Rio Grande
Pueblo Plant

January 27, 2013

Via FedEx 794610785053

Mr. Tim Cazier
Division of Reclamation, Mining, and Safety
1313 Sherman Street
Room 215
Denver, CO 80203

**Re: GCC Rio Grande, Inc. - DRMS Permit No. M-2002-004, Revision No. AM-1
Exceedance of Groundwater Numeric Protection Levels**

Dear Mr. Cazier:

Enclosed are two copies of a report prepared by Contour Consulting Engineering (Contour) in response to your letter dated November 29, 2012. Your letter requested that GCC submit, by January 30, 2013, a remedial action plan or documentation demonstrating that the increase in TDS (and sulfate) in the alluvial groundwater monitoring wells is not the result of contamination from the GCC facility.

Contour's report demonstrates the latter. To that end, your letter requested specific documentation consisting of a hydrogeologic cross-section containing various information. Contour's report contains all of the requested documentation, which is contained in the following figures.

Figures G1/G1A

Figure G1 presents the surface geologic map and Figure G1A presents the accompanying stratigraphic section description for the GCC facility. Figure G1 shows section line A-A', which runs from the plant and quarry area through well MW-004 and across the St. Charles River, and section line B-B', which runs through the three alluvial monitoring wells (MW-001, MW-004 and MW-005) along the St. Charles River. The locations of all of the monitoring wells that have been drilled at the facility, Arroyos A through E, the cement plant and quarry, and other features of the facility are also shown in Figure G1.

Figure G2

Figure G2 presents the surface topography for the same map area.

Figure G3

Figure G3 presents the inferred site geology in section view looking west across section A-A' shown in plan view Figures G1 and G2. Wells MW-001, MW-004 and MW-005 are projected onto the section. The locations of Arroyos C and D and the St. Charles River are also projected onto the section. Unconsolidated Quaternary alluvial and colluvial strata are shown in yellow and orange.

Figure G3 also shows the confined and unconfined stratigraphic units. The confined unit is the Dakota Sandstone. The two production wells installed at the facility (DW-001 and DW-002)

GCC Rio Grande Pueblo Plant

penetrate the Dakota Sandstone, as shown in Figure G3. The potentiometric surface (head) of these artesian wells has not been determined. The only water table documented in the unconfined units is the alluvial water table in the St. Charles River drainage, which is also shown in Figure G3.

Figure G4

Completion details for well MW-001A, MW-002, MW-003, MW-004 and MW-005 are shown in Figure G-4.

Figure G5

Figure G5 presents a cross section of the three alluvial monitoring wells looking north across the St. Charles River profile. Water levels from October 2010 and September 2012 are shown in the section. Well MW-003 was dry in September 2012 and December 2012.

In summary, the report demonstrates that the cement plant and quarry are situated in the Quaternary Colluvium, a deposit that is observed to be dry down to bedrock. The Colluvium, the Smoky Hill Shale and the Fort Hayes limestone are all observed to be dry where they are continuously exposed in the quarry. Based on the large number of geotechnical drill holes installed at the site prior to construction of the facility, all of which were dry, it is not anticipated that the quarry will ever encounter groundwater during the life of the mining operation.

Monitoring wells MW-002, MW-003 and MW-004 are drilled into sands and gravels along the St. Charles River. The wells are screened in the lower parts of the sands and gravels, which form a channelized unconfined aquifer following the River floodplain. This aquifer is recharged by the River itself. River flows along the St. Charles reached a 5-year low during the 3rd Quarter of 2012. This is reflected in the monitoring wells, which reached their lowest levels in the 3rd Quarter of 2012.

The St. Charles is a tributary of the Arkansas River. There is an observed relationship between increasing TDS and low river flows in the Arkansas River, which reduce the level of groundwater in the alluvial aquifer that follows the river bed. (See references cited in the Contour report.) According to these references, levels of TDS in the River during low flow periods can exceed 4000 mg/l, which is similar to the levels recorded in MW-003 just before it went dry in late 2012.

The enclosed report and Figures G1 through G5 document that the increase in TDS (and sulfate) in the alluvial monitoring wells cannot be the result of contamination from the GCC facility.

Please contact me if you have questions about this report.

Sincerely,

Barbara T. Hodgson
Environmental Manager
(719) 647-6829
bhodgson@gcc.com

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GEOLOGIC REPORT AND SUBMITTAL

1/25/2013

Barbara Hodgson
GCC Pueblo Cement Plant
3372 Lime Road
Pueblo, Colorado 81004

SUBJECT: A submittal in response to the letter by Division of Reclamation, Mining and Safety (DRMS), dated 29 November 2012 regarding: Pueblo Cement Plant and Limestone Quarry, Permit No. M-2002-004, Exceedance of Groundwater Numeric Protection Levels.

This submittal in intended to fulfill the requirements presented by the DRMS as Option B, as described in the above referenced letter, and includes (5) attached figures which provide the geologic information requested in subparts (a. through g.).

Figure G1	Geologic map showing the surficial geology and locations of project features and geologic cross sections. Figure G1A gives the explanation of each geologic map unit.
Figure G2	Detailed topographic map with the cross section locations and plant features.
Figure G3	Geologic Cross Section A-A' Looking West.
Figure G4.	Monitor Well Logs and Completion Diagrams.
Figure G5	Profile B-B' along the St. Charles River Looking North with three monitor wells and water level information.

Discussion of Submittal

Geology

The cross section requested in Option B of the DRMS letter is presented in Figure G3, as section A-A'. The remaining figures provide the additional supporting data requested. A detailed set of responses to each of the Option B subparts (a through g) is provided following this Submittal Discussion.

The information presented in the figures illustrate that monitor wells MW-002, MW-003 and MW-004 were drilled into the sands and gravels along the St. Charles River down the top of bedrock which varies from Fort Hayes Limestone to Smoky Hills Shale. The wells are screened and sand packed in the lower part of the sands and gravels. These alluvial deposits along the St. Charles River are comprised of Piney Creek Alluvium (Qp), Post-Piney Creek Alluvium (Qpp) and modern river sands and gravels (Fig. G1 and G1A). The wells are approximately 50 to 75 feet south of the present river channel and the well logs indicate that the bottom of these alluvial deposits are 10 to 12 feet below the present-day bottom of the river bed, thus forming a channelized unconfined aquifer following the river floodplain that is recharged by the river itself.

