



STATE OF
COLORADO

Lennberg - DNR, Patrick <patrick.lennberg@state.co.us>

Goose Haven Response to Additional Groundwater Monitoring Information

Peter Wayland <pwayland@weilandinc.com>
To: Patrick Lennberg <patrick.lennberg@state.co.us>
Cc: Melanie Asquith <Melanie.Asquith@lafayetteco.gov>

Thu, Dec 19, 2024 at 10:46 AM

Patrick,

Please find attached.

Happy Holidays!

Peter Wayland

Weiland, Inc.

PO Box 18087

Boulder, CO 80308

M 303.518-2182

2 attachments



M-2010-071 Ground Water Monitoring 2023-2024 additional Information.pdf
136K



Goose Haven Water Levels 23-24.pdf
113K



11/15/2024

Patrick Lennberg
Environmental protection Specialist
Colorado Division of Mining Reclamation & Safety
1313 Sherman St., Room 215
Denver, Colorado 80202

Re: Response to November 19, 2024 Request for Additional Information Required, Annual Groundwater Level Data for 2024, Goose Haven Reservoir #2 – Complex Expansion, Permit No. M-2010-071

Patrick,

1. Please provide an explanation for the missing water level data for P-3, P-6, and P-7.

It is my understanding that the City had been using a sonic water level meter which had been giving anomalous readings in those wells due to broken or bent pvc non perforated casing in those wells. The City has since purchased a more conventional submersible probe which is now working well and giving accurate readings in those well.

2. Please update the water level data table to include a column that compares the measured water level with the approved mitigation trigger values for each location.

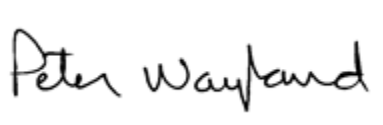
The currently approved mitigation trigger states "If a change in groundwater elevation greater than two feet beyond the seasonal baseline plus the anticipated (modeled) change in ground water elevations occurs then an intermediate second measurement will be taken 45 days after the initial reading. If the reading is still outside the mitigation trigger and an impact is imminent (i.e. a flooded basement or field), mitigation will be performed." The mitigation trigger can be revised in the future through a separate permit technical revision.

Given that all three of the mining cells are actively being dewatered by pumping, the mitigation triggers are not applicable since the groundwater modeling only contemplated post mining steady state conditions after the pumps are shut off.

I have however, added the seasonal baseline elevations to the piezometer data worksheet to allow for comparison with transient groundwater pumping conditions at the site.

Additionally, we have field verified well head elevations and measured riser height for all of the older wells and made some corrections for riser heights in Wells P-1, P-2 and P-4. Moving forward we will instruct the field technician to record the riser height when measuring depth to water.

Sincerely

A handwritten signature in black ink that reads "Peter Wayland". The signature is written in a cursive style and is contained within a thin black rectangular border.

Peter Wayland
President

Encl. Goose Haven Piezometer data and 2023-2024.

