jeff Cooper, Allen Merritt, Jeff Peppersack, Pam Skaggs and Nick Van Dyke.

Multiple requests to change portions of previously submitted applications have been made by IDWR causing a delay in processing of applications submitted by our office on behalf of our clients. Our office has made multiple revisions to the attached applications to comply with IDWR's requests and both the applications and their supporting documents exceed the requirements set forth by Idaho State Statute 42-222 by providing adequate information for IDWR to prepare public advertisement of the attached Spring Creek Idaho Ranch LLC and previously submitted Sun Valley Ranch LLC water right transfer applications.

Attached is an amended permit application 37-22459 and associated map which is meant to supersede the permit application filed by our office on January 19th 2010. This permit application identifies points of diversion, re-diversion, and injection for the multiple open water storage facilities, as well as other minor changes to the application as requested in a 2/10/10 meeting by IDWR.

Also attached are 5 amended water right transfers in the name of Spring Creek Idaho Ranch LLC (transfers 75838, 75840, 75854, 75855 and 75856) and 5 amended water right transfers in the name of Sun Valley Ranch LLC (transfers 75849, 75850, 75851, 75852 and 75853). A simplified consumptive

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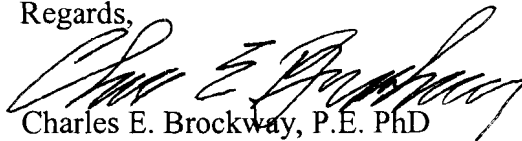
FAX: 736•8506

use analysis was performed (descriptive memo attached) which shows no additional acres are proposed to be dried up in addition to the acres of grass pasture proposing to be converted to open water.

A first fill analysis for the proposed storage listed in permit 37-22459 is included and identifies the volume of water required for the first fill of portions of the storage outlined in permit 37-22459 and the number of acres needed to be idled during the first year of operation in order to fill the volume of the proposed features.

Please copy our office on all correspondence dealing with water right permit application 37-22459 and all 11 associated water right transfer applications. Don't hesitate to give our office a call should you have additional questions or comments. Thanks for your time and have a great day.

Regards,



Charles E. Brockway, P.E. PhD

Enclosures: (1) Amended Application for Permit 37-22459 and Diversion Map
(10) Amended Water Right Transfer Applications, Split Calculations and Associated Maps
(1) Consumptive Use Analysis Memo
(1) First Fill Analysis Memo
(2) Limited Power of Attorney Documents

Cc: George Kirk
Jim Laski



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DEPT. OF WATER RESOURCES
SOUTHERN REGION

Sun Valley Ranch LLC- Permit 37-22459 Consumptive Use Analysis Summary

To: Mr. Allen Merritt, IDWR Southern Region Office
From: Charles E. Brockway, Charles G. Brockway, Zach Latham
Cc: Mr. Jeff Cooper, Mrs. Jeanie Robertson, IDWR Southern Region
Date: March 10th 2010
Re: Sun Valley Ranch LLC Permit 37-22459 Consumptive Use Analysis

This is a review of Brockway Engineering's consumptive use analysis of the storage proposed and listed on water right permit 37-22459 in the name of Sun Valley Ranch LLC as requested in a February 10th 2010 meeting by Allen Merritt of IDWR. Previously, Brockway Engineering submitted a consumptive use analysis (2 tables) during a meeting with IDWR (Jeanie Robertson, Allen Merritt, and Jeff Cooper) on January 14th 2010. The attached tables are intended to supersede the previously submitted tables.

Water right permit 37-22459 seeks to divert a total of 76.36 cfs from the Big Wood River, Willow Creek, Crystal Creek, Black Slough, Spring Creek and ground water under existing water rights to fill 815.5 acre feet of wildlife, recreation and aesthetic storage on the Sun Valley Ranch LLC and Spring Creek Idaho Ranch LLC properties. After project implementation, open water areas consisting of in-line oxbows, constructed wetlands, irrigation management wetland cells and excavated areas total approximately 192 acres. The in-line oxbow features are dug into the ground and receive water from irrigation ditches; fill up and then spill into the next oxbow feature in zones 1 and 2 (see Figure 1). Oxbow features in zone 3 are also dug into the ground and have a diversion from the enhanced stream channel into the oxbow, and a diversion out of the oxbow back to the enhanced stream. Constructed wetlands features are also dug into the ground in zone 3 and have a diversion from and injection back into the enhanced stream. Irrigation management wetland cells receive water from irrigation ditches and fill up above the ground surface due to the presence of a dyke with an outlet control structure. These irrigation management wetland cells are designed to improve irrigation efficiency on the property. Excavated areas adjacent to irrigation management wetland cells will be dug into the ground and may be filled by existing natural ground water and or irrigation recharge. Excavated area features are included in the consumptive use and first fill analyses.

Individual feature area estimations were made by Dave Rosgen of Wildland Hydrology (Fort Collins CO), designer of the oxbow and constructed wetlands portion of the stream restoration and enhancement project, and by project engineers at Ducks Unlimited of Spokane WA who designed the excavated areas and irrigation management wetland cells.

Table 1 (attached) lists the individual storage features and corresponding estimated surface areas on both the Sun Valley Ranch LLC and Spring Creek Idaho Ranch LLC properties considered in this consumptive use analysis. Refer to the companion memorandum from Brockway Engineering regarding first fill requirement for a description of categories 1, 2, and 3. The irrigation management wetland cells authorized to store the 24 hour fill volume under existing irrigation water rights were not included in proposed open water consumptive use calculation because the consumptive use associated with those features is exempt under IDWR's 24 hour fill rule. In other words, an irrigator using an irrigation water right on his property isn't required by IDWR to mitigate for the newly created water surface evaporation from a storage feature created to improve irrigation efficiency under IDWR's 24 hour fill rule. However, these same irrigation management wetland cell storage features were included in the

total amount of irrigated grass pasture converted to open water after project implementation to currently document the changes in consumptive use resulting from the proposed project.

Table 2 lists all of the proposed irrigation management wetland cells, their total proposed storage volumes, the water rights able to be utilized for storage under the IDWR 24 hour fill rule, the source of the water rights utilized for storage, the associated diversion rates for the water rights utilized for storage, the associated 24 hour diversion volume for the water rights utilized for storage, and the difference between the water rights 24 hour diversion volume able to be stored under the 24 hour fill rule and the total storage of the irrigation management wetland cells. Irrigation management wetlands cells 1-14 authorized under the IDWR 24 hour fill rule are shown with a black and white "x" marker in Figure 2. Portions of the volumes of cells 15-20 are not able to be filled under IDWR's 24 hour fill rule. Therefore, the evaporation associated with the surface areas of irrigation management wetland cells 15-20 are not exempt under IDWR's 24 hour fill rule and evaporation from these cells was included in the consumptive use analysis.

Inherently, assumptions were made to simplify the consumptive use analysis summarized in Table 3. Existing open water in the form of open water ponds (approximately 9 acres) and streams were not considered in this analysis because most of the existing open water will remain after the proposed features are constructed, and although a longer length of stream is proposed to be built, it will be narrower than the existing stream which results in a very similar surface area before and after project implementation. As noted above, the irrigation management wetland cells authorized to store the 24 hour fill volume under existing irrigation water rights were not included in proposed open water consumptive use calculation because the consumptive use associated with those features is exempt under IDWR's 24 hour fill rule.