In contrast, the cement plant and monitor well MW-005 are situated in the Quaternary Colluvium (Qc) that mantles much of the north sloping mesa, a deposit that is observed to be dry down to bedrock. Monitor well MW-005, drilled in the colluvium between the plant site and the river has been a dry hole since installation in 2008. Cross section A-A' shows that the Quaternary Colluvium is truncated between the plant site and the St. Charles River, and is not in direct hydrologic contact with the alluvium along the river, due to bedrock outcrop and intervening arroyos. The Colluvium, the Smoky Hill Shale and the Fort Hayes limestone are also observed to be dry where they are continuously exposed in the quarry. From these observations, we conclude that the source of groundwater in monitor wells MW-002, MW-003 and MW-004 comes from the St. Charles River system and is recharged by the river itself.

St. Charles River Flows

River flows along the St. Charles reached a 5-year low during the 3rd quarter of 2012 when they were only 20% of the typical base flows of previous years. This is illustrated in Figure 1, which is a U.S.G.S. hydrograph of the St. Charles River, near Vineland, that is located between the GCC property and the confluence with the Arkansas River. There were no sustained spring "snow-melt" peaks in the past two years and the base flow has also been dropping. In correlation with these low levels, the 3rd quarter of 2012 also represents the lowest water levels in the monitor wells which then showed a slight recovery in the 4th quarter (although MW-003 remained dry, see Table 1.), similar to the recovery of river flow.

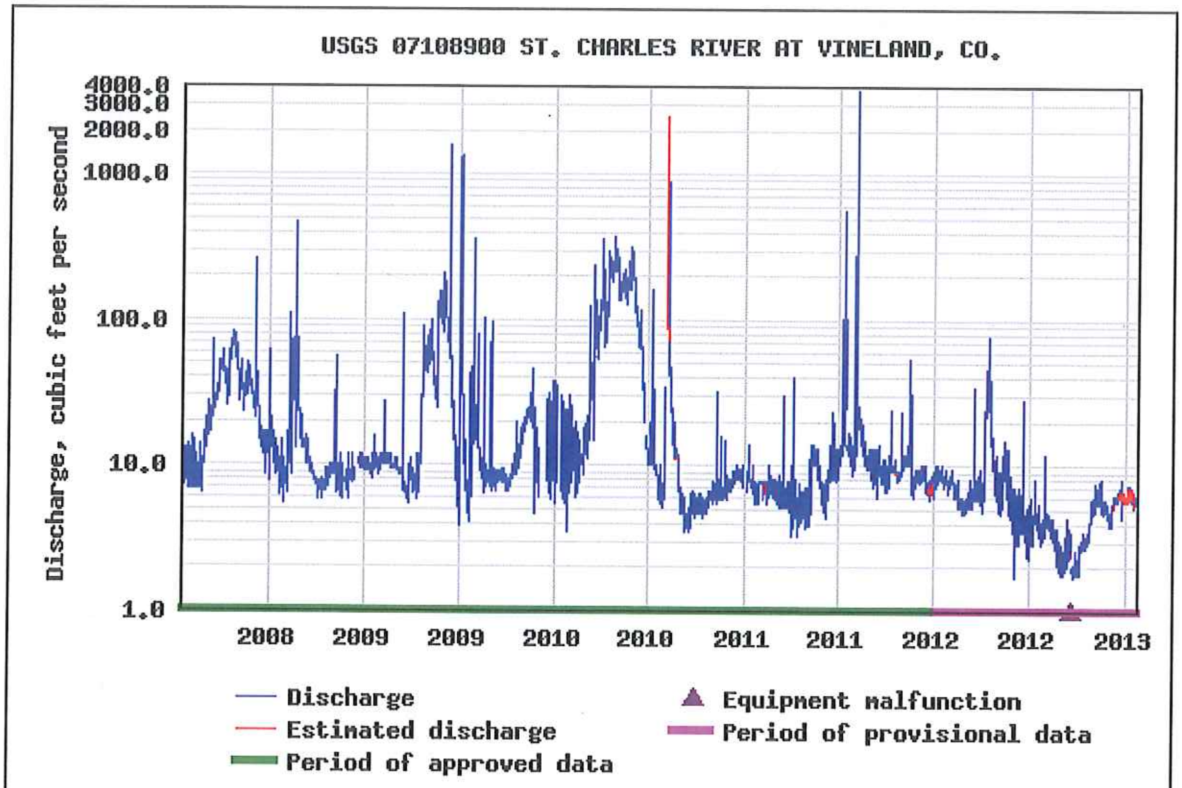


Figure 1. USGS Data on river flows in the St. Charles River, 2008 to present.

Depth to water measurements. (from top of steel casing)

Date	MW-002	MW-003	MW-004
12/12/2012	15.12	Dry	11.41
09/26/2012	15.24	Dry	11.94
06/21/2012	14.23	15.4	10.19
10/13/2011	14.3	16.52	11.10
10/26/2010	13.9	15.55	9.95

Table 1. Recent water level readings showing low levels during 3rd quarter 2012.

Geochemistry

Increasing amounts of Total Dissolved Solids (TDS) and Sulfates, detected in the monitoring wells, are naturally occurring and are due to lower river flows and reduced levels of groundwater in the alluvial aquifer that follows the river bed. The observed relation between increasing TDS and river flows has been established for the nearby Arkansas River in both Colorado and Kansas (Figure 2 and References 1 and 2) and both referenced reports indicate that the groundwater along the river is similarly affected during times of low flows. The graph indicates that levels of TDS in the river, during low flow periods, can commonly exceed 4000 (mg/L). This is similar to the highest level of TDS for this project of 4,700 (mg/L) which was from the 2nd quarter, 2012, in MW-003 just before it went dry.

