

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 65-22960

Exam Date: 10/16/2014

1. Current Owner: THE MCCALL ASSOCIATES, LLC
C/O HADEN TANNER
PO BOX 4271
MC CALL ID 83638
208-315-2242
2. Accompanied by: Aaron Harvey & Warren Drake
Phone No: (208) 573-6261 – Warren Drake
Address:
Relationship to Permit Holder: Property Manager & Water System Operator

- | 3. <u>SOURCE</u> | <u>TRIBUTARY</u> |
|------------------|------------------|
| GROUND WATER | |

B. OVERLAP REVIEW

1. Other water rights with the same place of use: None
2. Other water rights with the same point of diversion: None

C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER VALLEY County	L1 SE1/4SE1/4	Sec. 25,	Twp 18N,	Rge 02E, B.M.
GROUND WATER VALLEY County	L1 SE1/4SE1/4	Sec. 25,	Twp 18N,	Rge 02E, B.M.

Method of Determination: Arc Map (Aerial Photo)

2.

PLACE OF USE: AESTHETIC STORAGE

[illegible]

PLACE OF USE: AESTHETIC FROM STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
18N	02E	25	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
															X	X	X	X	L 1

PLACE OF USE: RECREATION STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
18N	02E	25	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
															X	X	X	X	L 1

DIVERSION TO STORAGE same as RECREATION STORAGE

Method of Determination: Arc Map (Aerial Photo); Tax Lots.

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☒ Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
D0039525	Franklin	15	Unknown	Berkeley	8"
D0039525	Franklin	100	Unknown	Berkeley	8"
D0041733	Franklin	40	Unknown	Berkeley	6"

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
N/A						

2. Measurements: No field measurement. Well No.1 operating gauge pressure of 72 psi with 5 pressure tanks. Well No.2 was not operating during the field exam.

E. FLOW CALCULATIONS

_____ Additional Computation Sheets Attached

Measured Method: (Theoretical Horsepower Equation)

$$Q = 8.8 \times 0.7 \times 115/200 + (2.31 \times 72) = 708.40/366.32 = 1.93 \text{ cfs}$$

$$Q(\text{theoretical}) = 1.93 \text{ cfs} > 0.17 \text{ cfs } Q(\text{permit})$$

$$HP = 15$$

$$HP = 100$$

$$Z = 200' \text{ (Estimated)}$$

$$P = 72 \text{ psi (gauge)}$$

The current pumping system can attain the permit diversion rate of 0.17 cfs.

Recommend the permit diversion rate of 0.17 cfs.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: N/A

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$$

2. Volume Calculations for Other Uses: (Two Recreation/Aesthetic Storage Ponds)

Pond Surface Area (Blackmare Lake) – 7.0 ac.

Pond Surface Area (Rock Lake) – 2.0 ac.

Maximum Pond Depth – 32 feet

$$V_d = 9.0 \text{ ac.} \times 32 \text{ ft} \times 0.6 = 173.0 \text{ AF}$$

$$V_d = 173.0 \text{ AF} > 150.0 \text{ AF } V_r$$

Recommend Permit Volume of 150.0 AFA

G. NARRATIVE/REMARKS/COMMENTS**WATER SUPPLY SYSTEM:**

Two ground water wells divert water to two (2) recreation and aesthetic storage ponds. Well No.1, is the main well for the Blackhawk on the River development. Well No.1 has a 20" steel casing and two (2) submersible pumps. A 15-hp jockey pump and a 100-hp main pump. Well No.2, which is used as a backup well to Well No.1, has a 10" steel casing and a 40-hp submersible pump. Water is pumped to an irrigation pump house near the two storage ponds. Water is pumped from an irrigation wet well in the irrigation pump house to the large storage pond (Blackmare Lake). Water from Blackmare Lake is discharged through an overflow outlet and stream to the small storage pond (Rock Lake).

OVERLAP ANALYSIS:

Point of Diversion: Water Right Permit No.65-22960 and Water Right Permit No.65-23042, owned by Blackhawk Partners, LLC, have overlapping points of diversion. Water Right Permit No. 65-22945, which is owned by Sage SGI, LLC, has overlapping points of diversion with Water Right Permit No. 65-22960. However, the right holder has not submitted a proof of beneficial use for diverting ground water from Well No.1 and Well No.2 for irrigation, domestic use, and fire protection. The right holder has been notified of the active permit, and is proceeding with submitting the proof of beneficial use for Blackhawk on the River.

Place of Use: There are no place of use overlaps for Water Right Permit No.65-22960.

Have conditions of permit approval been met? ☒ Yes ☐ No

RATE &/OR STORAGE RECOMMENDED FOR LICENSING

Description	Rate of Flow (cfs)		Storage (af)
Permit Amount	0.17	&/or	150.00
Beneficial Use Limit	0.17	&/or	150.00
System Measurement	1.93(theoretical)	&/or	173.00
Proof Fee Amount	2.00	&/or	200.00
Recommended Amount	0.17	&/or	150.00

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
DIVERSION TO STORAGE	01/01 to 12/31	0.170 CFS	N/A
AESTHETIC STORAGE	01/01 to 12/31	N/A	150.00 AF
AESTHETIC FROM STORAGE	01/01 to 12/31	N/A	150.00 AF
RECREATION STORAGE	01/01 to 12/31	N/A	150.00 AF
<u>Totals:</u>		0.170 CFS	150.00 AF

2. Recommended Amendments

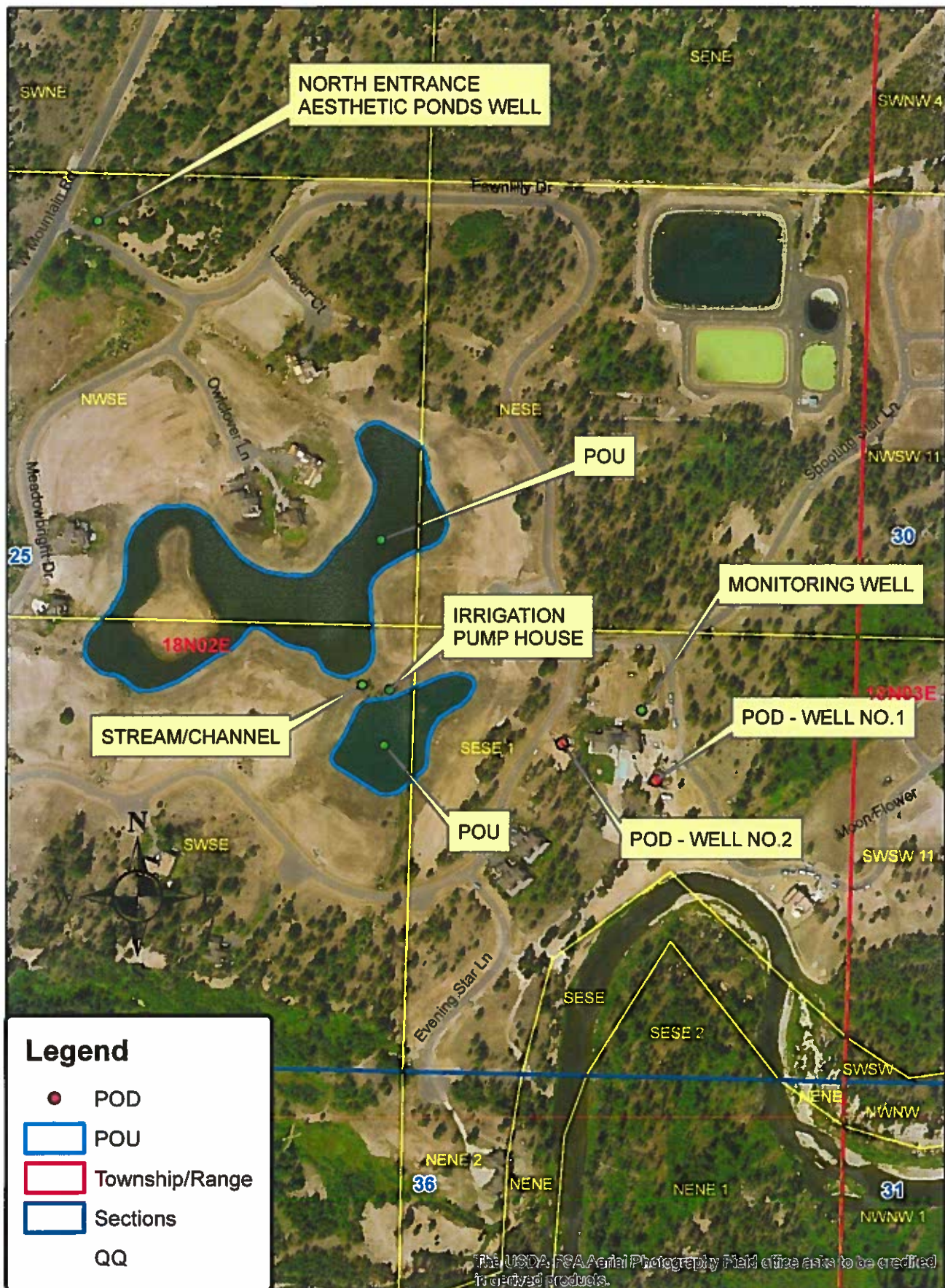
☒ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☒ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name _____ Date _____

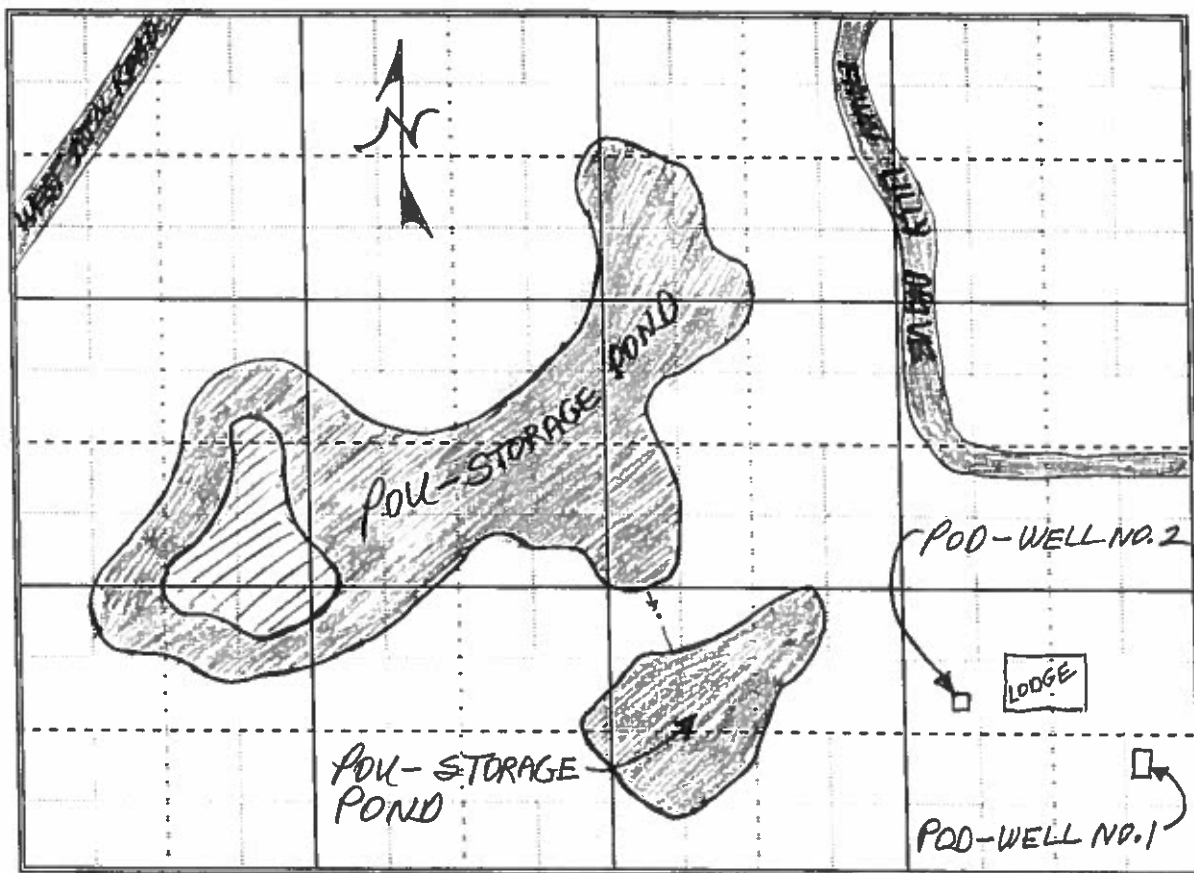
Reviewer _____ Date _____



The USDA, FSA Aerial Photography Field office asks to be credited in derived products.

0 137.5 275 550 825 1,100 Feet

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☐ see attached.



Scale: 1" = NTS

- ☐ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (required)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ Photo of diversion and system attached

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

834514

Office Use Only
Well ID No. 405053
Inspected by _____
Twp _____ Rge _____ Sec _____
1/4 _____ 1/4 _____ 1/4 _____
Lat: _____ : _____ : _____ Long: _____ : _____ : _____

1. WELL TAG NO. D 0039525
DRILLING PERMIT NO. 889533-
Water Right or Injection Well No. _____

2. OWNER:

Name SAGE SG, INC.
Address 1220 20th STREET SE
City SALEM State OR Zip 97302

3. LOCATION OF WELL by legal description: WELL #1

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 18 North ☒ or South ☐
Rge. 2 East ☒ or West ☐
Sec. 25 1/4 SE 1/4 SE 1/4
Gov't Lot _____ County VALLEY
Lat: _____ : _____ : _____ Long: _____ : _____ : _____
Address of Well Site LOOP ROAD City McCall

(Give at least name of road + Distance to Road or Landmark)
Lt. _____ Blk. _____ Sub. Name BLACKHAWK ON the RIVER

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation
☐ Thermal ☐ Injection ☒ Other FIRE PROTECTION

5. TYPE OF WORK check all that apply (Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☐ Air Rotary ☐ Cable ☐ Mud Rotary ☒ Other REVERSE

7. SEALING PROCEDURES

Seal Material	From	To	Weight	Volume	Seal Placement Method
1" BENTONITE CAP	0	271	18.750		DRY POUR
1" BENTONITE CAP	271	381	700		DRY POUR

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) _____

Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
12	+2	275	.375	STEEL	☒	☐	☒	☐
10	275	295	.365	STEEL	☒	☐	☒	☐
10	295	355	.365	STEEL	☒	☐	☒	☐
10	355	405	.365	STEEL	☒	☐	☒	☐

Length of Hole 405 Length of Tailpipe _____

Packer ☐ Y ☒ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation JOHNSON WIRE WRAP

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
295	345	.030		10	S.S.	☒	☐
355	365	.030		10	S.S.	☒	☐
405	455	.030		10	S.S.	☒	☐

10. FILTER PACK

Filter Material	From	To	Weight	Volume	Placement Method
CSST #6-9 SAND	271	495	36.000		DRY POUR

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

_____ ft. below ground Artesian pressure 4 lb.

Depth flow encountered 293 ft. Describe access port or control devices: _____

BLIND FLANGES

12. WELL TESTS:

☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Pumping Level	Time
1700	86'	74'	2 hrs

Water Temp. 52° Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
22	0	1	TOP SOIL		
	1	9	GRAVEL		
	9	56	MED-COARSE SAND, GRAVEL		
	56	61	BR + BLUE CLAY		
	61	65	SAND, GRAVEL		
	65	88	GRAY, BROWN CLAY LAYERS		
	88	115	MED SAND, FEA GRAVEL		
	115	120	SANDY BR CLAY		
	120	150	MED SAND, FEA GRAVEL		
	150	153	DARK BR CLAY		
	153	174	SAND, SM GRAVEL		
	174	193	BROWN + GRAY CLAY LAYERS		
	193	212	SAND, SM GRAVEL		
	212	222	TAN + BLACK CLAY		
	222	234	SAND, SM GRAVEL		
	234	255	BR CLAY		
	255	270	MED-COARSE SAND, FEA GRAVEL		
	270	293	BR CLAY + SAND LAYERS		
	293	323	FINE-MED SAND, FEA GRAVEL		
	323	326	BLUE CLAY		
	326	457	FINE-COARSE SAND w/ sm clay layers		
	457	472	GRAY CLAY		
	472	475	SAND, CLAY MIX		
	475	495	GRAY CLAY		

RECEIVED

SCANNED

AUG 31 2005

JAN 19 2006

WATER RESOURCES
WESTERN REGION

Completed Depth 455' (Measurable)

Date: Started 7-19-05 Completed 8-22-05

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name RIVERSIDE INC Firm No. 333

Principal Driller [Signature] Date 8-30-05

and Driller or Operator II _____ Date _____

Operator I [Signature] Date 8-30-05

Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

835302

Office Use Only		
Well ID No.	405812	
Inspected by		
Twp	Rge	Sec
1/4	1/4	1/4
Lat:	:	Long:
:	:	:

1. WELL TAG NO. D 0041733
 DRILLING PERMIT NO. 890321-835302
 Water Right or Injection Well No. 65-22945

2. OWNER:

Name SAGE SGI, LLC
 Address 1220 20th STREET SE
 City SALEM State OR Zip 97302

3. LOCATION OF WELL by legal description: WELL #2

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 18 North ☒ or South ☐
 Rge. 2 East ☒ or West ☐
 Sec. 25 1/4 SE 1/4 SE 1/4
 Gov't Lot _____ County VALLEY
 Lat: : : Long: : :
 Address of Well Site LOOP ROAD City _____

(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name BLACKHAWK ON the RIVER

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation
☐ Thermal ☐ Injection ☒ Other PWS, FIRE PROTECTION

5. TYPE OF WORK check all that apply

(Replacement etc.)

☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☐ Air Rotary ☐ Cable ☐ Mud Rotary ☒ Other REVERSE

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
1" BENTONITE	0	295	27,500	DRY POUR
1" BENTONITE	356	366	800	

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) _____

Was drive shoe seal tested? ☐ Y ☒ N How? _____

8. CASING/LINER: 20" X 10" REDUCER @ 285' to 288'

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
20"	285	375		STEEL	☒	☐	☒	☐
10"	321	365		STEEL	☒	☐	☒	☐
10"	351	376		STEEL	☒	☐	☒	☐

Length of Headpipe N/A Length of Tailpipe N/A

Packer ☐ Y ☒ N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method _____

Screen Type & Method of Installation JOHNSON WIRE WRAP

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
321	351	.030		10"	S.S.	☒	☐
376	456	.030		10"	S.S.	☒	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
#6-9 SAND	295	495	21,000	DRY POUR

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

_____ ft. below ground Artesian pressure 5.5 lb.

Depth flow encountered _____ ft. Describe access port or control devices:

8" FLANGE OFF SIDE w/BUTTERFLY VALVE

12. WELL TESTS:

☒ Pump ☐ Bailor ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
1990 gpm	114'	92'	5.5 hrs

Water Temp. _____ Bottom hole temp. _____

Water Quality test or comments: _____

Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Water

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Y	N
28"	0	2	TOP SOIL		
	2	119	SAND, GRAVEL, SM LAYERS CLAY		
	119	133	BRN CLAY		
	133	145	FINE-COARSE SAND		
	145	152	TAN CLAY		
	152	290	FINE-COARSE SAND, PEAGRAVEL		
	18	290	314 FINE-COARSE SAND, PEAGRAVEL, SM LAYERS CLAY		
		314	320 BLUE CLAY		
		320	352 FINE-MED SAND		
		352	375 GREY CLAY w/FINE SAND LAYERS		
		375	458 FINE-MED SAND, PEAGRAVEL		
		458	463 GREY CLAY		
		463	473 FINE-MED SAND		
		473	477 GREY CLAY		
		477	481 FINE-COARSE SAND		
		481	495 GREY CLAY		

RECEIVED

SCANNED

OCT 14 2005

FEB 19 2006

WATER RESOURCES
WESTERN REGION

Completed Depth 456' (Measurable)

Date: Started 8-19-05 Completed 9-17-05

14. DRILLER'S CERTIFICATION

I/we certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Russell Chris Firm No. 333

Principal Driller [Signature] Date 10-12-05

Driller or Operator II [Signature] Date _____

Operator I [Signature] Date 10-12-05

Principal Driller and Rig Operator Required.

Operator I must have signature of Driller/Operator II.

FIELD EXAM PHOTOS

Water Right Permit: 65-22945
PLS: SW1/4, SE1/4 Section 25, T.18N, R.02E
Field Examiner: RC

Field Exam Date: 10-16-14



Place of Use – View westerly of the large aesthetic/recreation storage pond. The large and small storage ponds are hydraulically connected by a stream/outlet channel which conveys water from the large pond to the small pond.



View of the concrete headwall and screened outlet located on the southeast bank of the large pond. Water is conveyed in the stream/channel to the small pond.



Place of Use: View southeasterly of the small storage pond and the stream/channel which conveys water from the large pond to the small pond.



View of the irrigation pump house located between the large and small storage ponds. Water is pumped from Well No.1 to the pump house for the pressurized irrigation system.



Point of Diversion: View westerly of the well/pump house for Well No.1. Well No.1 is the main well used to maintain the water surface elevations for the two storage ponds. A second well, Well No.2, is a backup groundwater source for the development.



Point of Diversion: View of Well No.1 and the 20" well casing, piping, and appurtenances. The well/pump house for Well No.1 includes the main discharge and distribution main lines to the development and to the pump house adjacent to the storage ponds.



Point of Diversion: View northwesterly of well/pump house for Well No.2. Water is pumped from Well No.2 to the distribution main lines in the well/pump house which houses Well No.1. Well No.2 is primarily used as a backup to Well No.1.



Point of Diversion: View of Well No.2 and the 12" steel casing in the small well/pump house west of the lodge building.



View inside of the irrigation pump house of the 3" supply line from Well No.1, the irrigation wet well, and the irrigation discharge main line. Water is pumped from the wet well to the storage ponds to replace the water losses due to evapotranspiration and leakage.



View of the control panel, 3" supply line from Well No.1, and the wet well located in the irrigation pump house.



State of Idaho

DEPARTMENT OF WATER RESOURCES

WESTERN REGION, 2735 Airport Way, Boise, Idaho 83705-5082

Phone: (208) 334-2190 FAX: (208) 334-2348 www.idwr.idaho.gov

C. L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

June 9, 2014

McCall Associates, LLC
P.O. Box 2084
McCall, ID 83638

Re: Water Right Permit No. 65-22960

I am writing to inform you of an existing water right permit which exists in the Blackhawk development in McCall, Idaho. A water right permit is not a water right, but a permit issued by the Department to allow the beneficial use of water as requested by the applicant. The beneficial use for the water right permit is to divert ground water from a well for two aesthetic and recreation storage ponds.

The water right permit was issued to the previous property owner, Sage SGI, LLC. I sent a letter in 2012 to schedule a field exam, but the letter was returned as undeliverable.

In order to proceed with obtaining a water right for the wildlife storage on your property, there are two options available which transfers the water right ownership to you. The first option would be to have Sage SGI, LLC, assign the permit to you. If you have contact information for Sage SGI, LLC, we can submit an 'Assignment of Permit' form to them for execution. The process fee for an 'Assignment of Permit' is \$25.00. If contact information is not attainable for Sage SGI, LLC, the next option would be to proceed with obtaining the water right under Sage SGI, LLC. Upon issuance of the water right, you will then need to execute a 'Change of Ownership'. This will officially transfer the water right ownership to you. The process fee for the 'Change of Ownership' is \$25.00.

The next step which needs to take place to proceed with the issuance of the water right is to conduct a field examination. The field examination is required to verify that the permit information is accurate, and if possible to obtain a water flow measurement. If the ground water is no longer being put to beneficial use for aesthetic and recreation storage, please let me know and we will proceed with relinquishment or voidance of the water right permit. However, if you are beneficially using the ground water for aesthetic and recreation storage, you are required to obtain a water right from our Department.

If you have any questions, you can contact me at the Idaho Department of Water Resources Western Region Office at (208) 334-2190, or by e-mail at rick.collingwood@idwr.idaho.gov.

Sincerely,

A handwritten signature in black ink that reads "Rick Collingwood". The signature is written in a cursive, flowing style.

Rick Collingwood, P.E.
Staff Engineer



State of Idaho

DEPARTMENT OF WATER RESOURCES

Western Region, 2735 Airport Way • Boise, Idaho 83705-5082

Phone: (208) 334-2190 • Fax: (208) 334-2348 • Web Site: www.idwr.idaho.gov

C. L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Interim Director

August 6, 2012

Sage SGI, LLC
C/O SIMA Muroff
P.O. Box 1110
McCall, ID 83638

RE: Scheduling Field Exam for Water Right Permit No. 65-22960

We are planning to **conduct water right field examinations** in the vicinity of the above-referenced permit **on August 29, 30, & 31, 2012**. An examination is needed to verify your water use in order to issue a water right license.

Please be advised that you will need to operate your system under normal operating conditions during the examination. The permit authorizes the diversion of 0.170 cfs of ground water for 150.00 AF of aesthetic and recreation storage.

In order to conduct your exam as efficiently as possible, we ask that you call this office to schedule a day and time convenient for you. **Please call me at 208-334-2190 by August 14, 2012, to conduct the exam on August 29, 30, or 31, 2012.** If there is a problem with scheduling or conducting the examination at this time, please let me know so we can reschedule or make other arrangements.

I appreciate your attention to this matter and I look forward to hearing from you.

Sincerely,

A handwritten signature in black ink that reads "Rick Collingwood". The signature is written in a cursive, flowing style.

Rick Collingwood, P.E.
Water Resource Agent, Sr.

APPENDIX A

WATER WELL CONSTRUCTION AND TESTING REPORT

WELL COMPLETION REPORT
BLACKHAWK ON THE RIVER
WEST MOUNTAIN ROAD
VALLEY COUNTY, IDAHO
PWS NO. 4430105

Prepared for

Sage SGI, LLC
c/o Sima Muroff
1220 20th Street SE
Salem, OR 97302

Prepared by

SPF Water Engineering, LLC
600 East River Park Lane
Boise, ID 83706

October 3, 2005



SPF

Water Engineering, LLC
water resource consultants

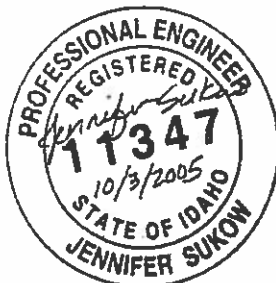


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INTRODUCTION AND BACKGROUND

Two new public water supply wells were constructed in 2005 for Sage SGI, LLC at Blackhawk on the River. Both wells were completed in August 2005. This report provides a summary of permitting, construction, and testing for both wells.

The wells are proposed to serve a new 132-lot residential subdivision (Blackhawk on the River) being developed by Sage SGI, LLC. Blackhawk on the River is located in Valley County, approximately three miles south and one mile west of McCall, Idaho. The project site is bounded by the North Fork Payette River on the east, and by West Mountain Road on the West (Figure 1). The well sites are located in the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 25, Township 18 North, Range 2 East. The wells are located approximately 280 feet apart. Each well is located on a separate designated well lot. Well locations are shown in Figure 2.

Idaho Department of Environmental Quality (DEQ) approval of the well site and well construction specifications was provided by letters dated August 9, August 10, and August 17, 2005. The wells will divert water as authorized by water right permit 65-22945, which was issued by the Idaho Department of Water Resources (IDWR) on August 22, 2005. Copies of the approval letters, water right permit, and drilling permits are included in Appendix A.

WELL 1 (WEST WELL) DRILLING AND CONSTRUCTION

Drilling of an exploratory boring was initiated in July 2005. Well construction and pump testing were completed in August 2005. Riverside, Inc. was the drilling and testing contractor.

Pilot Borehole Drilling and Geophysical Logging

Between July 19 and July 22, 2005, a pilot borehole was drilled to a depth of 495 feet using the reverse rotary method. The drilling fluid consisted of water from a shallow 6-inch diameter drill water supply well mixed with bentonite and well cuttings. The bentonite was used to seal off the borehole walls to prevent fluid loss.

Geophysical logs (16-inch and 64-inch normal resistivity, natural gamma, spontaneous potential, and temperature) were run to determination formation characteristics. Geophysical logging was performed by Strata Data, Inc. of Casper, Wyoming.

The driller's log indicates that significant clay layers are present at depths of approximately 65 to 88 feet, 174 to 193 feet, 212 to 222 feet, 234 to 255 feet, 347 to 353, and 475 to 495 feet below ground surface (BGS). Several thinner clay layers were also noted at various depths. The driller noted artesian pressure at depths of approximately 172 and 400 feet BGS. The resistivity log was consistent with the driller's log. Borehole temperature ranged from 54°F to 56.5°F.

Samples were collected from the drill cuttings at each material change and at approximate 10-foot intervals. Sieve analyses were conducted on samples from sand layers at depths of 315 to 325 feet and 415 to 425 feet BGS. A copy of the driller's log, geophysical logs, and results of sieve analyses are included in Appendix B.

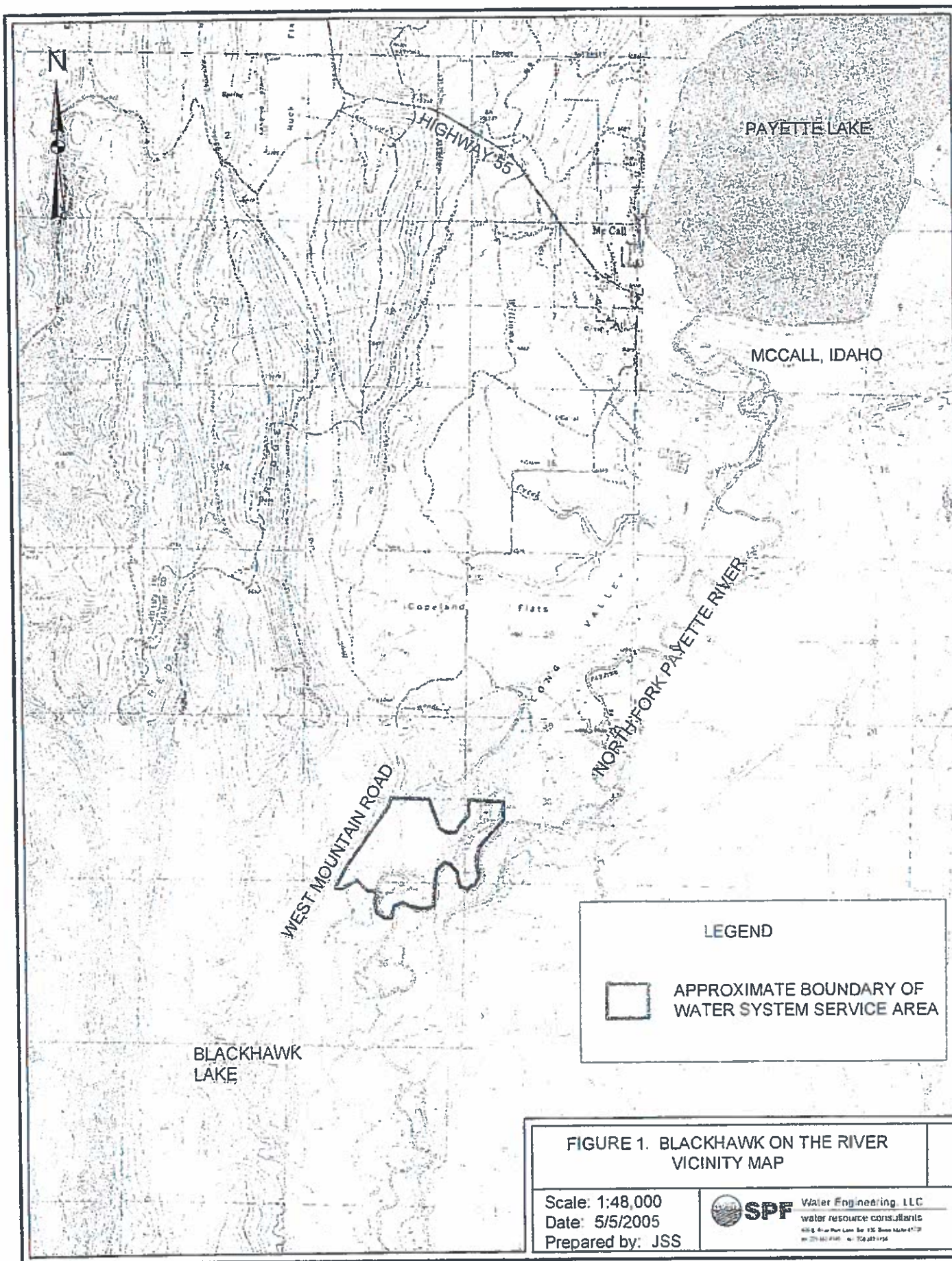


FIGURE 1. BLACKHAWK ON THE RIVER VICINITY MAP

Scale: 1:48,000
Date: 5/5/2005
Prepared by: JSS



Water Engineering, LLC
water resource consultants
400 S. 4th Street, Suite 100, Boise, Idaho 83721
PH: 208.343.1111 FAX: 208.343.1112

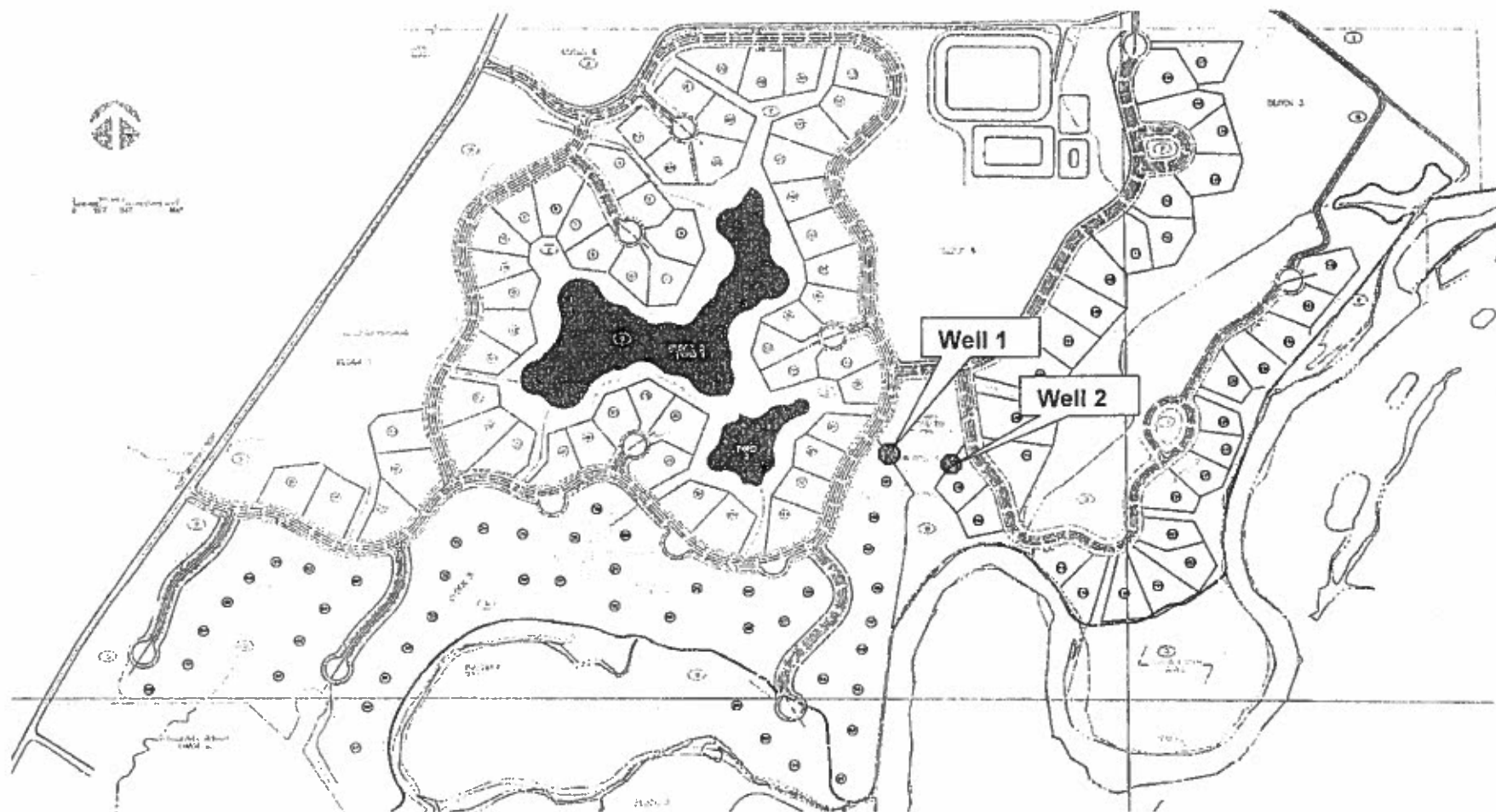


Figure 2. Approximate locations of Blackhawk on the River public water system wells.