A consumptive use balance was performed to determine the amount of cropland that must be removed from production to mitigate for the new open water evaporation. Consumptive use data for open water- shallow systems and grass pasture- low management at the nearby Picabo National Weather Service cooperative station as cited in Allen and Robison, 2009¹ was used in this analysis. The precipitation deficit (P_{def}) value is the best estimate of the net depletion of the water source which is used for either irrigation or evaporation. Jeff Peppersack at IDWR (2/10/10 meeting) has indicated that in determining consumptive use for ponds, only the months where the P_{def} values are positive should be used in the calculation, under the assumption that wintertime precipitation may not be stored and therefore would not be available to offset summertime evaporation. This is true if the pond is always full and able to spill any excess precipitation, and therefore we have applied this assumption to storage features in zone 3 as they are anticipated to be full year round and flow data recorded in existing streams in zone 3 supports this assumption. However, in zones 1 and 2, the proposed storage features are not anticipated to be full year round. In this situation, winter time precipitation is stored and available to be evaporated during the non-winter time months, and therefore, less Big Wood River water would be used towards meeting the evaporation of the storage features. To account for this fact, the annual P_{def} for open water-shallow systems was used in this analysis.

To determine the acreage of crop to be removed for mitigation of pond evaporation, the annual P_{def} value for grass pasture- low management was used and is representative of the actual depletion of the irrigation water applied to the existing crop because a portion of the winter time precipitation is stored in the root zone and is available for uptake by the crop².

To summarize, the P_{def} consumptive use value used in this analysis for storage features in zone 3 for open water-shallow systems was calculated using only positive values, (calculation attached) and is shown in line 1 of Table 3. The annual P_{def} consumptive use value for open water shallow systems was used in this analysis for storage features in zones 1 and 2 and is shown in line 2 of Table 3. The annual precipitation deficit (P_{def}) consumptive use value for

¹ Allen, Richard G. and Clarence W. Robison, 2009. Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho: Supplement updating the Time Series through December 2008, Research Technical Completion Report, Kimberly Research and Extension Center, University of Idaho, Moscow, ID.

² C. Robison, personal communication

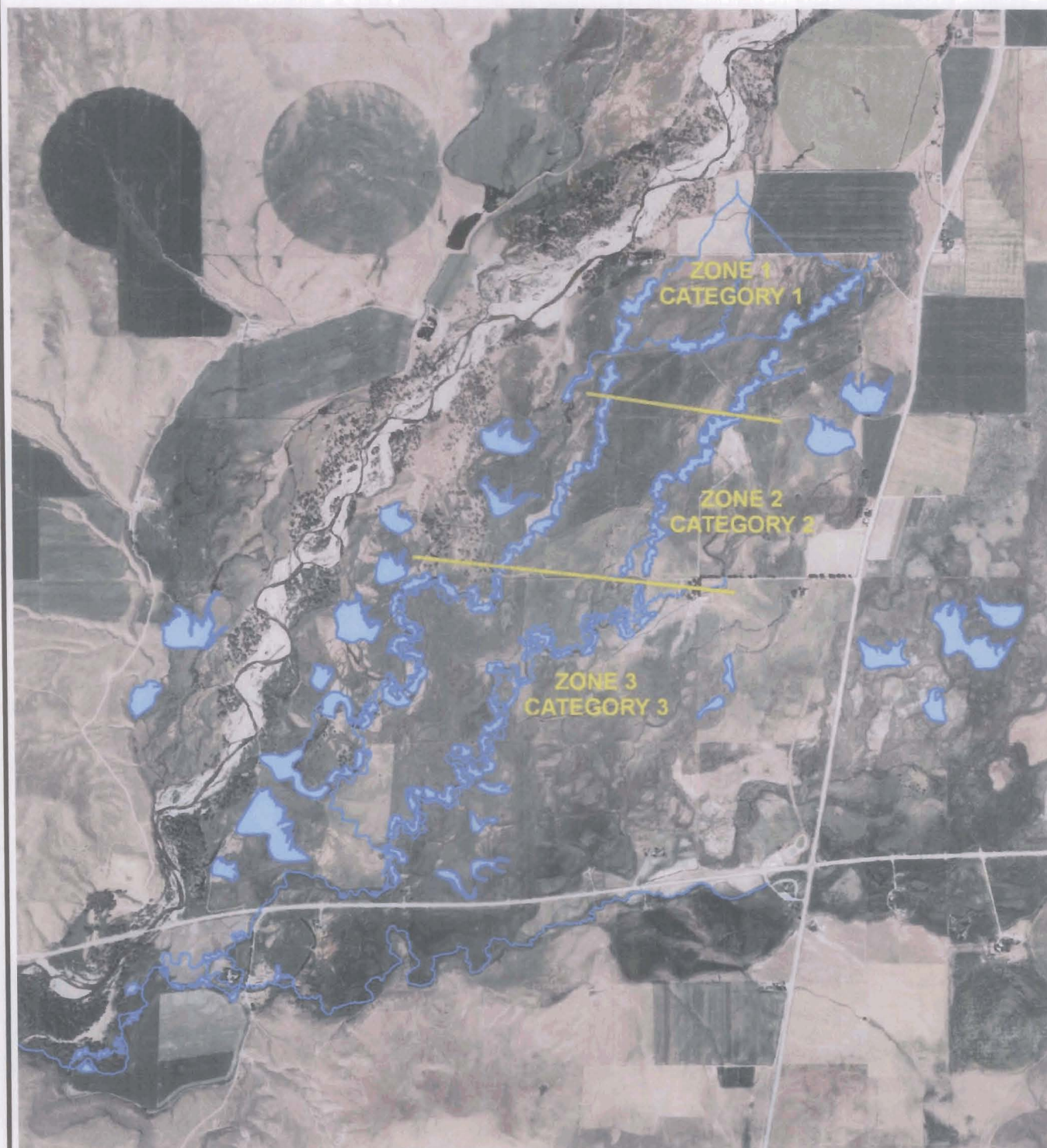
grass pasture- low management was used in this analysis for storage features in all zones within a water right place of use and is shown in line 3 of Table 3.

The total proposed surface water acreage is shown in line 4 which includes 24-hour ponds but does not include existing open water that will remain after project implementation. Of the amount on line 4, the number of newly proposed open water acres situated within an authorized water right place of use is listed in line 5. The line 5 value represents the number of existing irrigated acres of grass-pasture, low management that will be converted to open water- shallow systems within a water right place of use. Line 6 shows the number of newly proposed open water acres outside a water right place of use.

The surface area of the proposed storage features in zone 3 excluding the surface area of proposed features exempt under IDWR's 24 hour fill rule was taken from Table 1 and is listed on line 7. Because the storage features in zone 3 are anticipated to be full year round, the P_{def} value for months with positive values (line 1) was multiplied by the line 7 acreage value, resulting in a consumptive use listed on line 8 for the proposed storage features in zone 3. The surface area of the proposed storage features in zones 1 and 2 includes the surface area of proposed features not authorized under IDWR's 24 hour fill rule, taken from Table 1 and listed on line 9. Because the storage features in zones 1 and 2 are anticipated to fill with wintertime precipitation to offset subsequent evaporation, the annual P_{def} value (line 2) was multiplied by the line 9 acreage value, resulting in a consumptive use listed on line 10 for the proposed storage features in zones 1 and 2. Note that the sum of lines 7 and 9 (121.0 acres) is less than the total open water (183.4 acres) by the area of exempt ponds under the 24-hour rule.