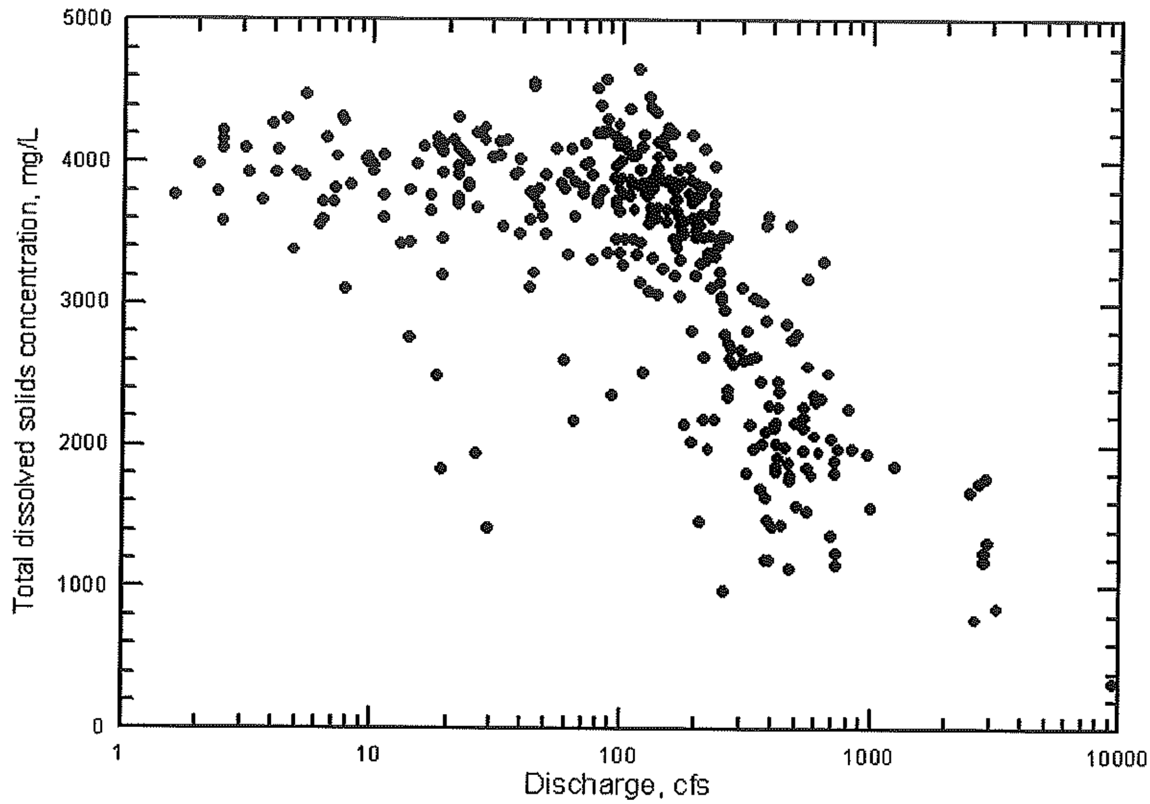


Figure 20. Total dissolved solids concentration versus discharge for the Arkansas River near Coolidge, Kansas, 1963-1999.

Figure 2. Relation between Total Dissolved Solids and Discharge for Arkansas River. (Reference 2)

Conclusions

This submittal is intended to support our conclusion that increasing TDS and Sulfates that have been detected in the monitor wells during recent quarters are not related to contamination from the cement plant, rather, they are related to the reduced flows in St. Charles River and the associated reduced levels of groundwater in the alluvial aquifer that follows the river floodplain, where the wells are located. The geologic data along cross section A-A' indicates there is not a direct hydrologic connection between the dry Colluvium that underlies the cement plant and the saturated Alluvium that follows the St. Charles River floodplain. Additionally, it has been established in referenced studies of the nearby Arkansas River, that increases of TDS in both surface and groundwater are typically observed during periods of lower river flows, which we believe, is a conclusion that can be extended to the groundwater along St. Charles River system as well.

Contour Consulting Engineering
James D. Gill, PE
Geological Engineer

References:

1. Cain, D.L., 1985, Quality of the Arkansas River and irrigation-return flows in the lower Arkansas River valley, Colorado: U.S. Geological Survey Water-Resources Investigations Report 84-4273, 85 p.

2. WATER QUALITY OF THE ARKANSAS RIVER IN SOUTHWEST KANSAS , A Report to the Kansas Water Office , Contract No. 00-113 Upper Arkansas River Corridor Study , A Kansas Water Plan Project , Donald O. Whittemore , 2000 , Kansas Geological Survey Open-File Report 2000-44

3. Scott, G.R., Geologic map of the Southwest and Southeast Pueblo quadrangles, Colorado, USGS Map I-597

Attachments:

1. Detailed responses to each of Subparts (a. through g.) of Option B.
2. Figures G1 – G5.

RESPONSE TO COMMENTS

The following are responses to individual comments provided in the November 29, 2012, letter to GCC from the Colorado Division of Reclamation, Mining, and Safety (DRMS).

DRMS Option B: Provide documentation demonstrating that increased TDS and sulfate concentrations noted in the alluvial well monitoring network are not the result of "contamination from the GCC Facility."

Documentation for Option B should include a hydrogeologic cross-section that meets the following specifications.

a) *Extends through the cement plant/quarry area, monitoring well MW-004, and the St. Charles River.*

Response: Figure G1/G1A presents the surface geologic map and accompanying stratigraphic section description (Scott, Glenn R, Geologic Map of the Southwest and Southeast Pueblo Quadrangles, Colorado, U.S. Geological Survey Miscellaneous Investigations Series Map I-597. Scale 1:24,000, 1969) for the GCC property and surrounding area. Figure G2 presents the surface topography for the same map area. Both figures show section line A-A', which runs from the plant and quarry area, through well MW-004, and across the St. Charles River, and section line B-B, which runs through the three alluvial monitoring wells along the St. Charles River. Monitoring wells MW-001 through MW-005 are shown on the Figures. The figures also identify the locations of Arroyos (A through E), the rail spur, the cement plant and quarry, the storm-water retention pond, and the leach field.

b) *Shows the inferred geology in the cross-section to a depth that is at least as deep as the total depth of the deepest monitoring well associated with permit M-2002-004.*

Response: Figure G3 presents the inferred site geology in section view looking west across section A-A' shown in plan view Figures G1 and G2. The deepest Dakota formation production well associated with permit M-2002-004 is shown in the section. Wells MW-001, MW-004, and MW-005 are projected onto the section. The locations of Arroyos C and D, are projected onto the section, as well as the location of the St. Charles River. Unconsolidated Quaternary alluvial and colluvial strata are shown on the figure in yellow and orange.

c) *Shows the completion interval of well MW-004*

Response: Completion details for well MW-004 and all monitoring wells are shown in Figure G-4.

d) *Shows the completion intervals of MW-002, MW-003, and MW-004 (project into cross-section)*

Response: Figure G5 presents a cross section of the three alluvial monitoring wells, looking north across the St. Charles River profile. Water levels from October 2010 and September 2012 are shown in the section. Well MW-003 was dry in September 2012 and December 2012.

e) *Shows the water levels of the wells in the 3rd quarter 2012*

Response: Water levels are shown in cross section Figure G-5 for the third quarter 2012 monitoring event (September 26, 2012), and for the third quarter 2010 event. Well MW-003 was dry in the third quarter 2012. Well MW-003 had approximately 3 inches of water in the second quarter 2012 monitoring event (June 21, 2012), just before the well went dry.

f) *Shows the inferred potentiometric surface in the confined hydrostratigraphic units*

Response: There are two production wells (DW-001 and DW-002) installed at the facility that penetrate the Dakota Sandstone. The general location and depth of these wells is projected onto the section in Figure G3. The source of groundwater and head in these wells is the Wet Mountains, located approximately 20 miles west of the GCC site. These wells are confined, and would flow under artesian conditions, if they were not capped. The potentiometric surface (head) of these artesian wells has not been determined.