Pilot Borehole Zone Testing

In order to select the optimum depth for well completion, zone pumping tests were conducted to obtain information on water quality and aquifer hydraulics. Based on interpretation of geophysical logs and well cuttings, three zones were selected for water quality and hydraulic testing. Zone tests generally consisted of placing approximately 15 feet of perforated pipe opposite the zone of interest, backfilling below and opposite the perforated pipe with gravel, and then sealing above the zone of interest with bentonite chips. A 5-hp submersible pump was then installed in the drill pipe for well development, hydraulic testing, and water quality sampling. The water samples collected represented generalized water quality at the depths of interest. Given the stratified nature of the formation and the need to develop a large section to achieve adequate well yield, quality of water from the finished well was anticipated to vary somewhat from the quality of water in the thinner zone-tested interval.

The following zones were tested: 415 to 430 feet (Zone 3), 335 to 350 feet (Zone 2), and 140 to 155 feet (Zone 1) BGS. The zone at 415 to 430 feet flowed at the surface without pumping at a rate of approximately 27 gpm. The zone test in this interval consisted of allowing the temporary well to flow at this rate overnight. Water samples were collected from the temporary well discharge after the well had been allowed to flow for approximately 26 hours. The zone tests at 335 to 350 feet and 140 to 155 feet were conducted by pumping the temporary well overnight at rates of approximately 40 gpm and 32 gpm, respectively. Water samples were collected near the end of test pumping, and water level recovery was measured for approximately 40 to 50 minutes. Following completion of recovery monitoring, the perforated pipe was pulled upward to the next zone for testing.

Water samples were analyzed in the field for pH, temperature, and conductivity, and were submitted to Analytical Laboratories, Inc. for analysis of selected inorganic constituents. Samples analyzed for dissolved arsenic, iron and manganese were filtered in the field to remove sediment that might influence sample results. Results of sample analyses and recovery tests are summarized in Table 1. High total iron and manganese concentrations in samples collected from Zones 1 and 2 resulted from the digestion of sediment in the samples.

TABLE 1
SUMMARY OF WELL 1 (WEST WELL) AQUIFER ZONE DATA

Parameter	Zone 1	Zone 2	Zone 3
Zone depth (feet BGS)	140-155	335-350	415-430
Static water level (feet BGS)	5	-5	-16
Transmissivity (gpd/ft)	2,100	5,500	5,500
Temperature (°F)	48	51	53
Specific conductance (μS)	101	123	126
pH	6.7	7.3	7.4
Total iron (mg/L)	3.29	53.4	0.33
Dissolved iron (mg/L)	0.17	0.38	0.33
Total manganese (mg/L)	<0.05	0.74	<0.05
Dissolved manganese (mg/L)	<0.05	0.07	<0.05
Total arsenic (mg/L)	<0.005	<0.005	<0.005
Dissolved arsenic (mg/L)	<0.005	<0.005	<0.005
Ammonia (mg/L as N)	<0.04	0.47	<0.04
Fluoride (mg/L)	0.10	0.13	0.15
TDS (mg/L)	82	136	62

Selection of the appropriate water-bearing zones to develop for the well was influenced, controlled or constrained by the following criteria.

1. Target well yield is 450 gpm or more for the west well and 1,000 gpm or more for the east well.
2. Maximum allowable concentration of arsenic is 0.010 mg/L.
3. Target maximum concentrations of iron and manganese are 0.30 mg/L and 0.05 mg/L, respectively.
4. Hydrogen sulfide odor is undesirable from an aesthetic standpoint. Chlorination may be effective for elimination of hydrogen sulfide.
5. Well construction costs increase with depth due to unit pricing for drilling and construction materials.
6. Hydraulic separation is needed between nearby surface water and land application site.

Based on the test data and the criteria listed above, zone 2 and zone 3 were selected for development. Although results of zone testing indicate that these zones have higher iron and manganese concentrations than zone 1, they have higher production potential. Zone 1 was not selected for development because of the lower estimated transmissivity and lower available drawdown. The lower zones are also expected have a higher factor of safety with respect to

separation from potential surficial sources of contamination (i.e. nearby surface water and land application site).

Final Design and Construction

The West Well borehole was reamed to 21-inch diameter from ground surface to approximately 460 feet. The well is constructed with 12-inch diameter casing to a depth of 275 feet, a 12-inch by 10-inch welded reducer, and 10-inch casing and screens to a depth of 455 feet. The well has three sections of 10-inch, 0.030 slot well screen, including a 50-foot section from 295 to 345 feet, a 10-foot section from 355 to 365 feet, and a 50-foot section from 405 to 455 feet. No. 6-9 Colorado Silica Sand filter pack was installed from 271 feet to 370 feet and 390 feet to 455 feet. An intermediate bentonite chip seal chip was installed between 370 and 390 feet to provide annular separation between zones 2 and 3.

A bentonite chip surface seal was installed to a depth of 271 feet. Installation of the surface seal was witnessed by Terry Scanlan, P.E., P.G. on August 11, 2005. Notes from inspection of the surface seal are included in Appendix C. An as-built construction schematic is provided as Figure 3.

WELL 1 (WEST WELL) TEST PUMPING

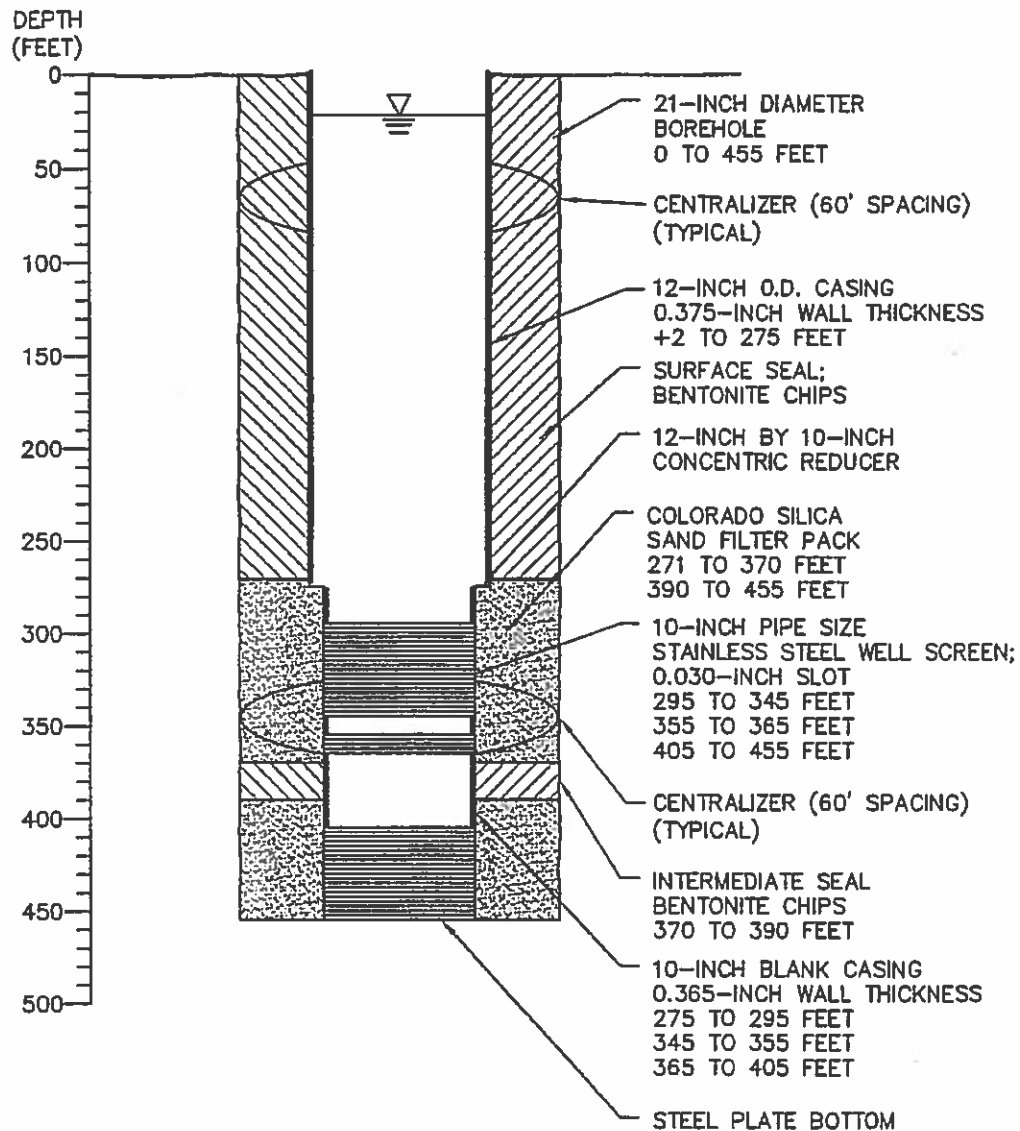
Well development and testing consisted of development pumping on August 20, 2005, step-rate test pumping on August 20, 2005, constant-rate test pumping on August 21, and recovery monitoring on August 21, 2005. Test data are provided in Appendix D.

Pumping equipment consisted of a diesel-driven line-shaft turbine pump set at a depth of 258 feet. Water levels were measured with an electric-line well sounder. The measuring point was 3.6 feet above ground level. Pumping rates were measured with 10-inch by 6-inch and 10-inch by 7-inch orifice weirs and manometer tube.

Development pumping consisted of pumping at rates of up to approximately 1,200 gpm followed by "rawhiding" the well (i.e. pump surging).

Step-rate testing was initiated following development pumping. The well was pumped for ½-hour to 1 hour intervals at approximate rates of 300 gpm, 500 gpm, 830 gpm, and 1,910 gpm. Specific capacities at the end of the steps ranged from 18 gpm/ft at 300 gpm to 23 gpm/ft at 1,910 gpm. These specific capacities suggest that the well is relatively efficient over the tested discharge range. The lower specific capacity calculated at the 300 gpm step suggests that flow may have been underestimated by the 10-inch by 6-inch orifice at this low rate.

At the beginning of the constant-rate test, a shut-in pressure of approximately 4 psi was observed at a pressure gage located approximately 2.8 feet above ground level. The equivalent static water level would be approximately 12 feet above ground surface. The constant-rate test consisted of pumping the well at a constant rate of approximately 1,690 gpm for 8 hours. Pumping water level at the end of the test was 74 feet below the measuring point (71 feet below ground level), and total drawdown was 83 feet.



SPF Water Engineering, LLC
water resource consultants

600 East River Park Lane, Suite 105, Boise, Idaho 83706

Tel (208) 383-4140 Fax (208) 383-4156

**BLACKHAWK ON THE RIVER
WATER SUPPLY WELL No. 1 (WEST WELL)
AS BUILT**

SCALE: NTS

DRAWN BY: SDC

FIGURE 3

Proj. #396.0030

Analyses of water-level responses for both the drawdown and recovery portions of the constant-rate test indicate the aquifer transmissivity is between approximately 30,000 and 50,000 gpd/ft. Based on the response to test pumping, the well appears to be capable of sustaining a pumping rate of 1,800 gpm for several months with a projected pumping water level of approximately 115 feet below ground surface. Projected pumping levels for Well 1 are provided below. Well interference from Well 2 will decrease the pumping water level in Well 1 if both wells are pumped simultaneously. Well interference effects are quantified later in this report.

TABLE 2
PROJECTED WELL 1 (WEST WELL) PUMPING WATER LEVELS

Pumping Rate (gpm)	West Well Short-Term Pumping Water Level (feet below ground surface)	West Well Long-Term Pumping Water Level (feet below ground surface)
0	-12	-12
100	-7	-5
200	-2	2
300	4	9
400	9	16
450	11	20
500	14	23
600	19	30
700	24	37
800	30	44
900	35	51
1000	40	58
1200	50	72
1400	61	87
1500	66	94
1600	71	101
1800	82	115
2000	92	129

WELL 1 (WEST WELL) WATER QUALITY

Water quality samples were collected near the end of the constant-rate pumping test on August 21, 2005 and submitted to Analytical Laboratories for analysis. Disinfection of the well was completed on September 21, 2005, by injection of liquid chlorine. On September 22, 2005, the well was flushed by artesian flow until a free chlorine residual was not detected. A water sample was collected at the end of the flushing period for bacterial analysis.

Water quality data indicate that the well water meets primary drinking water standards, and therefore is acceptable for public water system use. Laboratory reports are provided in Appendix E.

- After disinfection of the well, total coliform were absent.
- The arsenic concentration was below the method detection limit.
- The nitrate concentration was 1.6 mg/L, below the maximum contaminant level (MCL) of 10 mg/L.
- The fluoride concentration was 0.11 mg/L, below the secondary MCL of 2.0 mg/L.
- Gross alpha, radium 226, radium 228, and uranium were below the method detection limit. Gross beta was detected at 4.7 ± 1.4 pCi/L, below the MCL of 50 pCi/L.
- The manganese concentration was below the method detection limit.
- The iron concentration was 0.60 mg/L in the sample collected during the constant rate pumping test on August 21, 2005 and 0.25 mg/L in a sample collected from artesian flow on September 9, 2005. The flow rates during sample collection were approximately 1,700 gpm and 150 gpm, respectively. The secondary MCL for iron is 0.30 mg/L. Concentrations exceeding the secondary MCL may result in consumer complaints due to taste, staining, or odor. The higher iron concentration of 0.60 mg/L is associated with laboratory digestion of sand in the sample collected at 1,700 gpm, and is not representative of the iron concentration at the design pumping capacity, which is 450 gpm. The iron concentration of 0.25 mg/L in the sample collected at 150 gpm is expected to be more representative of the iron concentration in water that will be delivered to consumers.
- Hydrogen sulfide was below the method detection limit.
- The water has relatively low total dissolved solids (94 mg/L), and is moderately aggressive, with a Langlier index of -1.5.
- Specific conductance, temperature and pH were measured in the field at 130 μ S, 53°F, and 6.8, respectively. The pH measured in the laboratory was 7.2.
- Two water samples were analyzed in the laboratory for sand content. A sand concentration of 9 mg/L was measured in the sample collected during the constant rate pumping test on August 21, 2005. During this test the well was pumped at a rate of approximately 1,700 gpm. A sand concentration of 2 mg/L was measured in the sample collected from artesian flow on September 9, 2005. The artesian flow rate during collection of this sample was approximately 150 gpm. The design pumping capacity for this well is 450 gpm. Based on sampling results, the sand content is expected to be less than 5 mg/L at the design pumping capacity.

WELL 2 (EAST WELL) DRILLING AND CONSTRUCTION

Well 2 (East Well) drilling and testing was initiated in August 2005 and was completed in September 2005. Riverside, Inc. was the drilling and testing contractor. This well is located approximately 280 feet southeast of Well 1 (West Well).

Pilot Borehole Drilling

Between August 19 and 20, 2005, a pilot borehole was drilled to a depth of 495 feet using the reverse rotary method. The drilling fluid consisted of water from Well 1 mixed with bentonite and well cuttings. The bentonite was used to seal off the borehole walls to prevent fluid loss.

The driller's log indicates that the lithology is similar to that encountered in Well 1, with significant clay layers present at depths of approximately 119 to 133 feet, 145 to 152 feet, 267 to 277 feet, 294 to 306 feet, 314 to 320 feet, 352 to 360, and 481 to 495 feet below ground surface (BGS). Several thinner clay layers were also noted at various depths.

Because of the proximity to Well 1 and the similarity of the pilot borehole logs, geophysical logging and sieve analyses were not performed for Well 2.

Final Design and Construction

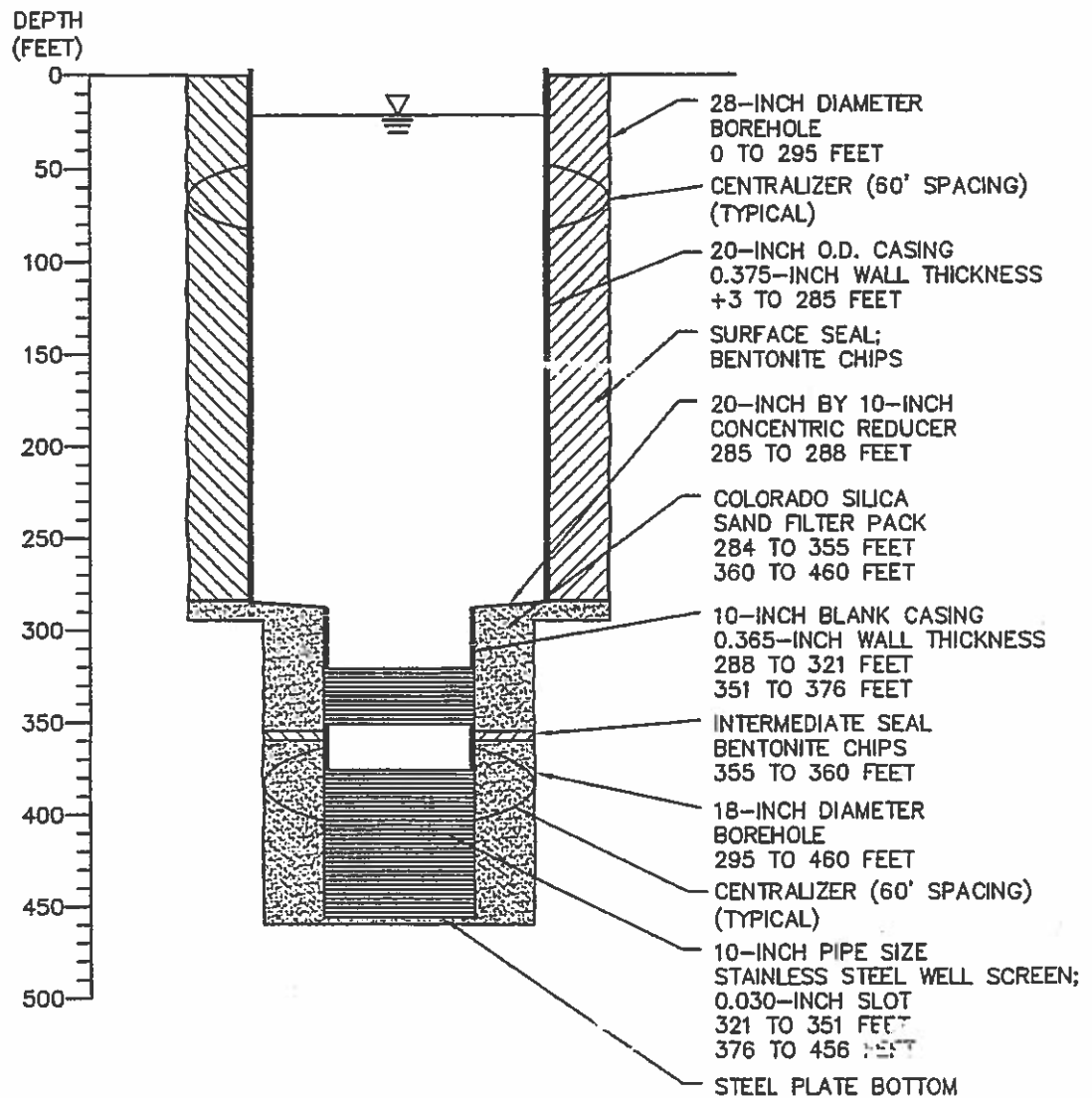
The pilot borehole was reamed to 28-inch diameter from ground surface to approximately 295 feet, and to 18-inch diameter from approximately 295 to 460 feet. The well is constructed with 20-inch diameter casing to a depth of approximately 285 feet, a 20-inch by 10-inch concentric reducer, and 10-inch casing and screens. Screened intervals are located from approximately 321 to 351 feet and 376 to 456 feet.

No. 6-9 Colorado Silica Sand filter pack extends from the bottom of the borehole to 284 feet, with the exception of an intermediate bentonite chip seal, which was installed at a depth of approximately 355 to 360 feet. A bentonite chip surface seal extends from 284 feet to ground surface. Installation of the surface seal was witnessed by Jennifer Sukow, P.E., on August 24, 2005. Notes from inspection of the surface seal are included in Appendix F. An as-built construction schematic is provided in Figure 4.

WELL 2 (EAST WELL) TEST PUMPING

Well development and testing consisted of air-lift development on August 25, 2005, development pumping on September 16, 2005, and a constant-rate pump test on September 17, 2005. Pump testing data are provided in Appendix G.

Pumping equipment consisted of a diesel-driven line-shaft turbine pump set at a depth 200 feet. Water levels were measured with an electric-line well sounder. The measuring point was 2.5 feet above ground level. Pumping rates were measured with a 10-inch by 8-inch orifice weir and manometer tube.



SPF Water Engineering, LLC
water resource consultants

600 East River Park Lane, Suite 105, Boise, Idaho 83706

Tel (208) 383-4140 Fax (208) 383-4156

**BLACKHAWK ON THE RIVER
WATER SUPPLY WELL No. 2 (EAST WELL)
AS BUILT**

SCALE: NTS

DRAWN BY: SDC

FIGURE 4

Proj. #396.0030

The static pressure at the beginning of the constant-rate test was approximately 8 psi, measured on a 100 psi pressure gauge located 3.7 feet above ground surface. The equivalent static water level was approximately 22 feet above ground surface. The pump test consisted of pumping the well at a constant rate of approximately 1,990 gpm for 5.25 hours. The pump test was discontinued after 5.25 hours, because of concerns about erosion and sediment control at the discharge site. Pumping water level at the end of the test was 94.1 feet below the measuring point (91.6 feet below ground level), and total drawdown was approximately 114 feet. Water level recovery was measured for 81 minutes after shutting off the pump.

Water levels in Well 1 were also measured during the Well 2 pumping test. The water level in Well 1 at the end of the pumping test was 10.8 feet below ground surface, and the drawdown was approximately 18.6 feet. Water level recovery in Well 1 was measured for 72 minutes after shutting off the pump.

Water-level responses in both wells during the drawdown and recovery portions of the constant rate test were analyzed to estimate aquifer transmissivity. Results are summarized in Table 3. Results from the pumping test at Well 1 are included for comparison. Pumping test results from both wells are significantly higher than the transmissivities estimated from the zone tests conducted in the pilot borehole at Well 1. The zone test results may have been lower because of the limited zone test screen interval combined with confinement of sand beds by thin clay interbeds and/or because the relatively thick drilling mud used to suppress the artesian pressure during drilling interfered with transmission of fluid into the temporary well constructed for the zone tests.

TABLE 3
TRANSMISSIVITY ESTIMATES FROM WELL 1 AND WELL 2 PUMPING TESTS

Pumping Test	Estimated Aquifer Transmissivity (gpd/ft)			
	Well 1 Drawdown Data	Well 1 Recovery Data	Well 2 Drawdown Data	Well 2 Recovery Data
Well 1 Constant Rate Pump Test	30,400	47,500	NA	NA
Well 2 Constant Rate Pump Test	36,000	75,000	26,800	34,800

Based on the response to test pumping, the well can likely produce a sustained pumping rate of 1,800 gpm for several months with a projected pumping water level of approximately 125 feet below ground surface. Projected pumping levels for Well 1 are provided in Table 4. Well interference from Well 1 will decrease the pumping water level in Well 2 if both wells are pumped simultaneously. Well interference effects are quantified later in this report.

TABLE 4
PROJECTED WELL 2 (EAST WELL) PUMPING WATER LEVELS

Pumping Rate (gpm)	East Well Short-Term Pumping Water Level (feet below ground)	East Well Long-Term Pumping Water Level (feet below ground)
0	-22	-22
100	-16	-14
200	-10	-6
300	-3	3
400	3	11
500	9	19
600	15	27
700	22	35
800	28	44
900	34	52
1000	40	60
1200	53	76
1225	54	78
1400	65	93
1500	71	101
1600	78	109
1800	90	125
2000	103	142

WELL 2 (EAST WELL) WATER QUALITY

Water quality samples were collected following air-lift development of the well on August 25, 2005, and submitted to Analytical Laboratories, Inc. for analysis. Disinfection of the well was completed on September 21, 2005, by injection of liquid chlorine. On September 22, 2005, the well was flushed by artesian flow until a free chlorine residual was not detected. A water sample was collected at the end of the flushing period for bacterial analysis.

As described below, the analytical results indicate that water quality from the well meets primary drinking water standards, and therefore is acceptable for public water system use. Laboratory reports and correspondence are provided as Appendix H.

- After disinfection of the well, total coliform was absent.
- The arsenic concentration was below the method detection limit.
- The nitrate concentration was 0.2 mg/L, below the maximum contaminant level (MCL) of 10 mg/L.
- The fluoride concentration was 0.13 mg/L, below the secondary MCL of 2.0 mg/L.

- Gross alpha, radium 226, and radium 228 were below the method detection limit. The uranium concentration was 2 µg/L, below the MCL of 30 µg/L. Gross beta was detected at 5.4 ± 1.4 pCi/L, below the MCL of 50 pCi/L.
- The manganese concentration was below the method detection limit.
- The iron concentration was 0.17 mg/L, below the secondary MCL of 0.30 mg/L.
- Hydrogen sulfide was below the method detection limit.
- The water has relatively low total dissolved solids (100 mg/L), and is moderately aggressive, with a Langlier index of -1.34.
- Specific conductance, temperature and pH were measured in the field at 133 µS, 53°F, and 7.5, respectively. The pH measured in the laboratory was 7.2.
- Sand content was measured during the constant rate (1,990 gpm) pump test on September 17, 2005 using a Rossum centrifugal sand tester. Sand was not measurable at the end of a 10-minute test, indicating that the sand content was less than 0.5 mg/L. Laboratory analysis of a water sample collected immediately following the Rossum sand test indicated that the sand content was 1 mg/L.

WELL INTERFERENCE EFFECTS

Both wells are completed in the same aquifer and are located approximately 280 feet apart. Well interference effects are estimated from measurements collected from Well 1 during the constant rate pumping test of Well 2. If both wells are pumped simultaneously, the additional drawdown due to well interference should be added to the pumping water levels presented in Tables 2 and 4. Estimates of the additional drawdown in one well due to pumping of the other well are provided in Table 5.

TABLE 5
PROJECTED ADDITIONAL DRAWDOWN DUE TO WELL INTERFERENCE

Pumping Rate (gpm)	Well Interference Effect Short-Term Additional Drawdown (feet)	Well Interference Effect Short-Term Additional Drawdown (feet)
0	0	0
100	1	3
200	3	6
300	4	8
400	5	11
450	6	12
500	7	14
600	8	17
700	9	19
800	10	22
900	12	25
1000	13	28
1200	16	33
1225	16	34
1400	18	39
1500	20	41
1600	21	44
1800	24	50
2000	26	55

DISCUSSION

Pump testing results indicate that each well could potentially be equipped with pumps rated to produce approximately 1,800 gpm. Operated as redundant sources of supply, each well could produce approximately 1,800 gpm. Because of well interference effects, a realistic long-term capacity of the two wells operated simultaneously would be expected to be less than 3,200 gpm, with pumping water levels of approximately 150 feet below ground surface.

Design pump capacities for the Blackhawk on the River subdivision are 450 gpm for Well 1 (West Well) and 1,225 gpm for Well 2 (East Well). Recommended pump settings for each pump are a minimum of 50 feet below the anticipated maximum pumping levels listed in Tables 2, 4, and 5 for the design pump capacities. These setting depths are expected to provide adequate submergence in the event of declining well efficiency.

Water quality from both wells is adequate for public water system purposes. Iron concentration data collected from the completed wells and during zone testing indicate that the iron concentration is approximately ± 0.1 mg/L of the secondary MCL. Manganese concentrations are below the method detection limit. Sequestering is not recommended at this time.

The wells were constructed without significant deviation from the approved plans and specifications.

APPENDIX A

NO. 65-22945

Maximum Diversion Rate: 5.00 CFS

has applied for a permit to appropriate water from:

and a permit is APPROVED for development of water as follows:

LOCATION OF POINTS OF DIVERSION:

LOCATION OF POINTS OF DIVERSION:		
GROUND WATER	SW¼NW¼	Sec. 12, Twp 17N, Rge 02E, B.M., VALLEY County
GROUND WATER	NW¼SW¼	Sec. 12, Twp 17N, Rge 02E, B.M., VALLEY County
GROUND WATER	SE¼SW¼	Sec. 25, Twp 18N, Rge 02E, B.M., VALLEY County
GROUND WATER	SW¼SE¼	Sec. 25, Twp 18N, Rge 02E, B.M., VALLEY County
GROUND WATER	L1 (SE¼SE¼)	Sec. 25, Twp 18N, Rge 02E, B.M., VALLEY County
GROUND WATER	L1 (SE¼SE¼)	Sec. 25, Twp 18N, Rge 02E, B.M., VALLEY County
GROUND WATER	NE¼NW¼	Sec. 36, Twp 18N, Rge 02E, B.M., VALLEY County
GROUND WATER	L11 (SW¼SW¼)	Sec. 30, Twp 18N, Rge 03E, B.M., VALLEY County

PLACE OF USE: FIRE PROTECTION & DOMESTIC

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
17N	02E	1						X	X			X	X						
17N	02E	2			X	X									X			X	
17N	02E	11	X																
17N	02E	12					X	X			X								
18N	02E	25								X				X	X	X		X	L1
18N	02E	36	X	X			X	X											
18N	03E	30	L2	L2				X			X	X							
18N	03E	31					X				X	X							

State of Idaho
Department of Water Resources

Permit to Appropriate Water

NO. 65-22945

PLACE OF USE: IRRIGATION

Twp Rge Sec	NE				NW				SW				SE				Totals
	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
17N 02E 1					2.0	2.0			2.0	10.0							16.0
17N 02E 2			5.0	3.0		L 4							3.0			5.0	16.0
17N 02E 11	5.0																5.0
17N 02E 12					7.0	10.0			10.0								27.0
18N 02E 25									2.0			10.0	5.0	18.0	20.0	5.0	60.0
18N 02E 36	2.0	1.0			2.0	1.0										L 1	6.0
	L 2	L 2															
18N 03E 30							2.0			5.0	4.0						11.0
							L 4			L 11	L 11						
18N 03E 31						1.0											1.0
						L 1											

Total Acres: 142

CONDITIONS OF APPROVAL

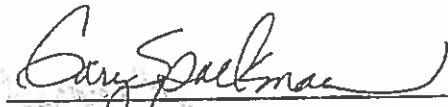
1. Proof of application of water to beneficial use shall be submitted on or before August 01, 2010.
2. Subject to all prior water rights.
3. Project construction shall commence within one year from the date of permit issuance and shall proceed diligently to completion unless it can be shown to the satisfaction of the Director of the Department of Water Resources that delays were due to circumstances over which the permit holder had no control.
4. Right holder shall comply with the drilling permit requirements of Section 42-235, Idaho Code and applicable Well Construction Rules of the Department.
5. This right authorizes development of four points of diversion within the tracts identified.
6. Domestic use is for 250 homes. Irrigation of lawns, gardens and landscaping associated with the homes is authorized under the irrigation component of this right.
7. Place of use is for 137 lots within the North Phase of Blackhawk Ranch, 40 lots within the South Phase of Blackhawk Ranch, 34 residential lots and 39 cabins within Blackhawk Lake Subdivisions.
8. The right holder shall make full beneficial use of all surface water rights available to the right holder for irrigation of the lands authorized to be irrigated under this right. The right holder shall limit the diversion of ground water under this right to those times when the surface water supply is not available or the surface water supply is not reasonably sufficient to irrigate the place of use authorized under this right.
9. This right when combined with all other rights shall provide no more than 0.02 cfs per acre nor exceed a combined annual maximum diversion volume of 426.0 af at the field headgate for the irrigation of the lands above.
10. If the surface water right(s) appurtenant to the place of use is sold, transferred, leased or used on any other place of use, this right to divert groundwater shall not be used for irrigation purposes without an approved transfer pursuant to Section 42-222, Idaho Code, or approval of the Department if a transfer is not required.

State of Idaho
Department of Water Resources
Permit to Appropriate Water

NO. 65-22945

11. This right when combined with all other rights shall provide no more than 3.0 afa per acre at the field headgate for irrigation of the lands above.
12. Water shall not be diverted for fire protection use under this right except to fight or repel an existing fire.
13. After specific notification by the Department, the right holder shall install a suitable measuring device or shall enter into an agreement with the Department to determine the amount of water diverted from power records and shall annually report the information to the Department.
14. The Director retains jurisdiction to require the right holder to provide purchased or leased natural flow or stored water to offset depletion of Lower Snake River flows if needed for salmon migration purposes. The amount of water required to be released into the Snake River or a tributary, if needed for this purpose, will be determined by the Director based upon the reduction in flow caused by the use of water pursuant to this permit.

This permit is issued pursuant to the provisions of Section 42-204, Idaho Code. Witness the signature of the Director, affixed at Boise, this 22nd day of August, 20 05.


FOR KARL J. DREHER, Director

Drilling Permit No. 889533-834514
Drilling Permit I.D. Tag No. D0039525
Water Right Permit No. 65-22945 (pending)
Injection Permit No. _____

State of Idaho
Department of Water Resources
APPLICATION FOR DRILLING PERMIT
(FOR THE CONSTRUCTION OF A WELL)

RECEIVED

JUN 29 2005

WATER RESOURCES
WESTERN REGION

1. Owner (please print): Sage SG, Inc.
2. Mailing Address: 1220 20th Street SE
City: Salem State: OR Zip Code: 97302 Telephone (503) 999-3333
3. Proposed Well Location: Twp. 18N, Rge. 2E, Sec. 25, 1/4 SE 1/4 SE 1/4;
Gov't Lot No. _____ County Valley Lat. _____: _____: _____ Long. _____: _____: _____
Street Address of Well Site Loop Road City _____
Give at least name of road + Distance to Road or Landmark
Lot, block and subdivision Blackhawk on the River Subdivision

4. Proposed Use of Well:

- ☐ DOMESTIC: The use of water for homes, organization camps, public campgrounds, livestock and for any other purpose in connection therewith, including irrigation of up to 1/2 acre of land, if the total use is not in excess of 13,000 gpd; or any other uses, if the total use does not exceed a diversion rate of 0.04 cfs and a diversion volume of 2500 gpd.