Line 11 represents the sum of the total proposed consumptive use listed on lines 8 and 10. Line 12 represents the amount of acres needed to be dried up to meet the total consumptive use listed on line 11, calculated by dividing by the annual P_{def} of grass pasture-low management. Line 13 represents the number of existing grass pasture- low management acres that will actually be converted to open water (same as line 5). Because the line 13 value is larger than the line 12 value, there is no need to dry up additional acres beyond those identified in lines 5 and 13. Line 14 shows the difference between line 12 and line 13.

This analysis indicates that 45.6 more acres will be physically dried by the pond construction than are required to mitigate for the consumptive use of the ponds, based on the above assumptions and accounting for the 24-hour exempt ponds. These acres have not been forfeited and the applicant does not intend to abandon them. They will be included in the permissible place of use being created by the companion transfers.



1 inch equals 2,200 feet

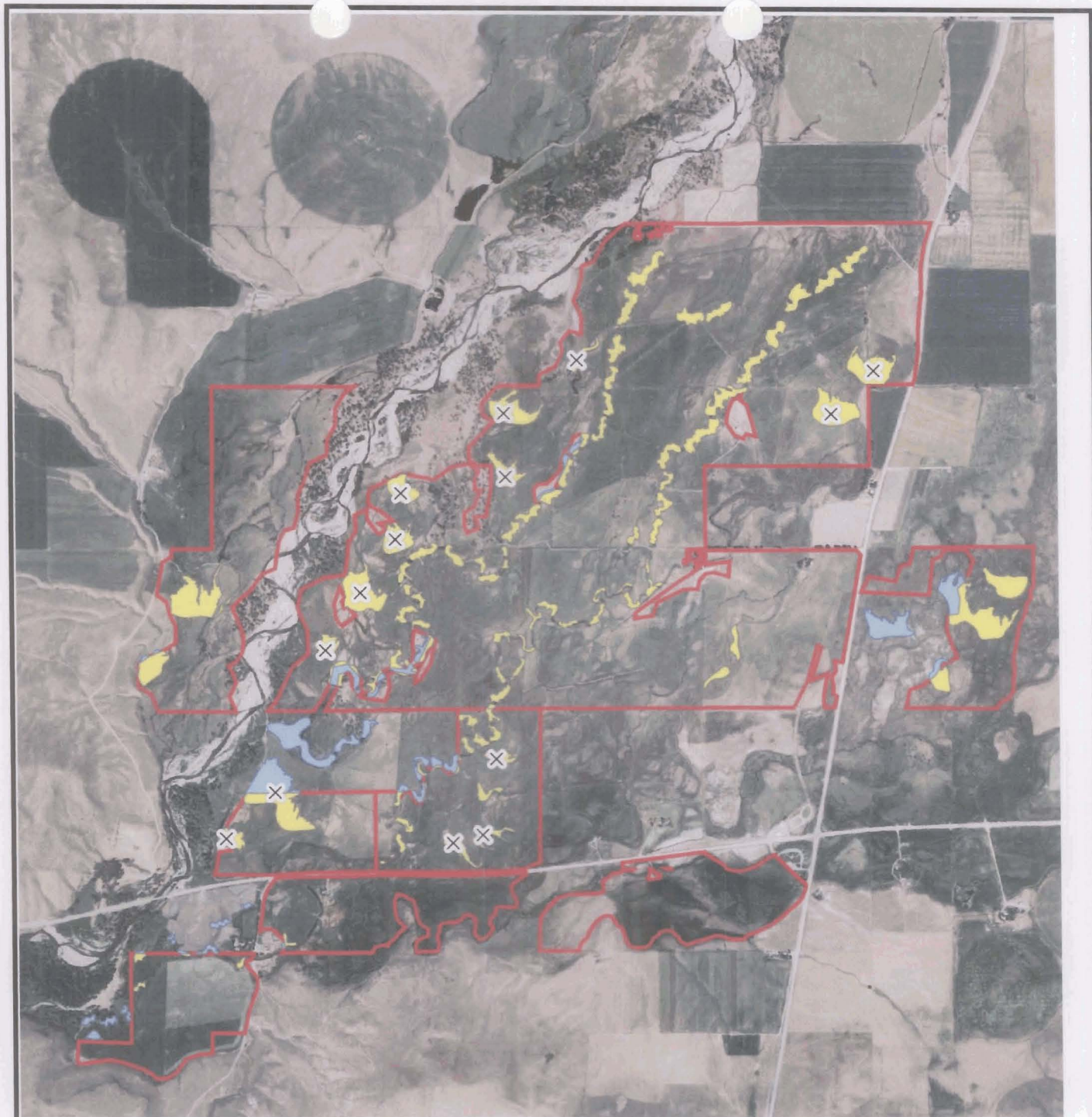
BROCKWAY ENGINEERING PLLC
ALR (ZL) - MAR. 1, 2010

FIGURE 1
SUN VALLEY RANCH LLC.
CONSUMPTIVE USE ANALYSIS
NAIP 2006 AERIAL

Legend

- Proposed Storage Area for Permit
- Waterways





1 inch equals 2,200 feet

FIGURE 2
SUN VALLEY RANCH LLC
SURFACE WATER ACRES FOR CONSUMPTIVE USE ANALYSIS
NAIP 2006 AERIAL PHOTOGRAPH

Legend

- × Storage features authorized under IDWR 24 Hr fill rule
- Proposed Surface Water Inside WR POU = 156.4 acres
- Proposed Surface Water outside WR POU = 27.0 acres
- Water Right POU



BROCKWAY ENGINEERING PLLC
 ALR - MARCH 2, 2010

TABLE 1:
SUN VALLEY RANCH LLC- PERMIT 37-22459
PROPOSED STORAGE FEATURES FOR CONSUMPTIVE USE ANALYSIS:

CATEGORY 1 FEATURES:	
Feature Name:	Total Surface Area (acres):
OX - 1	2.80
OX - 2	2.17
OX - 3	1.68
OX - 16	1.86
OX - 17	1.97
OX - 18	2.17
OX - 19	1.81
OX - 20	2.23
WS - 1	1.78
WS - 2	1.49
DU-15	8.89
DU-16	4.06
DU-17	4.60
DU-18	12.17
DU-19	5.19
DU-20	2.86
57.73	

All Category Total Acres: 121.0

Feature Type:	Description:
CW	Constructed Wetlands
DU	Irrigation Management Wetland Cell
FP	Open Water
EA	Excavated Area
OX	Oxbow
WS	Open Water

CATEGORY 2 FEATURES:	
Feature Name:	Total Surface Area (acres):
OX - 4	1.06
OX - 5	1.03
OX - 6	1.04
OX - 7	1.17
OX - 8	1.51
OX - 9	1.40
OX - 10	1.21
OX - 11	1.07
OX - 21	2.99
OX - 22	2.68
OX - 23	1.58
OX - 24	0.80
OX - 25	1.29
OX - 26	1.13
WS - 3	0.71
20.69	

