



STATE OF
COLORADO

Ebert - DNR, Jared <jared.ebert@state.co.us>

Pit 29 Groundwater Data and Response to Zigan Complaint

Joshua Oliver <joliver@brannan1.com>

Mon, Sep 24, 2018 at 8:24 AM

To: "Ebert - DNR, Jared" <jared.ebert@state.co.us>

Cc: Fred Marvel <fmarvel@brannan1.com>, Alex Schatz <aschatz@brannan1.com>, Drew Damiano <drew@unitedwaterdistrict.com>

Mr. Ebert,

Please find the attached letter and requested groundwater elevation table.

Let me know if there are any questions or further information that I can provide.

Joshua Oliver

Environmental Manager



joliver@brannan1.com

O: 303.853.5159 |M: 303.472.1736 |F: 303.853.5233



2 attachments



9-24-18 Letter.pdf

110K



Pit 29 Piezometers Monitoring with Datum Shift and Elevations.pdf

36K



September 24, 2018
Mr. Jared Ebert
Colorado Division of Reclamation, Mining and Safety
1313 Sherman St.
Denver, CO 80203

Mr. Ebert,

Please find the attached requested information regarding groundwater levels around Pit 29 reclamation permit M-1980-183.

MW-2 on the south side of the south cell and MW-4 on the southwest wide of the north cell are the two monitoring wells that are most applicable to the Zigan Homeowner's Association concerns.

The brief history associated with potential groundwater mounding in the area is:

- Slurry wall installed around the north and south cell of Pit 29 in the fall and winter of 2003-04
- Stagecoach (adjacent off-site property, operated by LaFarge/A.F.S.) slurry wall installed in 2005
- Leak test conducted on the south cell in 2006
- French drain installed in 2015 along the western half of the south side of the north cell
- French drain continues to be operational
- Groundwater level monitoring continues to be performed in accordance with TR-03

The groundwater elevation table in the area is attached. Well MW-4 was surveyed in 2014, and the elevation of MW-2 used was according to the 2004 well completion report associated with TR-03.

The pre-mining groundwater contour map produced in 1979-80 was created on the vertical datum NGVD 29, and subsequent survey data used NAD 88. There is a datum shift associated with NGVD 29 and NAD 88 of about 2.877 feet. Note that associated discrepancies in elevation data were discussed in reference to TR-05. The datum shift adjustment is accounted for in the attached groundwater elevation tables.

According to the groundwater level monitoring data in MW-4, the French drain is keeping groundwater levels at pre-mining levels. The groundwater level in MW-2 is at a level slightly below pre-mining conditions. The level in this well fluctuates several feet regularly, likely associated with the Stagecoach Overflow Drain, serving Zigan Lake (installed by Albert Frei and Sons around 2010), and with the operations of the Fulton Ditch.

There are a number of other considerations in any discussion of hydrologic balance. First, the intersection of climate variation and baseline data. In the case of the Pit 29 vicinity, slurry walls were installed in the middle of a series of historically dry years. Second, seasonal

weather patterns, including periods of days or weeks when soils in the South Platte valley become relatively saturated, are not unusual or at odds with the normal hydrologic balance. Finally, water management practices in the agricultural lands of Colorado, particularly in the vicinity of the South Platte River, yield very significant changes to groundwater levels. This includes changes to surface water diversions, development of stormwater facilities, in-stream flow rights, and augmentation rules that have notably been associated with a significant rise in groundwater and well levels.

Regarding Pit 29, the available data demonstrates that groundwater mitigation structures are managing groundwater levels properly and minimizing disturbance to the prevailing hydrologic balance.

The current activity at the Site is limited to repair of existing facilities and will not impact the local groundwater levels.

It is significant that the Stagecoach overflow Drain was specifically installed by Albert Frei and Sons to manage the Zigan Lake water levels. Additionally, it should be noted that we are unaware of any evidence that slurry wall repairs currently underway at Pit 29 have had any effect on hydrologic balance.

Please let me know if there is any further information that Brannan can provide.