g) *Shows the water table in the unconfined units,*

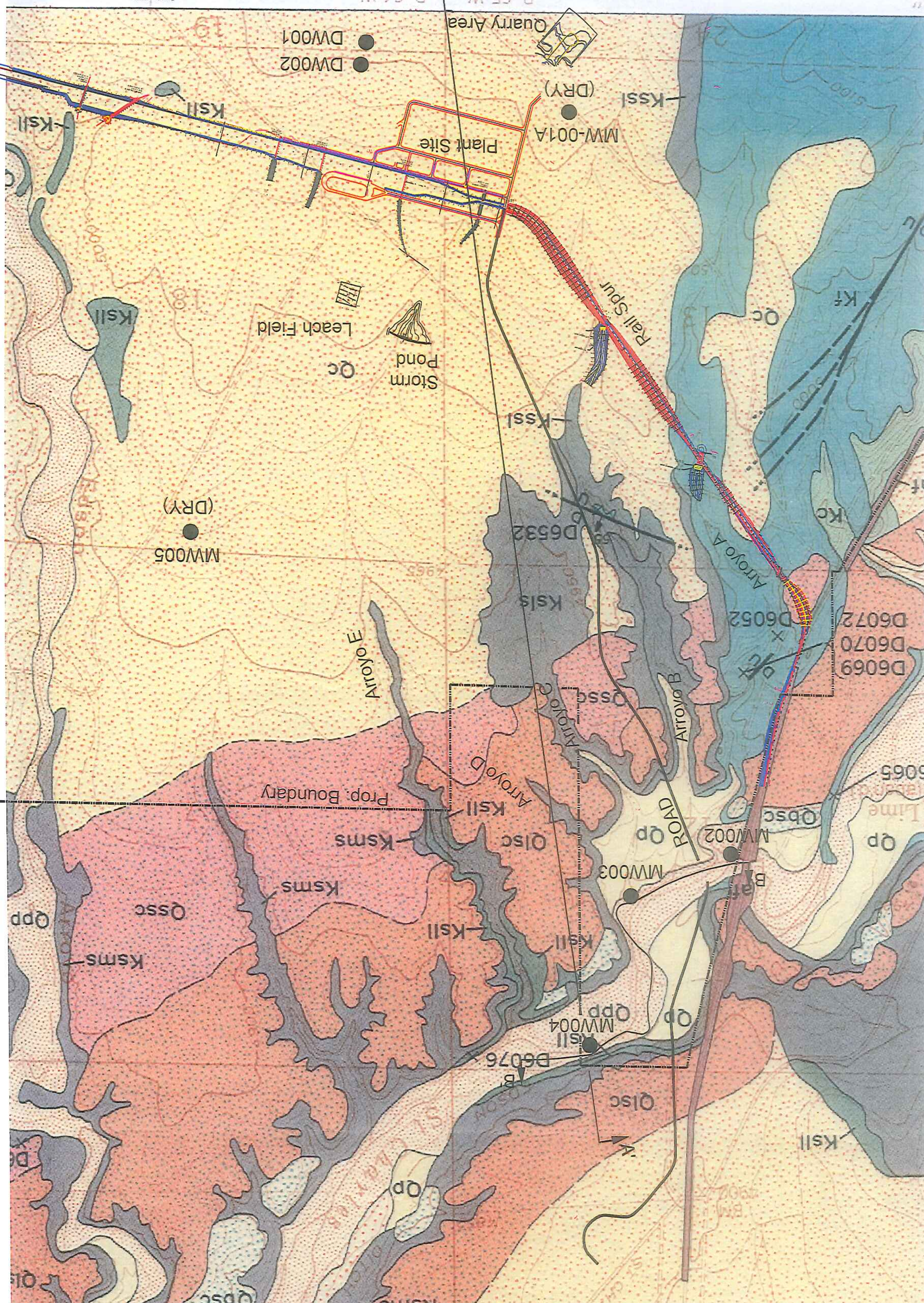
Response: The only water table documented in the unconfined units is the alluvial water table in the St. Charles River drainage, as shown in Figure G3.

Option B should also include a map showing the line of cross-section and potentiometric contour for the hydrostratigraphic unit in which the quarry is excavated.

Response: There has not been any groundwater encountered during excavation of the quarry. Based on the large number of geotechnical drill holes installed at the site, all of which were dry, it is not anticipated that the quarry will ever encounter groundwater during the life of the mining operation.

1. Scott, Glenn R., 1969, Geologic Map of the Southwest and Southeast Pueblo Quadrangles, Colorado
U.S. Geological Survey Miscellaneous Investigations Series Map I-597. Scale 1:24,000.

Scale (FT) 0 1000 2000



G1	Geologic Base Map	BY: JAMES D. GILL, PE	GCC PUEBLO CEMENT PLANT PUEBLO,COLORADO	PLANT SITE GEOLOGY A-A' Cross Section	CONTOUR CONSULTING ENGINEERING Limited Liability Company ©2013