CATEGORY 3 FEATURES:			
Feature Name:	Total Surface Area (acres):	Feature Name:	Total Surface Area (acres):
CW - 1	0.30	OX - 27	0.75
CW - 2	0.31	OX - 28	0.77
CW - 3	0.65	OX - 29	0.45
CW - 4	1.50	OX - 30	0.69
CW - 4b	0.90	OX - 31	0.83
CW - 5	0.39	OX - 32	0.48
CW - 6	0.61	OX - 33	1.01
CW - 7	0.64	OX - 34	0.58
CW - 8	1.44	OX - 35	1.04
CW - 9	1.25	OX - 36	0.83
CW - 12	0.82	OX - 37	0.76
CW - 13	0.32	OX - 38	0.61
CW - 14	0.34	OX - 39	0.52
CW - 15	0.55	OX - 40	0.33
CW - 16	0.77	OX - 41	0.56
CW - 17	0.51	OX - 42	0.27
CW - 18	0.71	OX - 43	0.23
CW - 19	0.54	OX - 44	0.32
CW - 20	0.73	OX - 45	0.38
CW - 21a	0.78	OX - 46	0.46
CW - 21b	0.72	OX - 47	0.49
CW - 22	0.91	OX - 48	0.42
CW - 23	0.65	OX - 49	0.55
CW - 24	1.16	DU-1	24-Hour Rule
CW - 25	0.81	DU-2	24-Hour Rule
CW - 26	0.06	DU-3	24-Hour Rule
CW - 27	0.08	DU-4	24-Hour Rule
CW - 28	0.04	DU-5	24-Hour Rule
CW - 29	0.21	DU-6	24-Hour Rule
CW - 30	0.56	DU-7	24-Hour Rule
FP - 1	Existing	DU-8	24-Hour Rule
FP - 2	Existing	DU-9	24-Hour Rule
FP - 3	0.99	DU-10	24-Hour Rule
OX - 12	0.86	DU-11	24-Hour Rule
OX - 13	1.10	DU-12	24-Hour Rule
OX - 14	1.15	DU-13	24-Hour Rule
OX - 15	2.03	DU-14	24-Hour Rule
EA - 1	1.22	EA - 3	1.15
EA - 2	1.17	EA - 5	0.36
42.6			

TABLE 2:
SUN VALLEY RANCH LLC
PROPOSED FEATURES FILLED BY 24 HOUR STORAGE:

IRRIGATION MANAGEMENT WETLAND CELL #:	PROPOSED STORAGE (ACRE-FT)	TOTAL PROPOSED STORAGE BY GROUP (ACRE-FT):	WATER RIGHT(S) ABLE TO BE UTILIZED FOR STORAGE UNDER THE 24 HOUR FILL RULE:	SOURCE FOR STORAGE UNDER THE 24 HOUR FILL RULE:	DIVERSION RATE AVAILABLE FOR STORAGE FEATURE (CFS):	24 HOUR DIVERSION VOLUME AVAILABLE FOR STORAGE FEATURE (ACRE-FEET):	DIFFERENCE NEEDED TO BE COVERED BY THE FIRST FILL (ACRE-FEET)
DU-1	5.3	41.4	37-60, 37-61, 37-62, 37-63A, 37-64A, 37-66A, 37-67B, 37-68A, 37-230, 37-231B, 37-232, 37-577AZ	BIG WOOD RIVER	39.4	78.0	0.0
DU-2	9.2						
DU-3	1.6						
DU-4	4.1						
DU-5	3.1						
DU-6	2.8						
DU-7	4.2						
DU-8	7.7						
DU-9	3.2						
DU-10	27.5	30.2	37-180, 37-181, 37-231A, 37-233, 37-1207	BIG WOOD RIVER	16.4	32.5	0.0
DU-11	2.7						
DU-12	0.8						
DU-13	0.8	3.5	37-139	CRYSTAL CREEK	3	5.9	0.0
DU-14	1.9						
DU-15	10.1						
DU-16	6.6	16.7	37-69B, 37-70, 37-71B	BIG WOOD RIVER	5.5	10.9	5.8
DU-17	6.7						
DU-18	16.2	34.0	37-2538	GROUND WATER	1.65	3.3	30.7
DU-19	7.4						
DU-20	3.7						
TOTALS =	125.8	125.8			66.0	130.6	36.5

TABLE 3:
SUN VALLEY RANCH LLC & SPRING CREEK IDAHO RANCH LLC
AMENDED CONSUMPTIVE USE BALANCE FOR ASSOCIATED WATER RIGHT TRANSFERS

LINE:	VALUE:	EXPLANATION:
1	1.86	Picabo NWS- Open Water- Shallow Systems (Calculated Using Positive P _{def} values only) 1.86 ft (567.5mm) per acre
2	1.56	Picabo NWS- Open Water- Shallow Systems (Annual P _{def} value) 1.56 ft (477mm) per acre
3	1.82	Picabo NWS- Grass Pasture, Low Management (Annual P _{def}) 1.82 ft (554mm) per acre
4	183.4	Total Number of Proposed Open Water Acres*
5	156.4	Total Number of Proposed Open Water Acres Within a Water Right POU
6	27.0	Total Number of Proposed Open Water Acres Outside a Water Right POU*
7	42.6	Category 3 Storage Features- Proposed Open Water Acres Excluding 24 Hour Irrigation Storage
8	79.3	Category 3 Storage Features- CU (acre-feet)- Positive P _{def} Values Only- Open Water- Shallow Systems (1.86 ft per acre)
9	78.4	Category 1 and 2 Storage Features- Proposed Open Water Acres Excluding 24 Hour Irrigation Storage
10	122.3	Category 1 and 2 Storage Features- CU (acre-feet)- Annual P _{def} for Open Water- Shallow Systems (1.56 ft per acre)
11	201.6	Total Proposed Category 1-3 Storage Feature CU (acre-feet) Excluding 24 hour Irrigation Storage
12	110.8	Acres of Grass Pasture to be dried up to meet Proposed Category 1-3 CU (acres)
13	156.4	Acres of Grass Pasture within a WR POU Proposed To Be Physically Dug Up and Dried Up to Build Ponds
14	-45.6	Acreage Difference: (-) = Additional Dry Up Not Needed, (+) = Additional Dry Up Needed

* Does not include existing open water or existing and proposed stream due to negligible surface area changes.

Allen, Richard G. and Clarence W. Robison, 2009. Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho: Supplement updating the Time Series through December 2008, Research Technical Completion Report, Kimberly Research and Extension Center, University of Idaho, Moscow, ID.

SUN VALLEY RANCH LLC- PERMIT 37-22459

ZONE 3 FEATURES

CU Analysis Using Picabo NWS Station:

Daily P_{def} (mm) for Open Water- Shallow Systems (ponds, streams)

(Analysis considers positive ET values only per IDWR Transfer Processing Memo 26, 2/23/04
and per meeting with Jeff Peppersack, 2/10/10)

(mm)											
January	February	March	April	May	June	July	August	September	October	November	December
-1.01	-0.37	0.35	1.65	2.39	3.19	4.10	3.59	2.36	0.91	-0.50	-1.05

Date:	(mm)	(inches)	(ft)
1-Mar	0.35	0.014	0.001
2-Mar	0.35	0.014	0.001
3-Mar	0.35	0.014	0.001
4-Mar	0.35	0.014	0.001
5-Mar	0.35	0.014	0.001
6-Mar	0.35	0.014	0.001
7-Mar	0.35	0.014	0.001
8-Mar	0.35	0.014	0.001
9-Mar	0.35	0.014	0.001
10-Mar	0.35	0.014	0.001
11-Mar	0.35	0.014	0.001
12-Mar	0.35	0.014	0.001
13-Mar	0.35	0.014	0.001
14-Mar	0.35	0.014	0.001
15-Mar	0.35	0.014	0.001
16-Mar	0.35	0.014	0.001
17-Mar	0.35	0.014	0.001
18-Mar	0.35	0.014	0.001
19-Mar	0.35	0.014	0.001
20-Mar	0.35	0.014	0.001
21-Mar	0.35	0.014	0.001
22-Mar	0.35	0.014	0.001
23-Mar	0.35	0.014	0.001
24-Mar	0.35	0.014	0.001
25-Mar	0.35	0.014	0.001
26-Mar	0.35	0.014	0.001
27-Mar	0.35	0.014	0.001
28-Mar	0.35	0.014	0.001
29-Mar	0.35	0.014	0.001
30-Mar	0.35	0.014	0.001
31-Mar	0.35	0.014	0.001
1-Apr	1.65	0.065	0.005
2-Apr	1.65	0.065	0.005
3-Apr	1.65	0.065	0.005
4-Apr	1.65	0.065	0.005
5-Apr	1.65	0.065	0.005
6-Apr	1.65	0.065	0.005
7-Apr	1.65	0.065	0.005
8-Apr	1.65	0.065	0.005
9-Apr	1.65	0.065	0.005
10-Apr	1.65	0.065	0.005
11-Apr	1.65	0.065	0.005
12-Apr	1.65	0.065	0.005
13-Apr	1.65	0.065	0.005
14-Apr	1.65	0.065	0.005