Sincerely,

A handwritten signature in blue ink, appearing to read "Josh Oliver", with a long horizontal flourish extending to the right.

Joshua Oliver
Environmental Manager
Brannan Sand and Gravel Company, L.L.C.
(303) 472-1736
joliver@brannan1.com

Brannan Pit #29											
Water Level Measurements											
Date Month-Year	Depth to Water (ft)								MW-4 Historic GW Elevation (AM-02 Datum Shift Memo to DRMS 9-25-18 - NAD88 Datum)	MW-4 Historic May 1980 (Pre- mining GW Contour Map - Blatchley and Associates - NGVD 29 Datum)	
	MW-1 OUT	MW-2 OUT	MW2 GW Elevation	MW-2 Historic GW Elevation (AM-02 Datum Shift Memo to DRMS 9-25-18 - NAD88 Datum)	MW 2 Historic June 1980 (Pre- mining GW Contour Map - Blatchley and Associates - NGVD 29 Datum)	MW-3 OUT	MW-4 OUT	MW-4 GW Elevation			
12/1/2005	21.50	22.50	5010.15	5016.88	5014	11	NA	NA	5008.777		5006
1/1/2006	23.00	23.00	5009.65	5016.88	5014	13	NA	NA	5008.777		5006
3/1/2006	22.00	20.00	5012.65	5016.88	5014	11.5	NA	NA	5008.777		5006
5/1/2006	21.50	20.00	5012.65	5016.88	5014	10.5	NA	NA	5008.777		5006
6/1/2010	20.50	17.70	5014.95	5016.88	5014	N/A	NA	NA	5008.777		5006
9/1/2010	20.00	18.00	5013.75	5016.88	5014	N/A	21.40	4996.48	5008.777		5005
12/1/2010	20.90	23.17	5009.48	5016.88	5014	N/A	25.25	4991.63	5008.777		5005
3/1/2011	20.57	19.40	5013.25	5016.88	5014	N/A	24.66	4993.22	5008.777		5006
6/1/2011	19.40	15.74	5016.91	5016.88	5014	N/A	21.80	4996.08	5008.777		5006
9/1/2011	18.94	18.63	5014.02	5016.88	5014	N/A	21.08	4996.80	5008.777		5006
12/1/2011	20.20	21.10	5011.55	5016.88	5014	N/A	21.15	4996.73	5008.777		5006
3/1/2012	20.95	10.30	5012.35	5016.88	5014	N/A	17.75	5000.13	5008.777		5005
6/1/2012	20.89	18.47	5014.18	5016.88	5014	N/A	14.09	5003.79	5008.777		5006
9/12/2012	20.97	19.21	5013.44	5016.88	5014	N/A	5.64	5012.24	5008.777		5006
11/12/2012	-	-	-	5016.88	5014	N/A	4.84	5013.04	5008.777		5006
12/12/2012	21.79	20.54	5012.11	5016.88	5014	N/A	5.67	5012.21	5008.777		5006
4/13/2013	22.84	18.16	5014.49	5016.88	5014	N/A	5.61	5012.27	5008.777		5006
4/22/2013	22.55	19.70	5012.95	5016.88	5014	N/A	5.30	5012.58	5008.777		5006
6/13/2013	22.48	18.78	5013.87	5016.88	5014	N/A	5.60	5012.28	5008.777		5006
9/1/2013	21.66	19.15	5013.50	5016.88	5014	N/A	4.52	5013.36	5008.777		5006
12/13/2013	23.19	20.60	5012.05	5016.88	5014	N/A	5.60	5012.28	5008.777		5006
3/14/2014	24.15	16.75	5015.90	5016.88	5014	N/A	6.09	5011.79	5008.777		5006
6/14/2014	23.32	17.76	5014.90	5016.88	5014	N/A	5.18	5012.71	5008.777		5006
9/14/2014	22.91	18.80	5013.85	5016.88	5014	N/A	4.64	5013.24	5008.777		5006