Ref: USGS Miscellaneous Geologic Investigations Map I-597

GEOLOGIC STRATIGRAPHY PUEBLO CEMENT PLANT

Formation	*Member*	*USGS Map Symbol*	*Stratigraphic Description*	*Thickness (Feet)*	*Remarks*
COLLUVIUM (Quaternary)		Qc	Yellowish-gray silt and clay containing pebbles, angular blocks of limestone, and sandstone derived from underlying bedrock and surficial deposits. Areas of lower elevations above streams are same age as and grade into Piney Creek Alluvium. Large broad upland areas range in age from Illinoian to Holocene. Along drainageways includes some alluvium.	10-20	plant site and mine site overburden material
NIOBRARA FORMATION (Late Cretaceous)	SMOKEY HILL SHALE	Ksuc	upper chalk unit: olive-black blocky ledge-forming chalk that weathers dark yellowish orange.	8	missing at Red Rock Site (removed by erosion)
		Ksus	upper chalky shale unit: olive-gray gypsiferous bentonitic calcareous shale and yellowish-gray platy chalk beds in upper part; pale-yellowish brown soft calcareous shale and platy chalky limestone beds in lower part.	263	
		Ksmc	middle chalk unit: yellowish-gray platy ledge-forming chalk containing selenite nodules.	28	
		Ksms	middle shale unit: light-olive-gray platy bentonitic gypsiferous calcareous shale containing limestone concretions 30 to 40 feet below the top; sandy shale 150 to 190 feet above base; shaly limestone at base.	283	
		Ksll	lower limestone unit: dark-gray platy hard ledge-forming limestone in about 16 beds separated by light-olive-gray platy shale containing limonite-stained gypsum lenses. Contains alternating thick shale and thin limestone beds in lower 15 feet.	38	
		Ksls	lower shale unit: yellowish-brown platy to earthy calcareous shale containing thin beds of platy limestone and limonite-stained gypsum lenses.	56	underlies Colluvium at plant site
		Kssl	shale and limestone unit: about 18 beds of gray dense ledge-forming limestone separated by soft calcareous shale.	21	underlies Colluvium in portion of mine area
	FORT HAYES LIMESTONE	Kf	about 40 beds of gray desnse ledge-forming limestone separated by thin beds of calcareous shale. Contains pseudomorphs of limonite after pyrite.	40	source of limestone for mining operation
CARLILE SHALE (Late Cretaceous)	JUANA LOPEZ MEMBER	Kc	yellowish-gray calcareous shale containing lenses of dark-brownish-gray fetid fine-grained calcarenite that has spots of light-gray glauconitic calcarenite.	2	
	CODELL SANDSTONE		yellowish-gray massive to platy cliff-forming sandstone; shaly and containing spherical concretions in lower part.	30	
	BLUE HILL SHALE		dary-gray hard to soft blocky shale; upper half sandy, and containing two prominent layers of large septarian concretions.	101	
	FAIRPORT CHALKY SHALE		gray to yellowish brown soft bentonitic platy calcareous shale	99	
GREENHORN LIMESTONE (Late Cretaceous)	BRIDGE CREEK LIMESTONE	Kgh	about 26 gray hard shaly-weathering limestone beds separated by soft calcareous shale and bentonite layers.	52	
	HARTLAND SHALE		dark-gray calcareous platy shale and thin layers of calcarenite composed of tests of Foraminifera and prisms of Inoceramus shells.	59	
	LINCOLN LIMESTONE		gray thin-bedded petroliferous limestone and calcareous shale	25-50	
GRANEROS SHALE (Late Cretaceous)		Kg	Dark-gray to black fissile gypsiferous shale; contains zone of calcereous concentrations about 40 feet below top. Alternating beds of shale and sandstone at base.	90-200	
DAKOTA SANDSTONE (Early Cretaceous)	UPPER SANDSTONE	Kd	Tan to bright gray, fine-to medium-grained massive sandstone. May be conglomeratic and moderately cemented, but may be soft and contain thin shale beds.	74-140	proposed aquifer for production well
	DRY CREEK CANYON		Dark-gray to black sandy shale, this unit may not be present.		
	LOWER SANDSTONE		Medium-grained sandstone.		

Sources:

1. Scott, Glenn R., 1969, Geologic Map of the Southwest and Southeast Pueblo Quadrangles, Colorado U.S. Geological Survey Miscellaneous Investigations Series Map I-597. Scale 1:24,000.
2. Weist, 1965, U.S. Geological Survey Water Supply Paper 1799.

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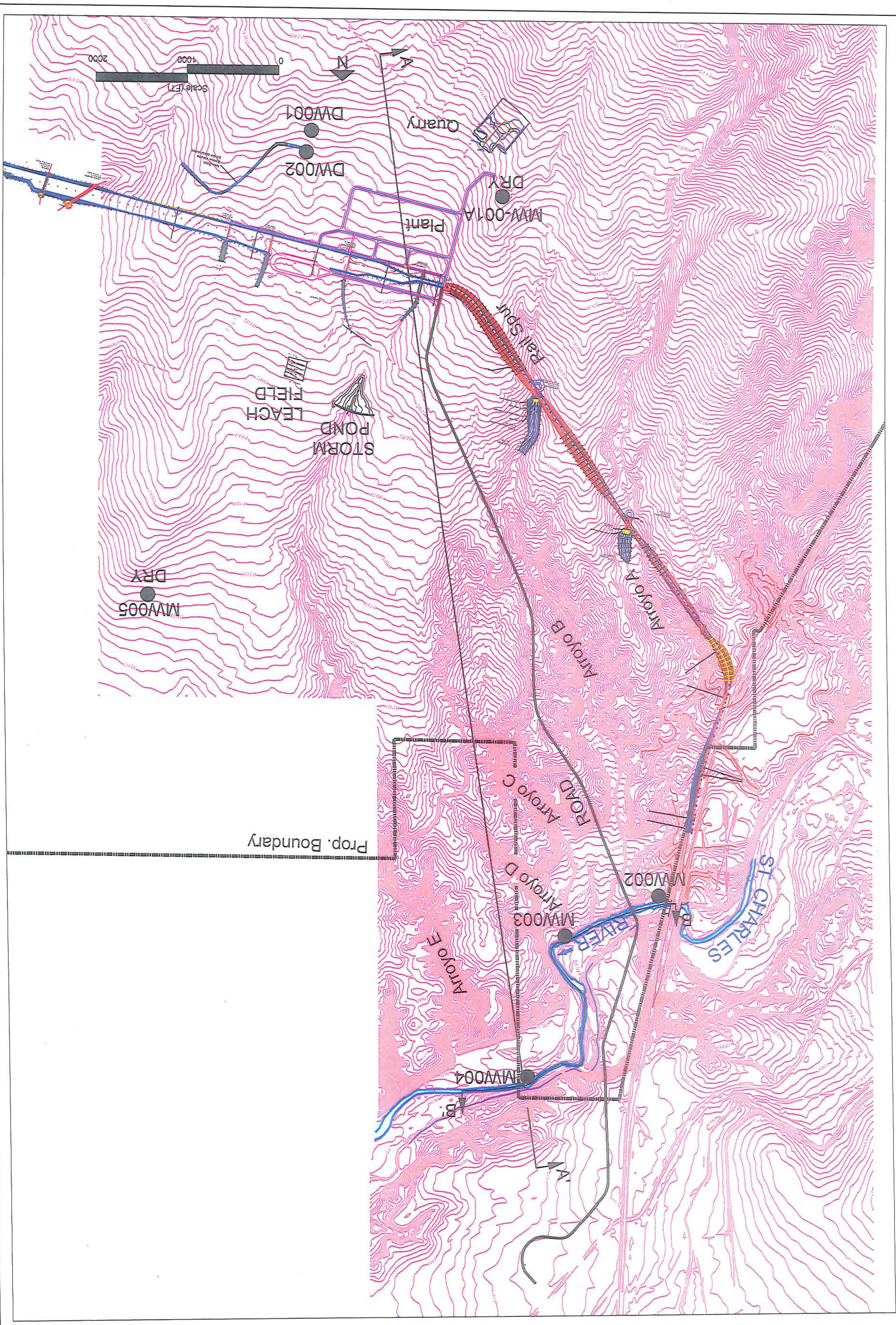
PLANT SITE GEOLOGY
GEOLOGIC STRAT. COLUMN