Date:	(mm)	(inches)	(ft)
15-Apr	1.65	0.065	0.005
16-Apr	1.65	0.065	0.005
17-Apr	1.65	0.065	0.005
18-Apr	1.65	0.065	0.005
19-Apr	1.65	0.065	0.005
20-Apr	1.65	0.065	0.005
21-Apr	1.65	0.065	0.005
22-Apr	1.65	0.065	0.005
23-Apr	1.65	0.065	0.005
24-Apr	1.65	0.065	0.005
25-Apr	1.65	0.065	0.005
26-Apr	1.65	0.065	0.005
27-Apr	1.65	0.065	0.005
28-Apr	1.65	0.065	0.005
29-Apr	1.65	0.065	0.005
30-Apr	1.65	0.065	0.005
1-May	2.39	0.094	0.008
2-May	2.39	0.094	0.008
3-May	2.39	0.094	0.008
4-May	2.39	0.094	0.008
5-May	2.39	0.094	0.008
6-May	2.39	0.094	0.008
7-May	2.39	0.094	0.008
8-May	2.39	0.094	0.008
9-May	2.39	0.094	0.008
10-May	2.39	0.094	0.008
11-May	2.39	0.094	0.008
12-May	2.39	0.094	0.008
13-May	2.39	0.094	0.008
14-May	2.39	0.094	0.008
15-May	2.39	0.094	0.008
16-May	2.39	0.094	0.008
17-May	2.39	0.094	0.008
18-May	2.39	0.094	0.008
19-May	2.39	0.094	0.008
20-May	2.39	0.094	0.008
21-May	2.39	0.094	0.008
22-May	2.39	0.094	0.008
23-May	2.39	0.094	0.008
24-May	2.39	0.094	0.008
25-May	2.39	0.094	0.008
26-May	2.39	0.094	0.008
27-May	2.39	0.094	0.008
28-May	2.39	0.094	0.008
29-May	2.39	0.094	0.008
30-May	2.39	0.094	0.008
31-May	2.39	0.094	0.008
1-Jun	3.19	0.126	0.010
2-Jun	3.19	0.126	0.010
3-Jun	3.19	0.126	0.010
4-Jun	3.19	0.126	0.010
5-Jun	3.19	0.126	0.010
6-Jun	3.19	0.126	0.010

Date:	(mm)	(inches)	(ft)
7-Jun	3.19	0.126	0.010
8-Jun	3.19	0.126	0.010
9-Jun	3.19	0.126	0.010
10-Jun	3.19	0.126	0.010
11-Jun	3.19	0.126	0.010
12-Jun	3.19	0.126	0.010
13-Jun	3.19	0.126	0.010
14-Jun	3.19	0.126	0.010
15-Jun	3.19	0.126	0.010
16-Jun	3.19	0.126	0.010
17-Jun	3.19	0.126	0.010
18-Jun	3.19	0.126	0.010
19-Jun	3.19	0.126	0.010
20-Jun	3.19	0.126	0.010
21-Jun	3.19	0.126	0.010
22-Jun	3.19	0.126	0.010
23-Jun	3.19	0.126	0.010
24-Jun	3.19	0.126	0.010
25-Jun	3.19	0.126	0.010
26-Jun	3.19	0.126	0.010
27-Jun	3.19	0.126	0.010
28-Jun	3.19	0.126	0.010
29-Jun	3.19	0.126	0.010
30-Jun	3.19	0.126	0.010
1-Jul	4.1	0.162	0.013
2-Jul	4.1	0.162	0.013
3-Jul	4.1	0.162	0.013
4-Jul	4.1	0.162	0.013
5-Jul	4.1	0.162	0.013
6-Jul	4.1	0.162	0.013
7-Jul	4.1	0.162	0.013
8-Jul	4.1	0.162	0.013
9-Jul	4.1	0.162	0.013
10-Jul	4.1	0.162	0.013
11-Jul	4.1	0.162	0.013
12-Jul	4.1	0.162	0.013
13-Jul	4.1	0.162	0.013
14-Jul	4.1	0.162	0.013
15-Jul	4.1	0.162	0.013
16-Jul	4.1	0.162	0.013
17-Jul	4.1	0.162	0.013
18-Jul	4.1	0.162	0.013
19-Jul	4.1	0.162	0.013
20-Jul	4.1	0.162	0.013
21-Jul	4.1	0.162	0.013
22-Jul	4.1	0.162	0.013
23-Jul	4.1	0.162	0.013
24-Jul	4.1	0.162	0.013
25-Jul	4.1	0.162	0.013
26-Jul	4.1	0.162	0.013
27-Jul	4.1	0.162	0.013
28-Jul	4.1	0.162	0.013
29-Jul	4.1	0.162	0.013

Date:	(mm)	(inches)	(ft)
30-Jul	4.1	0.162	0.013
31-Jul	4.1	0.162	0.013
1-Aug	3.59	0.141	0.012
2-Aug	3.59	0.141	0.012
3-Aug	3.59	0.141	0.012
4-Aug	3.59	0.141	0.012
5-Aug	3.59	0.141	0.012
6-Aug	3.59	0.141	0.012
7-Aug	3.59	0.141	0.012
8-Aug	3.59	0.141	0.012
9-Aug	3.59	0.141	0.012
10-Aug	3.59	0.141	0.012
11-Aug	3.59	0.141	0.012
12-Aug	3.59	0.141	0.012
13-Aug	3.59	0.141	0.012
14-Aug	3.59	0.141	0.012
15-Aug	3.59	0.141	0.012
16-Aug	3.59	0.141	0.012
17-Aug	3.59	0.141	0.012
18-Aug	3.59	0.141	0.012
19-Aug	3.59	0.141	0.012
20-Aug	3.59	0.141	0.012
21-Aug	3.59	0.141	0.012
22-Aug	3.59	0.141	0.012
23-Aug	3.59	0.141	0.012
24-Aug	3.59	0.141	0.012
25-Aug	3.59	0.141	0.012
26-Aug	3.59	0.141	0.012
27-Aug	3.59	0.141	0.012
28-Aug	3.59	0.141	0.012
29-Aug	3.59	0.141	0.012
30-Aug	3.59	0.141	0.012
31-Aug	3.59	0.141	0.012
1-Sep	2.36	0.093	0.008
2-Sep	2.36	0.093	0.008
3-Sep	2.36	0.093	0.008
4-Sep	2.36	0.093	0.008
5-Sep	2.36	0.093	0.008
6-Sep	2.36	0.093	0.008
7-Sep	2.36	0.093	0.008
8-Sep	2.36	0.093	0.008
9-Sep	2.36	0.093	0.008
10-Sep	2.36	0.093	0.008
11-Sep	2.36	0.093	0.008
12-Sep	2.36	0.093	0.008
13-Sep	2.36	0.093	0.008
14-Sep	2.36	0.093	0.008
15-Sep	2.36	0.093	0.008
16-Sep	2.36	0.093	0.008
17-Sep	2.36	0.093	0.008
18-Sep	2.36	0.093	0.008
19-Sep	2.36	0.093	0.008
20-Sep	2.36	0.093	0.008