Domestic does not include water for multiple ownership subdivisions, mobile home parks, commercial or business establishments, unless the use does not exceed a diversion rate of 0.04 cfs and a diversion volume of 2500 gpd.

NON-DOMESTIC: ☒ Irrigation ☐ Municipal ☐ Industrial
☐ Livestock ☐ Test ☒ Other Fire Protection
Type _____ Number Hds _____ (Describe)

☐ INJECTION

☐ MONITORING: A well bore schematic and map is required for each blanket permit. No. of proposed wells: _____

5. Well Construction Information:

A. ☒ New well ☐ Modify ☐ Replace
B. Proposed Casing Diameter 16-inch Proposed Maximum Depth 500 feet
C. Anticipated bottom hole temperature:
☒ 85 F or less ☐ 85 F to 212 F ☐ 212 F. or more
(Cold Water Well) (Low Temp. Geo. Well) (Geothermal Well)

6. Construction Start Date: June 27, 2005

7. Anticipated Well Driller: Riverside, Inc. Driller's Lic. No. 333

NOTE: The actual well driller must be identified prior to drilling.

8. Applicant's Signature: [Signature] Date 6-22-05

Address (if different than owner): same as owner

City: _____ State: _____ Zip Code: _____ Telephone: _____

Title: _____
(Owner, Firm Representative, Other)

ACTION OF . DEPARTMENT OF WATER RESOURCES

This Permit is Approved Date 7-11-05

If approved, this permit authorizes the construction or modification of a well subject to the following conditions. READ CAREFULLY!

GENERAL CONDITIONS:

1. This drilling permit is valid for two (2) months from the above approval date for the start of construction and is valid for one (1) year from the approval date for completion of the well unless an extension has been granted.
2. This permit does not constitute an approval of the District Health Department or the Idaho Department of Health and Welfare, which may be required before construction of the well. All wells must be drilled a minimum distance of 100 feet from a drain field. Domestic and Public Water Supply wells must be drilled a minimum of 50 feet and 100 feet respectively from a septic tank.
3. The well shall be constructed by a driller currently licensed in the State of Idaho who must maintain a copy of the drilling permit at the drilling site.
4. Approval of this drilling permit does not authorize trespass on the land of another party.
5. This permit does not constitute other local, county, state or federal approvals, which may be required for construction of a well.
6. This drilling permit does not represent a right to divert and use the water of the State of Idaho.
7. If a bottom hole temperature of 85 or greater is encountered, well construction shall cease and the well driller and the well owner shall contact the Department immediately.
8. Idaho Code, S 55-2201 - 55-2210 requires the applicant and/or his contractors to contact "Digline" (DigLine is a one-call center for utility notification) not less than 2 working days prior to the start of any excavation for this project. The "DigLine" Number for your area is 1-800-342-1585.
9. Please be advised that this drilling permit should be considered and treated as a preliminary permit. If you are in disagreement with this preliminary permit you have fourteen (14) days of the service date of this permit to petition the Department for reconsideration pursuant to Section 67-5243, Idaho Code.
10. The well tag for the drilling permit/start card shall be securely and permanently attached to the well casing through welding or by the use of four closed end domed stainless steel pop rivets. The tag attachment will be done at the time of completion of the well, and prior to removing the drill rig from the drill site.

SPECIFIC CONDITIONS:

Well construction shall be consistent with plans & specs as approved by IDEQ. A proposal for final well design and completion of this well shall be submitted for IDWR review after drilling of the pilot hole.



Signature of Authorized Department Representative



Title

Receipt No. W033112 Received by DB Fee \$200- Date 6/29/05

EXTENSION OF DRILLING PERMIT

Extension approved by _____ Approval Date _____

This extension expires: _____

APPLICANT'S COPY

E Form 235-1

1/31/03

RECEIVED

AUG 10 2005

WATER RESOURCES
WESTERN REGION

Drilling Permit No. 890321-835302
Drilling Permit I.D. Tag No. DOO41733
Water Right Permit No. 65-22945 (pending)
Injection Permit No. _____

State of Idaho

well #2

Department of Water Resources

APPLICATION FOR DRILLING PERMIT
(FOR THE CONSTRUCTION OF A WELL)

1. Owner (please print): Sage SGI, LLC

2. Mailing Address: 1220 20th Street SE

City: Salem State: OR Zip Code: 97302 Telephone (503) 999-3333

3. Proposed Well Location: Twp. 18N Rge. 2E Sec. 25 1/4 SE 1/4 SE 1/4

Gov't Lot No. 1 County Valley Lat. _____ Long. _____

Street Address of Well Site Loop Road City _____

Give at least name of road + Distance to Road or Landmark

Lot, block and subdivision Blackhawk on the River Subdivision

4. Proposed Use of Well:

- ☐ DOMESTIC: The use of water for homes, organization camps, public campgrounds, livestock and for any other purpose in connection therewith, including irrigation of up to 1/2 acre of land, if the total use is not in excess of 13,000 gpd; or any other uses, if the total use does not exceed a diversion rate of 0.04 cfs and a diversion volume of 2500 gpd.

Domestic does not include water for multiple ownership subdivisions, mobile home parks, commercial or business establishments, unless the use does not exceed a diversion rate of 0.04 cfs and a diversion volume of 2500 gpd.

NON-DOMESTIC: ☒ Irrigation ☐ Municipal ☐ Industrial
☐ Livestock ☐ Test ☒ Other PWS: fire protection
Type _____ Number Hd _____

☐ INJECTION

☐ MONITORING: A well bore schematic and map is required for each blanket permit. No. of proposed wells:

5. Well Construction Information:

A. ☒ New well ☐ Modify ☐ Replace

B. Proposed Casing Diameter 16-inch Proposed Maximum Depth 500 feet

C. Anticipated bottom hole temperature:

☒ 85 F or less ☐ 85 F to 212 F ☐ 212 F. or more
(Cold Water Well) (Low Temp. Geo. Well) (Geothermal Well)

6. Construction Start Date: August 15, 2005

7. Anticipated Well Driller: Riverside, Inc. Driller's Lic. No. 333

NOTE: The actual well driller must be identified prior to drilling.

8. Applicant's Signature: [Signature] Date 8-9-05

Address (if different than owner): same as owner

City: _____ State: _____ Zip Code: _____ Telephone: _____

Title: _____

(Owner, Firm Representative, Other)

ACTION OF DEPARTMENT OF WATER RESOURCESThis Permit is Approved Date 8-11-05

If approved, this permit authorizes the construction or modification of a well subject to the following conditions. READ CAREFULLY!

GENERAL CONDITIONS:

1. This drilling permit is valid for two (2) months from the above approval date for the start of construction and is valid for one (1) year from the approval date for completion of the well unless an extension has been granted.
2. This permit does not constitute an approval of the District Health Department or the Idaho Department of Health and Welfare, which may be required before construction of the well. All wells must be drilled a minimum distance of 100 feet from a drain field. Domestic and Public Water Supply wells must be drilled a minimum of 50 feet and 100 feet respectively from a septic tank.
3. The well shall be constructed by a driller currently licensed in the State of Idaho who must maintain a copy of the drilling permit at the drilling site.
4. Approval of this drilling permit does not authorize trespass on the land of another party.
5. This permit does not constitute other local, county, state or federal approvals, which may be required for construction of a well.
6. This drilling permit does not represent a right to divert and use the water of the State of Idaho.
7. If a bottom hole temperature of 85 or greater is encountered, well construction shall cease and the well driller and the well owner shall contact the Department immediately.
8. Idaho Code, § 55-2201 - 55-2210 requires the applicant and/or his contractors to contact "Digline" (Dig Line is a one-call center for utility notification) not less than 2 working days prior to the start of any excavation for this project. The "Dig Line" Number for your area is 1-800-342-1585.
9. Please be advised that this drilling permit should be considered and treated as a preliminary permit. If you are in disagreement with this preliminary permit you have fourteen (14) days of the service date of this permit to petition the Department for reconsideration pursuant to Section 67-5243, Idaho Code.

10. The well tag for the drilling permit/start card shall be securely and permanently attached to the well casing through welding or by the use of four closed end domed stainless steel pop rivets. The tag attachment will be done at the time of completion of the well, and prior to removing the drill rig from the drill site.

SPECIFIC CONDITIONS:

Well construction shall be consistent with plans & Spec.
Approved by IDEQ.
Construction of this well shall not start until the
6" temp. well (D0039524) has been properly plugged.


Signature of Authorized Department Representative
Sr WR Agent
TitleReceipt No. W033266 Received by DS Fee \$200 - Date 8/10/05

EXTENSION OF DRILLING PERMIT

Extension approved by _____ Approval Date _____

This extension expires: _____



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 N. Orchard • Boise, Idaho 83706 • (208) 373-0550

Dirk Kempthorne, Governor
Toni Hardesty, Director

August 9, 2005

Sima Muroff
Blackhawk Holdings
301 East Lake Street
McCall, Idaho 83638

RE: Blackhawk on the River, Well 1, PWS 4430105 (McCall, Valley County)
A. Well Site Conditional Approval
B. Groundwater Under Direct Influence of Surface Water (GWUDI) Determination
C. Future Federal Regulations

Dear Mr. Muroff:

I. WELL SITE CONDITIONAL APPROVAL

Your consultants have submitted the required information on the well site and have certified that the site is generally acceptable for a new Public Water System well. This includes the original submittal dated May 20, 2005 and the supplemental information dated July 28, 2005. We have reviewed that information and are approving the site per the *Idaho Rules for Public Drinking Water Systems (IRPDWS)*, Section 550.03.n, subject to the conditions below.

II. STANDARD CONDITIONS

- A. The approval is for the well site only.
- B. New source monitoring will need to be collected by the owner, tested by a certified laboratory, and approved by DEQ; before the water may be distributed to the public. The detailed list of parameters that need to be tested will be included in the well construction approval letter.

III. PROJECT SPECIFIC CONDITIONS

- A. This approval is for Well 1 well site only. Approval of related facilities such as the construction specification and associated well house and equipment are still required.
- B. Submit final documentation of the dedicated well lot meeting IRPDWS requirements.

IV. GROUNDWATER UNDER DIRECT INFLUENCE OF SURFACE WATER (GWUDI)

Idaho is required by federal drinking water regulations to determine whether groundwater sources serving public drinking water systems are directly influenced by surface water. "Groundwater Under the Direct Influence of Surface Water" (GWUDI) may contain disease causing organisms which are normally found only in surface water, and may require additional treatment including filtration and/or disinfection and contact time.

From our review of the materials submitted for this project, we have classified this source as:

X	"Groundwater"	No further action is necessary
	"Potentially Groundwater Under Direct Influence of Surface Water"	Although unlikely, this source could be shown in the future to be vulnerable to biological contamination. In that case, treatment and additional monitoring requirements would be necessary to protect public health.
	"Groundwater Under Direct Influence of Surface Water".	This source is subject to biological contamination and treatment is required as discussed below:

Please call Sandy Hemenway of this office 373-0550 with any questions on the classification.

V. COMMENTS FOR YOUR CONSIDERATION

You should be aware that future federal regulations could affect the design and operation of water systems utilizing groundwater sources.

- A. The proposed "Groundwater Disinfection Rule" will evaluate groundwater sources that are not under the direct influence of surface water, for vulnerability to microbial contamination. If a source is found to be vulnerable, it may be necessary to install disinfection and contact time prior to distribution to the first customer. To provide for that possibility, the planning and layout of the facility needs to include an evaluation of the how the system could be modified to supply an equivalent 30 minute contact time with a minimum residual of 0.2 parts per million of free chlorine.
- B. The proposed "Disinfectants-Disinfection By-Products Rule" will regulate certain compounds that are formed when disinfectants combine with certain naturally occurring, organic constituents in water. Both these rules are still under development and are subject to change.



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 N. Orchard • Boise, Idaho 83706 • (208) 373-0550

Dirk Kempthorne, Governor
Toni Hardesty, Director

August 10, 2005

Sima Muroff
Blackhawk Holdings
301 East Lake Street
McCall, ID 83638

RE: Blackhawk on the River, Well 1, PWS# 4430105 (McCall, Valley County)
Well Construction Approval

Dear Mr. Muroff:

The plans and specifications for the subject project appear to meet State of Idaho standards and are approved based on the conditions listed below.

I. STANDARD CONDITIONS

- A. The standard conditions on the Department of Environmental Quality (DEQ) review stamp are part of this approval. Supporting reports or documents are considered to be part of the approved documents.
- B. No work may begin until a copy of this approval letter and the approved plans and specifications are delivered to and kept on the job site. Approval conditions must be met and you, as the project owner, must ensure that the contractor, inspecting, and certifying engineer are aware of these conditions.
- C. This approval will be voided if: 1) construction is not completed by August 10, 2006; 2) the project is improperly constructed, operated, or maintained; or 3) the project fails to function as intended.
- D. The Land Developer or Owner or his representative shall ensure that a professional engineer with SPF Water Engineering, LLC provides supervision of construction inspection sufficient to ensure the project is built in substantial accordance with the approved plans. DEQ approval, prior to construction, is required for any substantial deviations from the approved plans and specifications. Verbal approvals, if any, shall be documented by the professional engineer in a cover letter submitted with the project record drawings.
- E. Within thirty days (30) after completion of construction, the Land Developer or Owner or his representative shall provide DEQ with one of the following documents certified by the professional engineer: 1) record drawings with a cover letter, or 2) a letter of certification stating that the project was installed in substantial accordance with the approved plans.

- F. The Idaho Department of Water Resources (IDWR) Application for Drilling Permit contains conditions that are an essential part of the plans and specifications. A copy of the Application for Drilling Permit and the DEQ-approved plans and specifications must be maintained at the drill site.
- G. Before drinking water may be distributed to the public:
 - 1. Water samples must be collected and tested by a certified laboratory. Please contact Sandy Hemenway at 373-0550 regarding the parameters that need to be analyzed for. The results of the testing must be sent to Ms. Hemenway for review and approval.
 - 2. DEQ will advise you if a sanitary survey will be conducted prior to serving water from this well to the public.

II. PROJECT SPECIFIC CONDITIONS:

- A. This approval is for the well construction only. Other water system components such as the Well 2 site evaluation, Well 2 construction specification, and the well house and equipment submittals still require DEQ review and approval.
- B. DEQ comments on the Demonstration of Technical, Financial, and Managerial Capacity for the Blackhawk on the River public drinking water system were sent in a letter dated August 3, 2005. These comments must be addressed and approved by DEQ prior to serving water to the public from this well.

Please call me with any questions at 373-0244 or via e-mail at Paul.Wakagawa@deq.idaho.gov

Sincerely,



Paul S. Wakagawa, P.E.
Technical Engineer

Enclosures: Set of Approved and Stamped Plans and Specifications

cc: Charles W. Ariss, P.E., Regional Engineering Manager, Boise Regional Office
Jennifer Sukow, P.E., SPF Water Engineering (w/approved and stamped set of plans)
David Powell, P.E., RiveRidge Engineering, 405 W. Myrtle St., Boise 83702
Rob Whitney, Idaho Department of Water Resources
Sandy Hemenway, DEQ Boise Office
Source File 1, Blackhawk on the River, Well 1, PWS# 4430105, Manager's File, Reading File



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 N. Orchard • Boise, Idaho 83706 • (208) 373-0550

Dirk Kempthorne, Governor
Toni Hardesty, Director

August 17, 2005

Sima Muroff
Blackhawk Holdings
301 East Lake Street
McCall, Idaho 83638

RE: Blackhawk on the River, Well 2, PWS 4430105 (McCall, Valley County)
A. Well Site Conditional Approval
B. Groundwater Under Direct Influence of Surface Water (GWUDI) Determination
C. Future Federal Regulations

Dear Mr. Muroff:

I. WELL SITE CONDITIONAL APPROVAL

Your consultants have submitted the required information on the well site and have certified that the site is generally acceptable for a new Public Water System well. This includes the original submittal dated May 20, 2005 and the supplemental information dated July 28, 2005. We have reviewed that information and are approving the site per the *Idaho Rules for Public Drinking Water Systems* (IRPDWS), Section 550.03.n, subject to the conditions below.

II. STANDARD CONDITIONS

- A. The approval is for the well site only.
- B. New source monitoring will need to be collected by the owner, tested by a certified laboratory, and approved by DEQ; before the water may be distributed to the public. The detailed list of parameters that need to be tested will be included in the well construction approval letter.

III. PROJECT SPECIFIC CONDITIONS

- A. This approval is for Well 2 well site only. Approval of related facilities such as the construction specification and associated well house and equipment are still required.
- B. Submit final documentation of the dedicated well lot meeting IRPDWS requirements.

IV. GROUNDWATER UNDER DIRECT INFLUENCE OF SURFACE WATER (GWUDI)

Idaho is required by federal drinking water regulations to determine whether groundwater sources serving public drinking water systems are directly influenced by surface water. "Groundwater Under the Direct Influence of Surface Water" (GWUDI)

may contain disease causing organisms which are normally found only in surface water, and may require additional treatment including filtration and/or disinfection and contact time.

We will classify this source after review of the well log.

V. COMMENTS FOR YOUR CONSIDERATION

You should be aware that future federal regulations could affect the design and operation of water systems utilizing groundwater sources.

- A. The proposed "Groundwater Disinfection Rule" will evaluate groundwater sources that are not under the direct influence of surface water, for vulnerability to microbial contamination. If a source is found to be vulnerable, it may be necessary to install disinfection and contact time prior to distribution to the first customer. To provide for that possibility, the planning and layout of the facility needs to include an evaluation of the how the system could be modified to supply an equivalent 30 minute contact time with a minimum residual of 0.2 parts per million of free chlorine.
- B. The proposed "Disinfectants-Disinfection By-Products Rule" will regulate certain compounds that are formed when disinfectants combine with certain naturally occurring, organic constituents in water. Both these rules are still under development and are subject to change.

Please call me with any questions at 373-0244 or via e-mail at Paul.Wakagawa@deq.idaho.gov.

Sincerely,



Paul S. Wakagawa, P.E.
Technical Engineer

cc: Charles W. Ariss, P.E., Regional Engineering Manager, Boise Regional Office
Sandy Hemenway, Boise Regional Office
Jennifer Sukow, P.E., SPF Water Engineering, LLC, 600 East River Park Lane, Suite 105, Boise 83706
David Powell, P.E., RiveRidge Engineering, 405 W. MyrtleSt., Boise, 83702
Rob Whitney, IDWR-Boise Field Office
Source File 1 Eng, Blackhawk on the River, Well 2, PWS 4430105, Managor's File, Reading File



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 N. Orchard • Boise, Idaho 83706 • (208) 373-0550

Dirk Kempthorne, Governor
Toni Hardesty, Director

August 17, 2005

Sima Muroff
Blackhawk Holdings
301 East Lake Street
McCall, ID 83638

RE: Blackhawk on the River, Well 2, PWS# 4430105 (McCall, Valley County)
Well Construction Approval

Dear Mr. Muroff:

The plans and specifications for the subject project appear to meet State of Idaho standards and are approved based on the conditions listed below.

I. STANDARD CONDITIONS

- A. The standard conditions on the Department of Environmental Quality (DEQ) review stamp are part of this approval. Supporting reports or documents are considered to be part of the approved documents.
- B. No work may begin until a copy of this approval letter and the approved plans and specifications are delivered to and kept on the job site. Approval conditions must be met and you, as the project owner, must ensure that the contractor, inspecting, and certifying engineer are aware of these conditions.
- C. This approval will be voided if: 1) construction is not completed by August 17, 2006; 2) the project is improperly constructed, operated, or maintained; or 3) the project fails to function as intended.
- D. The Land Developer or Owner or his representative shall ensure that a professional engineer with SPF Water Engineering, LLC provides supervision of construction inspection sufficient to ensure the project is built in substantial accordance with the approved plans. DEQ approval, prior to construction, is required for any substantial deviations from the approved plans and specifications. Verbal approvals, if any, shall be documented by the professional engineer in a cover letter submitted with the project record drawings.
- E. Within thirty days (30) after completion of construction, the Land Developer or Owner or his representative shall provide DEQ with one of the following documents certified by the professional engineer: 1) record drawings with a cover letter, or 2) a letter of certification stating that the project was installed in substantial accordance with the approved plans.

- F. The Idaho Department of Water Resources (IDWR) Application for Drilling Permit contains conditions that are an essential part of the plans and specifications. A copy of the Application for Drilling Permit and the DEQ-approved plans and specifications must be maintained at the drill site.
- G. Before drinking water may be distributed to the public:
 - 1. Water samples must be collected and tested by a certified laboratory. Please contact Sandy Hemenway at 373-0550 regarding the parameters that need to be analyzed for. The results of the testing must be sent to Ms. Hemenway for review and approval.
 - 2. DEQ will advise you if a sanitary survey will be conducted prior to serving water from this well to the public.

II. PROJECT SPECIFIC CONDITIONS:

- A. This approval is for the Well 2 construction specification only.

Please call me with any questions at 373-0244 or via e-mail at Paul.Wakagawa@deq.idaho.gov.

Sincerely,



Paul S. Wakagawa, P.E.
Technical I Engineer

Enclosures: Set of Approved and Stamped Plans and Specifications

cc: Charles W. Ariss, P.E., Regional Engineering Manager, Boise Regional Office
Jennifer Sukow, P.E., SPF Water Engineering (w/approved and stamped set of plans)
David Powell, P.E., RiveRidge Engineering, 405 W. Myrtle St., Boise 83702
Rob Whitney, Idaho Department of Water Resources
Sandy Hemenway, DEQ Boise Office
Source File 1, Blackhawk on the River, Well 2, PWS# 4430105, Manager's File, Reading File

Sima Muroff
Page 3

Please call me with any questions at 373-0244 or via e-mail at Paul.Wakagawa@deq.idaho.gov

Sincerely,



Paul S. Wakagawa, P.E.
Technical I Engineer

PSW:vce

Enclosures: GWUDI Field Evaluation

cc: Charles W. Ariss, P.E., Regional Engineering Manager, Boise Regional Office
Sandy Hemenway, Boise Regional Office
Jennifer Sukow, P.E., SPF Water Engineering, LLC, 600 East River Park Lane, Suite 105, Boise 83706
David Powell, P.E., RiveRidge Engineering, 405 W. Myrtle St., Boise, 83702
Rob Whitney, IDWR-Boise Field Office
Source File 1 Eng, Blackhawk on the River, Well 1, PWS 4430105, Manager's File, Reading File

GWUDI FIELD SURVEY

PWS # 4430105

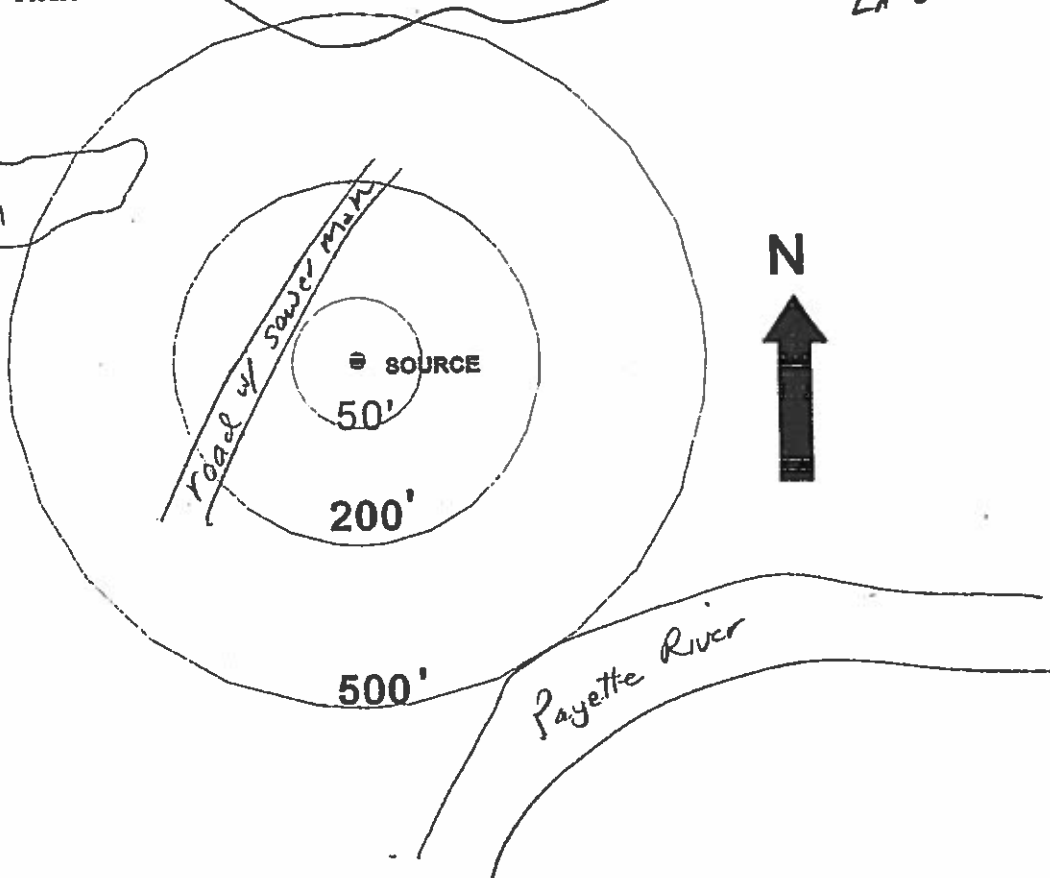
System Name: Blackhawk on the River	Source Name: Well 1
Source Type: Groundwater Well	Source: South ^{half SE} ~~half~~ of ~~SE~~ quarter of T18N,
	Address: R2E, Section 25
System Representative: Jennifer Sukow, P.E.	Survey Date: 7/13/2005
IDEQ Representative: Paul Wakagawa	

Part 1.a: Field Screening

MAP OF SOURCE VICINITY

Please draw in and label all items from the checklist below

amenity pond
with stormwater
contribution



Map Checklist:

- | | |
|--|--|
| ☒ Surface water within 500' | ☒ Stormwater disposal systems within 500' |
| ☐ On-site sewage systems or lagoons within 500' | ☐ Injection Wells within 500' |
| ☒ Municipal or on-site sewer lines within 200' | ☒ Other sources of contamination within 500' |

OFFICE USE ONLY

Final GWUDI

Determination: ☒ Ground Water ☐ Groundwater under Direct Influence of Surface Water

DEQ or HD Representative: Paul Wakagawa

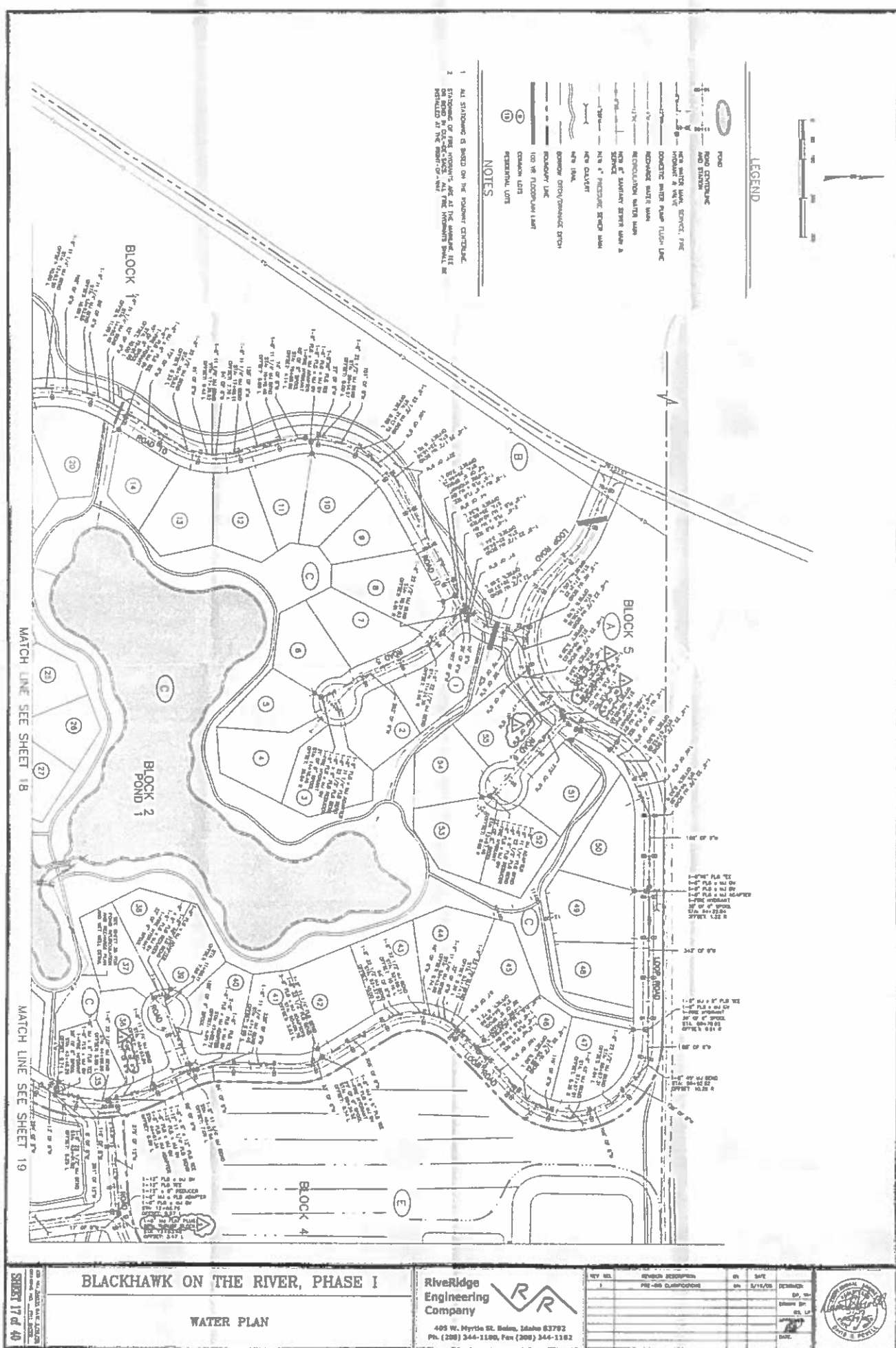
Date: 8/3/05

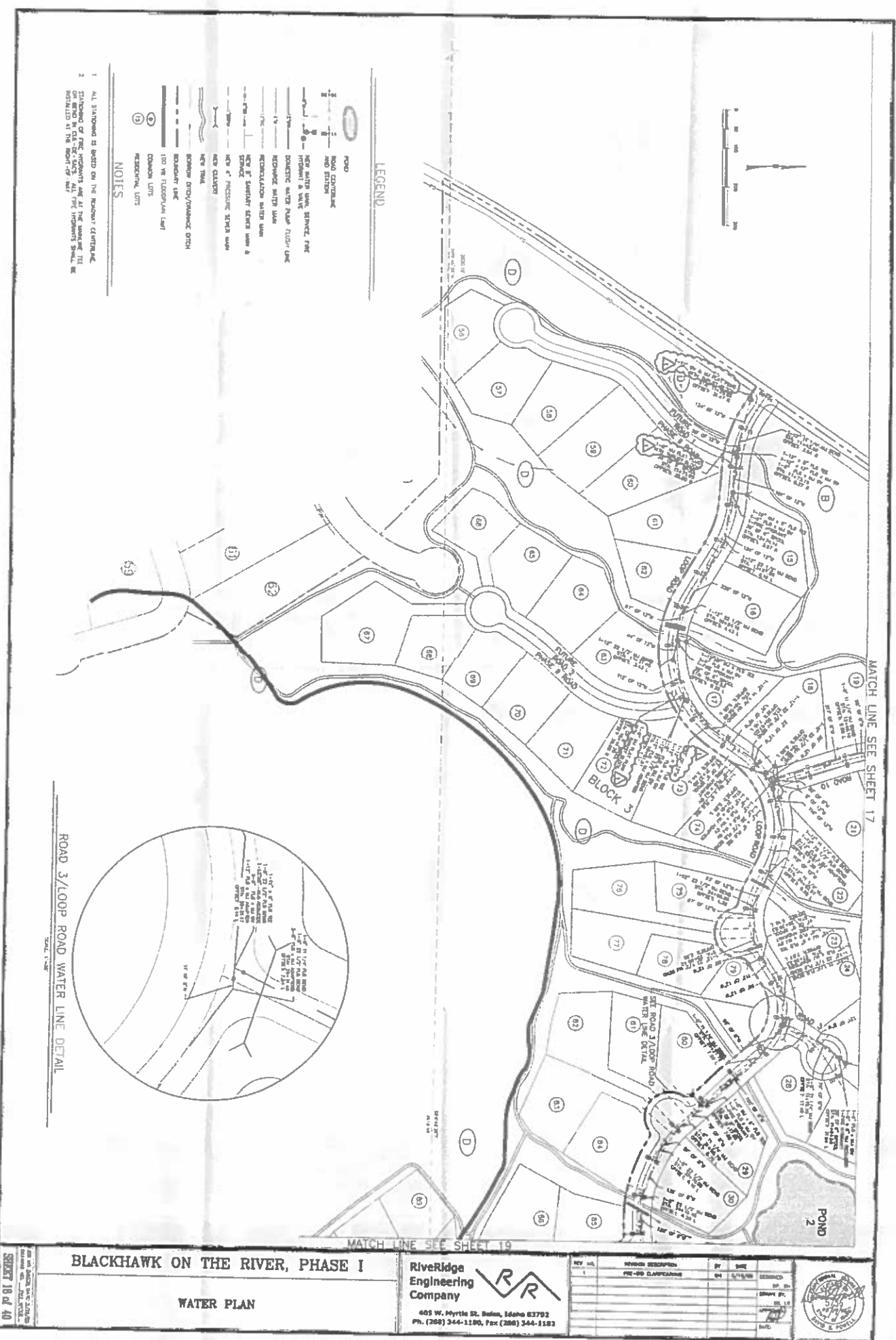
COMMENTS:

- Exploration borehole shows 4 significant clay layers above the anticipated well screen intervals. Clay at 65- 88', 174-193', 212-222' and 234-255'. First anticipated screened interval starts at a depth of 295'
- The Payette River is located approximately 500 feet south of this well site
- The existing land application site is located approximately 400 feet north of the well site. It is anticipated the clay layers will protect the well site from impacts. SPF Water Engineering has submitted a request, including technical justification, for this activity. It is anticipated this WLAP site will be abandoned in the future.
- A lined water feature pond, which will receive stormwater runoff, is located approximately 300 feet to the west.
- Sewer mains are planned to be installed in the road located west of the site

Part 1.b: Source Construction:

- | | | | |
|---|------------------------------|--|---|
| 1. Months with total coliform positive samples in past 3 years: | _____ | | Notes:
new well site
based on engineering
plans
Based on engineering
design report
Payette River
unknown at this time |
| 2. Depth of Source: | <u>500</u> | Ft | |
| 3. Maximum Sustainable Pumping Rate: | <u>450 or more</u> | GPM | |
| 4. Minimum Distance to Surface Water: | <u>500</u> | Ft | |
| 5. Is disinfection used for this source? | ☐ Yes | ☐ No | |
| 6. Construction problems allow surface water influence? | ☐ Yes | ☒ No | |
| 7. Comparison of water levels between this groundwater source and nearby surface water bodies: see discussion on confined layers and protection from surface contamination by clay layers | | | |





1. ALL STATIONING IS BASED ON THE RIVER CENTERLINE.
2. STATIONING OF PUMP STATIONS ARE AT THE MIDDLE OF THE PUMP.
3. STATIONING OF PUMP STATIONS ARE AT THE MIDDLE OF THE PUMP.
4. STATIONING OF PUMP STATIONS ARE AT THE MIDDLE OF THE PUMP.

