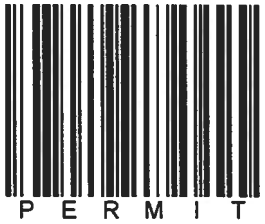
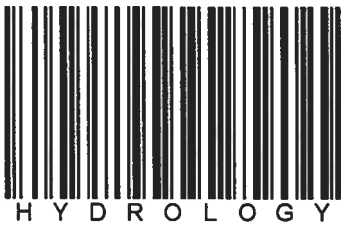
Hydrology





QATESTOCR

October 28, 2014

Mr. Eric Scott
Division of Reclamation , Mines, and Safety
1313 Sherman Street, Room 215
Denver, Colorado 80203

RE: Shores Gravel Mine (Burch Amendment), Permit No. M-1998-013; Groundwater Mitigation Plan Review & Comments

Dear Mr. Scott

The purpose of this letter is to provide a groundwater mitigation plan for the Shores Gravel Mine and more specifically the proposed area to be added under this amendment. The Shores Gravel Mine is located one mile east of Interstate 25 and approximately one mile south of St. Vrain Creek along State Highway 119. Refer to Figure 1.

Baseline Groundwater Evaluation

A groundwater monitoring plan has been implemented and on February 14, 2014 two piezometers were installed in the southeast corner and another in the northwest corner of the property. Another three piezometers were installed on April 16, 2014. These piezometers were continuously monitored on a monthly basis for 8 months and will be monitored throughout the mining process with water levels being reported twice a year or more frequently to the DRMS. Current groundwater levels were 10 feet below ground at the time of drilling in the southeast portion of the Site and 7 feet below ground in the northwest corner respectively. The groundwater gradient is generally from southwest to northeast.

There are a few farm properties to the west, east and north of the Site. Table 1 below reports the wells within the area with some well data reported during the time of drilling and Figure 1 shows the actual well locations.

Table 1

Well Owner	Well Permit	Water Level (bgs)	Well Depth (bgs)	Type	Pump Rate (gpm)
Rindour (well abandoned)	226509	2	28	Domestic	10
Aites	252974		18	Domestic	15
Vogl	103101	6	18	Domestic	15
Gillat	105608		34	Domestic	15
Andrews	201975	16	36	Domestic	15
Sewald	20441	12	30	Domestic	10

Bestway has continuously monitored the seasonal groundwater levels and determined a baseline water level after approximately 8 months of data has been recorded. Table 2 below reports the average, minimum and maximum water levels below ground for the monitoring wells.

Table 2

		SE Pond E	Pond D	NE Pond E	Pond B
Date	NW-Well	SE-Well	MW 3	MW 4	MW 5
	(feet below grade)	(feet below grade)	(feet below grade)	(feet below grade)	(feet below grade)
Average	7.15	7.01	19.25	7.75	6.37
Max	9.75	8.17	19.67	9.67	6.75
Min	6.58	6.33	18.42	6.08	6.00

Potential Groundwater Impacts

Originally the Burch Site was proposed to be dewatered, mined and reclaimed after construction of a slurry wall. Bestway has changed its plans and is now proposing to dewater the site, wet mine the site and backfill or leave one cell open completed with a compacted clay liner to be used as a small augmentation pond. The proposed method of mining could potentially cause some drawdown in the surrounding alluvial wells and in the event a cell is lined with clay it could cause some mounding on the west side of the site. The clay lining could cause a small shadow effect on the north and east. Existing water levels from borings done in 2004 on the Shores Pit indicate that water is 8 feet to 11 feet below ground surface. The current observed water levels in the wells are shown in Table 2 above.

Groundwater Mitigation Plan

Figure 2 shows the wells and potential residence with domestic wells and basements. The groundwater currently flows northeast with a potential shadow effect on the east side of the site and a mounding effect on the west side of the site.

The initial impact from mining could potentially cause a reduction or increase in water level of the surrounding wells due to dewatering or mounding. The majority of the wells are on the mounded side of the Site (west side) and there are three permitted wells on the shadow side of the site (east side). There are three residences that have basements on the mounded side of the site (west) as shown on Figure 1. These residence were built in early 2000 and they are located next to monitoring well 5. Monitoring well 5 has an average depth of 6.4 feet below ground which would indicate that the groundwater is already within the basement elevation and sump pumps and underdrain systems should already be in place to mitigate groundwater.