		P-1 W.L.				P-2 W.L.				P-3 W.L.				P-3R W.L.							
		DATE	P-1 MEAS.	Elev.	Baseline	Delta	P-2 MEAS.	Elev.	Baseline	Delta	P-3 MEAS.	Elev.	Baseline	Delta	P-3R MEAS.	Elev.	P-4 MEAS.	P-4 W.L. Elev.	Baseline	Delta	
FALL		10/12/2023	12.30	5035.70	5038.80	-3.10	13.40	5033.30	5036.30	-3.00	nd	nd	5031.70	nd	19.70	5033.86	11.65	5063.80	5064.10	-0.30	
		10/26/2023	13.30	5034.70	5038.80	-4.10	15.10	5031.60	5036.30	-4.70	nd	nd	5031.70	nd	19.80	5033.76	12.05	5063.40	5064.10	-0.70	
		11/2/2023	13.30	5034.70	5038.80	-4.10	15.50	5031.20	5036.30	-5.10	nd	nd	5031.70	nd	20.00	5033.56	12.15	5063.30	5064.10	-0.80	
		11/9/2023	13.50	5034.50	5038.80	-4.30	16.60	5030.10	5036.30	-6.20	nd	nd	5031.70	nd	20.30	5033.26	12.15	5063.30	5064.10	-0.80	
		11/15/2023	13.30	5034.70	5038.80	-4.10	16.30	5030.40	5036.30	-5.90	nd	nd	5031.70	nd	20.70	5032.86	12.15	5063.30	5064.10	-0.80	
WINTER		12/12/2023	13.20	5034.80	5037.90	-3.10	15.80	5030.90	5036.20	-5.30	nd	nd	5030.40	nd	20.90	5032.66	12.05	5063.40	5062.60	0.80	
		12/18/2023	13.60	5034.40	5037.90	-3.50	16.10	5030.60	5036.20	-5.60	25.50	5023.73	5030.40	-6.67	21.20	5032.36	11.75	5063.70	5062.60	1.10	
		1/18/2024	13.60	5034.40	5037.90	-3.50	17.00	5029.70	5036.20	-6.50	25.70	5023.53	5030.40	-6.87	21.40	5032.16	11.65	5063.80	5062.60	1.20	
		1/25/2024	13.50	5034.50	5037.90	-3.40	17.10	5029.60	5036.20	-6.60	25.80	5023.43	5030.40	-6.97	21.60	5031.96	11.45	5064.00	5062.60	1.40	
		2/6/2024	13.30	5034.70	5037.90	-3.20	17.20	5029.50	5036.20	-6.70	25.60	5023.63	5030.40	-6.77	21.70	5031.86	11.05	5064.40	5062.60	1.80	
SPRING		2/15/2024	13.10	5034.90	5036.40	-1.50	17.00	5029.70	5035.90	-6.20	25.60	5023.63	5030.30	-6.67	21.90	5031.66	10.85	5064.60	5062.60	2.00	
		3/5/2024	13.00	5035.00	5036.40	-1.40	16.20	5030.50	5035.90	-5.40	25.70	5023.53	5030.30	-6.77	22.10	5031.46	10.75	5064.70	5062.60	2.10	
		3/28/2024	12.80	5035.20	5036.40	-1.20	15.80	5030.90	5035.90	-5.00	25.40	5023.83	5030.30	-6.47	23.20	5030.36	9.85	5065.60	5062.60	3.00	
		4/11/2024	12.30	5035.70	5036.40	-0.70	14.80	5031.90	5035.90	-4.00	25.10	5024.13	5030.30	-6.17	23.10	5030.46	9.75	5065.70	5062.60	3.10	
		4/23/2024	12.10	5035.90	5036.40	-0.50	13.90	5032.80	5035.90	-3.10	25.00	5024.23	5030.30	-6.07	23.00	5030.56	9.95	5065.50	5062.60	2.90	
SUMMER		5/9/2024	12.20	5035.80	5036.40	-0.60	14.10	5032.60	5035.90	-3.30	25.00	5024.23	5030.30	-6.07	22.80	5030.76	9.75	5065.70	5062.60	3.10	