GCC
PUEBLO CEMENT PLANT
PUEBLO, COLORADO

BY:
JAMES D. GILL, PE

STRAT. COLUMN

G1-A



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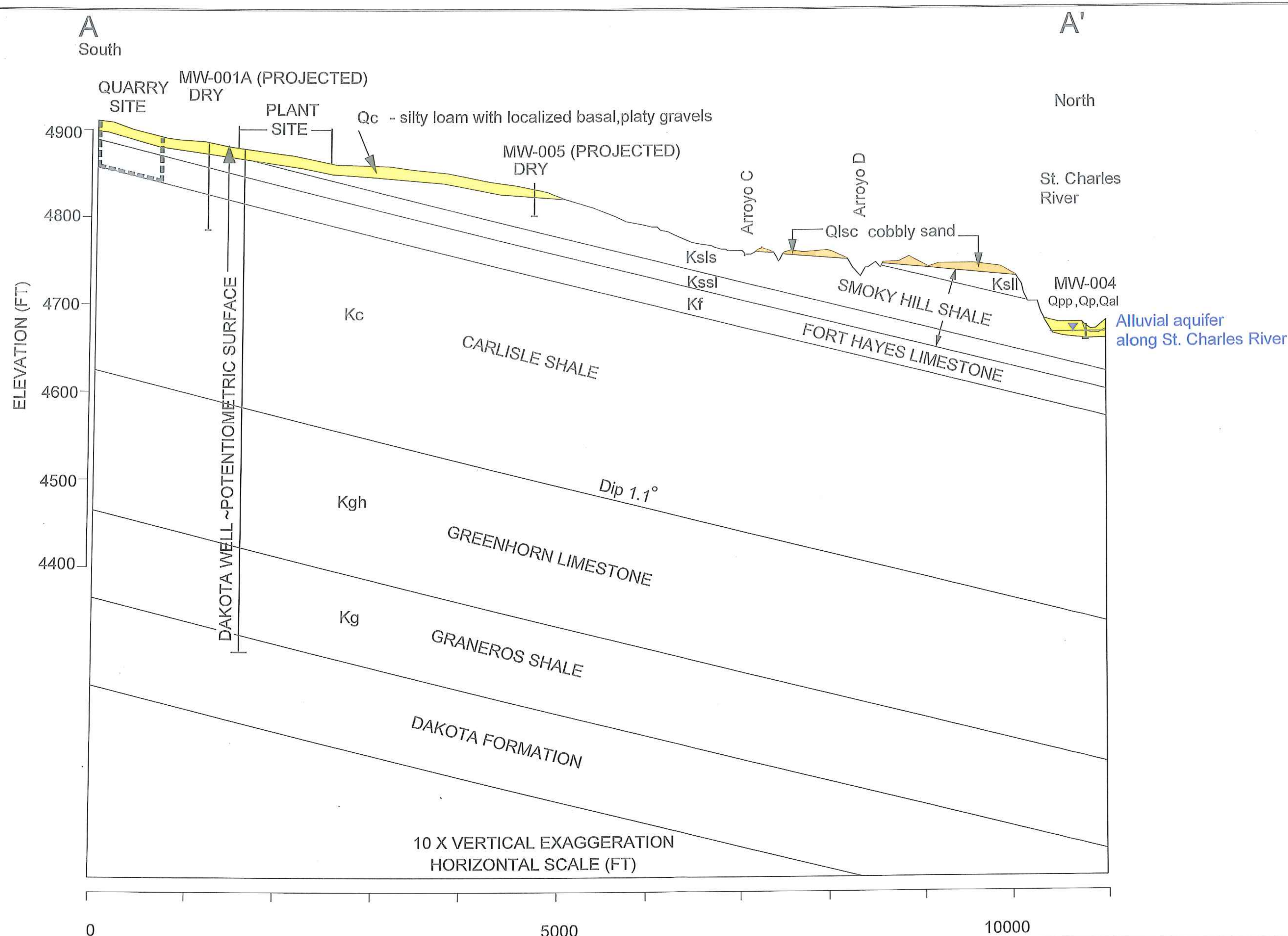
MONITOR WELLS GEOLOGY
A-A' Cross Section

GCC
PUEBLO CEMENT PLANT
PUEBLO,COLORADO

BY:
JAMES D. GILL, PE

Detailed Topo
2' CI Base

G2



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MONITOR WELLS GEOLOGY

GCC
PUEBLO CEMENT PLANT
PUEBLO,COLORADO

BY:
JAMES D. GILL, PE

Section A-A'

G3

MW-001A — Core Drilling Log

CONTOUR CONSULTING ENGINEERING Limited Liability Company — Core Drilling Log

Project	GCC RIO GRANDE RED ROCK PROJECT
Proj. No.	003-049
Hole Number	MW-001A
Location	APPROX. 300 FEET WEST (PLANT) OF LIMESTONE DOME
Coordinates	246587.05N,292890.60E
Ground Elevation	5064.88 FT. TOP OF 2 INCH PVC
Orientation	Vertical
Logged by	Good
Checked	Gill
Date started	4/8/03
Date completed	4/10
Total Depth	94.8'
Depth to Water	dry
Date	4/8/3
Driller	King Drilling
Drill	Mobile B 57

Graphic Symbols: clay, silt, sand, shale 0.5" to 3", claystone sandstone, shale limestone

Coring Rate	Recovery (FT)	Longest (FT)	Shortest (FT)	Hardness	Weathering	Joint Sp. (FT)	% REC	%RQD	Lithology Remarks
									CLAY (0-12.5') silty, dry lt. brown (CL) (Qc)
	1.9	1.25	.7	5	4	1.2	100	100	12.5'- Wx. Bedrock Wx. Shales and Limestones- Kssl
	4.85	.6	.1	4	4	.5	97	32	
6'/min	4.8	1.7	.25	5	5	2	96	91	22'- Fort Hayes Limestone Kf
5'/min	4.95	1.1	.3	5	4	1.5	99	69	
5'/min	4.8	1.7	.25	5	5	1.5	96	85	33.5'-34'- fossiliferous' fissile shale
3'/min	4.9	1.9	.1	5	5/4	1.5	98	94	
5'/min	4.85	1.5	.7	5	5	1.5	97	97	
	5	1.45	.65	5	5	1.5	100	100	

HARDNESS SCALE 1 TO 5 1 (SOFTEST) 5 (HARDEST)
WEATHERING SCALE 1 TO 5 EXTREMELY WEATHERED (1) FRESH (5)
%REC = (RECOVERY (FT) / LENGTH OF RUN (FT) x100%
%RQD = (AMOUNT > 4" (FT) / LENGTH OF RUN (FT) X 100%