Bestway proposes to follow the below steps in determining if they have caused a negative impact to groundwater levels due to mining:

- Meet with the affected well owner and determine the best course of action.
- Monitor the water levels in nearby monitoring wells and the affected well.
- Collect all necessary data to move forward on a solution.
- Table 3 below presents the site standard deviation for the well water level minimum and max variation (i.e. the max water level fluctuation (variation)). Using these parameters in Table 3, the maximum variation plus one standard deviation as an initial trigger in determining the appropriate mitigation measures of the affected well.

Table 3

		SE Pond E	Pond D	NE Pond E	Pond B
Date	NW-Well	SE-Well	MW 3	MW 4	MW 5
	(feet)	(feet below grade)	(feet below grade)	(feet below grade)	(feet below grade)
Variation	3.2	1.8	1.3	3.6	0.8
Standard Deviation	1.2	1.2	1.2	1.2	1.2
Trigger	4.4	3.1	2.5	4.8	2.0

- The initial trigger will be used in-conjunction with a reduced well productivity.
- Once these initial triggers are met and Bestway has determined they are responsible they will discuss final mitigation measures with the well owner.

Various mitigation measure such as the ones listed below could be use to relieve any negative impacts:

- Trucking in potable water will be plumbed directly into the domestic supply continuously until the well levels have returned to more season levels.
- Re-drilling the well to a deeper level below grade to increase well production.
- In the event mounding occurs due to lining a small portion of the Site, Bestway proposes to install an underdrain system with a sump pump around the uphill side of the problem residence.

Bestway is committed to mitigate groundwater impacts caused by their mining processes and has been in the St. Vrain valley for 15 years and intends on keep itself in good standing with the surrounding well users.

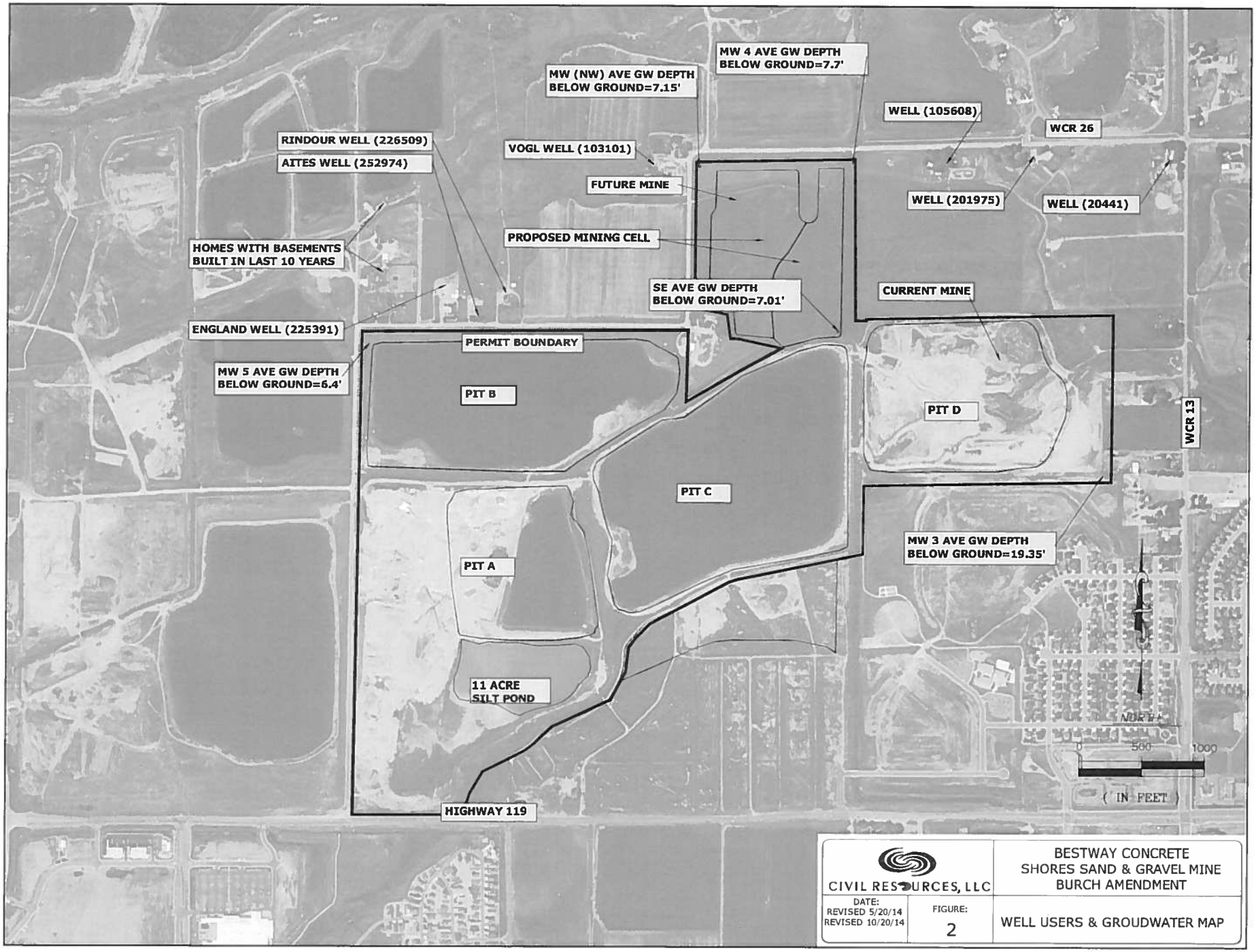
Please call if you have any questions.

