0005

Tracing
C/007/0041
gk

From: "Michael Hansen" <Mhansen@rbgengineering.com>
To: <Gregg_Hudson@blm.gov>, <James_Kohler@blm.gov>, <Jeff_McKenzie@blm.gov>,...
Date: 2/6/2008 11:42 AM
Subject: Grassy Trail Dam seismic update Jan 2008
Attachments: GrassyTr_1_08 part 1 of 2.pdf; GrassyTr_1_08 part 2 of 2.pdf

attached are pdf's for our seismic summary as of January 26, 2006.

we are seeing more 2.0 magnitude and greater earthquakes during the past month and an increase in events being recorded at the dam.

Michael N. Hansen, P.G.
Engineering Geologist

RB&G ENGINEERING Inc.
1435 West 820 North
Provo Ut. 84601

Ph 801-374-5771
SLC 801-521-5771
Fax 801-374-5773
Cell 801-369-4477

email mhansen@rbgengineering.com

RB&G ENGINEERING

Grassy Trail Dam, Seismic Summary for January 26, 2008.

For the period between December 15, 2007 and January 26, 2008 the UUSS has documented 57 earthquakes near the West Ridge Mine area with magnitudes ranging between 0.3 to 2.5 with an average of 1.4. These events are being reported from a distance of about 1 to 1.75 miles west of the dam. Since January 17 there has been an increase in the number of earthquakes with magnitudes greater than 2.0, with seven earthquakes ranging between 2.1 to 2.5 (2.3, 2.2, 2.2, 2.1, 2.3, 2.4, 2.5).

Eight MIS events were recorded on the Dam and include the seven magnitude 2.1 to 2.5 earthquakes listed above, and one 1.6 mag on Jan 12, 2008. As shown on the attached Blastware Seisomgraph Table the Dam instrument recorded a maximum PPV of 2.98mm/s and a max PGA of 0.0256g. The Hillside instrument has been calibrated but is not making a proper connection with the power supply cord and has been sent back for repair. It should also be noted that on the Dam instrument the vertical sensor on the geophone keeps reporting a check sensor message. I have talked with Instantel about the message and this instrument should also be sent back for repair after we get the Hillside Unit running again.

Inclinometer I-2 located on the dam showed no significant movement during the past month. This makes about 3 months without significant movement.

The roadway where I-4 is located has been widened and covered with a flush mounted cover at ground level. During clearing of the road it appears that the new cover set in concrete was hit and broken. Part of the concrete cover has been pushed overtop of the inclinometer cover so we cannot get into the inclinometer. We will ask them repair this location.

Due to cold temperatures (2°F) the data recorder did not function properly and I-3 could not be read with out error messages.

The dam is currently covered with about 2 feet of snow and access to the site was difficult. While covered with snow, no cracks or signs of movement were noted on the dam or abutments above the dam during the past month. Piezometer readings have been missing through much of December and January. We have included the most recent readings taken on January 31, 2008.