NOTES

1. ALL STATIONING IS BASED ON THE RIVER CENTERLINE.
2. STATIONING OF PUMP STATIONS ARE AT THE MIDDLE OF THE PUMP.
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4. STATIONING OF PUMP STATIONS ARE AT THE MIDDLE OF THE PUMP.

ROAD 3/LOOP ROAD WATER LINE DETAIL

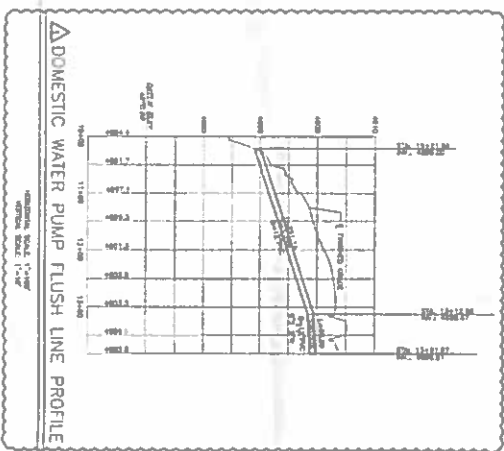
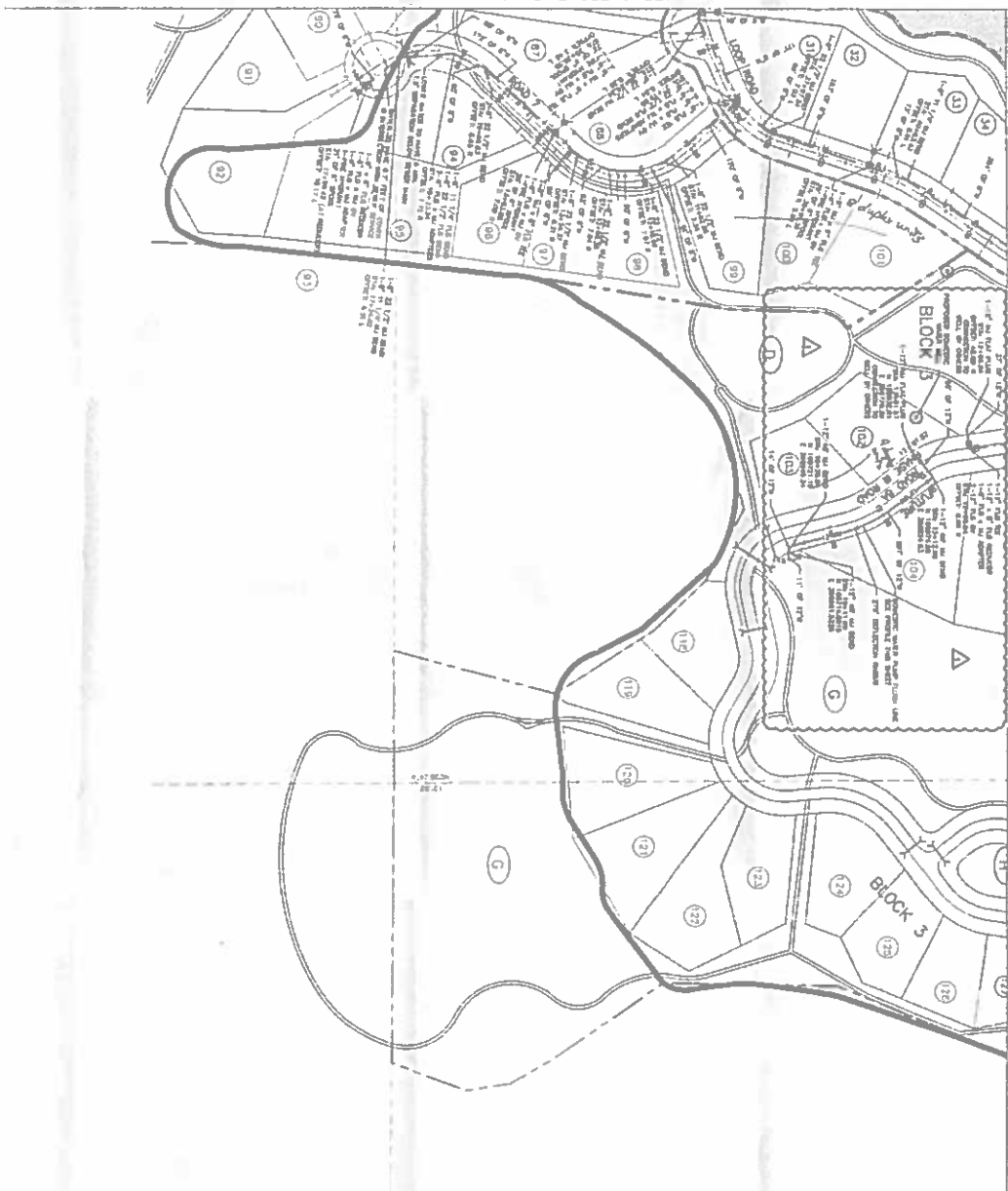
BLACKHAWK ON THE RIVER, PHASE I
WATER PLAN

RiverRidge
Engineering
Company
405 W. Myrtle St. Boise, Idaho 83702
Ph. (208) 344-1180, Fax (208) 344-1182

REV	NO.	DESCRIPTION	BY	DATE
1	1	REVISED DESCRIPTION	04	5/15/00
2	2	REVISED DESCRIPTION	04	5/15/00
3	3	REVISED DESCRIPTION	04	5/15/00
4	4	REVISED DESCRIPTION	04	5/15/00
5	5	REVISED DESCRIPTION	04	5/15/00
6	6	REVISED DESCRIPTION	04	5/15/00
7	7	REVISED DESCRIPTION	04	5/15/00
8	8	REVISED DESCRIPTION	04	5/15/00
9	9	REVISED DESCRIPTION	04	5/15/00
10	10	REVISED DESCRIPTION	04	5/15/00



MATCH LINE SEE SHEET 17



- 1 ALL STATINGS IN BOLD ON THE FOLLOWING CONTAINING.
- 2 STATINGS OF THE WITNESS ARE AT THE UNDERLINE
- 3 OF WORD IN CIRCLES. THE WITNESS AT THE UNDERLINE, OR
- 4 STATING AT THE FRONT OF THE

NOTES

Figure 1 illustrates the synthesis of poly(arylene ether)s. The reaction involves 4,4'-dichlorodiphenyl ether (1) reacting with various diamines (2a-f) in the presence of a base (K₂CO₃) and a solvent (DMAc) to form poly(arylene ether)s (3a-f). The diamines are: (a) 4,4'-diaminodiphenyl ether, (b) 4,4'-diaminodiphenyl sulfone, (c) 4,4'-diaminodiphenyl ether, (d) 4,4'-diaminodiphenyl ether, (e) 4,4'-diaminodiphenyl ether, and (f) 4,4'-diaminodiphenyl ether. The resulting polymers are labeled 3a-f and are shown as repeating units in a polymer chain.

LEGEND



BLACKHAWK ON THE RIVER, PHASE I

WATER PLAN

**RiverRidge
Engineering
Company**

405 W. Myrtle St. Boise, Idaho 83702
Ph. (208) 344-1180, Fax (208) 344-1182

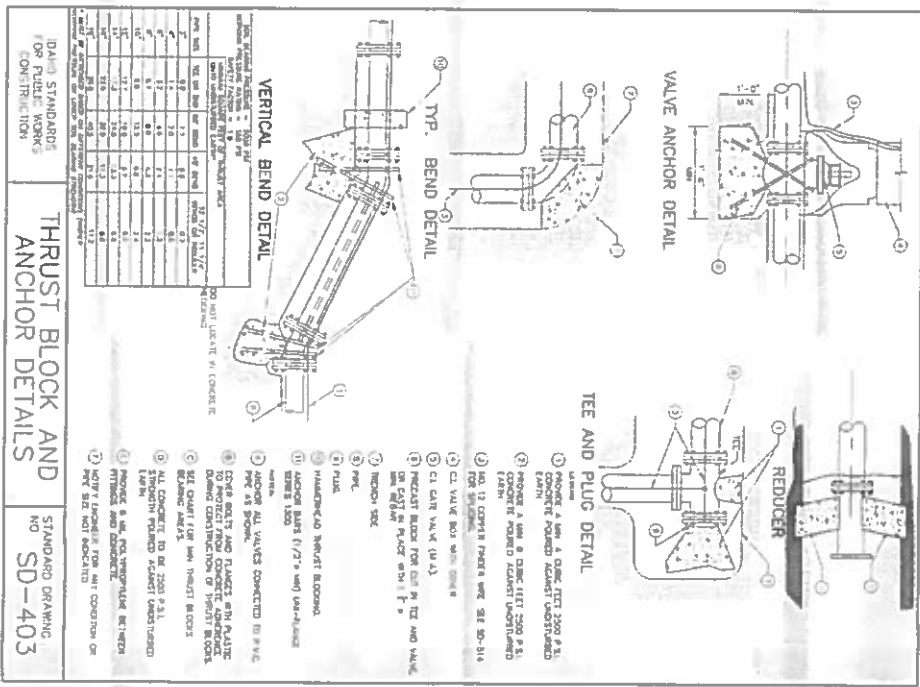
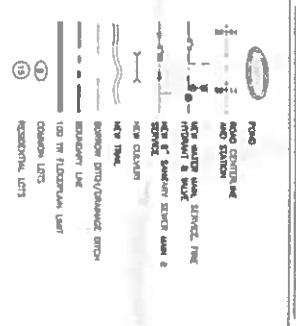
[illegible]

Sheet 19 of 45



1. SET SHEET 2 THE BOUNDARY LINES.
2. ALL STRUCTURES ARE BASED ON THE BOUNDARY LINES.
3. THE BOUNDARY LINES ARE BASED ON THE SURVEY DATA.
4. THE BOUNDARY LINES ARE BASED ON THE SURVEY DATA.
5. THE BOUNDARY LINES ARE BASED ON THE SURVEY DATA.

NOTES



THRUST BLOCK AND ANCHOR DETAILS
SD-403

BLACKHAWK ON THE RIVER, PHASE II

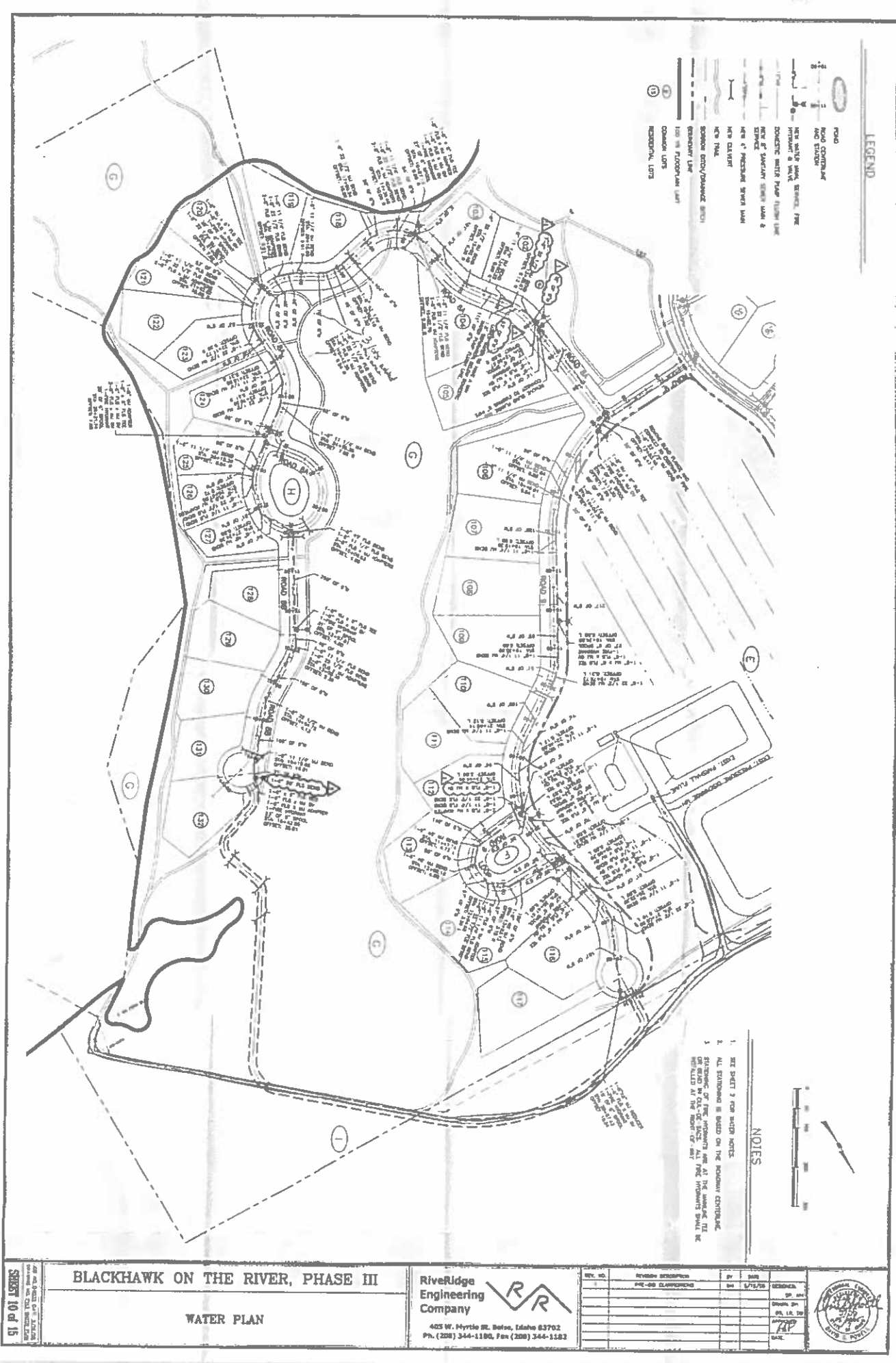
WATER PLAN

RiveRidge
Engineering
Company
405 W. Myrtle St., Baton Rouge, LA 70802
Ph. (225) 344-1180, Fax (225) 344-1183

REV.	DESCRIPTION	BY	DATE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			



SHEET 5 of 9



51 of 104 SHEETS

BLACKHAWK ON THE RIVER, PHASE III

WATER PLAN

RiverRidge Engineering Company

405 W. Myrtle St., Boise, Idaho 83702

Ph. (208) 344-1180, Fax (208) 344-1182

REV. NO.	REVISION DESCRIPTION	BY	DATE
1	PRELIMINARY		
2			
3			
4			
5			
6			
7			
8			
9			
10			

SEAL

Professional Engineer

Boise, Idaho

DATE: 1/15/03

17. The VFD systems shall be protected from spikes and surges in the line voltage and overvoltages caused by lightning strikes.
18. The VFD input displacement power factor shall be 0.95 or better at full load. Efficiency shall be measured at 95 percent minimum at full load.
19. All components of the VFD systems shall be selected to operate continuously without any system trip or damage under the following expected power variations:
 - a. plus or minus 10% voltage fluctuation
 - b. plus or minus 3 percent frequency variation
 - c. distorted voltage waveform with up to 7 percent total harmonic distortion.
20. The VFD systems shall employ voltage sag ride-through coordination under normal operating (average load) conditions to prevent nuisance trips with the following utility interruptions:
 - a. 0% voltage for one cycle
 - b. 60% voltage for 10 cycles
 - c. 87 % voltage continuous
21. The VFDs shall provide the following operational features:
 - a. The VFD shall be able to start from bypass or fault trip into a spinning load without stopping the motor or creating a fault condition. The VFD shall match the motor's speed and then drive the motor to its proper, pre-set speed.
 - b. Programmable current limit.
 - c. Programmable auto-restart function. Auto-restart precludes any attempt at restart in the event of trips typically indicative of component failures.
 - d. Individually programmable acceleration and deceleration times adjustable from 0.0-30 seconds.

2.7 SPARE PARTS

- A. Provide the manufacturer's recommended spare parts package for each pump.

2.8 MANUFACTURERS

- A. 450 gpm pump: Berkeley 7T40-450, 5 stages; or equal
- B. 225 gpm pump: Berkeley 6T15-225, 6 stages; or equal
- C. 1,000 gpm pump: Berkeley 8T100-900, 4 stages; or equal
- D. Motors: Franklin, Hitachi, or equal
- E. VFDs: Danfoss or equal

APPENDIX B

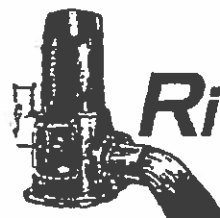
CUSTOMER Black Hawk #1

ADDRESS _____

DRILLER _____

HOLE SIZE _____" CASING SIZE _____"

SCREENS OR PERFORATIONS _____"



Riverside, Inc.

• Electrical Apparatus - Sales & Repair
• All type pumps - Sales & Repair
• Complete machine shop
• Design & installations
• Well drilling

DATE STARTED 7-19-05

DATE COMPLETED _____

HELPER Jack DRILL USED challenger

WATER LEVEL AT _____ FT.

TIME	STEM #	DEPTH		FORMATION
		FROM	TO	
		0	1	Top soil
		1	9	dirty gravel
		9		med to coarse sand with 2" gravel
			56	gravel bigger & thicker in places
		56	61	Bwn & Blue clay with imbedded sand & gravel & Black slate rock
		61	65	sand & gravel (5" minus)
		65	84	gray clay (sandy) with layers of gray sand
		84	88	bwn clay & imbedded sand & gravel & Black slate rock
		88	92	bwn sand & gravel some sandy Bwn clay
		92	115	med sand - Bwn to golden with layers of coarse & fine gravel
		115	120	sandy Bwn clay some sand
		120	150	med sand layers of pea gravel Bwn & gray sand
		150	153	Dark Bwn. clay
		153	157	sand & small gravel with clay layers
		157	174	sand & gravel 2" minus with clay at 172' (hit pressure)
		174	186	Bwn clay
		186	193	gray clay - Bwn. clay 191'
		193	212	sand & small gravel Bwn & yellow & tan clay 197'-199'

CUSTOMER _____

ADDRESS _____

DRILLER _____

HOLE SIZE _____" CASING SIZE _____"

SCREENS OR PERFORATIONS _____"



Riverside, Inc.

• Electrical Apparatus - Sales & Repair
• All type pumps - Sales & Repair
• Complete machine shop
• Design & installations
• Well drilling

DATE STARTED _____

DATE COMPLETED _____

HELPER _____ DRILL USED _____

WATER LEVEL AT _____ FT.

TIME	STEM #	DEPTH		FORMATION
		FROM	TO	
		212	222	Tan sticky clay & Black clay
		222	234	sand & small gravel - med. sand & pea gravel 230'
		234	255	Brown clay small streaks of sand
7-21	(	255	270	med to coarse sand & pea gravel - clay mixed at 265'-270'
		270	293	Brown clay & sand layers 2' to 4' Each
		293		fine to med - some coarse - some pea gravel (clay @ 305-308')
		308	323	small gravel at 310'
		323	326	Blue clay
		326	335	fine & coarse sand (gray) clay 329'-331'
		335	347	fine sand a little med.
		347	353	Blue clay with sand in places
		353	368	fine to coarse sand
		368	376	sand & clay layers 2' to 3' thick each
		376	395	fine to coarse sand with small clay layers
	(	395		fine to med sand some coarse (clean) (soft)
		457		high pressure at 400-435' - lost 55' of hole - more mud
		457	472	gray clay
		472	475	sand & clay mixed

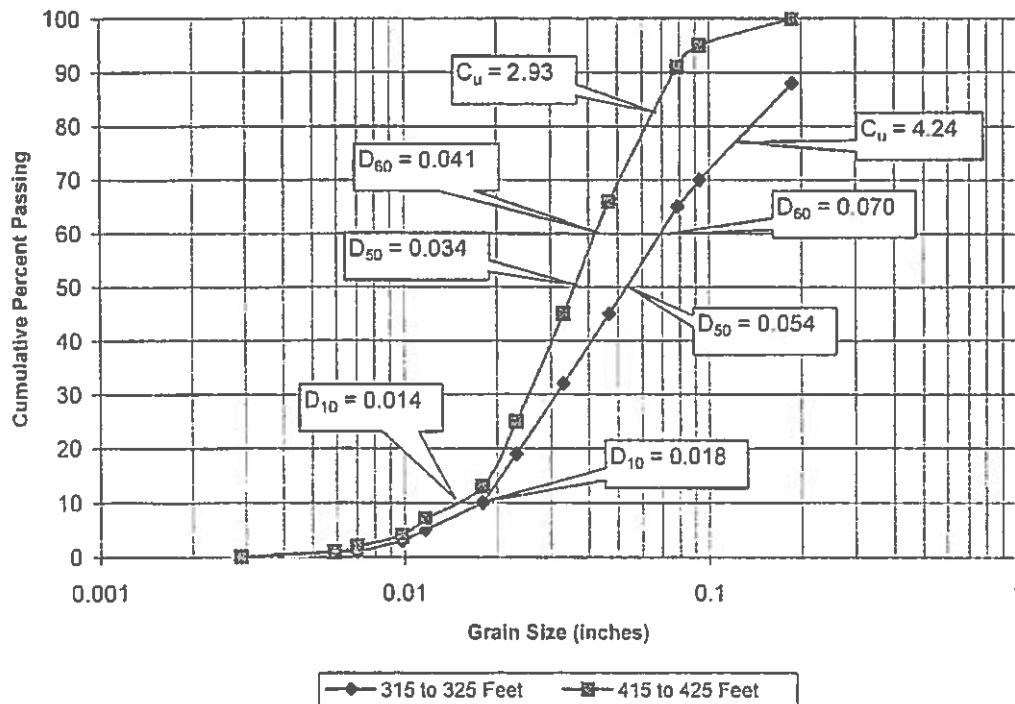
- 475-495 gray clay small layers of sand

BLACKHAWK ON THE RIVER
WELL 1, WEST WELL
SIEVE ANALYSES

Sieve analyses were performed by Materials Testing and Inspection, Boise, Idaho, on August 4, 2005.

Sieve No.	Grain Size (in)	Percent Passing	
		Sample Depth 315 to 325 Feet	Sample Depth 414 to 425 Feet
4	0.187	88	100
8	0.0931	70	95
10	0.0787	65	91
16	0.0469	45	66
20	0.0331	32	45
30	0.0232	19	25
40	0.0180	10	13
50	0.0117	5	7
60	0.0098	3	4
80	0.0070	1	2
100	0.0059	1	1
200	0.0029	0.2	0.1

Blackhawk on the River
Well 1, West Well
Sieve Analyses



STRATA**DATA INC.**

NATURAL GAMMA/SP 64 INCH NORMAL RESISTIVITY 16 INCH NORMAL RESISTIVITY FLUID TEMPERATURE LOG

FILE NO. 2287

COMPANY: RIVERSIDE, INC.

WELL: BLACKHAWK WELL No. 1

FIELD: BLACKHAWK ON THE RIVER

COUNTY: VALLEY STATE: IDAHO

G.P.S.: 44.86431 N, 116.15093 W

LOCATION:

SEC: 25 TWP: 18N RGE: 2E

OTHER LOGS

NONE

PERMANENT DATUM: GROUND LEVEL

ELEVATION: 4990' (G.P.S.)

LOG MEASURED FROM: GROUND LEVEL

RUN NO.	ONE		
DATE	07/22/05		
DRILLER:	RIVERSIDE, INC.		
BIT SIZE @ DEPTH	13 1/2" 12' TO 495'		
BIT SIZE @ DEPTH			
CASING SIZE @ DEPTH	30" 12'		
CASING SIZE @ DEPTH			
LOGGER:			
DEPTH	497'		
CASING DEPTH	12'		
BOT LOG INTERVAL	497'		
TOP LOG INTERVAL	0'		
TYPE FLUID IN HOLE	MUD		
Rm@ TEMP	N/A		
SAMPLE SOURCE	N/A		
FLUID LEVEL	FULL		
TIME SINCE CIRC.	24 Hours		
RECORDED BY:	Oneyear		
WITNESSED BY:	Mr. Scanlan		

LOGGING DATA

LOG FUNCTION	RUN NO.	EQUIPMENT		LOGGING SPEED FT./MIN	DISC INT FEET	DETECTOR		SPACING 1x-Rx FEET	Rx-Rx FEET	SOURCE TYPE	SOURCE SIZE CURIE	LOGGED INTERVAL	
		MODEL	PROBE SNL			TYPE	TYPE					FROM	TO
Gamma	One	ALP	1440	30	0.2	1"X4" Sonot	N/A	N/A	N/A	N/A	N/A	496'	496'
16" & 64" N	One	GOIRLP	0001	50	0.2	N/A	N/A	N/A	N/A	N/A	N/A	497'	497'
S.F.	One	GOIRLP	0001	50	0.2	N/A	N/A	N/A	N/A	N/A	N/A	497'	497'
TEMP	One	1207	4090	30	1.0	N/A	N/A	N/A	N/A	N/A	N/A	497'	497'

CALIBRATION FACTOR(S): Downhole and snap calibration.

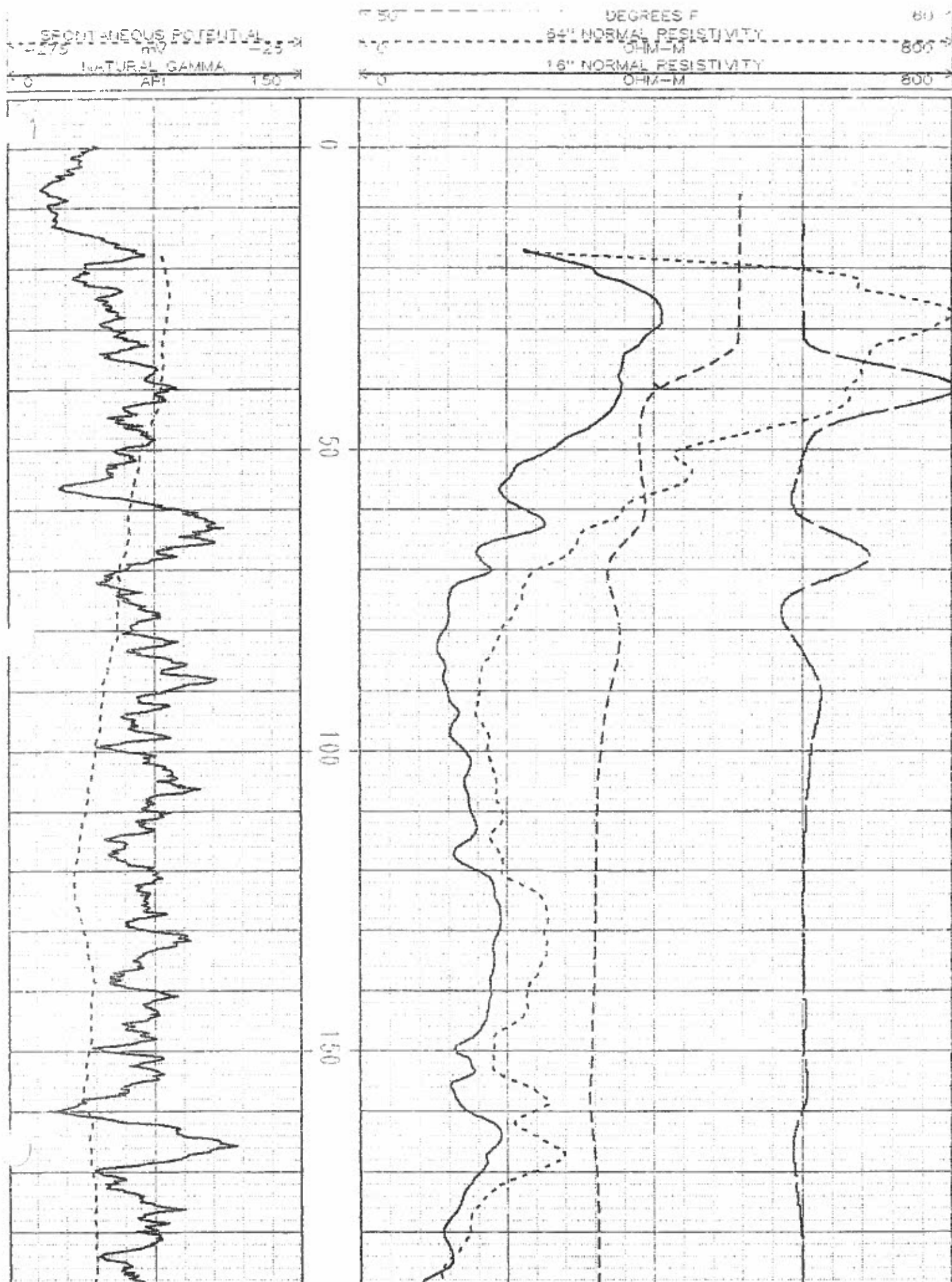
DIGITAL FILE NAME(S): 1 LOG

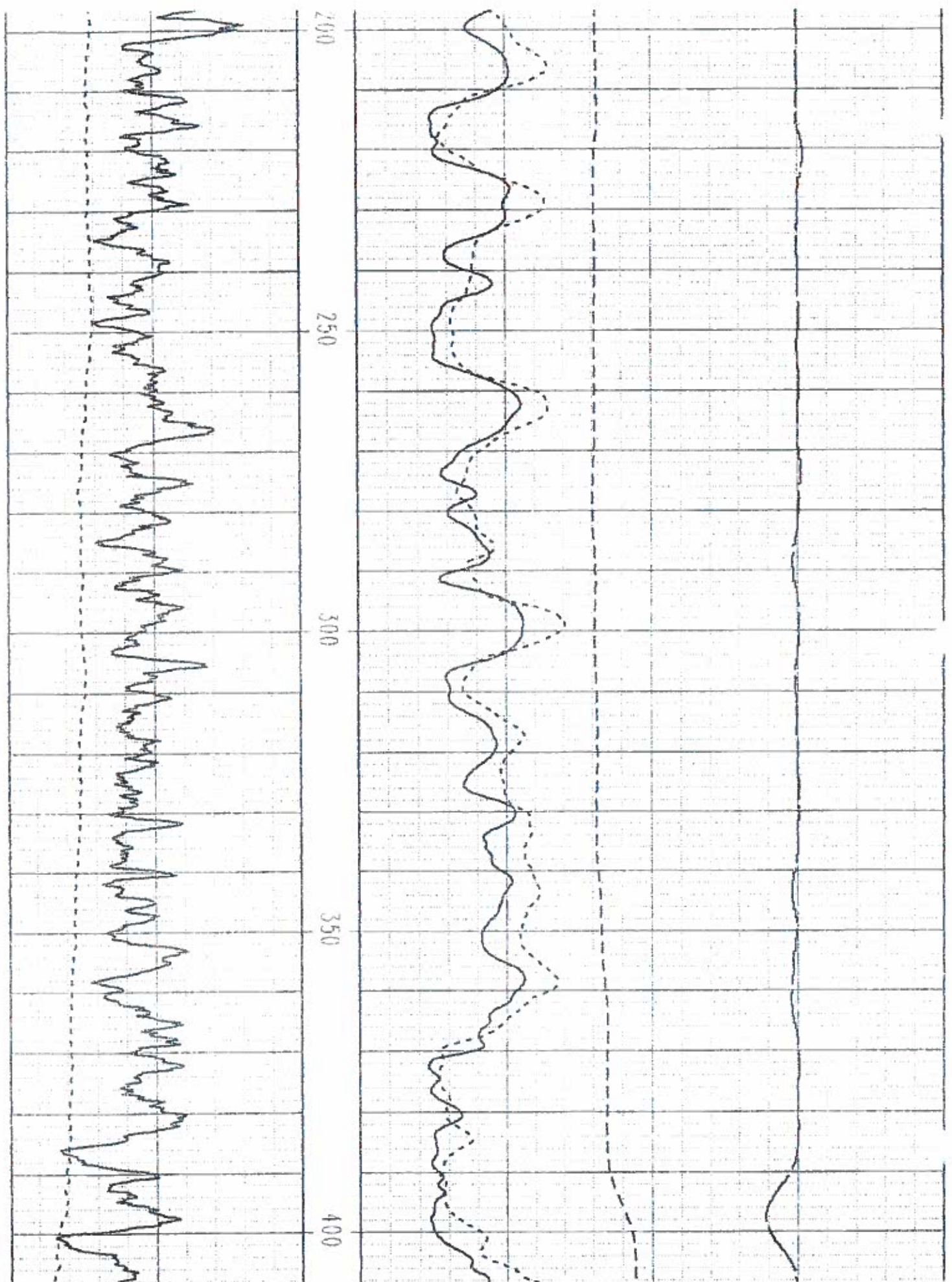
REMARKS:

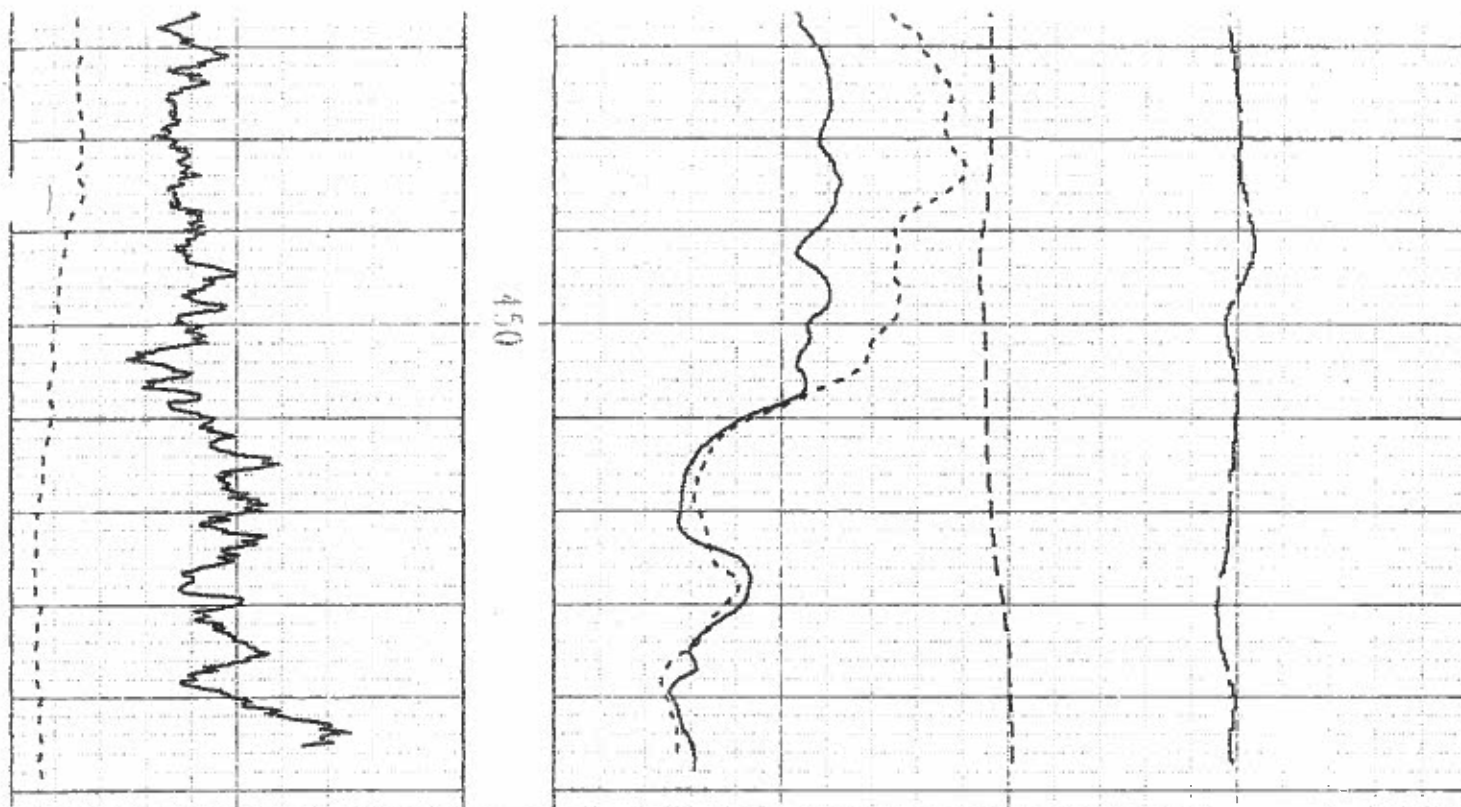
MSI Acquire Type 3

Gamma calibrated with 120 API Standard.