Date:	(mm)	(inches)	(ft)
21-Sep	2.36	0.093	0.008
22-Sep	2.36	0.093	0.008
23-Sep	2.36	0.093	0.008
24-Sep	2.36	0.093	0.008
25-Sep	2.36	0.093	0.008
26-Sep	2.36	0.093	0.008
27-Sep	2.36	0.093	0.008
28-Sep	2.36	0.093	0.008
29-Sep	2.36	0.093	0.008
30-Sep	2.36	0.093	0.008
1-Oct	0.91	0.036	0.003
2-Oct	0.91	0.036	0.003
3-Oct	0.91	0.036	0.003
4-Oct	0.91	0.036	0.003
5-Oct	0.91	0.036	0.003
6-Oct	0.91	0.036	0.003
7-Oct	0.91	0.036	0.003
8-Oct	0.91	0.036	0.003
9-Oct	0.91	0.036	0.003
10-Oct	0.91	0.036	0.003
11-Oct	0.91	0.036	0.003
12-Oct	0.91	0.036	0.003
13-Oct	0.91	0.036	0.003
14-Oct	0.91	0.036	0.003
15-Oct	0.91	0.036	0.003
16-Oct	0.91	0.036	0.003
17-Oct	0.91	0.036	0.003
18-Oct	0.91	0.036	0.003
19-Oct	0.91	0.036	0.003
20-Oct	0.91	0.036	0.003
21-Oct	0.91	0.036	0.003
22-Oct	0.91	0.036	0.003
23-Oct	0.91	0.036	0.003
24-Oct	0.91	0.036	0.003
25-Oct	0.91	0.036	0.003
26-Oct	0.91	0.036	0.003
27-Oct	0.91	0.036	0.003
28-Oct	0.91	0.036	0.003
29-Oct	0.91	0.036	0.003
30-Oct	0.91	0.036	0.003
31-Oct	0.91	0.036	0.003
TOTAL =	567.5	22.36	1.86



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MAR 12 2010

DEPT. OF WATER RESOURCES
SOUTHERN REGION

Sun Valley Ranch LLC- Permit 37-22459 First Fill Analysis Summary

To: Mr. Allen Merritt, IDWR Southern Region Office
From: Charles E. Brockway, Charles G. Brockway, Zach Latham
Cc: Mr. Jeff Cooper, Mrs. Jeanie Robertson, IDWR Southern Region
Date: March 10th 2010
Re: Sun Valley Ranch LLC Permit 37-22459 First Fill Analysis

This is a review of Brockway Engineering's first fill analysis of the storage proposed and listed on water right permit 37-22459 in the name of Sun Valley Ranch LLC as requested in a February 10th 2010 meeting by Allen Merritt of IDWR. Previously, Brockway Engineering submitted a first fill analysis (3 tables) via email to IDWR (Jeanie Robertson, Allen Merritt, Jeff Cooper and Nick Van Dyke) on February 2nd 2010. The attached tables are intended to supersede the previously submitted tables.

Water right permit 37-22459 seeks to divert a total of 76.36 cfs from the Big Wood River, Willow Creek, Crystal Creek, Black Slough, Spring Creek and ground water to fill 815.5 acre feet of wildlife, recreation and aesthetic storage on the Sun Valley Ranch LLC and Spring Creek Idaho Ranch LLC properties. Proposed storage features include in-line oxbows, constructed wetlands, irrigation management wetland cells and excavated areas. The in-line oxbow features are dug into the ground and receive water from irrigation ditches; fill up and then spill into the next oxbow feature in zones 1 and 2 (see Figure 1). Oxbow features in zone 3 are also dug into the ground and have a diversion from the enhanced stream channel into the oxbow, and a diversion out of the oxbow back to the enhanced stream. Constructed wetlands features are also dug into the ground in zone 3 and have a diversion from and injection back into the enhanced stream. Irrigation management wetland cells receive water from irrigation ditches and fill up above the ground surface due to the presence of a dyke with an outlet control structure. These irrigation management wetland cells are designed to improve irrigation efficiency on the property. Excavated areas adjacent to irrigation management wetland cells will be dug into the ground and may be filled by existing natural ground water and or irrigation application recharge water. Excavated area features are included in the consumptive use and first fill analyses.

Individual feature volume estimations were made by Dave Rosgen of Wildland Hydrology (Fort Collins CO), designer of the oxbow and constructed wetlands portion of the stream restoration and enhancement project, and by project engineers at Ducks Unlimited of Spokane WA who designed the excavated areas and irrigation management wetland cells. Wildland Hydrology used average depths to ground water observed and recorded in 29 piezometers by Brockway Engineering on the Sun Valley Ranch Property from 13 site visits during the period of April of 2005 through May of 2008 to estimate the volume of water that will naturally fill each of the oxbow, constructed wetlands, and excavated area features during average ground water conditions.

Table 1 (attached) lists each of the storage features contemplated on the project, along with their corresponding estimated total volumes of each feature in acre-feet. Table 1 is divided into 3 categories of storage features. Category 1 includes storage features that are anticipated to partially fill with ground water at the start of irrigation season (4/15) as a result of naturally existing ground water levels. Storage features in this category are not anticipated to fill completely during the irrigation season from incidental irrigation application recharge and will

need irrigation water to be delivered to completely fill each feature. Because the features in this category are not anticipated to be completely full at the start of, or any time during irrigation season due to natural existing conditions, an additional first fill volume is anticipated to be required for storage features in category 1. Multiple measuring devices on existing streams and irrigation ditches have shown perennial flows do not exist where these features are found during the irrigation season when irrigation water is not delivered to the property. This category of features also includes volumes associated with some of the irrigation management wetland cells that are not able to be filled under IDWR's 24 hour fill rule.

Category 2 includes storage features that are anticipated to be partially full of ground water at the start of irrigation season (4/15) as a result of naturally existing ground water levels. Storage features in this category are anticipated to fill completely during the irrigation season from incidental irrigation application recharge. Although these features will likely completely fill with natural ground water at some point during the irrigation season, they will not be full when irrigation water begins to be delivered to the Sun Valley Ranch. Because the features in this category are not anticipated to be full at the start of irrigation season due to natural existing ground water conditions, an additional first fill volume is anticipated to be required for storage features in category 2. Multiple measuring devices on existing streams and irrigation ditches have shown perennial flows increase in Crystal Creek, Black Slough, and Willow Creek during the irrigation season when irrigation water is being delivered to the property.

Category 3 includes storage features that are anticipated to completely fill with ground water as a result of naturally existing high ground water levels. Because the features in this category are anticipated to fill due to natural existing conditions, no additional first fill volume is anticipated to be required for storage features in category 3. Multiple measuring devices on existing streams and irrigation ditches have shown perennial flows in Crystal Creek, Black Slough, and Willow Creek year round when no irrigation water is being delivered to the property. This category of features includes any portion of the irrigation management wetland cells able to be filled under IDWR's 24 hour fill rule.