		5/16/2024	12.40	5035.60	5039.30	-3.70	14.50	5032.20	5036.70	-4.50	25.10	5024.13	5033.70	-9.57	22.90	5030.66	9.75	5065.70	5064.80	0.90	
		5/25/2024	11.90	5036.10	5039.30	-3.20	13.70	5033.00	5036.70	-3.70	25.00	5024.23	5033.70	-9.47	22.70	5030.86	10.25	5065.20	5064.80	0.40	
		6/3/2024	11.80	5036.20	5039.30	-3.10	13.20	5033.50	5036.70	-3.20	24.70	5024.53	5033.70	-9.17	22.50	5031.06	10.25	5065.20	5064.80	0.40	
		6/10/2024	11.70	5036.30	5039.30	-3.00	13.50	5033.20	5036.70	-3.50	24.80	5024.43	5033.70	-9.27	22.50	5031.06	9.95	5065.50	5064.80	0.70	
		6/24/2024	11.40	5036.60	5039.30	-2.70	13.50	5033.20	5036.70	-3.50	25.00	5024.23	5033.70	-9.47	22.80	5030.76	10.45	5065.00	5064.80	0.20	
		7/8/2024	11.70	5036.30	5039.30	-3.00	13.40	5033.30	5036.70	-3.40	24.20	5025.03	5033.70	-8.67	20.80	5032.76	9.85	5065.60	5064.80	0.80	
		7/15/2024	11.80	5036.20	5039.30	-3.10	13.10	5033.60	5036.70	-3.10	23.30	5025.93	5033.70	-7.77	19.40	5034.16	10.75	5064.70	5064.80	-0.10	
		7/22/2024	11.70	5036.30	5039.30	-3.00	13.00	5033.70	5036.70	-3.00	23.20	5026.03	5033.70	-7.67	19.40	5034.16	11.05	5064.40	5064.80	-0.40	
		8/2/2024	11.70	5036.30	5039.30	-3.00	13.10	5033.60	5036.70	-3.10	23.60	5025.63	5033.70	-8.07	20.10	5033.46	11.25	5064.20	5064.80	-0.60	
FALL		8/15/2024	11.60	5036.40	5039.30	-2.90	12.90	5033.80	5036.70	-2.90	23.90	5025.33	5033.70	-8.37	20.60	5032.96	11.35	5064.10	5064.80	-0.70	
		8/21/2024	11.60	5036.40	5038.80	-2.40	12.80	5033.90	5036.30	-2.40	24.10	5025.13	5031.70	-6.57	21.00	5032.56	11.85	5063.60	5064.10	-0.50	
		9/4/2024	11.70	5036.30	5038.80	-2.50	12.70	5034.00	5036.30	-2.30	24.00	5025.23	5031.70	-6.47	21.00	5032.56	12.75	5062.70	5064.10	-1.40	
		9/12/2024	11.50	5036.50	5038.80	-2.30	12.80	5033.90	5036.30	-2.40	24.20	5025.03	5031.70	-6.67	21.30	5032.26	13.25	5062.20	5064.10	-1.90	
		9/23/2024	11.80	5036.20	5038.80	-2.60	13.20	5033.50	5036.30	-2.80	23.90	5025.33	5031.70	-6.37	20.60	5032.96	13.75	5061.70	5064.10	-2.40	
		10/4/2024	11.70	5036.30	5038.80	-2.50	13.20	5033.50	5036.30	-2.80	24.30	5024.93	5031.70	-6.77	21.40	5032.16	13.95	5061.50	5064.10	-2.60	
		10/17/2024	11.80	5036.20	5038.80	-2.60	13.20	5033.50	5036.30	-2.80	24.60	5024.63	5031.70	-7.07	22.00	5031.56	14.45	5061.00	5064.10	-3.10	
	11/12/2024	12.40	5035.60	5038.80	-3.20	15.80	5030.90	5036.30	-5.40	25.10	5024.13	5031.70	-7.57	22.90	5030.66	13.75	5061.70	5064.10	-2.40		