Michael N. Hansen P.G.
Engineering Geologist
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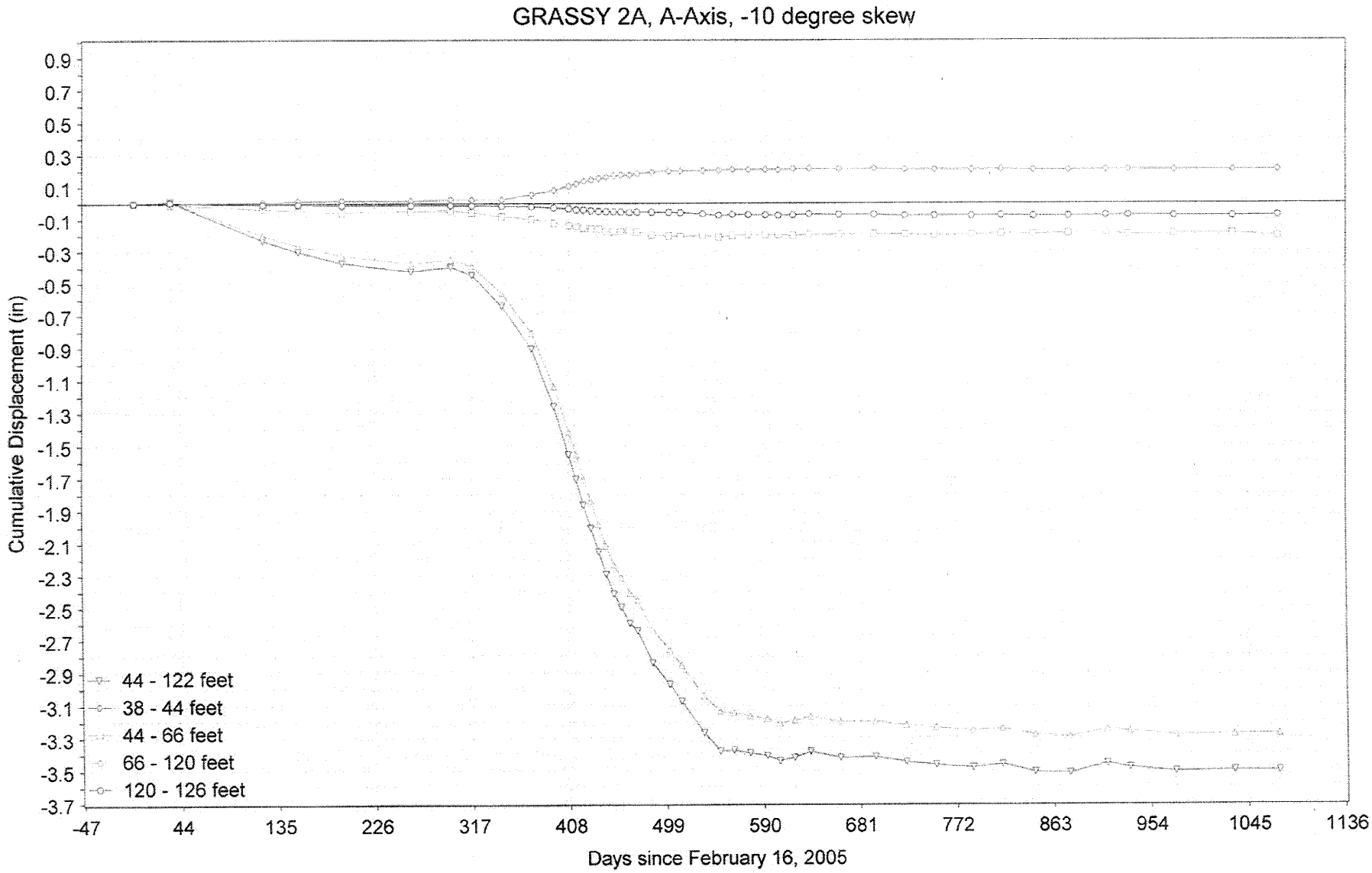
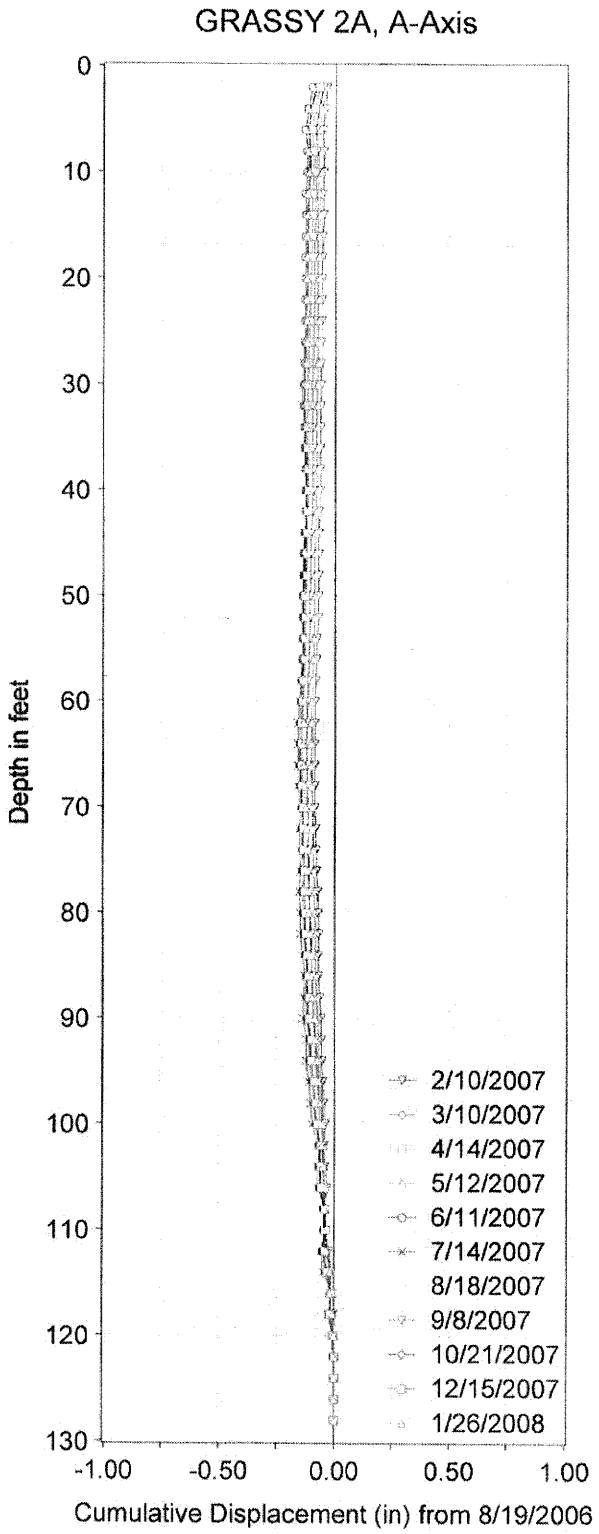
Grassy Trail Dam, Carbon County, Utah