Sincerely,

Betsway Concrete & Aggregate

Mark Johnson

Encl:
Figure 1
Water level data



CIVIL RESOURCES, LLC

BESTWAY CONCRETE
SHORES SAND & GRAVEL MINE
BURCH AMENDMENT

DATE:
REVISED 5/20/14
REVISED 10/20/14

FIGURE:
2

WELL USERS & GROUDWATER MAP

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Shores Gravel Mine (Burch Amendment) Monitoring Well Data

		SE Pond	Pond D	NE Pond E	Pond B
Date	NW-Well	SE-Well	MW 3	MW 4	MW 5
	(feet below grade)	(feet below grade)	(feet below grade)	(feet below grade)	(feet below grade)
3/5/2014	8.3	8.2			
3/12/2014	7.5	7.7			
3/17/2014	7.2	7.4			
3/24/2014	7.1	7.3			
4/1/2014	7.2	7.4			
4/9/2014	7.3	7.2			
4/15/2014	7.3	7.3			
4/22/2014	7.5	7.3	18.8	9.7	6.1
4/30/2014	7.5	7.4	18.8	9.7	6.0
5/7/2014	7.3	7.2	18.7	6.5	6.0
5/15/2014	7.2	7.3	19.0	6.2	6.1
5/20/214	7.1	7.3	19.1	9.4	6.2
5/29/2014	7.0	7.3	19.3	6.1	6.3
6/4/2014	7.1	7.2	19.2	8.6	6.2
6/12/2014	7.2	7.0	19.3	8.2	6.3
6/18/2014	6.9	6.8	19.5	8.0	6.3
6/25/2014	6.8	6.7	19.6	7.5	6.4
7/1/2014	9.8	6.6	19.7	7.3	6.5
7/9/2014	6.8	6.8	19.4	7.6	6.6
7/18/2014	6.9	7.0	19.6	7.6	6.5
7/22/2014	6.8	6.7	19.4	7.3	6.4
8/1/2014	6.8	6.8	19.5	7.4	6.7
8/8/2014	6.9	6.8	19.6	7.6	6.3
8/13/2014	6.8	6.7	19.4	7.3	6.3
8/21/2014	6.8	6.8	19.3	7.4	6.7
8/27/2014	6.9	6.8	19.6	7.5	6.4
9/5/2014	6.9	6.7	19.5	7.6	6.5
9/11/2014	6.8	6.6	19.4	7.8	6.7
9/19/2014	6.7	6.6	19.2	7.9	6.4
9/25/2014	6.8	6.5	18.8	8.0	6.5
10/1/2014	6.6	6.3	18.4	8.2	6.8
Average	7.15	7.01	19.25	7.75	6.37
Max	9.75	8.17	19.67	9.67	6.75
Min	6.58	6.33	18.42	6.08	6.00