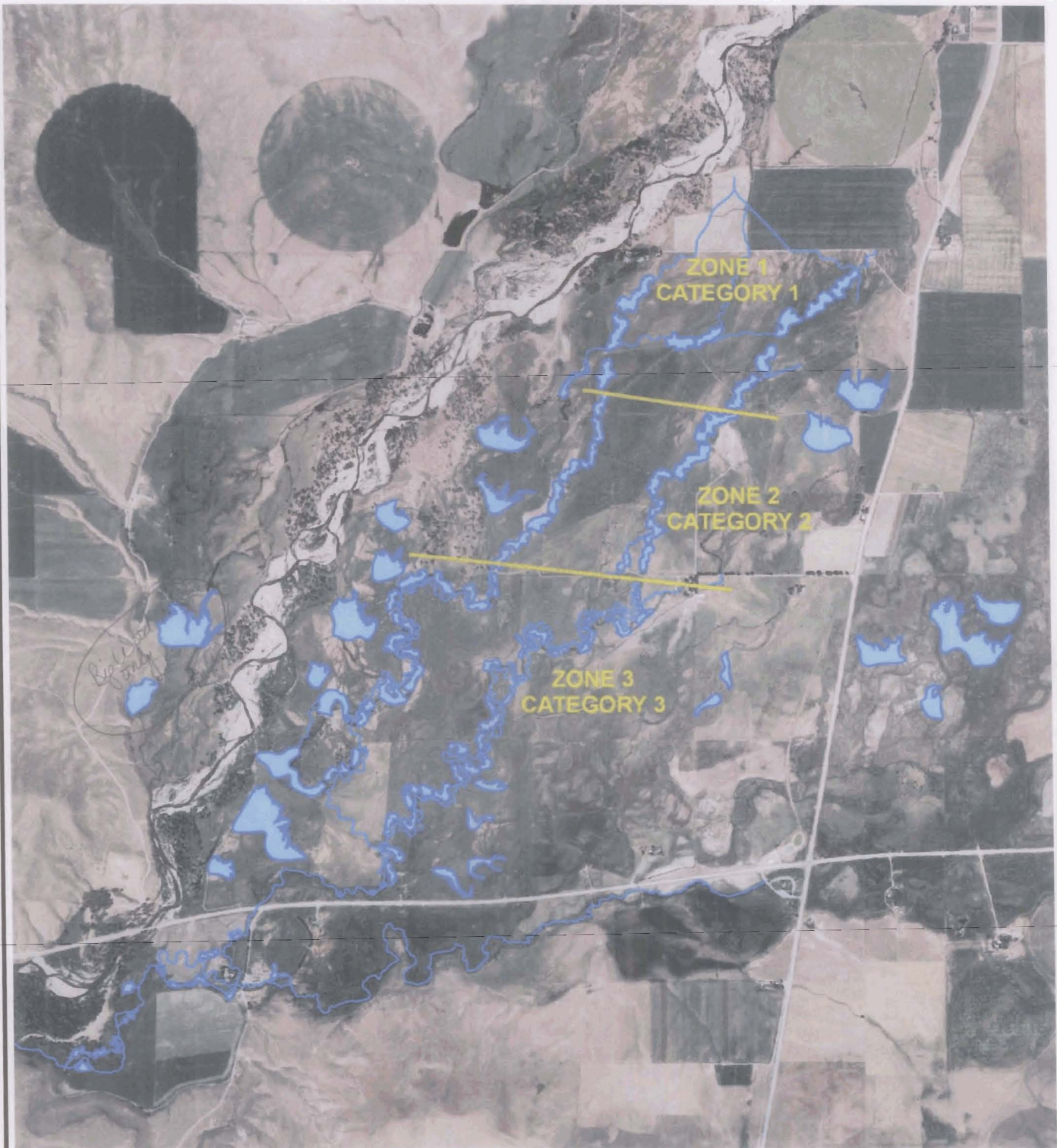
Table 2 lists all of the proposed irrigation management wetland cells, their total proposed storage volumes, the water rights able to be utilized for storage under the IDWR 24 hour fill rule, the source of the water rights utilized for storage, the associated diversion rates for the water rights utilized for storage, the associated 24 hour diversion volume for the water rights utilized for storage, and the difference between the water rights 24 hour diversion volume able to be stored under the 24 hour fill rule and the total storage of the irrigation management wetland cells. The total storage proposed within the irrigation management wetland cells exceeds the amount of storage authorized under the IDWR 24 hour fill rule; therefore, some of the proposed cells will need a first fill. The volumes of cells 1-14 are able to be filled under IDWR's 24 hour fill rule with existing irrigation water rights. Portions of the volumes of cells 15-20 are able to be filled under IDWR's 24 hour fill rule. The portions of cells 15-20 that are not able to be filled under IDWR's first fill rule will need a first fill (33.3 acre-feet).

Table 3 lists the category 1 and 2 features and the estimated volume that will require a first fill. Per feature, the name, total estimated volume, estimated volume to be filled with naturally existing ground water, and the estimated remaining first fill volume are listed on Table 3. The total estimated first fill volume for the entire project is 90.1 acre-feet. Historically, 49.6 acres of grass pasture has required 90.1 acre-feet of water to grow on the property. 49.6 acres of grass pasture (Picabo NWS- Grass Pasture, Low Management (Annual P_{def}) 1.82 ft per acre) are anticipated to be dried up for the first irrigation season to compensate for the first fill volumes listed on Table 3.

During the first year of project implementation ("first irrigation season"), it is proposed to dry up the amount of acres with an equivalent consumptive use to account for the volume needed to fill portions of the proposed storage features that are not anticipated to naturally fill with existing ground water. The total first fill volume has been estimated to be 90.1 acre-feet. Drying up 49.6 acres of grass pasture that has been historically irrigated will allow 90.1 acre-feet of water to be left in Big Wood River during the first irrigation season when the first fill occurs. Injury to

downstream water users will not be anticipated to occur because 90.1 acre-feet of water historically consumed by grass pasture, will remain in the Big Wood River during the first irrigation season.

Because 90.1 acre feet of first fill storage was initially dry at the beginning of the irrigation season (and was later filled), the same 90.1 acre feet of water is anticipated to drain out of Crystal Creek, Black Slough, Willow Creek and from ground water drainage into the Big Wood River and enter Magic Reservoir later in the fall or winter of the first irrigation season. During the first year of project implementation, 90.1 acre-feet of water was left in the Big Wood River due to the dry up of 49.6 acres, and 90.1 acre-feet of first fill water also re-entered the Big Wood River. In total, 180.2 acre-feet of water enters the Big Wood River. Therefore, the dry up of 49.6 acres to mitigate for the first fill volume of the 90.1 acre feet will only be required the first year of the project since every subsequent year's fill will be released downstream and will be stored in Magic Reservoir at the end of the previous irrigation season.