BLACKHAWK WELL 1

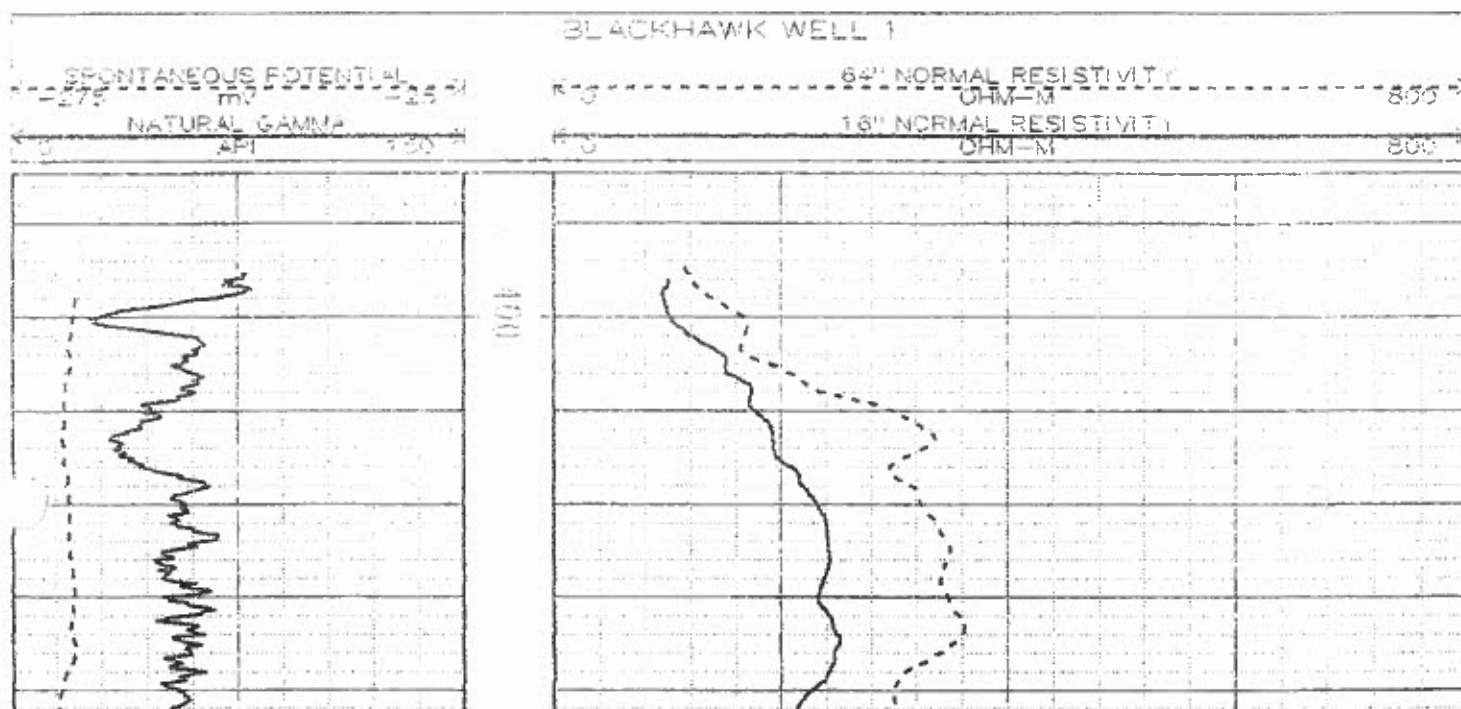


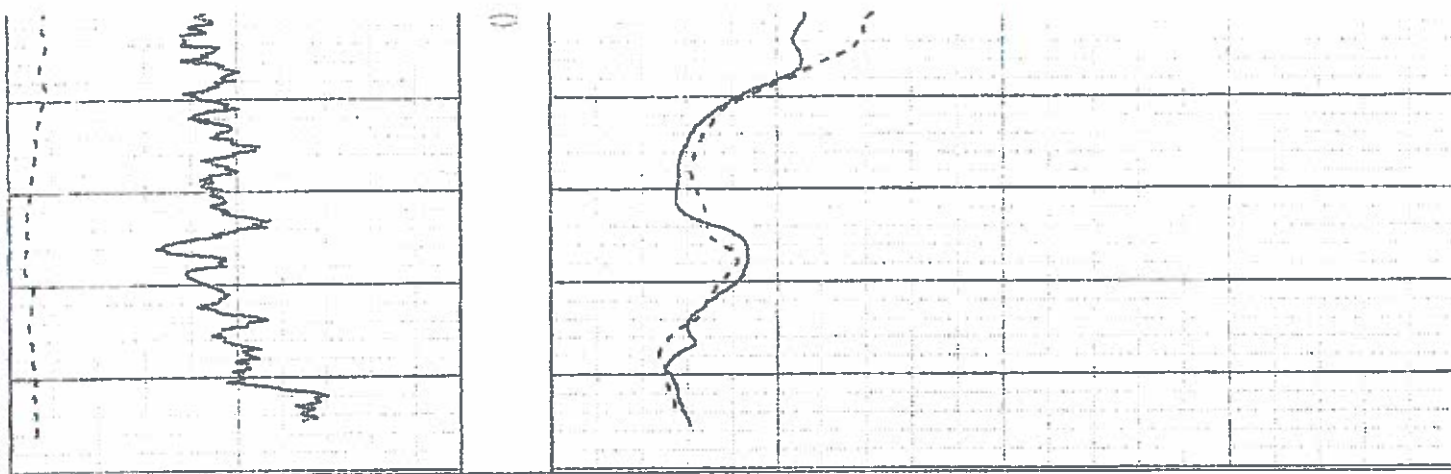




BLACKHAWK WELL 1

REPEAT SECTION





NATURAL GAMMA API	150	16" NORMAL RESISTIVITY OHM-M	500
SPONTANEOUS POTENTIAL mV	-25	64" NORMAL RESISTIVITY OHM-M	500
BLACKHAWK WELL 1			

COMPANY RIVERSIDE, INC.

DRILLER T.D. 495'

WELL BLACKHAWK WELL No. 1

LOG F.R. 497'

AREA BLACKHAWK ON THE RIVER

LOG T.D. 497'

COUNTY VALLEY

ELEVATIONS:

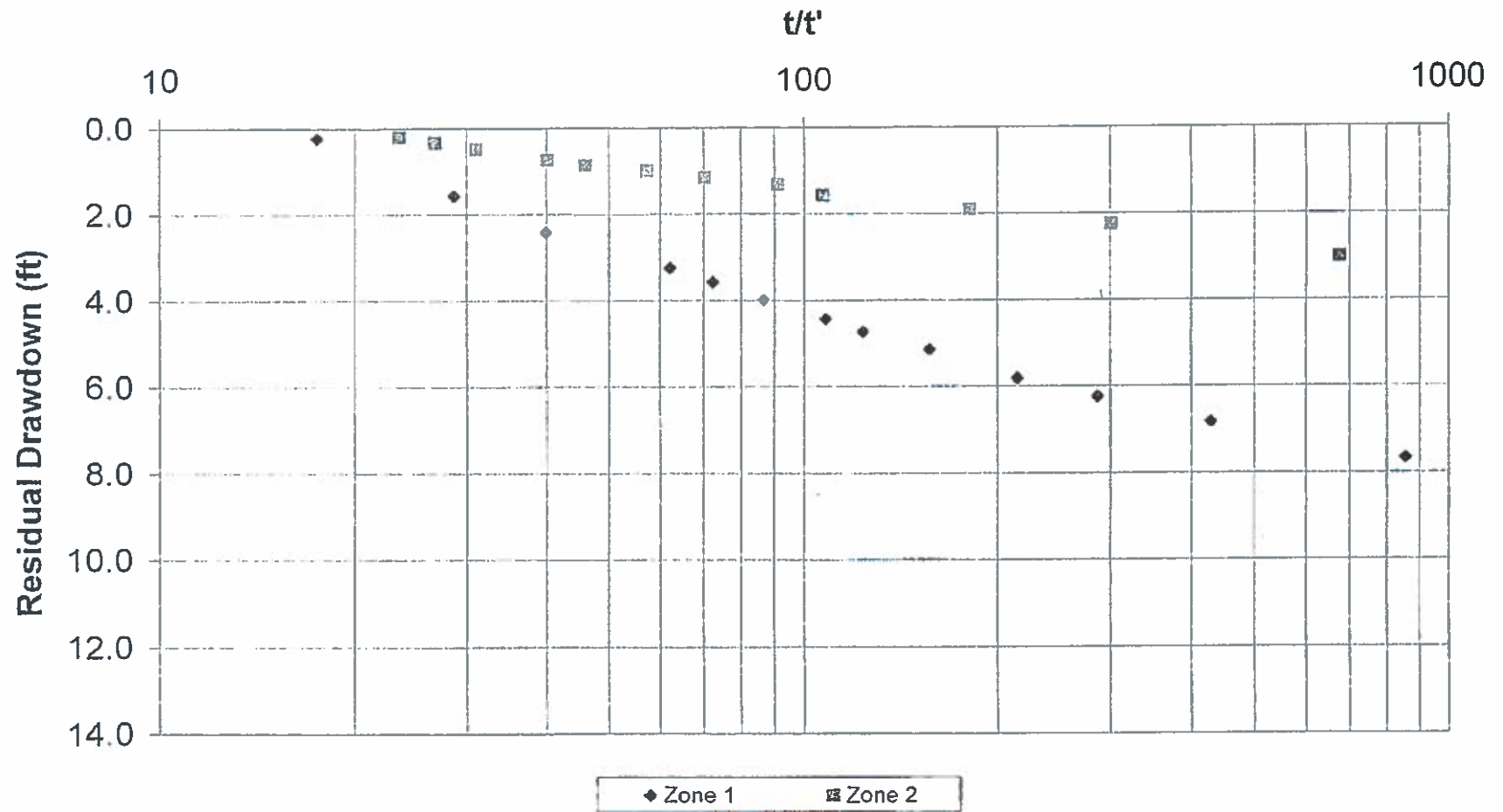
STATE IDAHO

G.L. 4990' T.O.C.

**BLACKHAWK ON THE RIVER
WELL 1, WEST WELL
ZONE TEST SUMMARY**

ZONE	1	2	3
Depth	140-155	335-350	415-430
Q (gpm)	32	40.00	27.00
Specific Conductance (µS)	101.3	122.6	126.1
Temperature (°F)	48	51	53
pH	6.7	7.3	7.4
Total Iron (mg/L)	3.29	53.4	0.33
Dissolved Iron (mg/L)	0.17	0.38	0.33
Total Manganese (mg/L)	<0.05	0.74	<0.05
Dissolved Manganese (mg/L)	<0.05	0.07	<0.05
Total Arsenic (mg/L)	<0.005	<0.005	<0.005
Dissolved Arsenic (mg/L)	<0.005	<0.005	<0.005
Ammonia (mg/L)	<0.04	0.47	<0.04
Fluoride (mg/L)	0.10	0.13	0.15
TDS (mg/L)	82	136	62
Estimated Transmissivity (gpd/ft)	2,100	5,500	
Static Water Level (feet below ground)	5	-5	-16

Blackhawk on the River, Well 1 Zone Test Recovery Data





Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0521676

Attn: JENNIFER SUKOW
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR WELL 1, ZN 3 (GROUNDWATER) - AS
DISSOLVED

Time of Collection: 10:15
Date of Collection: 7/24/2005
Date Received: 7/25/2005
Report Date: 7/27/2005

PWS#:

PWS Name:

FIELD DATA: TEMP 11.6 DEGREES C, 93.7 ^{us}/126.1 ^{us} CLIENT FILTERED SAMPLE IN FIELD FOR DISSOLVED METALS ANALYSIS.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/26/2005	DMB
Iron, Fe		0.33	mg/L	0.05	EPA 200.7	7/25/2005	KC
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	7/25/2005	KC

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future
analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0521675

Attn: JENNIFER SUKOW
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR WELL 1, ZN 3 (GROUNDWATER)

Time of Collection: 10:15
Date of Collection: 7/24/2005
Date Received: 7/25/2005
Report Date: 7/27/2005

PWS#:

PWS Name:

FIELD DATA: TEMP 11.6 DEGREES C; 93.7 us/126.1 us

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/26/2005	DMB
Iron, Fe		0.33	mg/L	0.05	EPA 200.7	7/25/2005	KC
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	7/25/2005	KC
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	7/25/2005	BF
Fluoride, F		0.15	mg/L	0.1	EPA 300.0	7/25/2005	WW
pH		7.4	S U		EPA 150.1	7/25/2005	CC
Total Dissolved Solids		62	mg/L	25	EPA 160.1	7/26/2005	DLR

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0522107

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR WELL 1 ZONE 2 (GROUNDWATER) - AS
DISSOLVED

Time of Collection: 10:40

Date of Collection: 7/27/2005

Date Received: 7/27/2005

Report Date: 7/29/2005

PWS#:

PWS Name:

FIELD DATA: PH=7.3, SC=122.6us, TEMP=10.8DEGREES C CLIENT FILTERED SAMPLE IN FIELD FOR DISSOLVED METALS ANALYSIS

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/29/2005	DMB
Iron, Fe		0.38	mg/L	0.05	EPA 200.7	7/28/2005	KC
Manganese, Mn		0.07	mg/L	0.05	EPA 200.7	7/28/2005	KC

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future
analytical needs, please contact: Michael Moore



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0522106

Attn: TERRY SCANLAN, P.E., P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR WELL 1 ZONE 2 (GROUNDWATER)

Time of Collection: 10:40
Date of Collection: 7/27/2005
Date Received: 7/27/2005
Report Date: 7/29/2005

PWS#:

PWS Name:

FIELD DATA: PH=7.3, SC=122.6us, TEMP=10.8DEGREES C

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/29/2005	DMB
Iron, Fe		53.4	mg/L	0.05	EPA 200.7	7/29/2005	KC
Manganese, Mn		0.74	mg/L	0.05	EPA 200.7	7/28/2005	KC
Metals Digestion		*			EPA 200.9-11	7/28/2005	JS
Ammonia Direct (as N)		0.47	mg/L	0.04	EPA 350.1	7/29/2005	WW
Fluoride, F		0.13	mg/L	0.1	EPA 300.0	7/29/2005	WW
pH		7.7	S.U.		EPA 150.1	7/28/2005	CC
Total Dissolved Solids		136	mg/L	25	EPA 160.1	7/29/2005	DLR

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0522223

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR WELL 1 ZN 1 (GROUNDWATER) - AS
DISSOLVED

Time of Collection: 9:50

Date of Collection: 7/28/2005

Date Received: 7/28/2005

Report Date: 7/29/2005

PWS#:

PWS Name:

FIELD DATA: TEMP=8.9 DEGREES C, SC=101.3us, PH=6.7; SAMPLE FILTERED IN FIELD FOR DISSOLVED METALS ANALYSIS.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/29/2005	DMB
Iron, Fe		0.17	mg/L	0.05	EPA 200.7	7/29/2005	KC
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	7/29/2005	KC

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0522222

Attn: TERRY SCANLAN, P.E., P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR WELL 1 ZN 1 (GROUNDWATER)

Time of Collection: 9:50
Date of Collection: 7/28/2005
Date Received: 7/28/2005
Report Date: 8/1/2005

PWS#:

PWS Name:

FIELD DATA: TEMP=8.9 DEGREES C, SC=101.3 us, PH=6.7

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/29/2005	DMB
Iron, Fe		3.29	mg/L	0.05	EPA 200.7	7/29/2005	KC
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	7/29/2005	KC
Metals Digestion		*			EPA 200.9-11	7/28/2005	KC
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	7/29/2005	WW
Fluoride, F		0.10	mg/L	0.1	EPA 300.0	7/29/2005	WW
Total Dissolved Solids		82	mg/L	25	EPA 160.1	8/1/2005	DLR

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342 5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0522225

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR TEMP SUPPLY WELL
(GROUNDWATER) - AS DISSOLVED

Time of Collection: 11:00
Date of Collection: 7/28/2005
Date Received: 7/28/2005
Report Date: 7/29/2005

PWS#:

PWS Name:

FIELD DATA: TEMP=7.5 DEGREES C, SC=67.4us, PH=6.9; SAMPLE FILTERED IN FIELD FOR DISSOLVED METALS ANALYSIS.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/29/2005	DMB
Iron, Fe		0.09	mg/L	0.05	EPA 200.7	7/29/2005	KC
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	7/29/2005	KC

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0522224

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BOTR TEMP SUPPLY WELL (GROUNDWATER)

Time of Collection: 11:00
Date of Collection: 7/28/2005
Date Received: 7/28/2005
Report Date: 8/1/2005

PWS#:

PWS Name:

FIELD DATA: TEMP=7.5 DEGREES C, SC=67.4us, PH=6.9

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	7/29/2005	DMB
Iron, Fe		0.18	mg/L	0.05	EPA 200.7	7/29/2005	KC
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	7/29/2005	KC
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	7/29/2005	WW
Fluoride, F		<0.10	mg/L	0.1	EPA 300.0	7/29/2005	WW
Total Dissolved Solids		72	mg/L	25	EPA 160.1	8/1/2005	DLR

Thank you for choosing Analytical Laboratories for your testing needs.

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MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

**BLACKHAWK ON THE RIVER WELL NO. 1 (WEST WELL)
STEP-RATE PUMPING TEST 8/20/05**

Pumping Equipment - diesel driven line-shaft turbine pump, 258-foot setting
Water level measuring point is 0.3 feet above top of casing, top of casing is 3.3 feet above ground
Flow measured with 10" x 6" orifice; 10" x 7" orifice
Water level measured with electric line well sounder

Time	Elapsed Time (minutes)	Depth to Water (feet)	Draw-down (feet)	Pumping Rate (gpm)	Specific Capacity (gpm/ft)	Remarks
		-9				shut in pressure reported to be 4 psi @ approx 2.8 feet agl opened valve to let water into mainline
9:35						
9:45				75		no water at orifice; 4 seconds to fill 5 gal bucket at overflow started step test
10:09	0					
10:10	1	19.00	28.00	850	30	
10:11	2	20.75	29.75	850	29	550 rpm
10:12	3	22.00	31.00	850	27	37" on tube; 550 rpm
10:13	4	22.25	31.25	850	27	very little color; 550 rpm
10:14	5	22.75	31.75	850	27	550 rpm
10:15	6	23.17	32.17	850	28	
10:16	7	23.33	32.33	850	28	
10:17	8	23.83	32.83	850	26	550 rpm
10:18	9	24.08	33.08	850	26	550 rpm
10:19	10					adjusting
10:20	11			880		39.5" on tube
10:23	14			1030		stepped up to 54" on tube; no color, water is crystal clear
10:27	18	29.00	38.00	1030	27	700 rpm
10:28	19	29.29	38.29	1030	27	
10:29	20	29.54	38.54	1030	27	700 rpm
10:30	21	29.83	38.83	1030	27	
10:32	23	30.17	39.17	1030	26	700 rpm
10:37	28	30.67	39.67	1030	26	
10:42	33	30.92	39.92	1030	26	700 rpm
10:47	38	30.92	39.92	1030	26	700 rpm
10:50	41			1180		stepped up to 71"
10:50	41	31.00	40.00	1180	30	
10:55	48	38.17	47.17	1180	25	adjusted 800 rpm
11:05	56	38.42	47.42	1180	25	800 rpm
11:12	63					surge well; 6 times
11:14	65					shutdown to rawhide
11:17	68					startup
11:17	68	38.75	47.75			
11:20	71					no color; shutdown to recover
11:25	76					startup to 300 gpm
11:28	79	10.08	19.08	300	18	500 rpm; start step test; valved back
11:40	91	8.67	17.67	300	17	
11:45	96	8.33	17.33	300	17	
11:55	108	8.00	17.00	300	18	500 rpm
11:55	108			500		adjusting; opening valve, stepped up to 500 gpm
12:00	111	14.33	23.33	500	21	
12:10	121	14.79	23.79	500	21	
12:20	131	14.92	23.92	500	21	
12:30	141	15.13	24.13	500	21	
12:31	142			830		stepped up to 830 gpm, switched to a 10" x 7" orifice
12:35	146	25.67	34.67	830	24	600 rpm
12:45	156	25.83	35.83	830	23	
13:02	173	27.33	36.33	1910		Stepped up to wide open; 89 1/2" on tube; 10" x 7" orifice
13:04	175					adjusting
13:05	176	64.00	73.00	1910	28	1300 rpm; 89 1/2 "
13:08	179	64.67	73.67	1910	26	1300 rpm
13:10	181					sounder stuck
13:39	210			1510		89 1/2"
13:53	224	72.00	81.00	1920	24	90 inches; 1300 rpm
13:57	228	72.75	81.75	1920	23	90 inches; 1300 rpm
14:00	231			1910		89 1/2"; shutdown

**BLACKHAWK ON THE RIVER WEST WELL
CONSTANT-RATE PUMPING TEST 8/21/2005**

Pumping Equipment - diesel driven line-shaft turbine pump, 258-foot setting
Water level measuring point is top of casing, approximately 3.3 feet above ground
Flow measured with 10" x 7" orifice
Water level measured with electric line well sounder

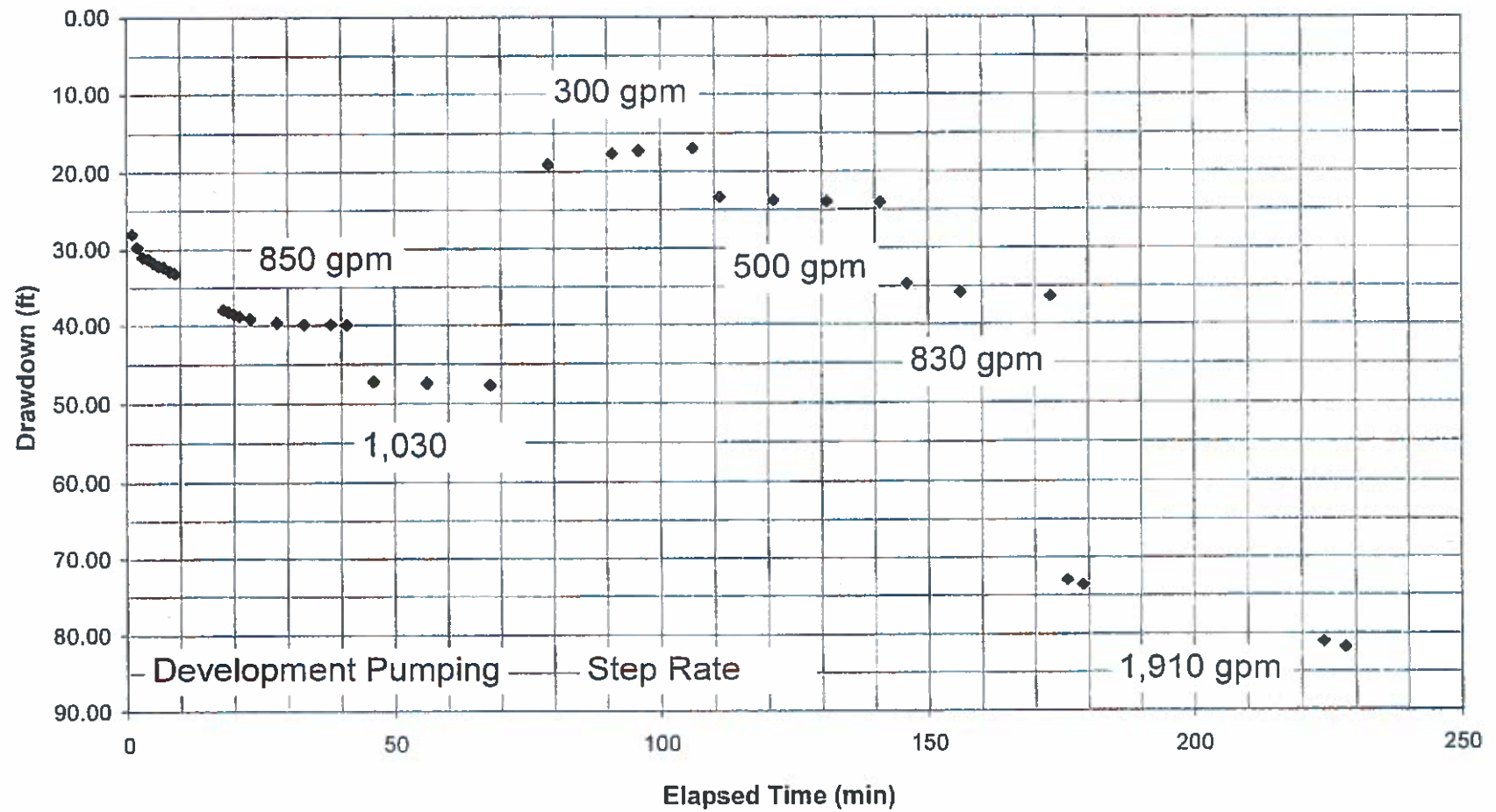
Time	Elapsed Time (minutes)	Depth to Water (feet)	Draw-down (feet)	Pumping Rate (gpm)	Remarks
		-9		Static	
					Shut in pressure of 4 psi
					w.l. = 1.7' while flowing 5 gal/2 sec (150 gpm), mp = 3.3' agl; edge of discharge head
9:08		1.7	10.70	150	on
9:11	0				
9:12	1	24.00	33.00		
9:13	2				adjusting flow up
9:15	4	49.00	58.00		
9:16	5	50.45	59.45		
9:17	6	51.63	60.63		
9:18	7	52.48	61.48		
9:19	8	53.09	62.09		
9:20	9	53.59	62.59		
9:21	10	54.02	63.02		
9:22	11	54.52	63.52		
9:23	12	55.00	64.00		
9:26	15	55.40	64.40		
9:30	19	56.83	65.83	1690	CLEAR; 70"
9:35	24	58.00	67.00		
9:39	28	58.42	67.42		
9:41	30	58.80	67.80		
9:45	34	59.45	68.45		
9:50	39	58.58	67.58		
9:55	44	59.00	68.00		
10:00	49	59.50	68.50		
10:05	54	59.92	68.92		
10:10	59	60.42	69.42		
10:15	64	60.68	69.68		
10:20	69	61.00	70.00		
10:25	74	61.37	70.37	1670	68 1/2"
10:32	81	61.75	70.75		adjusting flow up
10:34	83	62.68	71.68	1700	70-71
10:44	93	63.28	72.28	1700	71
10:50	99	63.58	72.58		
11:00	109	64.04	73.04		EC = 99; T = 11.4; SC = 130
11:10	119	64.55	73.55		
11:20	129	65.08	74.08		
11:35	144	65.57	74.57		
11:47	156	66.00	75.00		
12:00	169	66.50	75.50		
12:15	184	66.50	75.50		
12:35	204	66.85	75.85		Sampled for W.Q.
12:45	214	67.45	76.45		EC = 98; T = 11.3; SC = 129
12:50	219	69.32	78.32		pH = 6.68 and drifting up
12:54	223				pH = 6.76
12:59	228				pH = 6.81
13:00	229	69.53	78.53	1690	69 3/4"
13:08	237	68.36	77.36		
13:15	244	68.78	77.78		
13:30	259	70.70	79.70		
13:45	274	71.00	80.00		
14:00	289	69.84	78.84		
14:15	304	70.16	79.16		
14:21	310	71.36	80.36		
14:22	311	70.95	79.95		
14:30	319	70.13	79.13		
14:45	334	69.74	78.74	1650	67"
14:49	338			1700	adj up to 71"
14:50	339	71.74	80.74		
15:02	351	72.00	81.00		
15:15	364	72.25	81.25		
15:30	379	72.50	81.50		
15:45	394	72.71	81.71		
16:00	409	73.16	82.16		
16:15	424	73.45	82.45	1700	71
16:30	439	73.75	82.75		11.4/99/130

Time	Elapsed Time (minutes)	Depth to Water (feet)	Draw-down (feet)	Pumping Rate (gpm)	Remarks
16:45	454	73.99	82.99		
17:00	469	74.08	83.08		
17:06	475			1700	70-71"
17:09	478	74.20	83.20		
17:10	479				Off

Time	t	t'	t/t'	Depth to Water (feet)	Residual Drawdown (feet)
17:10:30	480	0.5	959	29.00	38.00
17:11	480	1.0	480	23.50	32.50
17:11:30	481	1.5	320	22.10	31.10
17:12	481	2.0	241	21.10	30.10
17:13	482	3.0	161	19.30	28.30
17:14	483	4.0	121	18.19	27.19
17:15	484	5.0	97	17.17	26.17
17:16	485	6.0	81	16.45	25.45
17:17	486	7.0	69	16.03	25.00
17:18	487	8.0	61	15.48	24.48
17:19	488	9.0	54	14.97	23.97
17:21	490	11.0	45	14.25	23.25
17:23	492	13.0	38	13.65	22.65
17:25	494	15.0	33	13.09	22.09
17:27	496	17.0	29	12.60	21.60
17:30	499	20.0	25	11.99	20.99
17:33	502	23.0	22	11.46	20.46
17:36	505	26.0	19	11.02	20.02
17:39	508	29.0	18	10.59	19.59
17:43	512	33.0	16	10.14	19.14
17:48	517	38.0	14	9.53	18.53
17:53	522	43.0	12	9.10	18.10
17:59	528	49.0	11	8.61	17.61
18:06	535	56.0	10	8.03	17.03
18:12	541	62.0	9	7.83	16.83
18:16	545	66.0	8	7.54	16.54
18:25	554	75.0	7	6.97	15.97
18:35	564	85.0	7	6.64	15.64
18:40	569	90.0	6	6.42	15.42
18:44	573	94.0	6	6.25	15.25