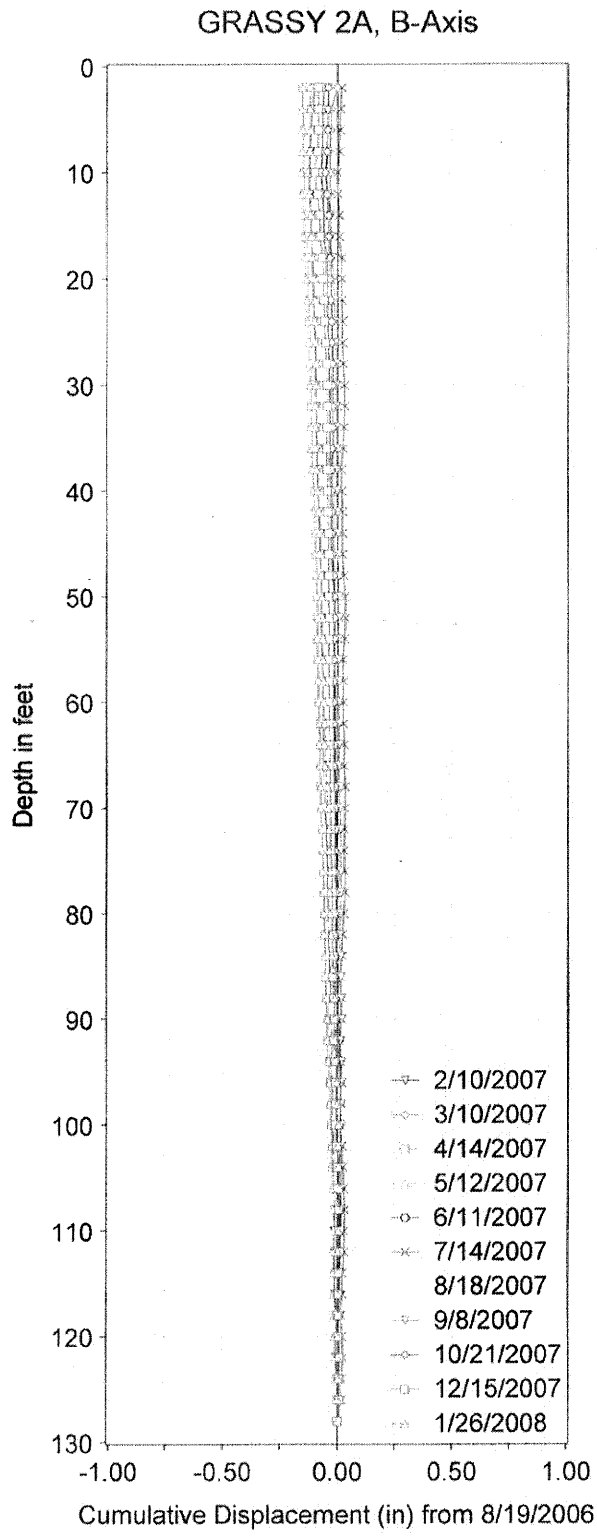
Type	Serial No.	Date	Time	Tran Peak (mm/s)	Vert Peak (mm/s)	Long Peak (mm/s)	PVS1 (mm/s)	Tran Freq. Hz.	Vert Freq. Hz.	Long Freq. Hz.	Tran Accel (g)	Vert Accel (g)	Long Accel (g)	Description	Post Event Note first line
LOG	BE9689	Dec 15 /07	11:15:03	***	***	***	***	***	***	***	***	***	***	Start Monitoring	Start Monitoring
W	BE9689	Jan 12 /08	2:02:01	0.762	0.254	0.635	0.823	6.56	>100	7.21	0.0133	0.0133	0.0265	GrassyTrailDam	EQ mag 1.6
W	BE9689	Jan 17 /08	22:00:31	1.65	0.254	1.4	1.81	6.48	>100	8	0.0265	0.0133	0.0133	GrassyTrailDam	EQ mag 2.3
W	BE9689	Jan 18 /08	4:04:53	1.78	0.254	1.27	1.79	6.65	>100	8.13	0.0133	0.0265	0.0133	GrassyTrailDam	EQ mag 2.2
W	BE9689	Jan 18 /08	13:51:36	1.65	0.254	1.27	1.67	6.17	>100	7.31	0.0265	0.0265	0.0133	GrassyTrailDam	EQ mag 2.2
W	BE9689	Jan 21 /08	23:59:26	1.4	0.254	1.14	1.41	6.74	>100	8.98	0.0133	0.0133	0.0133	GrassyTrailDam	EQ mag 2.1
W	BE9689	Jan 22 /08	14:00:38	1.65	0.254	1.27	1.71	6.24	>100	7.11	0.0265	0.0265	0.0265	GrassyTrailDam	EQ mag 2.3
W	BE9689	Jan 25 /08	11:04:59	2.92	0.254	2.29	**2.98**	6.65	>100	7.64	0.0265	0.0265	0.0265	GrassyTrailDam	EQ mag 2.4
W	BE9689	Jan 26 /08	17:40:31	2.03	0.254	1.65	2.25	6.4	>100	7.42	0.0265	0.0265	0.0265	GrassyTrailDam	EQ mag 2.5
W	BE9689	Jan 26 /08	17:42:27	0.762	0.254	0.508	0.916	>100	>100	>100	0.053	0.0133	0.0663	GrassyTrailDam	Man made
LOG	BE9689	Jan 26 /08	17:43:02	***	***	***	***	***	***	***	***	***	***	Keyboard Stop	