		P-5 W.L.				P-6 W.L.				P-7 W.L.				P-11 W.L.			P-12 W.L.		P-13 W.L.	
		DATE	P-5 MEAS.	Elev.	Baseline	Delta	P-6 MEAS.	Elev.	Baseline	Delta	P-7 MEAS.	Elev.	Baseline	Delta	P-11 MEAS.	Elev.	P- 12 MEAS.	Elev.	P-13 MEAS.	Elev.
FALL	10/12/2023	7.90	5063.82	5061.30	2.52	nd	nd	5045.80	nd	26.20	5037.57	5041.4	-3.83	12.50	5073.36	11.51	5066.14	15.54	5043.22	
	10/26/2023	8.30	5063.42	5061.30	2.12	nd	nd	5045.80	nd	27.80	5035.97	5041.4	-5.43	12.50	5073.36	11.82	5065.83	15.44	5043.33	
	11/2/2023	8.40	5063.32	5061.30	2.02	nd	nd	5045.80	nd	28.40	5035.37	5041.4	-6.03	12.50	5073.36	10.92	5066.73	15.33	5043.43	
	11/9/2023	8.40	5063.32	5061.30	2.02	nd	nd	5045.80	nd	28.90	5034.87	5041.4	-6.53	12.50	5073.36	11.07	5066.59	15.22	5043.54	
	11/15/2023	8.40	5063.32	5061.30	2.02	nd	nd	5045.80	nd	28.90	5034.87	5041.4	-6.53	12.50	5073.36	11.21	5066.44	15.12	5043.65	
WINTER	12/12/2023	8.30	5063.42	5060.70	2.72	nd	nd	5044.20	nd	nd	nd	5039.10	nd	12.60	5073.26	11.36	5066.30	15.01	5043.75	
	12/18/2023	8.00	5063.72	5060.70	3.02	nd	nd	5044.20	nd	nd	nd	5039.10	nd	12.50	5073.36	11.50	5066.15	14.90	5043.86	
	1/18/2024	7.90	5063.82	5060.70	3.12	nd	nd	5044.20	nd	nd	nd	5039.10	nd	12.60	5073.26	11.65	5066.01	14.79	5043.97	
	1/25/2024	7.70	5064.02	5060.70	3.32	nd	nd	5044.20	nd	nd	nd	5039.10	nd	12.70	5073.16	11.79	5065.86	14.69	5044.07	
	2/6/2024	7.30	5064.42	5060.70	3.72	nd	nd	5044.20	nd	nd	nd	5039.10	nd	12.60	5073.26	11.94	5065.72	14.58	5044.18	
SPRING	2/15/2024	7.10	5064.62	5060.70	3.92	nd	nd	5043.30	nd	nd	nd	5039.00	nd	12.70	5073.16	12.08	5065.57	14.47	5044.29	
	3/5/2024	7.00	5064.72	5060.70	4.02	nd	nd	5043.30	nd	nd	nd	5039.00	nd	12.50	5073.36	12.23	5065.43	14.37	5044.40	
	3/28/2024	6.10	5065.62	5060.70	4.92	35.40	5034.52	5043.30	-8.78	nd	nd	5039.00	nd	12.00	5073.86	12.37	5065.28	14.26	5044.50	
	4/11/2024	6.00	5065.72	5060.70	5.02	35.50	5034.42	5043.30	-8.88	nd	nd	5039.00	nd	12.30	5073.56	12.52	5065.14	14.15	5044.61	
	4/23/2024	6.20	5065.52	5060.70	4.82	35.40	5034.52	5043.30	-8.78	nd	nd	5039.00	nd	12.10	5073.76	12.66	5064.99	14.05	5044.72	
SUMMER	5/9/2024	6.00	5065.72	5060.70	5.02	35.40	5034.52	5043.30	-8.78	nd	nd	5039.00	nd	12.00	5073.86	12.81	5064.84	13.94	5044.82	
	5/16/2024	6.00	5065.72	5061.90	3.82	34.40	5035.52	5045.90	-10.38	nd	nd	5041.50	nd	12.20	5073.66	12.95	5064.70	13.83	5044.93	
	5/25/2024	6.50	5065.22	5061.90	3.32	35.40	5034.52	5045.90	-11.38	nd	nd	5041.50	nd	11.80	5074.06	13.10	5064.55	13.72	5045.04	
	6/3/2024	6.50	5065.22	5061.90	3.32	35.40	5034.52	5045.90	-11.38	nd	nd	5041.50	nd	9.90	5075.96	12.21	5065.44	13.00	5045.76	
	6/10/2024	6.20	5065.52	5061.90	3.62	34.80	5035.12	5045.90	-10.78	nd	nd	5041.50	nd	9.90	5075.96	12.10	5065.55	12.80	5045.96	
	6/24/2024	6.70	5065.02	5061.90	3.12	34.60	5035.32	5045.90	-10.58	nd	nd	5041.50	nd	10.90	5074.96	12.50	5065.15	13.51	5045.25	
	7/8/2024	6.10	5065.62	5061.90	3.72	33.60	5036.32	5045.90	-9.58	nd	nd	5041.50	nd	11.30	5074.56	12.55	5065.10	13.52	5045.24	
	7/15/2024	7.00	5064.72	5061.90	2.82	31.10	5038.82	5045.90	-7.08	nd	nd	5041.50	nd	11.60	5074.26	12.18	5065.48	13.50	5045.26	
	7/22/2024	7.30	5064.42	5061.90	2.52	31.90	5038.02	5045.90	-7.88	nd	nd	5041.50	nd	9.40	5076.46	12.00	5065.65	12.51	5046.25	
	8/2/2024	7.50	5064.22	5061.90	2.32	32.20	5037.72	5045.90	-8.18	nd	nd	5041.50	nd	10.30	5075.56	11.42	5066.23	12.25	5046.51	
8/15/2024	7.60	5064.12	5061.90	2.22	29.60	5040.32	5045.90	-5.58	nd	nd	5041.50	nd	11.00	5074.86	11.04	5066.61	13.20	5045.56		
FALL	8/21/2024	8.10	5063.62	5061.30	2.32	29.50	5040.42	5045.80	-5.38	nd	nd	5041.40	nd	12.00	5073.86	10.67	5066.99	13.45	5045.31	
	9/4/2024	9.00	5062.72	5061.30	1.42	29.40	5040.52	5045.80	-5.28	nd	nd	5041.40	nd	12.50	5073.36	10.29	5067.37	13.40	5045.36	
	9/12/2024	9.50	5062.22	5061.30	0.92	29.80	5040.12	5045.80	-5.68	nd	nd	5041.40	nd	12.50	5073.36	9.91	5067.74	13.45	5045.31	
	9/23/2024	10.00	5061.72	5061.30	0.42	30.50	5039.42	5045.80	-6.38	nd	nd	5041.40	nd	12.60	5073.26	9.53	5068.12	13.49	5045.27	
	10/4/2024	10.20	5061.52	5061.30	0.22	31.10	5038.82	5045.80	-6.98	nd	nd	5041.40	nd	12.70	5073.16	9.16	5068.50	13.51	5045.25	
	10/17/2024	10.70	5061.02	5061.30	-0.28	32.00	5037.92	5045.80	-7.88	nd	nd	5041.40	nd	12.80	5073.06	8.78	5068.88	13.52	5045.24	
	11/12/2024	10.00	5061.72	5061.30	0.42	32.50	5037.42	5045.80	-8.38	27.80	5035.97	5041.4	-5.43	13.80	5072.06	8.40	5069.25	13.50	5045.26	