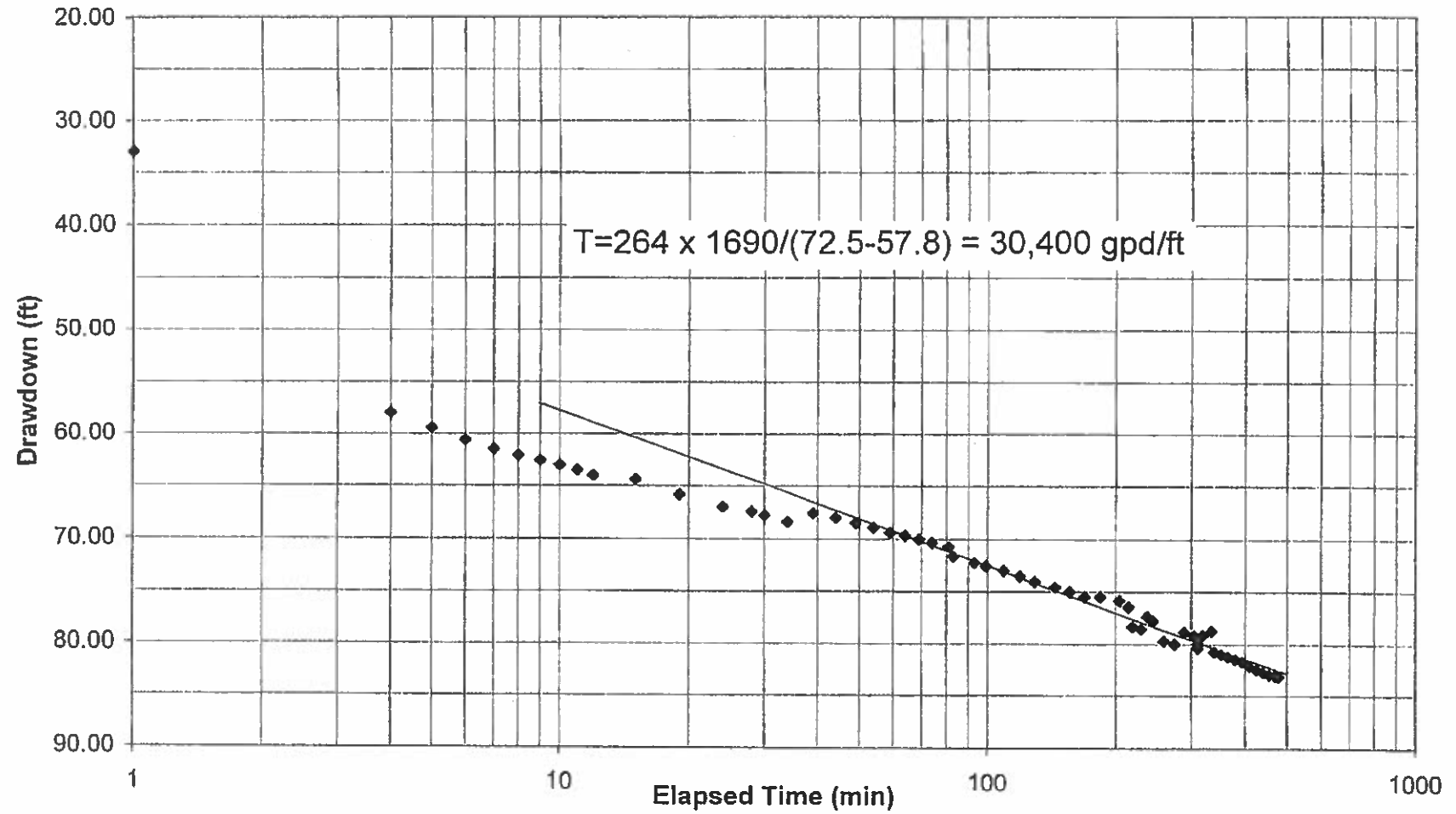
Blackhawk on the River West Well

Step Rate Test 8/20/05



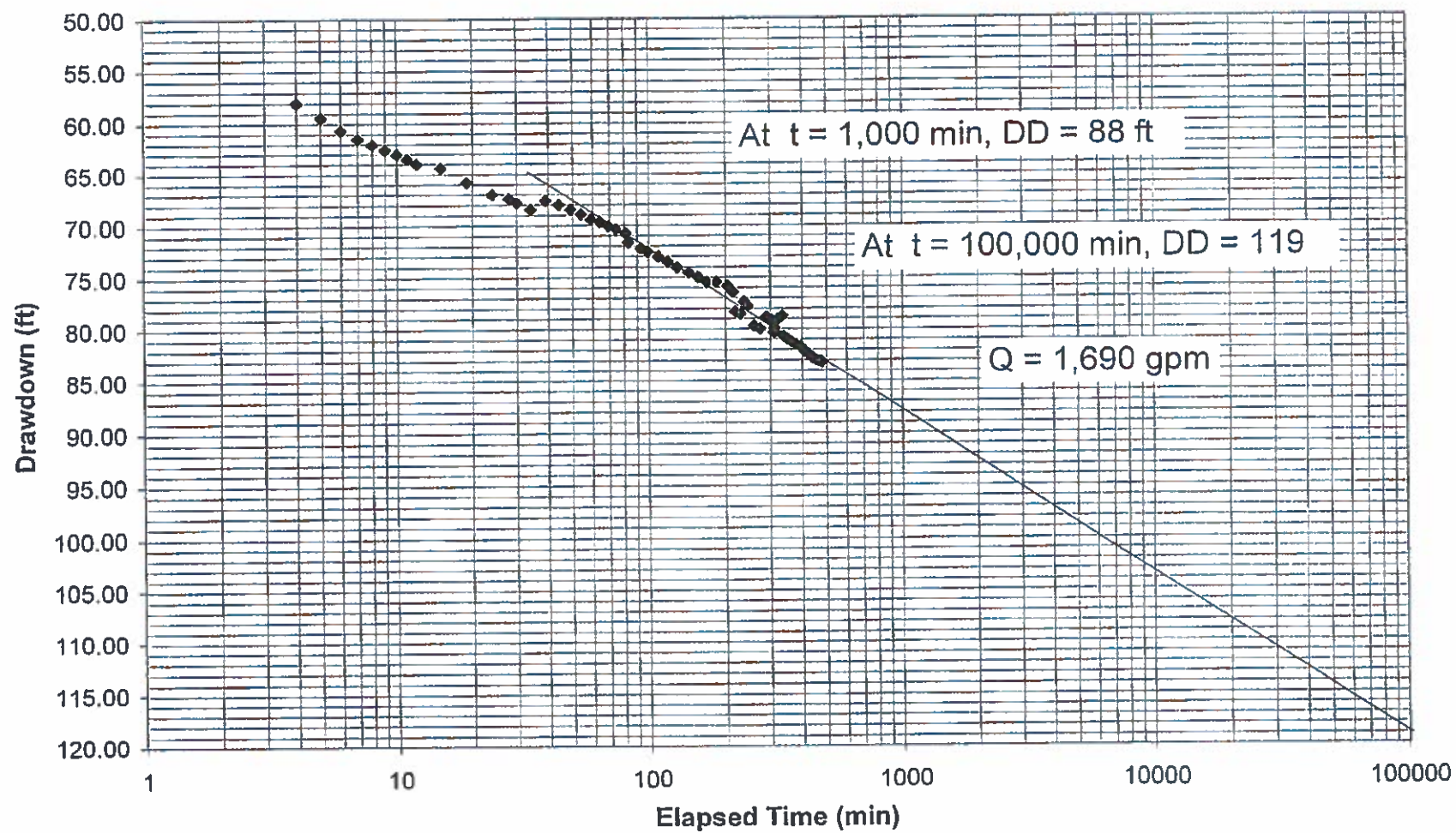
Blackhawk on the River West Well

Constant Rate Test 8/21/2005



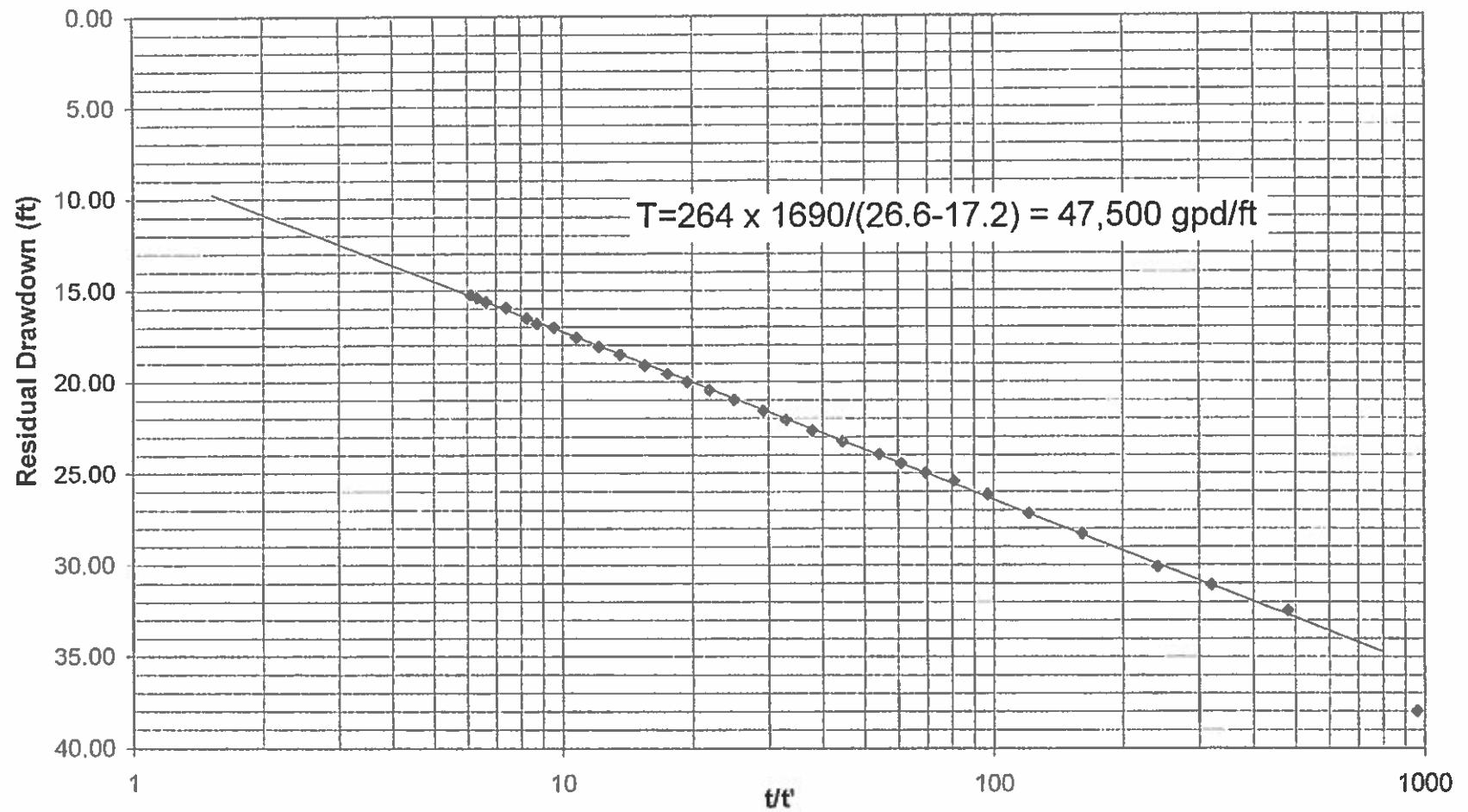
Blackhawk on the River West Well

Constant Rate Test 8/21/2005



Blackhawk on the River West Well

Recovery Test 8/21/2005



APPENDIX E

SAMPLE TYPE CODE S - Routine Sample P - Repeat sample (at original tap) E - Enforcement (chain of custody) U - Upstream repeat D - Downstream repeat X - Other Repeat W - Untreated V - Invalidated by Lab C - Construction / Special		ANALYTICAL LABORATORIES, INC. ID00020 1804 N. 33rd Street Boise, Idaho 83703 1-800-574-5773 1-208-342-5515 www.analyticallaboratories.com	
X Public Water Supply		Private Water Supply	
Other _____			

NAME OF WATER SYSTEM	COUNTY	PWS
----------------------	--------	-----

REPORT RESULTS TO:	DATE RECEIVED
TERRY SCANLAN, P.E., P.G.	9/23/2005
S P F WATER ENGINEERING, LLC	TIME RECEIVED
600 E RIVER PARK LN STE 105	11:00
BOISE, ID 83706	DATE ANALYZED
	9/23/2005
	TIME ANALYZED
	13:00

SEND ADDITIONAL COPIES TO:	IF RETEST, ORIGINAL SAMPLE DATE

Phone (208) 393-4140	Ext	Fax (208) 393-4156	email	CHILLED 10 C	☒ YES ☐ NO
----------------------	-----	--------------------	-------	--------------	---

COLLECTED BY: M DAVIS	TRANSPORTED BY: M DAVIS
-----------------------	-------------------------

SAMPLE TYPE	COLLECTION DATE/TIME	Sampling Location	CI res	TOTAL COLIFORMS	FECAL COLIFORMS	E. COLI	HPC
				SM 9223	SM 9221	SM 9223	SM 9215

C	9/22/2005 14:00	LAB# 0528899		ABSENCE		ABSENCE	
		BLACKHAWK WELL #2					
C	9/22/2005 17:30	LAB# 0528900		ABSENCE		ABSENCE	
		BLACKHAWK WELL #1					

REMARKS:	ANALYST: RLV
ANALYTICAL METHODS <u>Total Coliforms</u> SM 9222 Membrane Filter Technique, Parts 909 and 909A, Standard Methods... 16th ed., 1985 SM 9221 Multiple Tube Fermentation, Parts 908 and 908A, and 908B, Standard Methods... 16th ed., 1985 SM 9223 MMO-MUG Test Per 40 CFR 141.21(f)(3)(IV) HPC Pour Plate, Part 907, Standard Methods... 16th ed., 1	Fecal Coliforms Membrane Filter Technique, Parts 908C, Standard Methods... 16th ed., 1985 Membrane Filter Technique, Parts 909 and 909A, Standard Methods... 16th ed., 1985 E. coli MUG Test Per 141.214(x)(7) and 40 CFR 141.21(f)(6)(III)
Analytical Laboratories, Inc.  Laboratory Supervisor	



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

Laboratory Analysis Report

Sample Number: 0527180

Attn: JENNIFER SUKOW
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: J SUKOW

Submitted By: J SUKOW

Source of Sample:

PROJECT: BLACK HAWK ON THE RIVER WELL #1 (WEST WELL)

Time of Collection: 11:50

Date of Collection: 9/9/2005

Date Received: 9/9/2005

Report Date: 9/15/2005

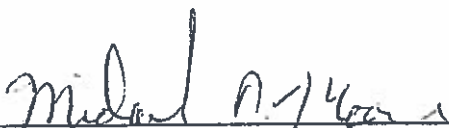
PWS#:

PWS Name:

FIELD DATA: SPECIFIC CONDUCTANCE = 131.2 US TEMP = 11.6 DEG C

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Iron, Fe		0.25	mg/L	0.05	EPA 200.7	9/15/2005	KC
Sand		2	mg/L	0.600	EPA 160.2	9/13/2005	DLR

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated


Michael Moore

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact Michael Moore

LAB/FEDERAL ID#: ID00020	LAB SAMPLE #: 0525061
DATE LAB REC'D SAMPLE: 8/22/2005	DATE REPORTED BY LAB: 9/8/2005
COMPLIANCE SAMPLE ☐ YES ☐ NO	REPLACEMENT SAMPLE ☐
COLLECTION DATE: 8/21/2005	COLLECTION TIME: 12:30 (24 hour clock)
SAMPLE TYPE: ☐ CO-confirmation ☐ RP-repeat ☐ RT-routine ☐ DU-duplicate ☐ SP-special ☐ Other	
PWS#: 4430105	PWS NAME:
SAMPLING POINT/LOCATION: PROJECT: BLACKHAWK ON THE RIVER BOTR W	TAG #/FACILITY ID:
COLLECTOR'S NAME: T.SCANLAN	CONTACT PHONE # (208) 383-4140



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

PUBLIC DRINKING WATER SYSTEM INORGANIC CHEMICAL (IOC) ANALYSIS REPORT:

Phase I								Phase V							
FRDS	Contaminant Name	Result	Method	MCL	MDL	Analysis Date	Analyst	FRDS	Contaminant Name	Result	Method	MCL	MDL	Analysis Date	Analyst
1010	Barium	ND	EPA 200.7	2	0.05	9/1/2005	KC	1085	Thallium	ND	EPA 200.8	0.002	0.002	9/8/2005	JH
1015	Cadmium	ND	EPA 200.8	0.005	0.0005	9/6/2005	JH	1075	Beryllium	ND	EPA 200.8	0.004	0.0005	9/6/2005	JH
1020	Chromium	ND	EPA 200.8	0.1	0.002	9/6/2005	JH	1074	Antimony	ND	EPA 200.8	0.006	0.005	9/6/2005	JH
1035	Mercury	ND	EPA 245.1	0.002	0.0002	8/25/2005	KC	1036	Nickel	ND	EPA 200.7	n/a	0.02	9/1/2005	KC
1038	Tu(NO2/NO3)	—		10				Other IOC's							
1040	Nitrate	1.6	EPA 300.0	10	0.2	8/23/2005	BF	1052	Sodium	11.2	EPA 200.7	n/a	0.1	8/31/2005	KC
1041	Nitrite	ND	EPA 353.2	1.0	0.01	8/22/2005	PM	1025	Fluoride	0.11	EPA 300.0	4.0	0.1	8/25/2005	WW
1045	Selenium	ND	EPA 200.8	0.05	0.005	9/6/2005	JH	1005	Arsenic	ND	EPA 200.8	0.05	0.005	9/6/2005	JH
1024	Cyanide	ND	SM 4500	0.2	0.005	8/29/2005	WW	Secondary CDS (optional)							
1050	Silver	ND	EPA 272.1	0.1	0.005	9/7/2005	JH	2905	Surfactants	ND	SM 5540		0.01	9/1/2005	MDM
1049	Silica	36.8	EPA 200.7		0.25	9/6/2005	KC	1997	Langlier Index	—					
1042	Potassium	3.4	EPA 200.7		0.5	8/31/2005	KC	1930	Dissolved Solids	94	EPA 160.1	500	25	8/24/2005	DLR
1032	Manganese	ND	EPA 200.7	0.05	0.05	9/1/2005	KC	1927	Alkalinity as CaCO3	66.0	SM 2320B			8/24/2005	JS
1031	Magnesium	4.59	EPA 200.7		0.1	8/31/2005	KC	1926	Conductivity uS/cm	131	SM 2510B		2	8/22/2005	CC
1028	Iron	0.60	EPA 200.7	0.3	0.05	9/1/2005	KC	1925	pH	7.2	EPA 150.1	6.5-8		8/22/2005	CC
1027	Hydrogen Sulfide	ND	SM 4500-S		0.05	8/23/2005	DLR	1920	Odor (Threshold #)	N.O.D.	EPA 140.1	3		8/29/2005	MDM
1022	Copper	ND	EPA 200.7	1.0	0.01	9/1/2005	KC	1915	Hardness as CaCO3	31.7	SM 2340		5	8/24/2005	JS
1017	Chloride	ND	EPA 300.0	250	1	8/24/2005	WW	1905	Color	ND	SM 2120	15cu	5	9/8/2005	MDM
1016	Calcium	11.0	EPA 200.7		0.1	8/31/2005	KC	1095	Zinc	ND	EPA 200.7	5	0.005	9/1/2005	KC
1003	Ammonia as N	ND	EPA 350.1		0.04	8/23/2005	WW	1055	Sulfate	1	EPA 300.0	250	1	8/24/2005	WW
1002	Aluminum	0.55	EPA 200.7	0.2	0.1	9/1/2005	KC								

JENNIFER SUKOW
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID, 83706

*Reported in mg/L unless otherwise noted
ND = Not detected within sensitivity of instrument
— = No analysis performed
MDL = Method detection limit

Michael N. Moore 9/7/05
Signature of Laboratory Supervisor Date
Staff Manager: Michael Moore

LAB FEDERAL ID#	ID00020	LAB SAMPLE #	0525061
DATE LAB REC'D SAMPLE	8/22/2005	DATE REPORTED BY LAB	9/8/2005
COMPLIANCE SAMPLE:	☐ YES ☐ NO	REPLACEMENT SAMPLE	☐
COLLECTION DATE:	8/21/2005	COLLECTION TIME:	12:30
SAMPLE TYPE:		☐ CO-confirmation ☐ RP-repeat ☐ RT-routine ☐ DU-duplicate ☐ SP-special ☐ Other	
PWS#	4430105	PWS NAME:	
SAMPLING POINT/LOCATION:		TAG #/FACILITY ID:	
PROJECT: BLACKHAWK ON THE RIVER			
COLLECTOR'S NAME:		CONTACT PHONE #:	
T. SCANLAN		(208) 383-4140	



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

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PUBLIC DRINKING WATER SYSTEM SYNTHETIC ORGANIC CHEMICAL (SOC) ANALYSIS REPORT:

PHDS	Contaminant Name	Result	Method	Vol	MDL	Analysis Date	Analyst	PHDS	Contaminant Name	Result	Method	Vol	MDL	Analysis Date	Analyst
2046	Carbofuran	ND	EPA 531.1	40	0.6	8/29/2005	CY	2959	Chlordane	ND	EPA 508.1	2.0	0.06	8/31/2005	CY
2042	Hexachlorocyclopentadiene	ND	EPA 508.1	50	0.02	8/31/2005	CY	2946	EDB	ND	EPA 504	0.05	0.02	8/29/2005	CY
2041	Dinoseb	ND	EPA 515.3	7	0.07	8/30/2005	CY	2931	DBCP	ND	EPA 504	0.2	0.02	8/29/2005	CY
2040	Picloram	ND	EPA 515.3	500	0.13	8/30/2005	CY	2383	PCBs	ND	EPA 508.1	0.5	0.1	8/31/2005	CY
2037	Simazine	ND	EPA 508.1	4.0	0.11	8/31/2005	CY	2326	Pentachlorophenol	ND	EPA 515.3	1	0.06	8/30/2005	CY
2036	Oxamyl	ND	EPA 531.1	200	0.4	8/29/2005	CY	2306	Benzo(a)pyrene	ND	EPA 550.1	0.2	0.01	8/31/2005	CY
2035	Di(2-ethylhexyl)adipate	ND	EPA 508	400	0.5	9/1/2005	CY	2039	Di(2-ethylhexyl)phthalate	ND	EPA 506	6.0	0.91	9/1/2005	CY
2034	Glyphosate	ND	EPA 547	700	5.6	8/30/2005	CY	2274	Hexachlorobenzene	ND	EPA 508.1	1.0	0.02	8/31/2005	CY
2033	Endosulfan	ND	EPA 548.1	100	7.9	9/1/2005	CY	2110	2,4,5-TP	ND	EPA 515.3	50	0.09	8/30/2005	CY
2032	Diquat	ND	EPA 549.2	20	0.8	9/1/2005	CY	2105	2,4-D	ND	EPA 515.3	70	0.06	8/30/2005	CY
2031	Datapon	ND	EPA 515.3	200	0.07	8/30/2005	CY	2067	Heptachlor epoxide	ND	EPA 508.1	0.2	0.01	8/31/2005	CY
2020	Toxaphene	ND	EPA 508.1	3.0	0.4	8/31/2005	CY	2065	Heptachlor	ND	EPA 508.1	0.4	0.02	8/31/2005	CY
2015	Methoxychlor	ND	EPA 508.1	40.0	0.02	8/31/2005	CY	2051	Alachlor	ND	EPA 508.1	2.0	0.24	8/31/2005	CY
2010	Lindane	ND	EPA 508.1	0.2	0.01	8/31/2005	CY	2050	Atrazine	ND	EPA 509.1	3.0	0.7	8/31/2005	CY
2005	Endrin	ND	EPA 508.1	2.0	0.01	8/31/2005	CY								

*Reported in ug/L unless otherwise noted
ND = Not detected within sensitivity of instrument

— = No analysis performed
MDL = Method detection limit

JENNIFER SUKOW
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID, 83706

Michael Moore 9/9/05
Signature of Laboratory Supervisor Date
Staff Manager: Michael Moore

LAB FEDERAL ID# ID00020		LAB SAMPLE# 0525061	
DATE LAB REC'D SAMPLE 8/22/2005		DATE REPORTED BY LAB 9/8/2005	
COMPLIANCE SAMPLE ☐ YES ☒ NO		REPLACEMENT SAMPLE ☐	
COLLECTION DATE: 8/21/2005		COLLECTION TIME: 12:30 (24 hour clock)	
SAMPLE TYPE: ☐ CO-conformation ☐ RP-repeat RT-routine ☐ DU-duel cate ☐ SP-special ☐ Other			
PWS#: 4430105		PWS NAME:	
SAMPLING POINT/LOCATION: PROJECT:BLACKHAWK ON THE RIVER BOTR		TAG #/FACILITY ID:	
COLLECTOR'S NAME: T. SCANLAN		CONTACT PHONE # (208) 383-4140	



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

<http://www.analyticallaboratories.com>

PUBLIC DRINKING WATER SYSTEM VOLATILE ORGANIC CHEMICAL (VOC) ANALYSIS REPORT:

METHOD: EPA 524.2		ANALYSIS DATE: 8/24/2005		ANALYST: ATL	
FRDS	Contaminant Name	Result	MCL	MDL	
2378	1,2,4-Trichlorobenzene	ND	70.0	0.02	
2380	cis-1,2-Dichloroethylene	ND	70.0	0.01	
2950	Trihalomethanes - Total	ND	80.0	2	
2941	Chloroform	ND		0.02	
2942	Bromoform	ND		0.4	
2943	Bromodichloromethane	ND		0.02	
2944	Dibromochloromethane	ND		0.03	
2955	Xylenes - Total	ND	10000	0.05	
2964	Dichloromethane	ND	5.0	0.02	
2969	p-Dichlorobenzene	ND	75.0	0.03	
2968	o-Dichlorobenzene	ND	600.0	0.03	
2976	Vinyl chloride	ND	2.0	0.03	
2977	1,1-Dichloroethylene	ND	7.0	0.07	
2979	trans-1,2-Dichloroethylene	ND	100.0	0.07	
2980	1,2-Dichloroethane	ND	5.0	0.02	
2981	1,1,1-Trichloroethane	ND	200.0	0.02	
2982	Carbon Tetrachloride	ND	5.0	0.01	
2983	1,2-Dichloropropane	ND	5.0	0.01	
2984	Trichloroethylene	ND	5.0	0.01	
2985	1,1,2-Trichloroethane	ND	200.0	0.04	
2987	Tetrachloroethylene	ND	5.0	0.03	
2989	Monochlorobenzene	ND	100.0	0.02	
2990	Benzene	ND	5.0	0.03	
2991	Toluene	ND	1000.0	0.05	
2992	Ethylbenzene	ND	700.0	0.05	
2996	Styrene	ND	100.0	0.02	

*Reported in ug/L unless otherwise noted
ND = Not detected at or above 0.5 ug/L

-- = No analysis performed
MDL = Method detection limit

JENNIFER SUKOW
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID, 83706

Michael N. Moore 9/2/05
Signature of Laboratory Supervisor Date
Staff Manager: **Michael Moore**

Lab Federal ID#:	WY00002	Lab Sample	0525062
Date Lab Rec'd Sample:	8/22/2005	Date Reported by Lab:	09/06/05
Compliance Sample:	☒ Yes ☐ No	Replacement Sample	☐
Collection Date:	8/22/2005	Time Collected:	12:30
Sample Type:	☐ CO-confirmation ☐ RP-repeat ☒ RT-routine ☐ DU-duplicate ☐ SP-special ☐ Other		
PWS #:	4430105	PWS Name:	
Sampling Point/Location	BLACKHAWK, BOTR WELL #1 WEST		
Collector's Name:	T.SCANLAN		
Tag # / Facility ID:			
Contact Phone #:	(208) 383-4140		



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

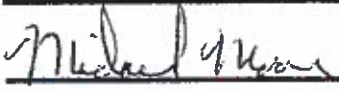
PUBLIC DRINKING WATER SYSTEM RADIOLOGICAL ANALYSIS REPORT

FRDS Number	CONTAMINANT	Result ug/L	Result pCi/L	MCL	Analysis Date	Analyst	Method
4002	Gross Alpha Activity (Includes Radium and Uranium)		ND		8/26/2005	ELI	EPA 900.0
4006	Uranium (measure if gross alpha exceeds 15 pCi/L; activity = 1.0 x concentration ug/L)	ND	ND	30	9/2/2005	ELI	EPA 908.1
4000	Adjusted Gross Alpha (Subtract Uranium activity level from Gross Alpha Activity above)		—				
4020	Radium-226 (Required if Alpha activity is greater than 5pCi/L)		*ND		8/23/2005	ELI	EPA 903.0
4030	Radium-228 (measure if radium 226 exceeds 3 pCi/L)		**ND		8/23/2005	ELI	EPA 904.0
4010	Total Measured Radium (Sum of Ra-226 and Ra-228)		—				
4100	Beta/Photon Activity (Measure major constituents if activity exceeds 50 pCi/L)		4.7+/-1.4	50pCi/L	8/26/2005	ELI	EPA 900.0

ND = Not detected within sensitivity of Instrument
— = No analysis performed for this contaminant

ELI-TESTING PERFORMED AT ENERGY LABORATORIES, INC. RESULTS RECEIVED 09/07/05.
*ND=NONE DETECTED @ 0.2 pCi/L. **ND=NONE DETECTED @ 1.0 pCi/L.
ND=NONE DETECTED

CC:

 9/8/05
 Lab Supervisor's Signature Date

Attn: JENNIFER SUKOW
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

APPENDIX F

CUSTOMER Black Hawk #2

ADDRESS _____

DRILLER Kevin

HOLE SIZE _____" CASING SIZE _____"

SCREENS OR PERFORATIONS _____"



Riverside, Inc.

• Electrical Apparatus - Sales & Repair
• All type pumps - Sales & Repair
• Complete machine shop
• Design & installations
• Well drilling

DATE STARTED 8-19-05

DATE COMPLETED _____

HELPER Terry DRILL USED Challenger

WATER LEVEL AT _____ FT.

TIME	STEM #	DEPTH		FORMATION
		FROM	TO	
		0	2	Top soil
		2	9	dirty gravel
		9	21	sand (Brn)
		21	34	sand & gravel (3" minus) gravel in layers
		34	40	sand & tan clay
		40	52	coarse sand
		52	55	Dark Brn clay some sand
		55	60	sand & gravel
8:20		60	63	Brn clay
		63	77	fine to coarse sand with ~~some~~ seams of clay
		77	83	sand & gravel
		83	119	fine to coarse sand ~~thin~~ layers Brn clay
		119	133	Brn clay
		133	145	fine to coarse sand with Brn clay layers
		145	152	tan clay
		152	171	fine to coarse sand with Brn clay layers
		171	201	" " " "
		201	206	Brn clay

CUSTOMER _____

ADDRESS _____

DRILLER _____

HOLE SIZE _____" CASING SIZE _____"

SCREENS OR PERFORATIONS _____"



Riverside, Inc.

• Electrical Apparatus - Sales & Repairs
• All type pumps - Sales & Repair
• Complete machine shop
• Design & installation
• Well drilling

DATE STARTED _____

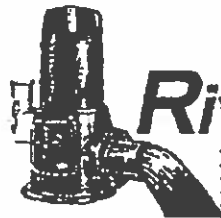
DATE COMPLETED _____

HELPER _____ DRILL USED _____

WATER LEVEL AT _____ FT.

TIME	STEM #	DEPTH		FORMATION
		FROM	TO	
		206	220	fine to coarse sand (layers of small gravel)
		220	225	Brn clay
		225	267	fine to coarse sand & pea gravel (with small gravel 252')
		267	277	Brn clay some sand
		277	294	fine to coarse sand - a little clay
8-21		294	306	lt. Brn. clay (300' Blue clay)
		306	310	fine to coarse blue sand some small gravel
		310	314	coarse sand & small gravel
		314	320	Blue clay some sand
		320	332	fine to med sand (fine sand 325' with clay layers)
		332	358	fine to med sand (layers of fine sand starting at 345')
		358	360	gray clay with fine sand layers
		360	365	fine to med sand some coarse
		365	375	gray clay thin sand layers
		375	402	fine to med sand clay from 385' - 388' - 394' - 395'
		402	410	fine to med sand layers of fine sand
		410	414	sand & clay mix
		414	419	fine to med sand

SCREENS OR PERFORATIONS _____



Riverside, Inc.

- Electrical Apparatus - Sales & Repairs
- All type pumps - Sales & Repair
- Complete machine shops
- Design & installations
- Welding

WATER LEVEL AT _____ FT.

[illegible]



Memorandum

DATE: September 1, 2005
TO: Well Construction File 396.0030
FROM: Jennifer Sukow, P.E.
CC:
RE: 396.0030 Blackhawk Well No. 2 (East Well) Surface Seal Installation

I observed placement of the annular seal in the East Well at Blackhawk on the River on August 24, 2005. Seal placement was supervised by Kevin Chastain of Riverside, Inc. The seal was placed in a nominal 28-inch diameter borehole, around 20.0-inch O.D. casing. The 20-inch casing extends to a depth of approximately 295 feet below ground level. The seal was installed by pouring approximately 8.5 super sacks (approximately 21,000 pounds) of Teague Minerals 1-inch bentonite chips. The annulus was filled with granular bentonite chips to the bottom of the surface casing at a depth of 12 feet (BGS).

When I arrived on site, Riverside had completed pouring filter pack sand. Kevin Chastain commented that the filter pack sand and the intermediate seal had settled well during pouring, and that he believes the 5-foot intermediate seal was placed to within a foot of the design depth. The top of the filter pack sand was at a depth of 284 feet BGS, approximately 11 feet higher than the design depth.

The bentonite surface seal was poured between 2:20 PM and 4:35 PM. Details are provided in the attached table

The calculated annular volume was 2.1 cubic feet per foot. Therefore, each super sack containing approximately 35 cubic feet should have filled approximately 17 linear feet of annulus. Instead, each bag filled an average annulus length of 32 feet. This discrepancy is assumed to be related to the thick bentonite drilling fluid, which may have suspended some of the bentonite as it was hydrating.

Blackhawk on the River East Well Sealing Event 8/24/2005

nominal 28-inch borehole with 20-inch casing
calculated annular space 2.1 cubic feet per foot
bentonite chips in nominal 1.3 cubic yard bags
measurements in feet below ground surface

start time	finish time	depth	feet of annular space per bag	comments
---		284		top of sand
14:20	14:30	262	22	finish bag 1
14:36	14:45	231	31	finish bag 2
14:55	15:05	197	34	finish bag 3
15:10	15:20	165	32	finish bag 4
15:24	15:35	131	34	finish bag 5
15:40	15:55	96	35	finish bag 6
15:57	16:08	64	32	finish bag 7
16:12	16:24	27	37	finish bag 8
16:27	16:35	12	15	finish part bag of 9

APPENDIX G

BLACKHAWK ON THE RIVER
WELL 2 (EAST WELL) PUMP TEST
SEPTEMBER 16-17, 2005

Pump intake set at 200 feet BGS

Well 2 pressure gage is 44 inches (3.67 feet) above ground level (AGL)

Well 2 water level measurement point is 21 inches AGL and 8 inches laterally; subtract 2.5 feet

Well 1 pressure gage is 2.0 feet AGL

Well 1 discharge pipe invert is approximately 0.25 feet AGL

Well 1 water level measurement point is 3 inches AGL and 17 inches laterally; subtract 1.67 feet

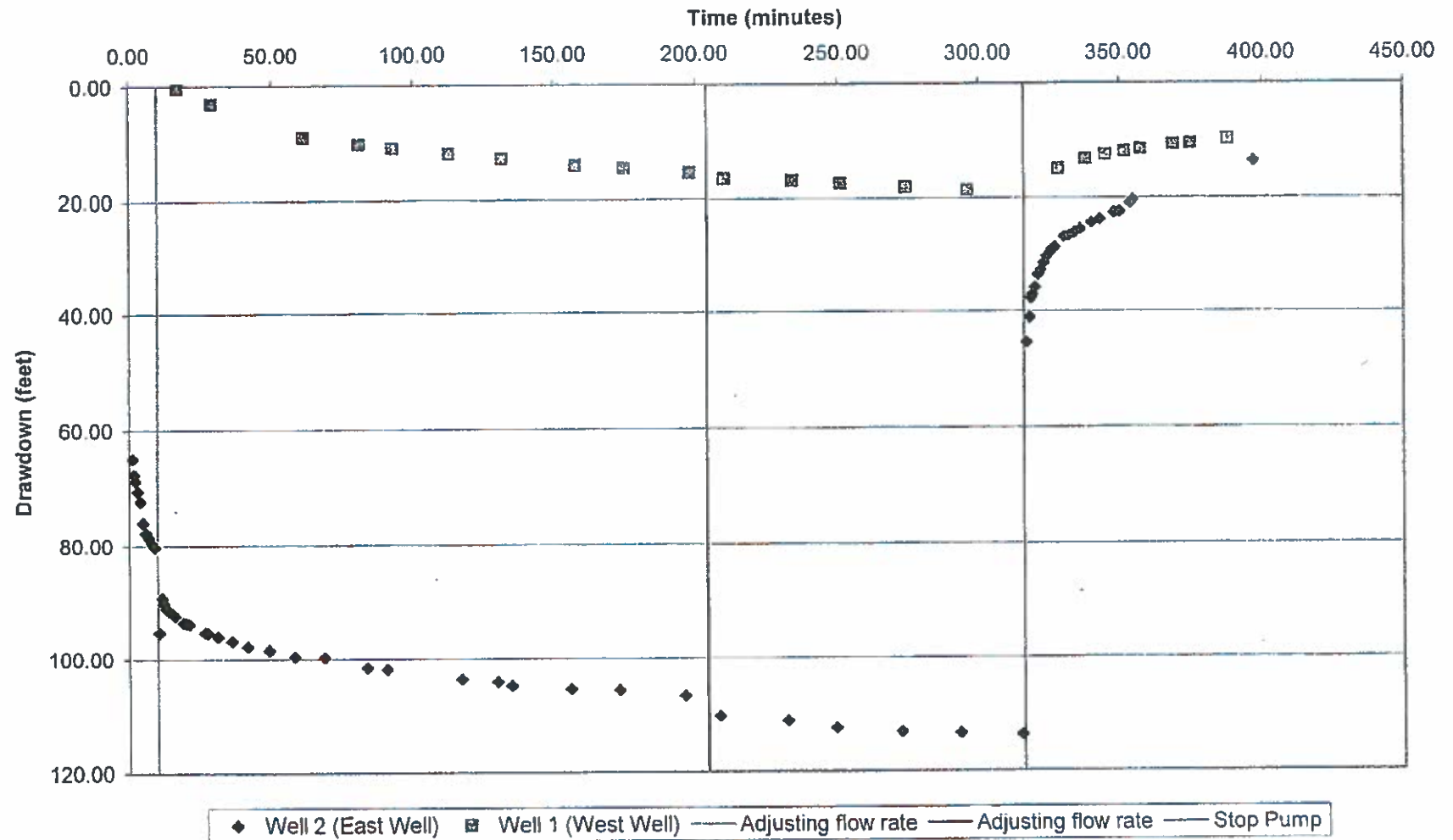
Flow rate measured with a 10" x 8" orifice and pilot tube. Orifice coefficient of 0.744 assumed.