vertical sensor readings may be in error



Inclinometer I-2 Located on Dam 1/26/08

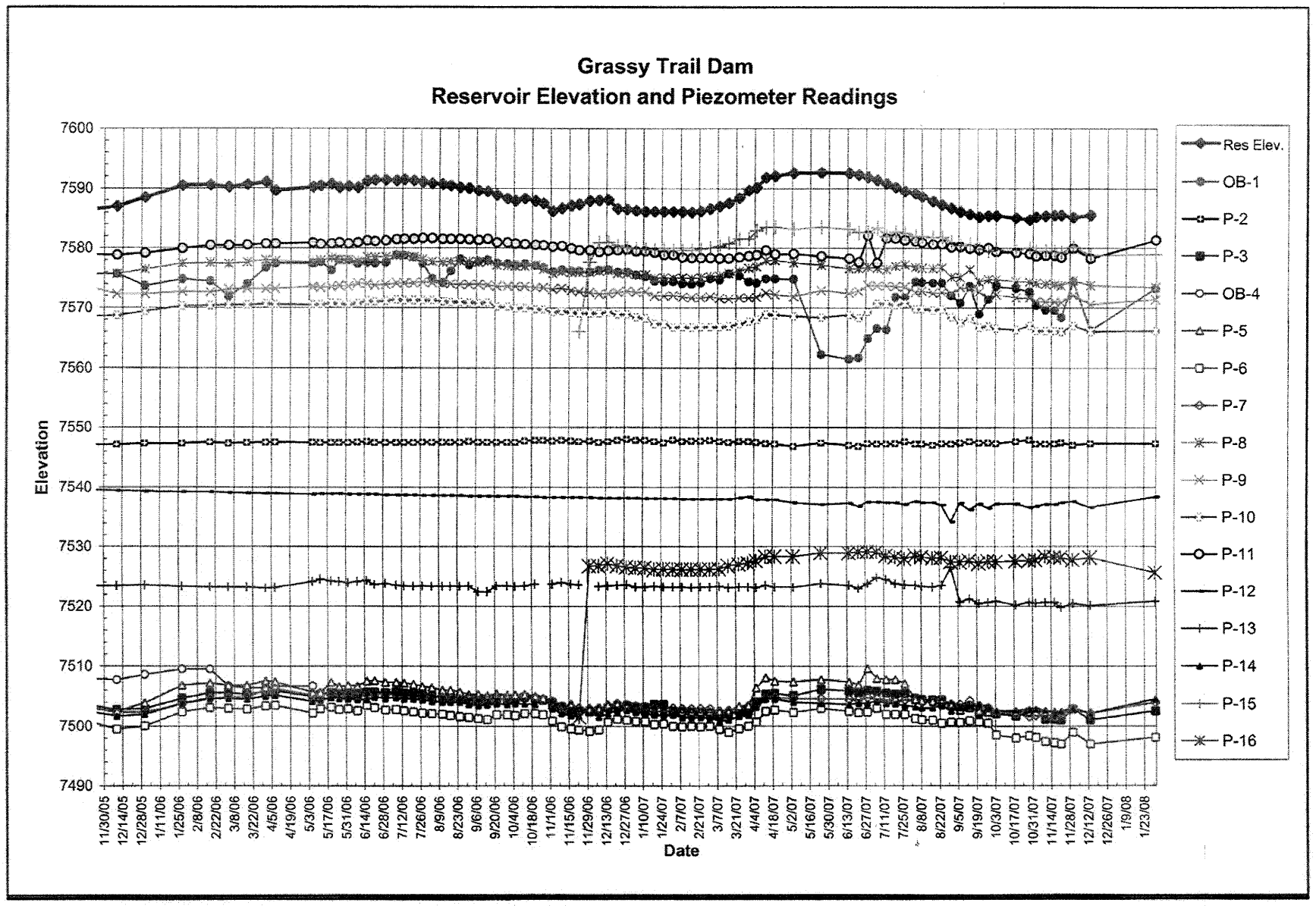

GRASSY 2A, A-Axis
Depth in feet
0
10
20
30
40
50
60
70
80
90
100
110
120
130
-1.00
-0.50
0.00
0.50
1.00
Cumulative Displacement (in) from 8/19/2006
2/10/2007
3/10/2007
4/14/2007
5/12/2007
6/11/2007
7/14/2007
8/18/2007
9/8/2007
10/21/2007
12/15/2007
1/26/2008


GRASSY 2A, B-Axis
Depth in feet
0
10
20
30
40
50
60
70
80
90
100
110
120
130
-1.00
-0.50
0.00
0.50
1.00
Cumulative Displacement (in) from 8/19/2006
2/10/2007
3/10/2007
4/14/2007
5/12/2007
6/11/2007
7/14/2007
8/18/2007
9/8/2007
10/21/2007
12/15/2007
1/26/2008