MEMORANDUM

TO: DRMS, Bestway Concrete, Project File

FROM: Civil Resources, LLC

DATE: November 6, 2014

RE: **DRMS TR-2 Groundwater Review Comments via email October 29, 2014**

Comments/clarifications on the GW Mitigation Plan submitted with TR02 responses - Please address:

-There is a reference to a Figure 1 about halfway through the third paragraph of the second page - there is no Figure 1, so I presume you mean Figure 2? Please clarify/correct.

The Figure has been updated and is labeled as Figure 1. See attached.

- Please edit the Figure 2 map to clearly show the revised post-amendment permit boundary on the south side of the site.

The Figure has been updated and is labeled as Figure 1. See attached.

- DRMS does not have any issues with the "trigger" levels presented (max amount of deviation from "average" levels) but would also like to see these stated in terms of maximum and minimum acceptable water level readings for each well. This makes it much easier for the people conducting the monitoring to determine if there may be an issue.

The maximum and minimum water level readings are reported below. For example the maximum water level reading before a trigger is determined in MW4 would be a 14.5 feet below grade reading and in the event the groundwater level was 4 feet below grade a trigger for mounding would be met. The rationale to use 4 feet is the entire sites average max groundwater level is approximately 6 feet below grade and Civil Resources believes a 4 foot depth below ground could possibly cause alarm in a few residences vicinities.

		SE Pond E	Pond D	NE Pond E	Pond B
Date	NW-Well	SE-Well	MW 3	MW 4	MW 5
	(feet)	(feet below grade)	(feet below grade)	(feet below grade)	(feet below grade)
Min water level reading below ground	4	4	4	4	4
Max water level reading below ground	14.15	11.27	22.17	14.47	8.75

- DRMS views the "trigger levels" as a level at which increased measures to monitor for off site impacts should be undertaken (impacts outside the normal expected range of variation are being observed). Typical examples of this would include increased monitoring frequency or addition of additional monitoring points. They may not, in themselves require immediate corrective actions, although DRMS fully encourages operators to be proactive in avoiding negative off-site impacts.

If a Trigger level is met Beswtay will contact its engineers and the DRMS to determine if there is further mitigation or if there is preliminary mitigation that can take place to alleviate the situation. At the minimum Bestway will conduct further investigations.