MW-002 — Geotechnical Drill Log, Soils

Project	GCC RIO GRANDE RED ROCK PROJECT
Proj. No.	003-049
Hole Number	MW-002
Location	BELOW BRIDGE, ST. CHARLES ALLUVIUM
Coordinates	254291.32N,291221.58
Ground Elevation	4852.32 TOP OF 2 INCH PVC
Orientation	Vertical
Logged by	Good
Checked	Gill
Date started	4/3/03
Date completed	4/3/03
Total Depth	13.5'
Depth to Water	10.5'
Date	4/3/3
Driller	King Drilling
Drill	Mobile B 57

Blows/in: 3/6, 3/6, 3/6; 4/6, 4/6, 5/6

Remarks: Water at 10.5'; (auger squeal refusal); MONITOR WELL COMPLETION; TD 13.5'

Description (USCS): Qa- fine sand, well sorted, lt. brn , clayey; sand w/ 1/2" fine gravel; sand w/ larger rounded gravel; REFUSAL ON HARD BEDROCK; TOTAL DEPTH 13.5 FEET

MW-003 — Geotechnical Drill Log, Soils

Project	GCC RIO GRANDE RED ROCK PROJECT
Proj. No.	003-049
Hole Number	MW-003
Location	D/.S OF ARROYOS, ST. CHARLES ALLUVIUM
Coordinates	254723.73N, 292259.57E
Ground Elevation	4848.52 FT TOP OF 2 INCH PVC
Orientation	Vertical
Logged by	Good
Checked	Gill
Date started	4/15/03
Date completed	4/15/03
Total Depth	15'
Depth to Water	12'
Date	4/15
Driller	King Drilling
Drill	Mobile B 57

Blows/in: 3/6, 6/6, 4/6; 6/6, 10/6, 15/5; 50/6

Remarks: Water at 12'; MONITOR WELL COMPLETION; TD 15'

Description (USCS): Qa- med. to course sand, clayey; 5'-sand and gravel; Bigger gravel w/depth- 3" rounded gravel and cobbles; REFUSAL ON HARD BEDROCK; TOTAL DEPTH 15 FEET

MW-004 — Geotechnical Drill Log, Soils

Project	GCC RIO GRANDE RED ROCK PROJECT
Proj. No.	003-049
Hole Number	MW-004
Location	NEAR PROJECT BOUNDARY AND ST. CHARLES RIVER
Coordinates	256279.51N,292697.98E
Ground Elevation	4833.46 FT. TOP OF 2 INCH PVC
Orientation	Vertical
Logged by	Good
Checked	Gill
Date started	4/4/03
Date completed	4/4/03
Total Depth	15'
Depth to Water	10'
Date	4/4/3
Driller	King Drilling
Drill	Mobile B 57

Blows/in: 5/6, 4/6, 10/6; 3/6, 7/6, 9/6; 3/6, 8/6, 14/6

Remarks: Water @ 10' AT TIME OF DRILL; MONITOR WELL COMPLETION; TD 17'

Description (USCS): Qa- well graded med. sand; course sand and gravel (wet); saturated sand & gravel, some yellow clay; wet gravels; REFUSAL ON HARD BEDROCK; TOTAL DEPTH 15 FEET

MW-001A — Core Drilling Log, PAGE 2

Recovery (FT)	Longest (FT)	Shortest (FT)	Hardness	Weathering	Joint Sp. (FT)	% REC	%RQD	Lithology Remarks
5	1.7	.6	5	5	1.5	100	100	
4.9	1.4	.5	5	5	1.5 .7	98	88	
4.8	3.2	1.3	5	5		96	96	JUANA LOPEZ SHALE (65.2'-68.2') fissile clayey shale, black CODELL SANDSTONE (68.2'-95' TD) shaley, very fine black sandstone, tight little to no joints,

MONITOR WELL COMPLETION

TD 95'

HARDNESS SCALE 1 TO 5 1 (SOFTEST) 5 (HARDEST)
WEATHERING SCALE 1 TO 5 EXTREMELY WEATHERED (1) FRESH (5)
%REC = (RECOVERY (FT) / LENGTH OF RUN (FT) x100%
%RQD = (AMOUNT > 4" (FT) / LENGTH OF RUN (FT) X 100%

MW-005 — Geotechnical Drill Log, Soils

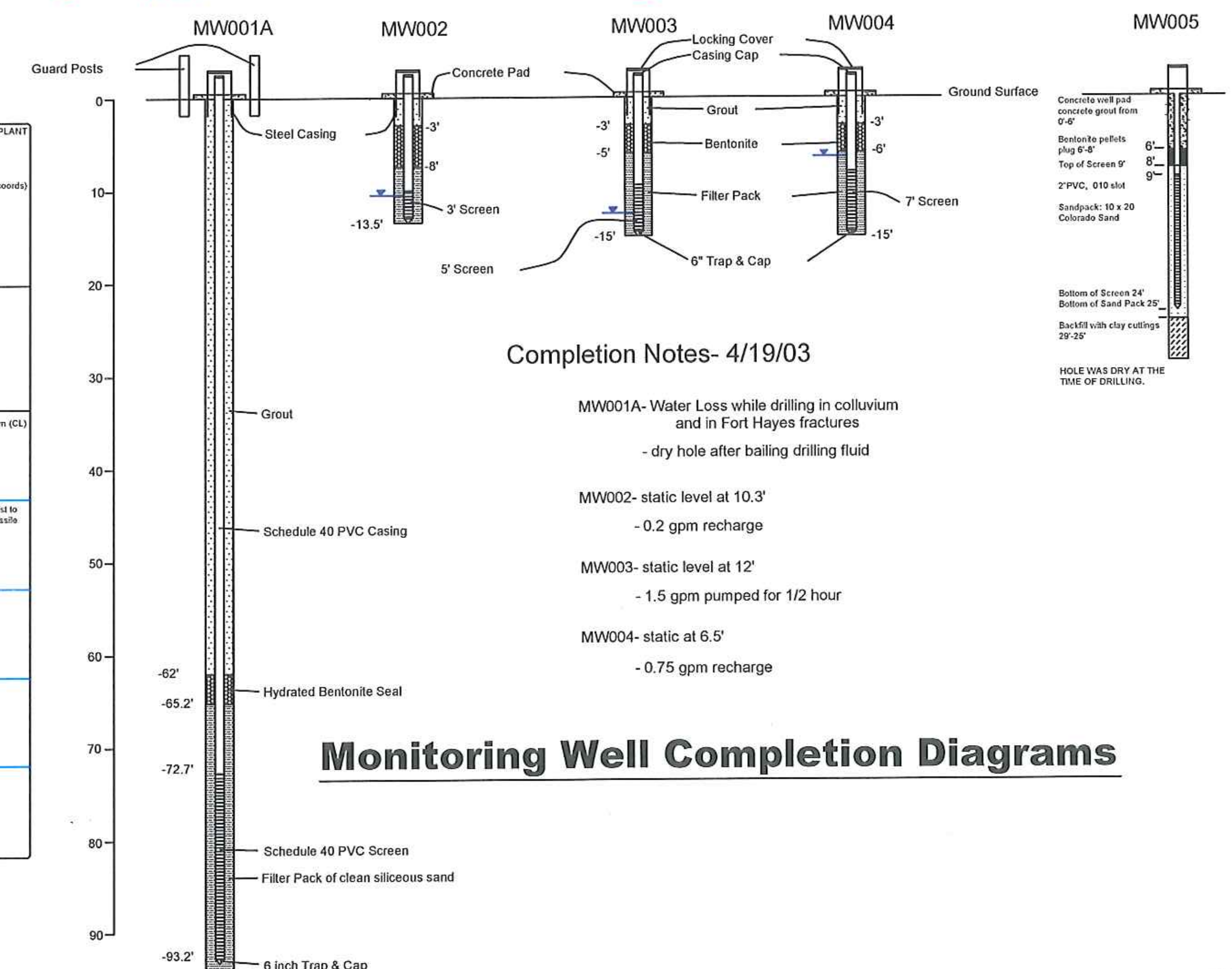
Project	GCC RIO GRANDE PUEBLO CEMENT PLANT
Proj. No.	008-124
Hole Number	MW-005
Location	BETWEEN PLANT AREA AND ST. CHARLES RIVER
Coordinates	250966.2 N., 296775.5 E. (GCC ground coords)
Ground Elevation	4964 FT Navd88
Orientation	Vertical
Logged by	Gill
Checked	Huskie
Date started	7/11/2008
Date completed	7/11/2008
Total Depth	29 FEET
Depth to Water	DRY AT DRILLING
Date	7/11/2008
Driller	PRECISION
Drill	CME 55