1 inch equals 2,200 feet

BROCKWAY ENGINEERING PLLC
ALR (ZL) - MAR. 1, 2010

FIGURE 1
SUN VALLEY RANCH LLC.
FIRST FILL ANALYSIS
NAIP 2006 AERIAL

Legend

- Proposed Storage Area for Permit
- Waterways



TABLE 1:
SUN VALLEY RANCH LLC-
PROPOSED STORAGE FEATURES FOR FIRST FILL ANALYSIS:

***CATEGORY 1 FEATURES:		
Total Estimated Fill		
Feature Name:	Volume (acre-feet):	
OX - 1	27.67	
OX - 2	21.00	
OX - 3	16.47	
OX - 16	17.53	
OX - 17	19.76	
OX - 18	21.59	
OX - 19	19.78	
OX - 20	21.99	
WS - 1	19.78	
WS - 2	16.56	
DU - 15	10.10	
DU - 16	6.60	
DU - 17	6.70	
DU - 18	16.20	
DU - 19	7.40	
DU - 20	3.70	
252.83		

***CATEGORY 2 FEATURES:		
Total Estimated Fill		
Feature Name:	Volume (acre-feet):	
OX - 4	10.02	
OX - 5	9.33	
OX - 6	8.54	
OX - 7	11.27	
OX - 8	14.42	
OX - 9	13.86	
OX - 10	11.15	
OX - 11	9.85	
OX - 21	27.66	
OX - 22	27.21	
OX - 23	15.95	
OX - 24	6.62	
OX - 25	11.55	
OX - 26	10.41	
WS - 3	7.89	
195.74		

All Category Total Volumes: 815.5		
Total Estimated Fill		
Feature Name:	Volume (acre-feet):	
CW - 1	0.28	
CW - 2	0.26	
CW - 3	0.62	
CW - 4	1.42	
CW - 4b	0.96	
CW - 5	0.40	
CW - 6	0.60	
CW - 7	0.63	
CW - 8	1.39	
CW - 9	1.16	
CW - 12	0.78	
CW - 13	0.29	
CW - 14	0.34	
CW - 15	0.54	
CW - 16	0.66	
CW - 17	0.49	
CW - 18	0.68	
CW - 19	0.52	
CW - 20	0.68	
CW - 21a	0.79	
CW - 21b	0.79	
CW - 22	0.86	
CW - 23	0.67	
CW - 24	1.14	
CW - 25	0.77	
CW - 26	0.06	
CW - 27	0.09	
CW - 28	0.04	
CW - 29	0.18	
CW - 30	0.25	
FP - 1	32.60	
FP - 2	72.80	
FP - 3	8.67	
OX - 12	7.51	
OX - 13	10.23	
OX - 14	9.84	
OX - 15	19.48	
EA - 1	3.60	
EA - 3	3.60	
EA - 5	3.60	
366.95		

***CATEGORY 3 FEATURES:		
Total		
Feature Name:	Volume (acre-feet):	
OX - 27	5.58	
OX - 28	6.35	
OX - 29	2.70	
OX - 30	5.56	
OX - 31	7.07	
OX - 32	3.79	
OX - 33	9.09	
OX - 34	4.93	
OX - 35	9.21	
OX - 36	6.57	
OX - 37	6.10	
OX - 38	5.20	
OX - 39	3.22	
OX - 40	2.33	
OX - 41	3.50	
OX - 42	1.74	
OX - 43	1.17	
OX - 44	1.10	
OX - 45	5.47	
OX - 46	3.00	
OX - 47	2.77	
OX - 48	1.95	
OX - 49	2.54	
DU - 1	5.30	
DU - 2	9.25	
DU - 3	1.65	
DU - 4	4.13	
DU - 5	3.06	
DU - 6	2.83	
DU - 7	4.18	
DU - 8	7.73	
DU - 9	3.25	
DU - 10	27.50	
DU - 11	2.70	
DU - 12	0.80	
DU - 13	0.80	
DU - 14	1.90	
EA - 3	3.70	
EA - 5	0.60	
366.95		

Feature Type: Description:		
CW	Constructed Wetlands	
DU	Irrigation Management Wetland Cell	
FP	Open Water	
EA	Excavated Area	
OX	Oxbow	
WS	Open Water	

TABLE 2:
SUN VALLEY RANCH LLC
PROPOSED FEATURES FILLED BY 24 HOUR STORAGE:

IRRIGATION MANAGEMENT WETLAND CELL #:	PROPOSED STORAGE (ACRE-FT)	TOTAL PROPOSED STORAGE BY GROUP (ACRE-FT):	WATER RIGHT(S) ABLE TO BE UTILIZED FOR STORAGE UNDER THE 24 HOUR FILL RULE:	SOURCE FOR STORAGE UNDER THE 24 HOUR FILL RULE:	DIVERSION RATE AVAILABLE FOR STORAGE FEATURE (CFS):	24 HOUR DIVERSION VOLUME AVAILABLE FOR STORAGE FEATURE (ACRE-FEET):	DIFFERENCE NEEDED TO BE COVERED BY THE FIRST LL (ACRE-FOOT)
DU-1	5.3	41.4	37-60, 37-61, 37-62, 37-63A, 37-64A, 37-66A, 37-67B, 37-68A, 37-230, 37-231B, 37-232, 37-577AZ	BIG WOOD RIVER	39.4	78.0	0.0
DU-2	9.2						
DU-3	1.6						
DU-4	4.1						
DU-5	3.1						
DU-6	2.8						
DU-7	4.2						
DU-8	7.7						
DU-9	3.2						
DU-10	27.5	30.2	37-180, 37-181, 37-231A, 37-233, 37-1207	BIG WOOD RIVER	16.4	32.5	0.0
DU-11	2.7						
DU-12	0.8	3.5	37-139	CRYSTAL CREEK	3	5.9	0.0
DU-13	0.8						
DU-14	1.9						
DU-15	10.1	16.7	37-69B, 37-70, 37-71B	BIG WOOD RIVER	5.5	10.9	5.8
DU-16	6.6						
DU-17	6.7	34.0	37-2538	GROUND WATER	1.65	3.3	30.7
DU-18	16.2						
DU-19	7.4						
DU-20	3.7						
TOTALS =	125.8	125.8			66.0	130.6	36.5

TABLE 3:
SUN VALLEY RANCH LLC
CATEGORY 1 AND 2 FEATURES NEEDING A FIRST FILL:

Feature Name:	Total Estimated Fill Volume (acre-feet):	Estimated Ground Water Fill Volume (acre-feet):	Remaining First Fill Volume (acre-feet):
OX - 1	27.7	20.0	7.7
OX - 2	21.0	17.7	3.3
OX - 3	16.5	14.2	2.2
OX - 4	10.0	8.6	1.4
OX - 5	9.3	8.7	0.7
OX - 6	8.5	8.4	0.2
OX - 7	11.3	9.9	1.4
OX - 8	14.4	13.8	0.6
OX - 9	13.9	12.6	1.3
OX - 10	11.1	9.6	1.5
OX - 11	9.8	8.5	1.3
OX - 16	17.5	13.3	4.2
OX - 17	19.8	16.0	3.7
OX - 18	21.6	18.9	2.7
OX - 19	19.8	17.9	1.9
OX - 20	22.0	17.5	4.5
OX - 21	27.7	23.0	4.6
OX - 22	27.2	24.6	2.7
OX - 23	15.9	13.8	2.2
OX - 24	6.6	5.7	0.9
OX - 25	11.5	11.3	0.3
OX - 26	10.4	9.0	1.4
WS - 1	19.8	17.1	2.7
WS - 2	16.6	14.3	2.3
WS - 3	7.9	6.8	1.1
DU-15*	10.1	0.0	24.4
DU-16*	6.6	0.0	
DU-17**	6.7	0.0	
DU-18**	16.2	0.0	
DU-19**	7.4	0.0	
DU-20**	3.7	0.0	
Total Remaining First Fill Volume (acre-feet)			<u>90.1</u>
One-Time Dry Up Acres for First Fill Volume***			<u>49.6</u>
* 24 Hour Fill eliminates 10.9 ac-ft of storage under 37-69B, 37-70, 37-71B - See Table 2.			
** 24 Hour Fill eliminates 3.3 ac-ft of storage under 37-2538 - See Table 2.			
*** Picabo NWS- Grass Pasture, Low Management (Annual Pdef) 1.82 ft per acre			