Date	Time	Elapsed Time from Pump Start (min)	Elapsed Time from Pump Stop (min)	W	Well 2 (East Well Readings)					Well 1 (West Well Readings)				Flow Measurements		Comments
					Pressure Gage Reading (psi)	Depth to Water (feet BMP)	Water Level (feet BGS)	Drawdown (feet)	Specific Capacity (gpm/ft)	Pressure Gage Reading (psi)	Depth to Water (feet BMP)	Water Level (feet BGS)	Drawdown (feet)	Orifice Measurement (inches)	Flow Rate (gpm)	
9/16/2005	13:13									3.1		-9.15				
	13:42									3.2		-8.39				
	13:45				8		-22.13									
	14:25	0:00														Start development pumping
	14:27	2:00				32	29.5	51.8	24							
	14:28	3:00				33	30.5	52.8	23							
	14:29	4:00				35	32.5	54.6	23							
	14:30	5:00				34	31.5	53.6	23							
	14:31	6:00				34	31.5	53.6	23							
	14:35	10:00												17	1237	
	14:40	15:00				85	82.5	114.6	23							
	14:42	17:00												74	2580	
	14:43	18:00				96	83.5	115.6	22							
	14:45	20:00														rewinding
	14:47	22:00				51	48.5	70.6								shut down to repair elbow downstream of pump discharge; restarted then shut down to move mainline because of erosion and sediment control concerns
	14:52															
9/17/2005	7:47				8		-22.13			2.5		-7.77				Start constant rate pump test
	8:00	0:00														
		1:25				45.3	42.6	64.9	31							
		1:75				48.1	45.6	67.7	30							
		2:25				49.2	46.7	68.8	29							
		3:00				51.0	48.5	70.8	28							
		4:00				52.7	50.2	72.3	28							
		5:00				58.4	53.9	76.0	28							
		6:00				58.1	55.6	77.7	26							
		7:00				58.9	56.4	78.5	25							
		8:00				59.9	57.4	79.6	25							
		9:00				60.6	58.1	80.2	25							
		10:50				75.7	73.2	85.3	21							Adjusting pump rpm to achieve ~2,000 gpm flow rate
		11:50				69.5	67.0	89.1	22							
		12:00				70.4	67.9	90.0	22							
		13:00				71.3	68.8	90.9	22							
		14:00				71.8	69.3	91.4	22							
		15:00				72.2	69.7	91.8	22							
		16:00				72.7	70.2	92.3	22							
		17:25								2.3		-7.31	0.45			
		19:00				73.9	71.4	93.5	21							
		20:00				74.0	71.5	93.6	21							
		21:00				74.2	71.7	93.8	21							
		24:00												45	2012	
		26:50				75.7	73.2	95.3	21							
		27:50				75.8	73.3	95.4	21							
		29:25								1.1		-4.54	3.23			
		31:00				76.4	73.9	96.0	21							

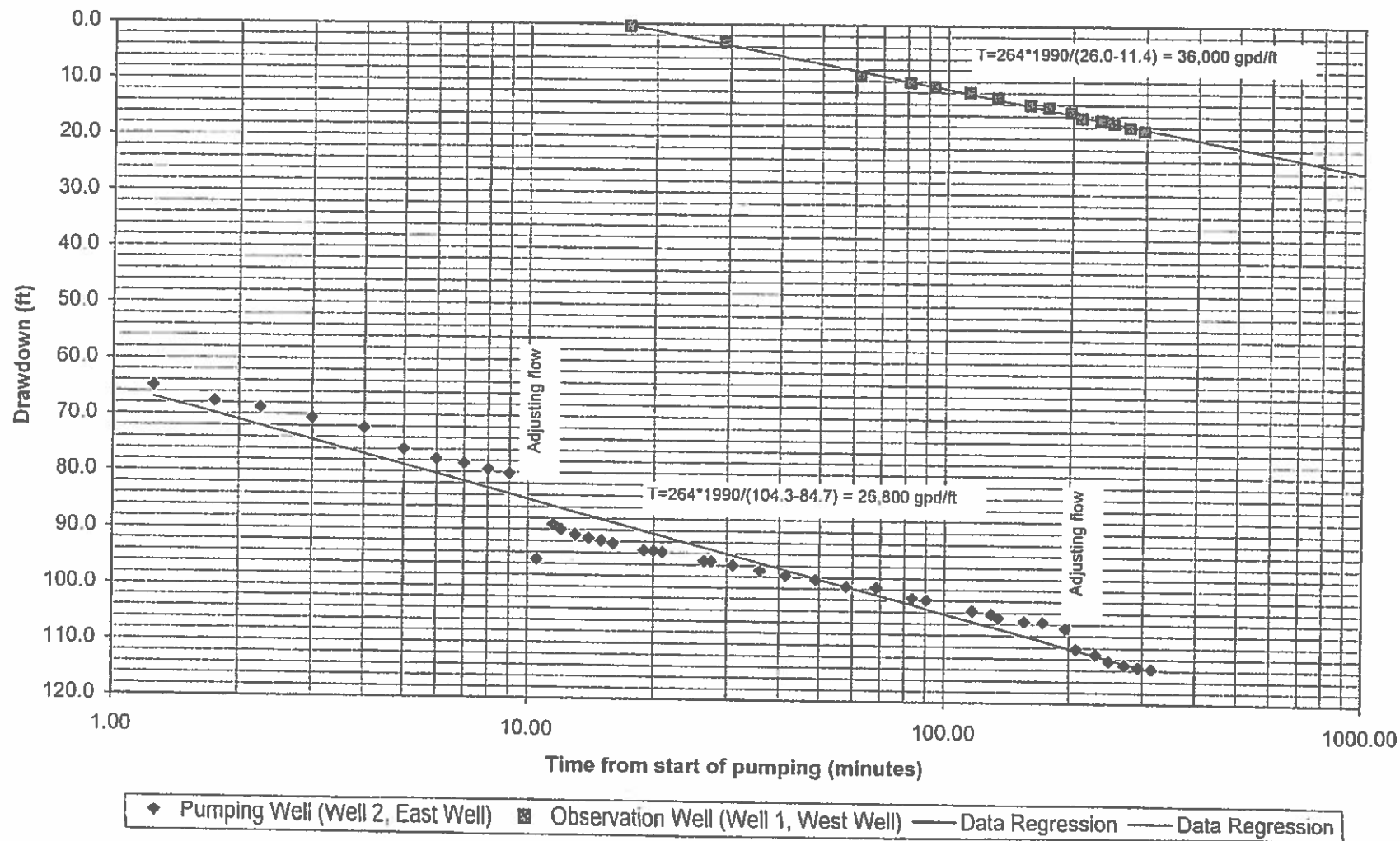
Date	Time	Elapsed Time from Pump Start (min)	Elapsed Time from Pump Stop (min)	UT	Well 2 (East Well Readings)				Specific Capacity (gpm/ft)	Well 1 (West Well Readings)				Flow Measurements		Comments
					Pressure Gage Reading (psi)	Depth to Water (feet BMP)	Water Level (feet BGS)	Drawdown (feet)		Pressure Gage Reading (psi)	Depth to Water (feet BMP)	Water Level (feet BGS)	Drawdown (feet)	Orifice Measurement (inches)	Flow Rate (gpm)	
		36.00				77.3	74.8	06.9	21							
		38.00														Well 1 < 1psi (gage has pegged)
		41.00				78.1	75.6	97.7	20							
		45.00														Opened valve on Well 1; water level still above invert; closed valve
		49.00				78.8	76.3	98.4	20							
		58.00				80.0	77.5	99.6	20							
		61.50									3.0	1.3	9.10			
		68.50				80.1	77.8	99.7	20							
		74.00												44	1959	
		81.00									4.2	2.5	10.30			
		83.50				82.0	79.5	101.6	20							
		90.50				82.3	79.8	101.9	20							
		93.00									4.9	3.2	11.00			
		96.00												44	1959	
		113.00									5.9	4.2	12.00			
		117.00				84.1	81.8	103.7	19							Specific conductance 120.8 uS; temperature 11.2 deg C
		125.00														
		130.00				84.6	82.1	104.2	19							
		132.00									6.8	5.1	12.90			
		135.00				85.3	82.8	104.9	19							
		137.00												44	1959	
		156.00				85.9	83.4	105.5	19							
		158.00									8.0	6.3	14.10			
		173.00				86.05	83.6	105.7	19							
		175.00									8.5	6.8	14.60			
		180.00														Started Rossum sand test
																Checked flow rate on Rossum sand tester; 5L in 2:18 = 0.57 gpm; at this rate 0.011 mL/min = 5 ppm sand
		185.00														Ended Rossum sand test; sand was not measurable, a tiny trace was visible at bottom of vial, <<< 0.1 mL/10 min, <<< 0.01 mL/min
		190.00														Removed Rossum apparatus and collected sample for laboratory analysis of sand content
		192.00														
		196.00				87.1	84.8	105.7	19							
		198.00									9.3	7.6	15.40			
		200.00												43	1967	
		203.00														Specific conductance 130.2 uS; temperature 11.2 deg C
		205.00														Adjusted rpm to increase flow
		208.00				90.7	88.2	110.3	18							
		210.00									10.25	8.6	16.35			
		214.00												45	2012	
		232.00				91.6	89.1	111.2	18							
		234.00									10.7	9.0	16.60			
		249.00				92.8	90.3	112.4	18							
		251.00									11.2	9.5	17.30			
		255.00												45		
		272.00				93.5	91.0	113.1	18							
		274.00									11.9	10.2	18.00			
		293.00				93.8	91.3	113.4	19							
		298.00									12.5	10.8	18.60			
		299.00														Specific conductance 134.2 uS; temperature 11.3 deg C
		305.00												44		
		315.00				94.1	91.6	113.7	18							
		316.00	0.00													Shut off pump because of sediment control concerns at designated discharge area
		317.00	1.00	317.00		25.8	23.3	45.4								
		318.00	2.00	159.00		21.5	19.0	41.1								

[illegible]

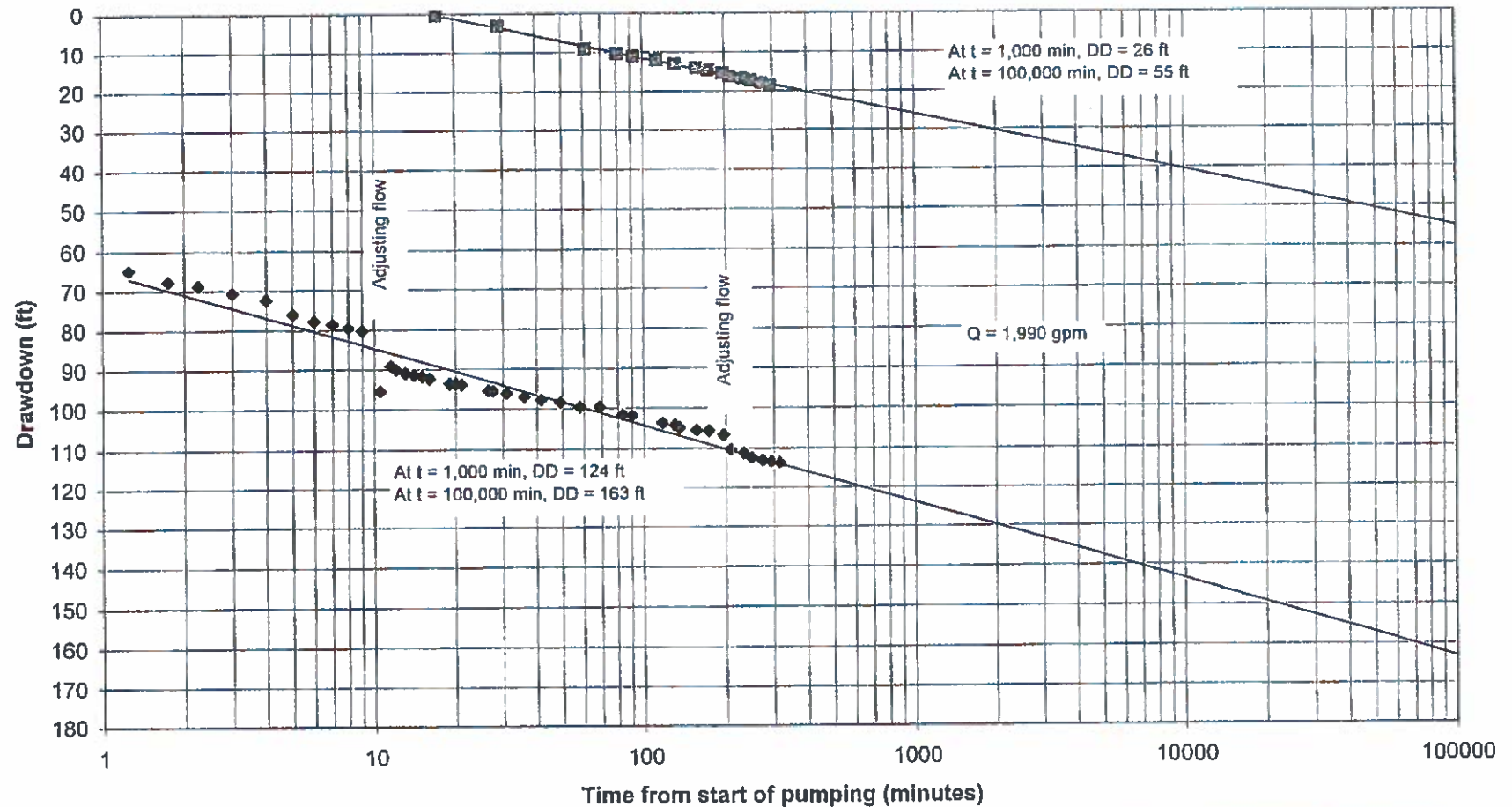
Blackhawk on the River, Well 2 Pump Test East Well, September 17, 2005



Blackhawk on the River, Well 2 Pump Test East Well, September 17, 2005

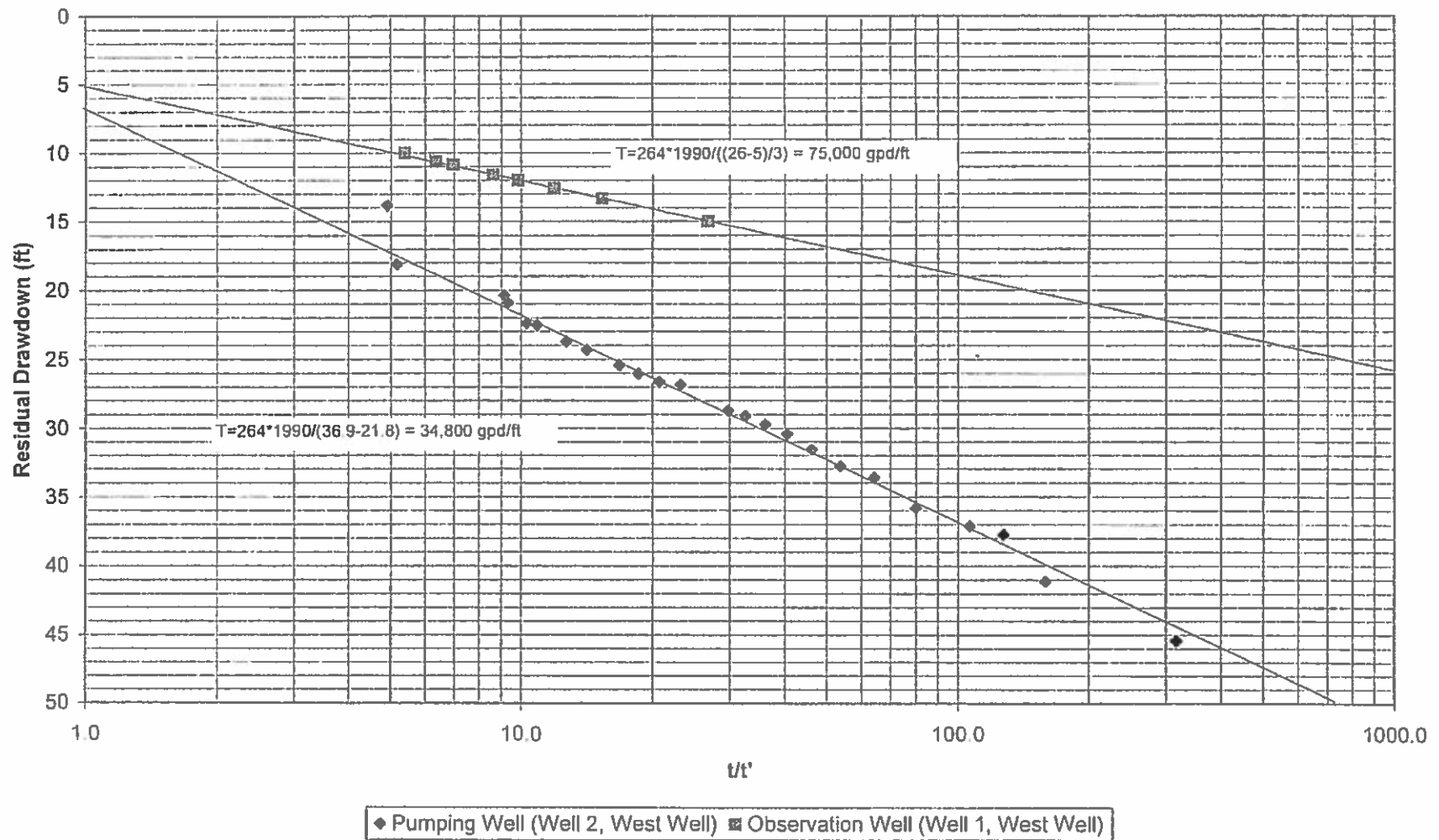


Blackhawk on the River, Well 2 Pump Test East Well, September 17, 2005



◆ Pumping Well (Well 2, East Well) ■ Observation Well (Well 1, West Well) — Data Regression — Data Regression

Blackhawk on the River, Well 2 Recovery Test East Well, September 17, 2005



17. The VFD systems shall be protected from spikes and surges in the line voltage and overvoltages caused by lightning strikes.
18. The VFD input displacement power factor shall be 0.95 or better at full load. Efficiency shall be measured at 95 percent minimum at full load.
19. All components of the VFD systems shall be selected to operate continuously without any system trip or damage under the following expected power variations:
 - a. plus or minus 10% voltage fluctuation
 - b. plus or minus 3 percent frequency variation
 - c. distorted voltage waveform with up to 7 percent total harmonic distortion.
20. The VFD systems shall employ voltage sag ride-through coordination under normal operating (average load) conditions to prevent nuisance trips with the following utility interruptions:
 - a. 0% voltage for one cycle
 - b. 60% voltage for 10 cycles
 - c. 87 % voltage continuous
21. The VFDs shall provide the following operational features:
 - a. The VFD shall be able to start from bypass or fault trip into a spinning load without stopping the motor or creating a fault condition. The VFD shall match the motor's speed and then drive the motor to its proper, pre-set speed.
 - b. Programmable current limit.
 - c. Programmable auto-restart function. Auto-restart precludes any attempt at restart in the event of trips typically indicative of component failures.
 - d. Individually programmable acceleration and deceleration times adjustable from 0.0-30 seconds.

2.7 SPARE PARTS

- A. Provide the manufacturer's recommended spare parts package for each pump.

2.8 MANUFACTURERS

- A. 450 gpm pump: Berkeley 7T40-450, 5 stages; or equal
- B. 225 gpm pump: Berkeley 6T15-225, 6 stages; or equal
- C. 1,000 gpm pump: Berkeley 8T100-900, 4 stages; or equal
- D. Motors: Franklin, Hitachi, or equal
- E. VFDs: Danfoss or equal

PART 3 -- EXECUTION

- 3.1 Pumping equipment shall be installed in accordance with approved procedures submitted with the shop drawings and as shown, unless otherwise approved by the Engineer.

- END OF SECTION -

Operations and Maintenance Manual

BLACKHAWK ON THE RIVER PUBLIC WATER SYSTEM

PWS No. 4430105
Valley County, Idaho
July 2006

RECEIVED

FEB 15 2007

DEPARTMENT OF
ENVIRONMENTAL QUALITY
BOISE REGIONAL OFFICE

Prepared By:

SPF Water Engineering, LLC
600 East River Park Lane, Suite 105
Boise, Idaho 83706
(208) 383-4140

APPROVED
By: *Paul A. Desjardis*
IDAHO DEQ
Boise Regional Office
Date: 2/16/07

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APPENDICES

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CHAPTER 1 – WATER SYSTEM OPERATION

1.0 Water System Description

The Blackhawk on the River water system will provide water for domestic and irrigation use to 132 residential lots and a recreation center. The average residential lot size of approximately 0.68 acres, but irrigation of residential lots is limited by the subdivision's Design Guidelines to an average of 0.18 acres per lot. The recreation center is expected to irrigate approximately 1 acre. Other water system demands include providing fire flow, providing water to replace irrigation losses in two lined aesthetic/recreational ponds and providing supplemental irrigation water for common areas that will be irrigated primarily through land application of reuse water after the subdivision is fully developed.

The water system service area is generally located approximately three miles south and one mile west of McCall, Idaho. The project site is bounded by the North Fork of the Payette River on the east and by West Mountain Road on the west. The water system service area includes portions of Sections 25 and 36, Township 18 North, Range 2 East, and Section 30, Township 18 North, Range 3 East.

The water system will initially be owned by the development company – Sage SGI, LLC, and the intent is to transfer the system to the homeowners association or another water provider prior to full build out. Engineering design and construction management for the subdivision is being provided by RiveRidge Engineering Company and Secesh Engineering, Inc. SPF Water Engineering, LLC (SPF) is providing engineering services related to the groundwater well and pumping system design, water rights issues, and preparation of the Financial, Technical, and Managerial documentation, which includes this Operations and Maintenance Manual.

The water system includes a distribution system with 12-inch and 8-inch water mains, metered service connections, and two water supply wells. Both wells were flowing under artesian pressure when constructed in 2005. Well 1 (West Well) is constructed with 12-inch casing and 10-inch stainless steel well screens and is located in a building to protect the artesian well from freezing. Well 2 (East Well) is constructed with 20-inch casing and 10-inch stainless steel well screens and is located inside the pump house. If the water system expands, Well 1 may be equipped with a larger pump, or a storage tank may be constructed for fire flow purposes.

Well construction and performance details are included in **Appendix A**. Distribution system drawings are included in **Appendix G**. As-built drawings of the well pumping facilities are included in **Appendix H**.

1.1 System Startup

Startup of well facilities should be accomplished by first flushing the pump in the active well to atmosphere until clear water is observed and then slowly valving the well into the distribution system. To start the well pump, locate the three way switch (OFF, HAND, AUTO) on the starter panel. First, run the pump in "HAND" mode during flushing to assure no preset controls are activated. Once the well has been flushed, set the starter to the "OFF" position to turn off the well pump. Wait 30 seconds, and turn the three way switch to the "AUTO" position. When filling the distribution system, always open hydrants at the farthest ends of the system to remove air from the distribution system during filling of the water system. Slowly open and close the appropriate isolation valves to allow water to enter the distribution system. Observe the open fire hydrants to assure the water mains have been filled. Slowly close the fire hydrant until the system pressurizes and the well pump gets a stop signal by achieving the high set point pressure setting. The pump should now run in automatic mode according to the control logic that has been programmed for the system.

1.2 System Shutdown

On the rare occasion that the water system may need to be completely shut down, the pumping facility should be isolated from the distribution system to avoid complete depressurization. This is accomplished by slowly closing the isolation valve located on the common discharge piping at the downstream end of the well house piping. After the isolation valve has been closed, water from the active pump(s) will be flushed to atmosphere through the 4-inch pressure relief valve. Once the distribution system has been isolated from the pumping system, and all active pump(s) are flushing to atmosphere, the operator can then proceed with the stop sequence on the pump control panel.

1.3 Wells and Submersible Pumps

Well 1 (West Well) is constructed with 12-inch casing and 10-inch stainless steel well screens and is located in a building to protect the artesian well from freezing. Well 2 (East Well) is constructed with 20-inch casing and 10-inch stainless steel well screens and is located inside the pump house. As-built drawings and well construction details are included in **Appendix A**.

Well 1 (West Well) is equipped with a 40 hp, 450 gpm pump and Well 2 (East Well) is equipped with a 15 hp, 225 gpm pump and a 100 hp, 1,000 gpm pump. If the water system expands, the Well 1 (West Well) may be equipped with a larger pump, and/or a storage tank may be constructed to provide fire and equalizing storage.

As built drawings of the pumping system are in **Appendix H**. Manufacturers manuals for the pumping station equipment are in **Appendix B**.

Recommended system operating pressures based on design data and hydraulic modeling are summarized in Table 1-2. System operating pressures may be modified after construction and system start-up to reflect as-built conditions.

Well No.	Pump Name	Drive	Design Capacity (gpm)	Design TDH (feet)	Horsepower (hp)
2	Primary Pump	VFD	225	213	15
1	Secondary Pump	VFD	450	290	40
2	Emergency Standby Pump	Constant speed	1,000	306	100

Table 1-1. Pump Operating Parameters

Condition	Well house discharge pressure (psi) ¹	Anticipated range of pressure in distribution system
Typical operating pressure	65	51 to 74 psi (at peak hour demand)
Minimum static pressure for hydropneumatic storage	55	41 to 65 psi (at zero demand)
Maximum static pressure for hydropneumatic storage	75	61 to 85 psi (at zero demand)
Minimum pressure for fire flow plus peak hour delivery (pump-on pressure for 1,000 gpm pump)	45	21 to 54 psi (at fire flow plus peak hour demand)
Maximum pressure for fire flow plus peak hour delivery (pressure relief set point for 1,000 gpm pump)	77	53 to 86 psi (at fire flow plus peak hour demand)

¹Well house discharge pressure is assumed to be measured at an elevation of 4,906.75 feet.

Table 1-2. Recommended pressure settings for water system operation.

1.4 Pump Controls

Because the system does not have a storage reservoir, it is recommended that the 15 hp, 225 gpm pump ordinarily be designated as the lead pump to accommodate low demand periods that are expected to occur daily. However, the operator may designate the 40 hp, 450 gpm pump as the lead pump if needed. Whichever of these pumps is not designated as the lead pump will be on standby status as the lag pump. The 100 hp, 1,000 gpm pump will also be on standby and is designed to operate only during a fire flow event or during occasional fire hydrant testing performed to document fire flow capacity to the fire department.

A programmable logic circuit (PLC) will control the pumps based on feedback from the pressure transducer and the VFDs. The PLC will direct the lead pump VFD to maintain a given pressure while in operation. The VFD will also be programmed with minimum and maximum speeds. When the lead pump is off, the distribution system will draw water from the hydropneumatic storage tanks.

The control scheme for pump operation is summarized below. Minimum pump speed settings and pressure settings will be adjustable and may be revised to reflect actual system construction and performance. Pressure settings will be measured at the well house discharge pressure gage. The pumps will be equipped with flow switches. Alarms will be sent for activation of the 100 hp, 1,000 gpm pump, power loss, and abnormal system pressure or flow rates. Detailed documentation of the control settings are included in the U.S. Filter Control Systems Operation and Maintenance Manual.

Summary of Control Scheme

1. Lead pump (15 hp, 225 gpm) will operate at variable speed to maintain a system pressure of 65 psi (adjustable).
2. If lead pump runs at 97% of speed for more than 15 minutes (adjustable) or at 100% for more than 1 minute (adjustable), the lag pump (40 hp, 450 gpm) will start. The lead pump and lag pump will operate at variable speed to maintain a system pressure of 65 psi (adjustable).
3. If the lag pump runs at 67% of speed for more than 20 minutes or at minimum speed for 30 seconds (adjustable), the lag pump will shut off. The lead pump will continue to operate at variable speed to maintain a system pressure of 65 psi (adjustable).
4. If the lead pump runs at minimum speed for 30 seconds (adjustable), and the 100 hp, 1,000 gpm pump is not running, the pump will continue to operate at minimum speed until the system pressure has increased to 75 psi (adjustable), then the lead pump will shut off.

5. The lead pump will start when the system pressure falls to 55 psi (adjustable).
6. If the system pressure falls below 45 psi (adjustable) at any time, or is below 50 psi for more than 15 minutes (adjustable), the 100 hp, 1,000 gpm pump will start. *stage 4*
stage 3
7. The 100 hp, 1,000 gpm pump will shut off when the system pressure has been at or above 65 psi for more than 7 minutes with the lead pump running at minimum speed (adjustable). The deep well pump control valve will be equipped with a pressure relief override, which is set between 70 and 75 psi (adjustable) to protect the system from a high pressure event. Excess water pumped prior to shut off will be discharged to waste through this valve.
8. During a power outage the emergency generator will automatically start. The 40 hp, 450 gpm pump will run to provide water to the distribution during power outages.
9. The system pressure relief valve is set between 80 and 85 psi (adjustable) to protect the system from a high pressure event.

1.5 Hydropneumatic Tanks

Water storage requirements are generally designed to meet two main components; fire protection and 24-hour peaking demands. Due to the relatively flat topography and small size of the project, large storage reservoirs are not economically feasible to construct until future customer growth can support such an investment. Hydropneumatic tanks along with variable frequency drives (VFD) will be installed to reduce pump cycling while maintaining system pressure within an acceptable range.

The Blackhawk on the River well facility will be equipped with five 120-gallon bladder pressure tanks that will supply water to the distribution system during periods of low system demand. The tanks will operate over a 20 psi pressure range as described in **Table 1-2**. The hydropneumatic storage will minimize pump cycling during low demand periods. Because VFDs will be used to meet peak period demands, the gross tank volume was calculated based on the anticipated minimum pumping rate (50 gpm) that can be achieved with the VFD. *55-75 psi*

Equipment manufacturer's literature regarding the hydropneumatic tanks is included in **Appendix B**.

1.6 Pressure Relief Valve

A pressure relief valve is required to relieve pressure within the water system if a high pressure event occurs. If any or all pump controls failed and one or more of the well pumps does not shut off at their preset pressure setting, the well pumps could potentially over pressurize the water system. In the event of high pressure, the pressure relief valve would activate (open) and relieve pressure at each pumping facility at a preset pressure. The pressure relief valve is piped to the flush line to allow water to flow to atmosphere through the flushing system. If water is observed flowing out of the flush line, this visual indicator should notify operational personnel or homeowners that a high pressure event has occurred.

Equipment manufacturer's literature regarding the pressure relief valve is included in Appendix B.

1.7 Deep Well Pump Control Valve with Pressure Relief Override

The deep well pump control valve is a solenoid-operated, modulating valve installed between the 100 hp, 1,000 gpm pump and the flushing line. Because this pump is not equipped with a VFD, the pump control valve is installed to minimize the potential for surge events during start up and shut down of the pump.

The pump control valve will be normally open to allow the 100 hp, 1,000 gpm pump to flush to atmosphere during initial startup. When the PLC senses a low pressure event within the distribution system, the 100 hp, 1,000 gpm pump will get a run signal, and an electronic signal will actuate the solenoid on the valve pilot system. The valve will begin to close and slowly allow water to enter the distribution system. The slow valve closure will minimize surges within the distribution system. Once demand in the system decreases, pressure will rise and the PLC will signal the solenoid on the valve pilot system to begin opening the valve. The valve will open slowly, allowing water to slowly begin flushing to atmosphere. When the valve is fully open it will trigger a limit switch, sending an off signal to the 100 hp, 1,000 gpm pump.

The deep well pump control valve is also equipped with a pressure relief override feature to protect the distribution system and pump from high pressure events. The pressure relief setting may be adjusted by the operator if needed. The initial recommended pressure relief setting is listed in Table 1-2, and will be modified after system construction and start-up.

Equipment manufacturer's literature regarding the deep well pump control valve is included in Appendix B.

1.8 Isolation Valves

Isolation valves have been installed in general accordance with industry standards. Transmission and distribution system valves have been installed to assist operation personnel to isolate unique parts of the distribution system in the event of system failure, maintenance or minor leak repair. Isolation valves have also been installed at various points within the well pumping facility to allow flushing of wells, and isolation of selected pumping facility components for routine or corrective maintenance.

Equipment manufacturer's literature regarding isolation valves is included in **Appendix B**.

1.9 Check Valves

Each well pump is equipped with a submersible column check valve and an above-ground check valve on the discharge side of each of the main discharge lines to stop a reversal of flow at the well head. The above-ground valves are globe style silent check valves.

Equipment manufacturer's literature regarding check valves is included in **Appendix B**.

1.10 Chemical Feed Equipment

No chemical feed equipment has been specified for this project. However, space for future chemical feed equipment (i.e. for chlorination or polyphosphate injection) has been designated on the plans. If a chemical feed system is added in the future, this section of the operations manual should be updated.

1.11 Flow Meter

The well facility will be equipped with a 4-inch magnetic flow meter, which will provide instantaneous flow rate and totalized volume readings. Equipment manufacturer's literature regarding the flowmeter is included in **Appendix B**.

1.12 Mechanical Piping

Mechanical piping within the Blackhawk on the River well pumping facility has been specified with flanged ductile iron piping. The Blackhawk on the River well pumping facility is designed with 8-inch, 6-inch, and 4-inch ductile iron pipe and fittings. A design working pressure of 150 psi has been selection for design of all mechanical piping. All replacement pipe and fittings must conform to the following standards.

Type, Typical: AWWA C150, C151 with minimum pressure class wall thickness that meets 150 psi working pressure classification.

Type, Screw on Flanges: AWWA C115 with minimum pressure class wall thickness that meets 150 psi working pressure classification.

As built drawings of the mechanical piping will be included in **Appendix H** when available.

1.13 Transmission and Distribution System

The transmission and distribution system is composed of 12-inch and 8-inch AWWA C900 PVC piping and 1-inch polyethylene service lines in common boxes. Below are the standards for materials and installations.

1. **Piping:** All transmission and distribution piping has been installed according to AWWA C-900 standards, pressure class 150 and SDR 18.
2. **Valves:** Distribution system valve shall be resilient seat gate valves conform to AWWA C509 standards.
3. **Service Lines:** All domestic service lines shall be 1-inch PE pipe, equipped with a corporation stop, meter box and setting. PE pipe shall be 200 psi, IPS, SDR 7.

As-built drawings of the distribution system will be included in **Appendix G** when available.

CHAPTER 2 - ROUTINE MAINTENANCE

2.0 General Maintenance and Water Sampling

The Owner/Operator shall contact Idaho Department of Environmental Quality (DEQ) compliance staff prior to water system operation to identify all appropriate water quality compliance requirements. DEQ will provide Owner/Operator a list of required sampling parameters for on-going operation of the public water system.

Daily:

- Check equipment in pump house for leaks or other problems.
- Take water meter reading and pressure reading; record readings on **System Usage Report form included in Appendix C.**
- Observe a complete pump cycle noting pressure when pump starts, pressure when pump shuts off, and time between run cycles.
- Clean the pump house as necessary.

Monthly:

- Collect water sample and submit to an approved laboratory to be analyzed for coliform bacteria. **Use sampling form included in Appendix C.**
- Inspect all system facilities for potential problems and compliance with regulations as required by the Idaho Rules for Public Drinking Water Systems.