11/14/2014	23.60	19.62	5013.03	5016.88	5014	N/A	5.22	5012.66	5008.777		5006
12/1/2014	24.85	20.48	5012.17	5016.88	5014	N/A	6.02	5011.86	5008.777		5006
3/31/2015	26.87	17.50	5015.16	5016.88	5014	N/A	6.78	5011.10	5008.777		5006
6/15/2015	21.79	16.69	5015.96	5016.88	5014	N/A	4.79	5013.09	5008.777		5006
9/15/2015	19.94	17.75	5014.90	5016.88	5014	N/A	5.27	5012.61	5008.777		5005
12/15/2015	21.42	19.15	5013.50	5016.88	5014	N/A	6.54	5011.34	5008.777		5006
4/6/2016	23.11	20.06	5012.59	5016.88	5014	N/A	9.15	5008.73	5008.777		5006
7/13/2016	20.66	18.64	5014.01	5016.88	5014	N/A	6.33	5011.55	5008.777		5006
8/30/2016	20.61	19.86	5012.79	5016.88	5014	N/A	9.01	5008.87	5008.777		5006
9/27/2016	20.78	20.37	5012.28	5016.88	5014	N/A	8.77	5009.11	5008.777		5005
10/31/2016	20.53	20.91	5011.74	5016.88	5014	N/A	9.09	5008.79	5008.777		5005
11/21/2016	20.58	21.05	5011.60	5016.88	5014	N/A	9.05	5008.83	5008.777		5006
12/28/2016	21.61	21.93	5010.72	5016.88	5014	N/A	9.15	5008.73	5008.777		5006
1/26/2017	22.49	22.31	5010.34	5016.88	5014	N/A	9.20	5008.68	5008.777		5006
2/27/2017	23.44	22.60	5010.05	5016.88	5014	N/A	9.20	5008.68	5008.777		5006
3/28/2017	23.35	19.78	5012.87	5016.88	5014	N/A	9.19	5008.69	5008.777		5005
5/22/2017	21.12	19.25	5013.40	5016.88	5014	N/A	8.90	5008.98	5008.777		5006
6/14/2017	20.76	18.88	5013.77	5016.88	5014	N/A	8.91	5008.97	5008.777		5006
7/17/2017	19.68	18.60	5014.05	5016.88	5014	N/A	8.94	5008.94	5008.777		5006
8/11/2017	19.81	19.5	5013.15	5016.88	5014	N/A	8.11	5009.77	5008.777		5006
9/11/2017	19.97	19.60	5013.05	5016.88	5014	N/A	8.96	5008.92	5008.777		5005
10/16/2017	20.42	20.30	5012.35	5016.88	5014	N/A	8.99	5008.89	5008.777		5005
11/21/2017	22.48	21.58	5011.07	5016.88	5014	N/A	9.12	5008.76	5008.777		5006
12/19/2017	22.39	22.14	5010.51	5016.88	5014	N/A	9.06	5008.82	5008.777		5006
1/19/2018	23.32	22.58	5010.07	5016.88	5014	N/A	9.22	5008.66	5008.777		5006
2/16/2018	23.90	22.81	5009.84	5016.88	5014	N/A	9.27	5008.61	5008.777		5006
3/12/2018	24.48	23.00	5009.65	5016.88	5014	N/A	9.38	5008.50	5008.777		5005
4/30/2018	22.80	20.19	5012.46	5016.88	5014	N/A	9.22	5008.66	5008.777		5006
5/21/2018	21.95	19.75	5012.90	5016.88	5014	N/A	9.18	5008.70	5008.777		5006
6/22/2018	20.80	19.08	5013.57	5016.88	5014	N/A	9.05	5008.83	5008.777		5006
7/12/2018	20.50	19.24	5013.41	5016.88	5014	N/A	9.06	5008.82	5008.777		5006
8/15/2018	20.60	19.83	5012.82	5016.88	5014	N/A	9.01	5008.87	5008.777		5005
9/5/2018	21.75	20.11	5012.54	5016.88	5014		9.05	5008.83	5008.777		5006