GRASSY TRAIL DAM PIEZOMETER & OBSERVATION WELL READINGS

TAKE READINGS AT RIM ELEV.			05-2		79-4	98-3		05-4		79-3	05-3A	05-3		06-1		98-2	98-4	98-6
			5+62		5+15	4+14		~4+14		3+63	2+77	2+71						
Dam Crest Elev.		7600.0	PIEZ.	PIEZ.	O.W.	PIEZ.		PIEZ.		O.W.	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ	PIEZ
Spillway Elev.		7592.5	8	9	1	2.0	3	13	14	4	10	11	12	15	16	5	6	7
Rim Elev. (ft)			7601.5		7601.8	7601.7		7558.9	7558.9	7601.7	7601.8	7601.7	7601.7	7601.50	7601.50	7528.8	7512.0	7519.5
Tip Elev. (ft	(actual)		7554.5	7535.1	7491.8	7525.4	7491.0	7521.0	7499.5	7491.7	7550.8	7572.0	7529.5	7566.00	7501.50	7501.5	7479.5	7493.0
Piezometer Location:			CREST	CREST	CREST	CREST	CREST	D.S. SLOPE	D.S. SLOPE	CREST	CREST	CREST	CREST	CREST	CREST	TOE	TOE	TOE
			EMBANK.	FOUND.	EMBANK/FOUND	EMBANK.	FOUND.	EMBANK.	FOUND.	(MBANK/FOUND	EMBANK.	EMBANK.	FOUND.	FOUND	BEDROCK	FOUND.	FOUND.	FOUND
Date	Initials	Reservoir Elevation	45.75' (47')	65' (66.4')	110'	76.2' (76.3')	110.7'	36.5' (37.9')	58.8' (59.4')	110'	49.5' (51')	28.5' (29.7')	84.0' (72.2')	34.00 35.50	98.50 100.00	27.3'	32.5'	26.5'
12/28/2006	LW	-72	25.8	28.7	25.8	53.6	98.2	35.2	56.2		32.9	21.9	63.4	21.4	74.9	25.5	11	15.8
1/4/2007	LW	-73	26	28.9	26.3	53.8	98.4	35.6	56.5		33.4	22.2	63.4	21.6	75	25.9	11.2	16
1/11/2007	LW	-76.5	26	28.8	26.6	53.8	98.5	35.6	56.6		33.6	22.2	63.5	21.7	75	26.3	11.2	16.1
1/18/2007	LW	-76.5	26.6	29.5	27.3	54.0	98	35.5	57		34.5	22.4	63.5	21.8	75.3	26.3	11.7	16.3
1/25/2007	LW	-76.5	26.5	29.5	27.4	54.2	98	35.6	57		34.5	22.8	63.5	21.8	75.2	26.3	11.6	16.3
2/1/2007	LW	-76.5	26.6	29.4	27.4	53.7	99.1	35.6	57		35.1	22.8	63.5	21.9	75.3	26.3	12	16.4
2/8/2007	LW	-77	26.5	29.7	27.7	54.0	99.2	35.6	57.4		35	23.2	63.6	21.9	75.3	26.3	12.1	16.5
2/15/2007	LW	-78	26.7	29.8	27.8	53.9	99.3	35.7	57.4		35.1	23.3	63.6	21.9	75.3	26.3	12	16.5
2/22/2007	LW	-76	26.5	29.8	27.6	53.9	99.3	35.6	57.4		35	23.3	63.6	21.7	75.3	26.3	12.1	16.5
3/1/2007	LW	-71	26.3	29.6	26.9	53.8	99.8	35.6	57.4		35	23.3	63.6	21.5	75.3	26.3	12	16.5
3/8/2007	LW	-66.5	26.2	29.9	27.1	54.0	99.9	35.5	58		35	23.4	63.6	21.2	75.2	26.3	12.5	16.9
3/15/2007	LW	-59.5	25.8	30	26.1	54.1	99.6	35.7	57.8		34.9	23.4	63.6	20.7	74.7	26.3	13	16.8
3/23/2007	LW	-49	25.4	29.8	26.4	54.0	99.1	35.6	57.2		34.5	23.2	63.4	20	74.4	25.4	12.4	16.4
3/30/2007	LW	-34	24.9	29.8	27.4	54.0	99.2	35.6	57		34.1	23	63.2	20	74.2	25.3	12	16.1
4/5/2007	CV	-28	24.65	29.7	27.6	54.1	97.65	35.7	55.6		33.8	22.8	63.7	18.6	73.8	22.4	11.3	15.6
4/12/2007	CV	-8	23.6	29	26.9	54.3	96.3	35.3	54.3		32.9	22	63.7	18	73.1	20.7	9.5	14.6
4/19/2007	CV	-5	23.6	29.3	26.9	54.4	96.2	35.6	54.3		33	22.7	63.7	18	73.1	21.3	9.3	14.6
5/3/2007	CV	1	24	29.6	27	54.8	96.6	35.6	54.8		33.2	22.6	64.2	18.3	73.1	21.4	9.7	14.8