Annual:

- Collect water sample and submit to an approved laboratory to be analyzed for nitrate. **Use sampling form included in Appendix C.**
- Enforce annual testing of Backflow Prevention Devices in accordance with the **Cross Connection Control Program as outlined in the Homeowners Association CCR's and Chapter 5 of this manual.**
- All backflow assemblies installed in the subdivision must be listed on the latest edition of the University of California Foundation for Cross-Connection Control and Hydraulic Research.

- Arrange for annual inspection of wells and pumps by _____, _____, Idaho and electrical controls and VFD's by _____, _____, Idaho. These inspections should include a pump performance test, inspection of electrical controls and panels, inspection of VFD, inspection of hydropneumatic tanks, and inspection of pressure gauge and water meter.

2.1 Well and Submersible Pump Maintenance

Performance of wells and submersible pumps should be evaluated at least every year. More frequent assessments should be made if a reduction in specific capacity and/or production capability is observed. Changes in specific capacity or production capability of 15 to 20 percent, more than likely indicates that the pump or well needs required maintenance. Pumps which have been in service for 12 years without maintenance should be pulled for inspection and repairs or replacement. The following check list should be used to evaluate well and/or pump performance:

- Check static water level.
- Check pumping rate after a specified period of continuous pumping.
- Check the well drawdown after a specified period of continuous pumping.
- Check the discharge pressure. Combine the discharge pressure with the total drawdown and static water level to determine the total dynamic head (TDH) developed by the pump. Compare the TDH and flow rate with the pump curve to determine pump efficiency.
- Check sand content of water after continuous period of pumping.
- Check well efficiency by measuring total depth to water at different flow rates and comparing to original well pumping tests. It is also necessary to log well recovery after pump is shut off.

2.2 Well Flushing

Any well that has remained dormant or has had minimal production over several months should be flushed to the flushing line to assure adequate water quality if called on for production. The well should be flushed long enough to pump the equivalent of five well bore volumes of water. At a minimum, wells should be flushed to atmosphere for at least 5 minutes per well.

Well flushing at the Blackhawk on the River well facility can be accomplished while the facility is operating. Well 1 (West Well) can be flushed with the 40 hp, 450 gpm pump while the 15 hp, 225 gpm pump in Well 2 (East Well) is running by closing the 6-inch

gate valve located upstream of the Well 2 (East Well) discharge pipe. If artesian pressure remains adequate, Well 1 (West Well) may also be flushed without pumping by opening the 6-inch butterfly valve located on the side discharge of the well casing.

Well 2 (East Well) can be flushed with the 100 hp, 1,000 gpm pump while the 40 hp, 450 gpm pump in Well 1 (West Well) is operating. The solenoid on the deep well pump control valve will need to be temporarily disabled according to the manufacturer's instructions (Appendix B) so that the valve remains open during the flushing event. If artesian pressure remains adequate, Well 2 (East Well) may also be flushed without pumping by opening the 8-inch butterfly valve located on the side discharge of the well casing.

2.3 Distribution System

The distribution system should require very little initial maintenance. Valves which will normally be set in one position, will require annual "exercising", that is, operation from fully open to fully closed once each year. This will also give the opportunity to inspect the condition of the valve box. The valve box should permit easy access and operation of the valve. The operator may find it necessary to remove gravel or other material from a box in order to operate the valve. Valves that cannot be operated must be exposed for further maintenance, or replaced.

2.4 Amenity Pond Recharge System

The two amenity ponds are recharged from the public water system wells to replace evaporation and seepage losses. Water to recharge to ponds is delivered to the pond recirculation wet well via a 4-inch water line that intersects the water main approximately 180 feet south of the intersection of Loop Road and Road 9. Water delivery is controlled by a solenoid valve that is normally closed. The solenoid valve opens and closes when signals are received from a float located in the wet well.

A butterfly valve is provided to control the rate at which water is provided to the wet well when the solenoid valve is open. The system should be controlled such that the total demand (including residential demand, pond recharge demand, and any demand for supplemental irrigation of common areas) does not exceed 450 gpm. If needed, the operator may temporarily curtail water delivery to the amenity ponds by manually closing the isolation valve on the 4-inch water line.

2.5 Depressurization Events

Depressurization events are serious threats to public health. Depressurization events are not only inconvenient but they also subject the system to contamination from cross-connections and water system leaks. Following a depressurization event the system owner shall immediately notify the public to drink bottled water until further notice, obtain clean bacteria sample results, and re-notify the public when the water is safe.

Depressurization events typically occur for three reasons: 1) loss of power, especially when there is no elevated storage on the system; 2) during line repair or replacement; and 3) when new service connections are made to a live main. For liability reasons, the owner/operator shall take every reasonable precaution to limit the frequency and severity of these events. Emergency back-up power is provided to run the 50 hp, 450 gpm pump which can meet the design peak day demand of the water system.

The following recommendations shall be followed by the owner/operator of the Blackhawk on the River Public Water System.

- A. **Public Notification:** All customers shall receive advance public notification on how to protect themselves during depressurization events, including a sample notification. The owner/operator shall submit a notification to all customers for each individual depressurization event. The customers shall be advised to drink bottled water until the system water is again safe to drink. They should also be notified that boiling water for one minute will provide protection from pathogens, but will not provide protection from chemical contaminants.
- B. **AWWA Standard Disinfecting Water Mains:** To meet state requirements, the water system or any part of the water system that has been depressurized shall be completely disinfected and tested for bacteria prior to serving the customers. The system owner/operator shall follow the requirements given in the AWWA Standard Disinfecting Water Mains. The key concepts of the AWWA Standard are as follows:
 1. Flush debris from system, repressurize using highly chlorinate water, and hold for a lengthy period (50 ppm for 3 hours, or 25 ppm for 24 hours).
 2. Flush the system until all the chlorine is gone and take a bacteria sample.
 3. Only after a total coliform absent sample is obtained, can the owner/operator inform the customers that the water from the water system is again safe to drink.

2.6 Distribution Maintenance

Distribution maintenance such as main line leaks, service line leaks, broken valves or damaged fire hydrants should only be repaired by a qualified contractor with experience in water utility work. Several contractors within the valley have experience with repair and replacement of water facilities. The Blackhawk on the River water system will have annual agreements with these contractors for routine and emergency maintenance. The system operator should always be present during a repair or replacement of the distribution system to assure the highest quality of work is being performed.

2.7 Distribution Flushing

Distribution flushing is a powerful tool available to maintain or improve the quality of water delivered to the end user. Reasons for flushing distribution system mains include improving the aesthetics of the water such as color, turbidity, taste and odor, reducing the presence of coliform and heterotrophic plate count bacteria, increasing low chlorine residual, restoring hydraulic performance and exercising and testing fire hydrants. A well planned and executed flushing program can reduce customer complaints and enhance water quality in the distribution system.

Please refer to Appendix F for guidelines in developing an effective flushing program.

2.8 Miscellaneous Maintenance

All gauges, pressure transducers, flow meters and other control equipments should be checked by the system operator on a routine basis. At a minimum, calibration as to the accuracy of each device should be checked against an accurate device on an annual basis.

- Magnetic Flow Meter – The pumping facility flow meter should be checked against metered customer usage within the water system on an annual basis. Monthly comparisons of daily/monthly production should be compared against past meter readings. If the flow meter falls out of the manufacturer's acceptable accuracy range, contact a local representative for corrective measures.
- Pressure Gauges – All pressure gauges should be checked on a routine basis to assure accuracy. An accurate test gauge should be installed on an adjacent tap and compared to each pressure gauge in each facility. If the gauge falls out of acceptable accuracy limits, simply replace the gauge with a high quality gauge.
- Transducers – The well facility is equipped with a pressure transducer that sends a 4-20mA signal to each variable frequency drive for pump control and startup. The transducers can be checked by referring to the pump control setting and comparing the facility operation with pressure observations on the pressure gauges. If the transducers need calibration, contact your local electrical contractor or regional product representative for maintenance or repair guidance.
- Chemical Feed Pumps – Not applicable

CHAPTER 3 – TROUBLE SHOOTING

3.0 General

Due to the simplicity of the Blackhawk on the River water system, most operational problems should have simple solutions discussed in the following sections. The distribution system has been designed to allow for emergency isolation of unique areas within the water system. The pumping facilities have been sized to accommodate the peak hour demand with the largest well out of service. Therefore, the Blackhawk on the River water system, at full build out, will have redundant source of supply capacity. It will be the responsibility of the system operator to assess any operational problem and to minimize the impact on water system customers. If a problem arises that cannot be quickly handled by operation personnel, or there is a concern over potential public health and safety, the emergency response plan should be activated and the appropriate chain of command should be followed.

3.1 Low Pressure in the Distribution System

Low pressure events within a water system are common and often require minor control adjustments or system maintenance to resolve the problem. The water system has been designed to supply a minimum pressure of 40 psi to each homeowner lot line. In the event that a low pressure complaint occurs within the distribution system, the operator must assess the point of the complaint and work backwards towards the source of supply. Below are potential problems that could result in a low pressure event.

- Homeowner plumbing is broken or inoperable
- Water service line is plugged or leaking
- Irrigation line is leaking
- Water meter is clogged or broken
- Water service line from main to meter is leaking
- Transmission or distribution valve is partially closed
- Transmission or distribution main is leaking
- Pumping facility valve is partially closed
- Pump control systems have failed
- Well system cannot keep up with demand

3.2 High Pressure in the Distribution System

Although high pressure events within the distribution system are not likely, they may occur due to problems at the pumping facilities. The well facility is equipped with a pressure relief valve to minimize the potential for high pressure events. There are only two ways that a high pressure could be observed in the initial phases of this project.

Pump Controls Fail - The pressure relief valve should activate and relieve pressure at the well pumping facility.

Instantaneous Surges – Pressure surges or water hammer within the distribution system can occur on a short term basis. Pressure surges can occur due to rapid valve closure or by rapid pump-shut down or start-up. These high pressure events will happen instantaneously, and may cause minor damage to homeowner plumbing. The pumps are equipped with VFDs or a pump control valve to minimize the potential for surge events due to pump start-up or shut down. The potential for surge events due to rapid valve closure can be minimized by taking care to close and open isolation valves slowly during manual operation.

3.3 Depressurize Water System

Depressurization events are serious threats to public health. Depressurization events are not only inconvenient but they also subject the system to contamination from cross-connections and water system leaks. Following a depressurization event the system owner shall immediately notify the public to drink bottled water until further notice, obtain clean bacteria sample results, and notify the public when the water is safe.

Depressurization events typically occur for three reasons: 1) loss of power, especially when there is no elevated storage on the system; 2) during line repair or replacement; and 3) when new service connections are made to a live main. For liability reasons, the owner/operator shall take every reasonable precaution to limit the frequency and severity of these events. Emergency back-up power is provided to run the 50 hp, 450 gpm pump which can meet the design peak day demand of the water system.

The following recommendations shall be followed by the owner/operator of the Blackhawk on the River water system.

Public Notification:

1. All customers shall receive advance public notification on how to protect themselves during depressurization events, including a sample notification. The owner/operator shall submit a notification to all customers for each individual depressurization event. The customers shall be advised to drink bottled water until the system water is again safe to drink.

2. They should also be notified that boiling water for one minute will provide protection from pathogens, but will not provide protection from chemical contaminants.

DEQ Requirements:

To meet state requirements, the water system or any part of the water system that has been depressurized shall be completely disinfected and tested for bacteria prior to serving the customers. The system owner/operator shall follow the requirements given in the AWWA Standard Disinfecting Water Mains. The key concepts of the AWWA Standard are as follows:

- A. Flush debris from system, pressurize using highly chlorinate water, and hold for a lengthy period (50 ppm for 3 hours, or 25 ppm for 24 hours).
- B. Flush the system until all the chlorine is gone and take a bacteria sample.
- C. Only after a total coliform absent sample is obtained, can the owner/operator inform the customers that the water from the water system is again safe to drink.

3.4 Pump Will Not Start

In the event that one or all of the submersible pumps will not start a simple logical procedure will either be to restart the pump(s) or identify an electrical problem that requires repair or replacement. Keep in mind it is always best to isolate the well and flush to atmosphere during startup, and then slowly valve the flow into the distribution system. Listed below are the major causes of pump shut down.

Power Outage - A power outage or power surge will often trip the breaker, and simply reset the breaker and give the pump a run signal to start.

Thermal Disconnect - If the starter unit is equipped with a thermal disconnect and the starter generates too much heat the starter will stop. Simply reset the switch and check for problems associated with the overheating.

Faulty Pressure Transducer or Pressure Switch - In the event that the above two potential problems cannot restart the pump, check all on/off pressure control equipment to assure that the starters are getting the appropriate run signals.

Motor or Starter Failure - If all of the above procedures have been exhausted, call your electrician to check for motor or starter failure.

3.5 System Demand Greater Than Pump Output

As discussed in section 3.1, a low pressure event may occur due to water demand being greater than available pumping capacity. The Blackhawk on the River well facility has a design capacity of 1,675 gpm, including three pumps rated to produce 225 gpm, 450 gpm, and 1,000 gpm. If water demand in the system exceeds the output of the lead pump, the lag pump(s) will get a run signal and should provide sufficient water to maintain the system pressure. If a low pressure event occurs due to a lack of pump output, check to see that the pump controls are operating according to design and adjust accordingly. If all pump controls and wells are operating per design, check the drawdown in each well to see if well or aquifer problems exist. Below is a logical sequence for assessing problems with a lack of production.

Low Production From Well Pumps – Check the flow meter to record the flow and correlate back to design flow rates of each pumping unit. Adjust pump controls if necessary to increase production.

System Demand Greater Than Pump Output – If the pumps and wells are producing design capacities and low pressure still exists, check to see if there is a major leak in the system or the wells are flushing to atmosphere. Also, make a visual check of the distribution system to see if hydrants are running or if there is too much water use in the system.

Wells Not Producing Enough Supply – In the event that the pumps are operating correctly and verify that there is no excess water usage in the distribution system, the wells should be checked for excessive drawdown potentially causing a lack of production. If the well drawdown is outside of "normal" operating parameters, turn the well off if possible and assess the need for routine well maintenance or repair.

3.6 Excessive Pump Cycling

All well pumps have been equipped with variable frequency drives to meet the variable demands of a small water system. In the event that the system operator observes a pump cycling on/off more than 10 times per hour, adjustments to control equipment should be made. The operator should check hydropneumatic tanks, pressure transmitters and pump controls to see if they require minor adjustment or repair.

3.7 Flow Meter Not Registering

The electronic flow meter is equipped with an electronic head and removable propeller that calculates flow rate and sends a 4-20 mA output signal. If the meter is not registering or registering slow (+,-2% accuracy) contact the supplier for options on recalibration or replacement. The meter register or head will sometimes need to be replaced but the meter tube should remain in place and should not need replacement. A

spare meter head may be purchased and held as a standby in the case of maintenance or recalibration.

3.8 Excessive Drawdown in the Well

An air line has been installed down hole to allow for simple pressure measurements of the pumping water level in each of the three wells. If the operator notices that excessive drawdown is present in any well, an action plan should be implemented to determine that appropriate corrective measures are taken. To avoid serious damage to the pump and motor, never allow the pumping water level to fall below the pump setting level. If the pumping water level is approaching the pump setting level, reduce the pump output or completely shut the well off and notify water system management of the condition.

CHAPTER 4 – EMERGENCY RESPONSE PLAN

4.0 Introduction to the Emergency Response Plan

The Blackhawk on the River water system has adopted the following template for developing a comprehensive Emergency Response Plan (ERP).

Public Water System – Emergency Response Plan Guide developed by the DEQ.

A template for the emergency response plan is shown below. The water system Operator will be responsible for finalizing the emergency response plan after the system has been constructed and posting the plan in appropriate location(s). The water system Operator will be responsible for informing key representatives of the emergency plan and their role in emergency response procedures. The water system Operator should also update this plan as information changes.

4.1 System Identification

Public Water System Number (PWS) Number	4430105	
System Name	BLACKHAWK ON THE RIVER WATER SYSTEM	
Town/City	VALLEY COUNTY	
Source ID Tag Number/Type/Description	TAG NO. TO BE DETERMINED Well 1 (West Well); 40 hp, 450 gpm pump	
Source ID Tag Number/Type/Description	TAG NO. TO BE DETERMINED Well 2 (East Well); 15 hp, 225 gpm pump 100 hp, 1,000 gpm pump	
Population Served and Number of Service Connections	people served: 312	# of connections 132
System Owner (the owner must be listed as a person's name)	Sage SGI, LLC c/o Sima Muroff	
Name, title, and telephone number of person responsible for maintaining this emergency plan.	name and title: Douglas A. MacNichol, Operator	Telephone: 208-630-3820

4.2 Chain-of-Command

This plan is intended to provide procedures and plans for personnel involved in an emergency situation serious enough to curtail water production or distribution for more than a few hours. It is not intended as a precise step-by-step procedure manual, as all emergencies are unique and require a specific approach. In an emergency situation,

clear thinking and calm analysis of the situation are required to prevent incorrect decisions from being made or improper actions being taken. In a serious emergency situation, all personnel involved will be counted on to cope with the emergency situation. The Incident leader will be in charge of the emergency situation in all cases. In the event of the president of the homeowner's association is not present during the emergency, the system operator will take charge.

Figure 4-1. Emergency Response Team Organizational Chart



Crisis Management Team

Upon activation of the emergency response plan, the crisis management team shall assemble at the Blackhawk on the River well house. The primary function of the team is to evaluate the emergency, direct and coordinate a practical response with both internal personnel and outside agencies. Proper planning and communication of the details of this plan are crucial and will help to minimize the extent of a catastrophic disaster.

Described below are the key team member and their general responsibilities.

Who is the Incident Leader?

The individual incident leader will often change in time during an actual emergency from the first responder to the most qualified individual or agency. The following list is the usual order of who will take command during an emergency.

1) The first emergency team member to respond to the incident and arrive on-site will take the control and guide the emergency response team until he passes on his duties to a more qualified individual or agency.

2) The next to act as the incident leader is often an agency with primary responsibility (Fire Department, Department of Environmental Quality, Health Department, etc.)

3) In the event of a major extended emergency such as a earth quake, forest fire or flood, the last to lead the incident would often be a highly qualified incident commander that has been trained within the ICS system.

Incident Leader

The incident leader will be the only person who is responsible for activating the emergency response plan. All major decisions made by the team should be conveyed by the incident leader. The major role of the incident leader is shown below.

- Perform Command Activities
- Protecting Life and Property
- Directing Team Members
- Maintaining Accountability for Responders and Public Safety
- Maintaining an Effective Liaison with Outside Agencies

Water System Operator

The system operator responsible for operation of the water system and is the only member of the team to make decisions on startup and shutdown of the facilities. In the event of water system failure, the operator's main responsibility is to maintain safe and clean drinking water to the general public.

Homeowner's Association (HOA) Representative

The president of the HOA will usually be the incident leader for localized emergencies that affect the water system. In general, volunteers from the HOA will act as support members to the water system operators. Common duties of HOA volunteers would be notifying the general public of the status of the drinking water supply, providing bottled water to homes and securing critical facilities. One HOA member should always be in charge of communication with outside agencies and procurement of equipment and supplies.

In an emergency situation, the primary goals driving all decisions will be as follows:

- Safety and health of operation personnel.
- Safety and health of the public.
- Safety of the surrounding environment.
- Maintaining production and operation of all water facilities.

4.3 Notification

It may be necessary to quickly notify other parties during an emergency. Other parties might include your water system users, health department officials, IDEQ personnel, and service/repair providers. Please fill out the lists on the next page. The following lists are not intended to be inclusive – they may be adapted to your specific needs. Include any additional listings that you consider appropriate. The level of effort needed for notification will vary greatly depending on the size of the system and the nature of the emergency. All systems should plan ahead how you will accomplish notification of your customers.

Coordinating Office

The coordinating office and primary meeting place for all emergencies:

- Blackhawk on the River – Well House

Any time the emergency plan is put into effect and there is potential for major property damage, loss of life or public notification for a water quality violation, the water system operator will be responsible to immediately notify the following individuals.

1. DEVELOPER'S DESIGNATED REPRESENTATIVE

Phone # Tony Maris – 208-634-6050

Cell 208-630-4348

630 5070

315-4956

2. HOA PRESIDENT

Phone # Sima Muroff – 208-634-6050

Cell 208-634-8014

Listed below is a contact list of important contact that may be required to remedy the immediate emergency.

Emergency Response Drills

Emergency response drills shall be preformed annually and should include local emergency planning agencies. It will be the responsibility of the Homeowners association to conduct and critique each drill. It may be necessary to quickly notify other parties during an emergency. Other parties might include your water system users, health department officials, DEQ personnel, and service/repair providers. Please fill out the lists on the next page. The following lists are not intended to be inclusive – they may be adapted to your specific needs. Include any additional listings that you consider appropriate. The level of effort needed for notification will vary greatly depending on the size of the system and the nature of the emergency. The water system should develop a plan for emergency notification of customers.

Local Notification List

Fire Department (day telephone number) 208-634-7070	Fire Department (emergency number) 911
Police Dept (day) 208-634-7144	Police Dept (emergency) 911
Ambulance service (day) 208-634-7070	Ambulance service (emergency) 911
Health Department (day) Central District Health Department, McCall Office 208-634-7194	Health Department (night) Central District Health Department, McCall Office 208-634-7194
Water System Operator (day) To Be Determined	Water System Operator (night) To Be Determined
Substitute Water System Operator (day) To Be Determined	Substitute Water System Operator (night) To Be Determined
Other:	Other:

HS Filter 651-766-2700x2731
Steve Talbot

Service/Repair Notification List

Electrician (day telephone number) Boise Basin Electric (208-887-2262)	Electrician night (night telephone number) Boise Basin Electric (208-887-2262)
Electric Utility Company (day) Idaho Power Company (208-634-2116)	Electric Utility Company (night) Idaho Power Company (800-488-6151)
Plumber (day) Riverside, Inc. (208-722-6731)	Plumber (night) Riverside, Inc. (208-722-6731)
Pump Specialist (day) Riverside, Inc. (208-722-6731)	Pump Specialist (night) Riverside, Inc. (208-722-6731)
Soil Excavator (day) Betts Landscaping & Excavation (208-634-3972)	Soil Excavator (night) Betts Landscaping & Excavation (208-634-3972)
Equipment Rental (day) McCall Rental & Sales (208-634-5709)	Equipment Rental (night) McCall Rental & Sales (208-634-5709)
Other:	Other:

State Notification List

Idaho Com Center (24 hours a day, 7 days a week). Only call the Com Center if you believe that there is a suspected or intentional contamination or intrusion into your system. -see "When to call the Com Center" on the next page.* Call the Com Center at 1-800-632-8000 . If that number is busy, call the alternative Com Center telephone number: 1-208-846-7610 . <i>Specify that your call concerns a threat to a drinking water system.</i>	
Local Regional DEQ Office (day) Boise Office (208-373-0550)	Local Regional DEQ Office (night) Boise Office (208-373-0550)
Local Department of Health (day) Central District Health Department, McCall Office (208-634-7194)	Local Department of Health (night) Central District Health Department, McCall Office (208-634-7194)
Other:	Other:

When to Call the Com Center

You should call when your system may have experienced any of the following scenarios:

- Physical security is compromised or there is obvious evidence of accidental or malicious intrusion.
- There is evidence of vandalism that may suggest intrusion leading to an added vulnerability of the system (e.g., hole in fences or gates, barbed wire cut, locksets removed or destroyed, etc.).
- Suspicious materials have been found around a site which is part of, or associated with, a public water supply (e.g., discarded packaging, plastic bags, unlabeled and discarded containers, evidence of marks indicating devices were dragged across the ground, vehicle tracks, etc.).
- An anonymous threat is directed at a location or facility.

Notification Questions:

Does this system have a specific location(s) where up-to-date notification information, including telephone numbers of key officials and services, is kept at all times?	☐ Yes	☐ No
Are the key decision-makers of this system clearly aware of where to find this information quickly?	☐ Yes	☐ No
Are the key decision-makers of this system familiar with your notification procedures?	☐ Yes	☐ No
If you checked "no" for line 1, 2, or 3, when will the situation be corrected?		

System Users with Special Water Needs

In an emergency your water system may have to provide priority notification to users with unique or special water needs. Unique or special users would include nursing homes, elderly housing facilities, hospitals, or individuals with serious medical concerns or mobility limitations. Water systems must identify and maintain an up-to-date list of service customers with unique water needs and make provisions for safe and adequate water supply to them.

Does this system have service customers with unique water needs?	☐ Yes	XX No
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If you checked "Yes" above for "service customers with unique water needs," make a list of unique service customers and a brief description of how you will notify them and provide for their water needs.

4.4 System Components

As the Emergency Response plan is an integrated part of the Operations Manual all system components will be shown and described within unique chapters of the Operations Manual. Please refer to the Operations Manual for As-Built drawings and operational parameters of the water System.

Design drawings are included in Appendices H, I, and J. As-Built drawings will be provided when available. Also refer to Chapters 1-3 of the operations manual for a complete description of all facilities and operational parameters.

Table 4-1. System Supply

Pump	Pump Type	Drive	Design Capacity	Pump Location
Primary Pump	Submersible turbine	VFD	225 gpm	Well 2 (East Well)
Secondary Pump	Submersible turbine	VFD	450 gpm	Well 1 (West Well)
Emergency Backup Pump	Submersible turbine	Constant speed	1,000 gpm	Well 2 (East Well)

Table 4-2. System Demand

Total production capacity	2,410,000 gallons per day
Total storage capacity	0 gallons
Gross volume of hydropneumatic tanks	600 gallons
Average daily demand	190,000 gallons per day (estimated)
Maximum daily demand	311,000 gallons per day (estimated)
Total storage capacity divided by average daily demand	0 days

In the event of a water shortage, supplemental irrigation of common areas and recharge to the amenity ponds would be curtailed first. If necessary, homeowners would be required to curtail landscape irrigation and minimize potable water usage.

4.5 Boil Water Notification

An emergency could create the potential that your well or source has been contaminated with microbiologic pathogens. The presence of certain pathogens in drinking water is a significant health concern. If that happens it may be necessary to implement a boil water notification. Contact your regional DEQ office for guidance on boil water notification. Keep an e-mail list or a telephone list of your customers and public establishments on hand for quick notification.

Please refer to **Appendix D**, for the following DEQ guidance on public notification:

1. Revised Public Notification Requirements – May 6, 2002
2. DEQ Regional Offices and District Health Departments
3. Attachment #2, Violations and Situations Requiring Public Notification
4. Attachment #3, The Ten Elements of a Public Notice
5. Attachment #4, Public Notification Certification Form
6. Template for Drinking Water Warning

4.6 Alternative Water Source

An emergency may necessitate obtaining water from an outside source to meet your basic water needs. All public water systems should plan ahead how they will provide alternative safe water during an emergency. Develop your system's contingency plan for providing alternative water considering bottled water, bulk water, and new or other sources.

Alternative Water Suppliers

During an extended emergency the Blackhawk on the River Water System will contact the following approved water haulers to provide bulk water to all homeowners. A list of all certified water haulers will be included with three local haulers as the first priority.

Bulk Water

Have you discussed your potential water needs with at least 2 suppliers?	☐ Yes	☐ No
Approximately how long will it take for bottled or bulk water to reach this system?	To be determined	

A list of suppliers of bulk water haulers may be found on the DEQ web site - see list of "Certified Idaho Bulk Water Haulers" on DEQ's web site at <http://www2.state.id.us/deq/water/water1.htm> - drinking water.

Holowitz Water & Farm
Jerry & Cathy Holowitz
McCall, ID 83638
(208) 634-5209

Jon Koch
14050 Pioneer Road
McCall, ID 83638
(208) 634-5934

Have Water Will Travel
Douglas Lohff
P.O. Box 1564
McCall, ID 83638
(208) 634-3704

Bottled Water Company

In addition to Bulk Water haulers, bottled drinking water could be trucked from Boise, Idaho from the following suppliers.

- Blue Springs Water Company (208) 375-1222
- Idaho Springs Water Company (208) 318-1540

Have you discussed your potential water needs with at least 2 suppliers?	☐ Yes	☐ No
Approximately how long will it take for bottled or bulk water to reach this system?	To be determined	

New Source of Water

An emergency may necessitate that your system develops a new source of water or use an inactive source. Remember - contact your local regional DEQ office or local health district for prior approval of new sources of water or the use of inactive sources. If your alternative water plan includes using an inactive source, you may have to consider your treatment capabilities.

Tie-in to Adjacent Water Supply System

Some water systems are situated in close proximity to one or more other water systems.

Are any water systems situated adjacent to this system?	☐ Yes	XX No
Have you discussed the feasibility of connecting to another system with representatives of that system(s)?	☐ Yes	XX No
Is it feasible for this system to connect to an adjacent system? If yes, how you would make the connection?	☐ Yes	XX No

4.7 Water Conservation

Water conservation can be an effective means of coping with minor losses of source capacity. Describe how your system would use conservation measures during an emergency. Your assessment should examine the potential of this system to save significant quantities of water through conservation measures, and a priority list of categories of water use that are nonessential in times of water shortage.

Priority List of Water Use during a Water Shortage in Order of Importance

1. Fire Protection Capacity.
2. Potable Water for Domestic Purposes Only.
3. Irrigation of Lawns and Common Areas.

4.8 Vulnerability Assessment

We encourage you to consider conducting a vulnerability assessment of your system as a valuable management/planning tool for your system. A vulnerability assessment looks for the "weak link in the chain" and frequently those weak areas can lead to emergencies. Some causes of emergencies are preventable.

Consider some of the following areas in your assessment. Age and obsolescence of equipment, poor maintenance, poor system design, lack of spare parts, high risk or ill advised land usage near a water source, and lack of source protection efforts are all preventable factors that can cause water system emergencies. Reducing a system's vulnerability to an emergency is a vital part of any emergency plan.

List and briefly describe any vulnerable areas of your system that need correction or improvement. Consider each supply, storage, and distribution component of your system when you do this, being sure to include each of the primary features of your system that were listed in Section 4, System Components. Also, consider the land usage near your water source(s) when you describe your vulnerable areas. High-risk land usage near your water source(s) may be preventable through source protection measures.

At this time, does this system have any vulnerable component areas that need correction or improvement?	☐ Yes	XX No
At this time, does this system have any land usage concerns that could be minimized through source protection measures?	☐ Yes	XX No
Has this system received its Source Water Assessment Report from the DEQ? If so, you should refer to this report when compiling your vulnerability assessment.	☐ Yes	XX No

4.9 Plan Readiness

In order for this plan to be useful, those people involved with the system must know the plan exists, they must know where to quickly find the plan, and they must understand their role during an emergency.

Do the key representatives of this system know about this emergency plan?	☐ Yes	☐ No	
Has this system clearly defined for each key person what his or her responsibilities will be during an emergency, i.e., does each key person clearly understand their role?	☐ Yes	☐ No	
Has this system rehearsed this emergency plan within the last two years?	☐ Yes	☐ No	
For property owner associations: will each successive group of officers be informed of the existence of, and briefed on, all aspects of this emergency plan?	☐ Yes	☐ No	☐ N/A

4.10 Signatures

For the record, have representatives of this water system who helped complete this emergency plan sign and date below.

system representative/title:	DATE
system representative/title:	DATE
system representative/title:	DATE

CHAPTER 5 – CROSS CONNECTION CONTROL PROGRAM

5.0 Program Objectives

The Blackhawk on the River water system considers an effective cross connection control program to be critical in protecting the public from hazards posed by cross connections to all water systems. Proper application of the cross connection control program will help protect the water system's interests, property and customers from the potential for contamination or pollution of the water by outside sources.

5.1 Administration

The water system Owner will be responsible for implementing and maintaining the cross-connection control program. Under the direction of the Owner, the water system Operator will collect and maintain records pertaining to administration of the cross-connection control program.

5.2 Action Plan

The Blackhawk on the River water system's cross connection control program will be based on the premise protection approach ("containment theory"). This approach uses backflow prevention devices to isolate the customer from the water main. The purpose of the backflow prevention devices is to prevent potential contamination of the public water supply system by the customer. This approach does not protect the customer from potential cross contamination within the customer's plumbing system downstream of the backflow prevention device. Customers may elect to install internal cross connection control devices within their plumbing system, but these devices would not be regulated by the water system Owner.

Potential cross connections within Blackhawk on the River water system and the proposed method of cross connection control are shown in Table 5-1.

Table 5-1. Potential Cross Connections

Potential Cross Connection	Control Method
Residential customer connections to water main	Approved backflow prevention assembly at each connection
Recreation center connection(s) to water main	Approved backflow prevention assembly at each connection
Pond recirculation wet well connection to water main	Air gap (minimum height 2 times outlet diameter)
Well house flush line	Air gap (minimum height 2 times outlet diameter)

Approved backflow prevention assemblies at the residential and recreation center connections will be installed, maintained, and tested by the customer. Institutional controls requiring customer compliance are included in the Declaration of Covenants, Conditions and Restrictions for Blackhawk on the River Subdivision, as follows.

"11.5 Backflow Prevention Systems and Assemblies. Each Lot shall be equipped with approved backflow prevention systems and assemblies. All backflow prevention assemblies installed on any Lot must be listed in the most recent edition of the University of California Foundation for Cross-Connection Control and Hydraulic Research. The backflow prevention system and assembly must be installed on the residential service line after the water meter and prior to any connections to the residential service line. It shall be the responsibility of each Lot Owner, at such Lot Owner's sole cost and expense, to promptly replace any backflow prevention system and assembly existing on any Lot that is no longer listed on the foregoing list of approved backflow prevention systems and assemblies. Each Lot Owner, at such Lot Owner's sole cost and expense, shall ensure the correct operation of the backflow prevention system and assembly on such Lot and shall test the functioning of the backflow prevention system and assembly at least annually and report the result of such testing to the Water System Owner. Testing must be performed by a backflow assembly tester licensed by the State of Idaho."

Installation of air gaps for the well house flush line and the pond recirculation wet well will be implemented during construction of these facilities.

The water system Owner and Operator will need to accomplish the following tasks to maintain the cross connection control program.

1. Inform customers of the cross connection control program through homeowners' association meetings, newsletters, and/or information notices issued with utility bills.
2. Arrange for annual testing of all testable cross connection devices owned by the Owner (i.e. recreation center connections). Annual testing must be performed by a backflow assembly tester licensed by the State of Idaho.
3. Remind customers of the annual testing requirement and compile results of annual testing submitted by customers.
4. Review construction plans for new connections.

5. Enforce failure to comply with installation, testing, and maintenance requirements.

5.3 References

Cross Connection Control Manual

The Pacific Northwest Section – AWWA, Cross Connection Control Manual, sixth edition, December 1995 should be used as a guidance manual for implementation of an effective Cross Connection Control (CCC) Program.

Ten States Standards

The cross-connection control program should comply with Recommended Standards for Public Water Works, 2003 Edition, Section 8.8 "Separation Distances from Contamination Sources", Section 8.9 "Surface Water Crossings", and Section 8.10 "Cross-Connections and Interconnections".

Codes and Standards

- PUC – Rules and regulations governing the rendering of services
- IDAPA 58 TITLE 01 CHAPTER 08
- Ten States Standards – 8.8.1, Cross connection and interconnections
- EPA – Cross connection control manual
- OSHA Standard – 19010.14
- Safe Drinking Water Act – 1974, 86-550.06, 552.01
- State of Idaho – Pressure irrigation/public water systems
- UPC – Chapter 6