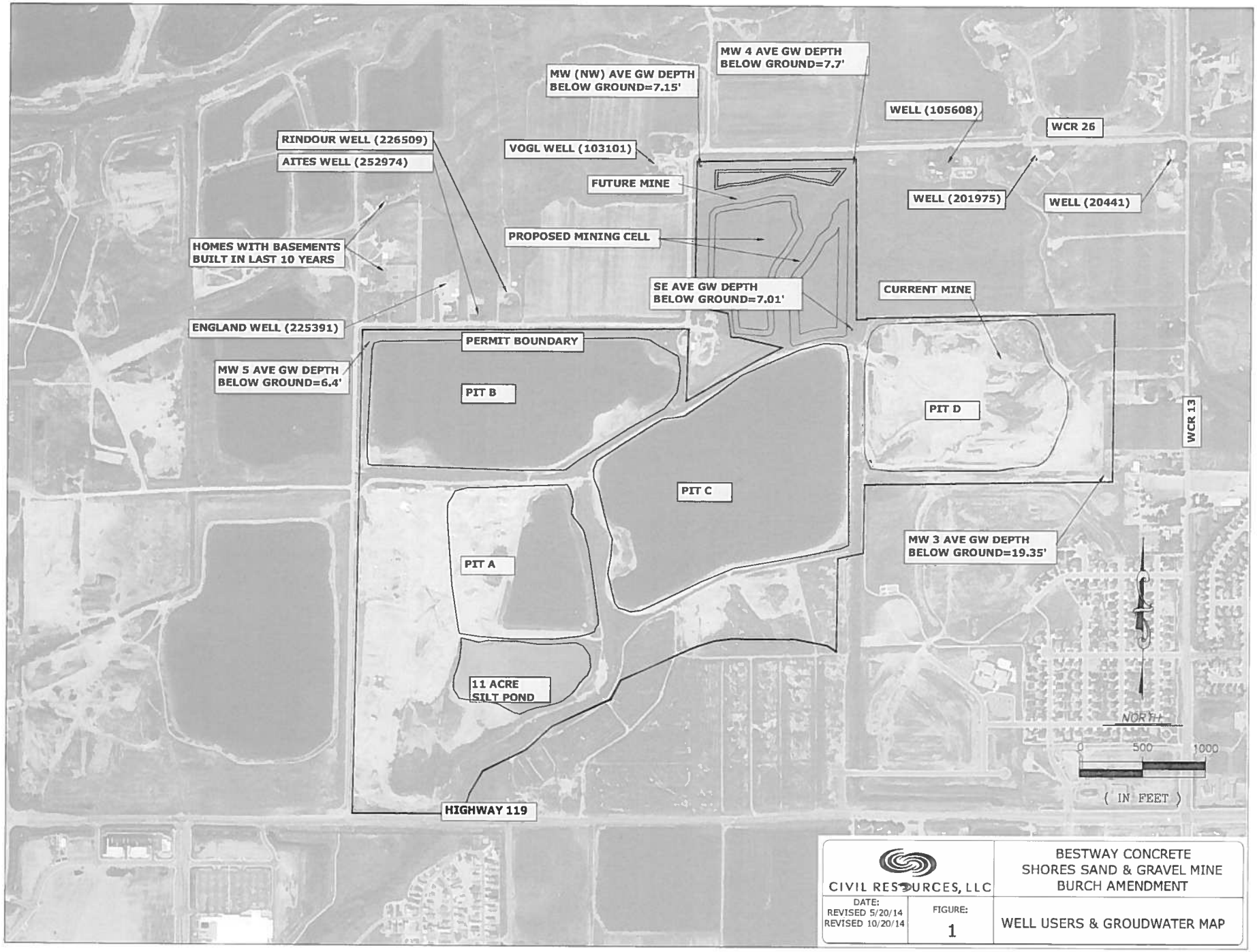
- In the event that an adverse off-site impact is observed or reported, it is not up to the permittee/operator to determine cause or responsibility. DRMS and/or the MLRB will make that determination, as well as what, if any, corrective actions are required to mitigate the observed impact. The permittee/operator will be required to provide any required monitoring data and any other potentially useful data (pumping dates, rates, etc.) to DRMS to help make that determination. Therefore it is obviously in the operator/permittee's best interest to collect and maintain as much data as possible (including pre-mining background conditions) to determine what, if any, effects to the "prevailing hydrologic balance" have resulted from activity at the site.

Beswtay will continue to collect weekly data throughout mining and Bestway understands this data protects their interest along with the surrounding well users.

- DRMS has no issues with the proposed mitigation measures for impacts to nearby wells (truck in water and plumb into domestic supply, re-drill well, etc.). However, in the event that groundwater mounding results in adverse off-site impacts (swamped property, basement flooding) a corrective measure must be implemented within the permit boundary (french drain or other). DRMS cannot compel the owner of another property to allow access so that a permittee can implement a corrective action to mitigate the permittee's impact. In addition, DRMS rule 3.1.6(1) states that the prevailing hydrologic balance must be maintained both during and after the mining operation for the affected land and the surrounding area, not just on a "basement by basement" or property specific basis.

Bestway does understand the DRMS position but as an owner and a neighbor in the mine area Bestway would like the opportunity to contact the individual prior to spending a significant amount of money on a remediation measure that could be done on a smaller scale. Bestway understands if the property owner is uncooperative that other measures will have to be implemented to mitigate the negative impacts.

Please feel free to call me with any questions, or if you would like these issues submitted to you in a more "formal" adequacy review letter. I understand that you would like to expedite the approval process as much as possible, so I thought e-mail would be faster.



CIVIL RESOURCES, LLC

BESTWAY CONCRETE
SHORES SAND & GRAVEL MINE
BURCH AMENDMENT

DATE:
REVISED 5/20/14
REVISED 10/20/14

FIGURE:
1

WELL USERS & GROUDWATER MAP