5/24/2007	CV	2	24.4	28.6	39.5	54.2	95.5	35	55		33.4	23	64.5	18	72.5	21.0	9	14.8
6/14/2007	CV	1	25	29	40.3	54.6	95.8	35.3	55.2		33	23.4	64.3	18.3	72.5	21.4	9.5	14.9
6/21/2007	CV	-2	25	28.7	40	54.8	96	35.8	55		33.5	24	64.8	18.9	72.3	21.9	9.7	15
6/28/2007	CV	-7	24.7	27.7	36.9	54.3	95.7	35	55		32.5	19.5	64.1	18.9	72.3	19.2	9.6	14.6
7/5/2007	CV	-13	24.9	27.8	35.2	54.4	95.8	34	54.6		31	24.1	64.1	18.1	72.3	20.8	9	14.8
7/12/2007	CV	-20	25.1	27.8	35.4	54.4	96.1	34.3	55		31.1	20	64.2	19.5	73	21.0	10	15
7/19/2007	CV	-27.5	24.6	27.9	29.9	54.3	96.3	35	55.1		31.3	20	64.2	18.8	73.2	21.0	10	15.3
7/26/2007	CV	-35.5	24.3	28	30	54.0	96.2	35.2	55.4		31	20.3	64.5	19	73.5	21.7	10	15
8/3/2007	CV	-40	24.8	28.9	27.4	54.4	97				32	20.5	64	19.5	73	24.3	10.7	15.1
8/8/2007	CV	-46.5	24.9	28.7	27.5	54.4	97.2	35.5	55.8		32	20.7	64.2	19.5	73.2	24.5	10.9	15.4
8/16/2007	CV	-56	25	29	27.6	54.6	97.3	35.6	55.8		32.2	21	64.2	19.8	73.4	24.6	11	15.3
8/23/2007	CV	-63	24.8	28.9	27.6	54.3	97.3	35.3	55.4		32	21	64.6	19.7	73.3	24.6	11.5	15
8/30/2007	CV	-69.5	26.4	29.1	29.7	54.4	98.3	32.3	56.3		33.4	21.5	67.4	20.4	74.0	25.3	11.3	15.7
9/6/2007	CV	-76.5	26.5	28.1	30.9	54.2	98.6	38.1	55.7		34.3	21.4	64.3	21.1	74.1	26.1	11.4	15.8
9/13/2007	CV	-82	25.1	28.4	28.1	54.0	98.3	37.6	55.5		33.6	21.7	65.4	20.8	73.8	25.7	11.1	15.2
9/20/2007	CV	-87	27.2	28.8	32.8	54.2	99.4	38.4	55.2		35.1	21.9	64.4	21.7	74.3	26.2	11.3	16
9/27/2007	CV	-85	26.8	29.8	30.3	54.2	99.3	38.2	55.6		34.9	21.6	65.1	22.1	73.9	26.4	11.5	16.3
10/3/2007	CV	-85	26.8	29.3	28.2	54.3	99.6	38	56.3		35.3	22.3	64.4	21.8	74.0	26.4	13.5	17.1
10/18/2007	CV	-89	27.1	29.8	28.5	54.0	100	38.6	56.2		35.5	22.4	64.4	21.9	73.9	26.4	14	17.4
10/28/2007	CV	-93	27.2	29.8	29	53.7	99.3	38.2	56		34.8	22.6	65	21.4	73.8	26.4	13.6	17.8
11/2/2007	CV	-87	27.4	30.4	31.4	54.4	99.3	38.3	56		35.7	23	64.8	22.0	73.7	26.4	13.9	17.6
11/9/2007	CV	-85.5	27.5	30.5	32.1	54.4	100.5	38.2	56.2		35.7	22.9	64.5	22.0	73.1	26.4	14.6	17.7
11/16/2007	D?	-84	27.6	30.5	32.2	54.4	100.5	38.2	56.4		35.7	22.9	64.5	22.1	73.2	26.4	14.8	17.8
11/21/2007	CV	-84	27.8	30.6	33.4	54.2	100.6	39	56.3		35.8	23.2	64.2	22.3	73.3	26.4	15	17.3
11/30/2007	CV	-88	27	29.4	27.3	54.6	98.8	38.4	55.8		34.8	21.7	64	21.3	73.7		13	16.5
12/13/2007	CV	-84	27.8	30.9	35.6	54.3	100.6	38.7	56.7		35.8	23.4	65	22.7	73.3	26.4	15	17.3
1/31/2008	CV		28.1	30.1	28.5	54.3	99.1	38	54.3		35.7	20.3	63.2	22.5	75.8		13.9	15.4

Shaded data cells may have interpolated data, original may not have been legible



RB&G ENGINEERING INC.
Provo, Utah

Figure Reservoir Elevation and Piezometer Readings
November 2005 to January 31, 2008

GRASSY TRAIL DAM - CARBON COUNTY, UTAH