Blows/in: 50/6

Monitor Well Completion: Concrete well pad concrete grout from 0'-6'; Bentonite pellets plug 6'-8'; Top of Screen 9'; 2"PVC, 010 slot; Sandpack: 10 x 20 Colorado Sand; Bottom of Screen 24' Bottom of Sand Pack 25'; Backfill with clay cuttings 29'-25'; HOLE WAS DRY AT THE TIME OF DRILLING.

Description (USCS): CLAY (0'-9'), very silty, dry to sl. moist, brown (CL); CLAYSTONE (9'-29' T.D.), very silty, sl. moist to moist, yellowish brown to yellowish green, fissile (weathered shale); TOTAL DEPTH 29 FEET

Monitoring Well Completion Diagrams



Completion Notes- 4/19/03

MW001A- Water Loss while drilling in colluvium and in Fort Hayes fractures
- dry hole after bailing drilling fluid

MW002- static level at 10.3'
- 0.2 gpm recharge

MW003- static level at 12'
- 1.5 gpm pumped for 1/2 hour

MW004- static at 6.5'
- 0.75 gpm recharge

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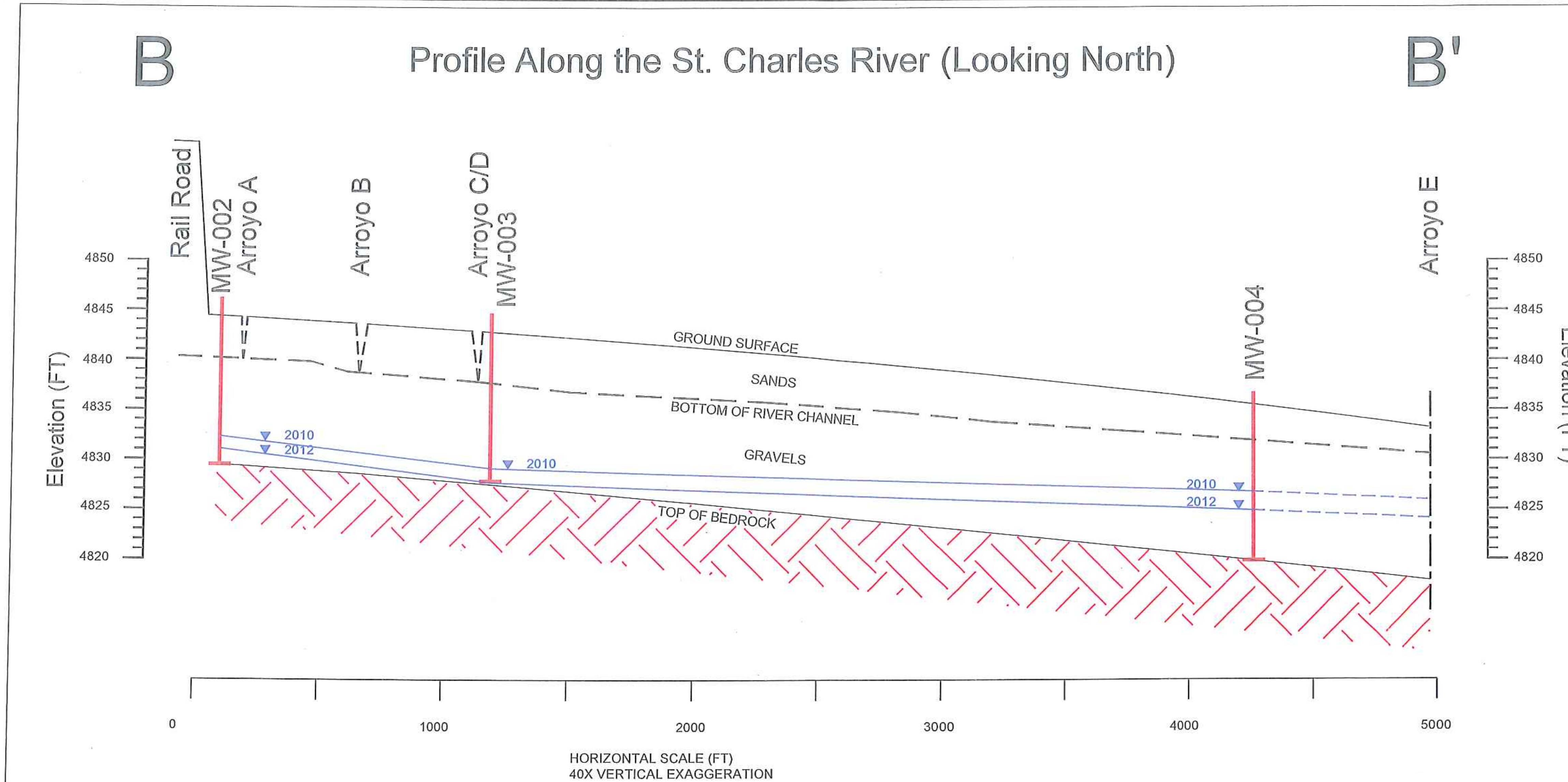
LOGS AND COMPLETIONS

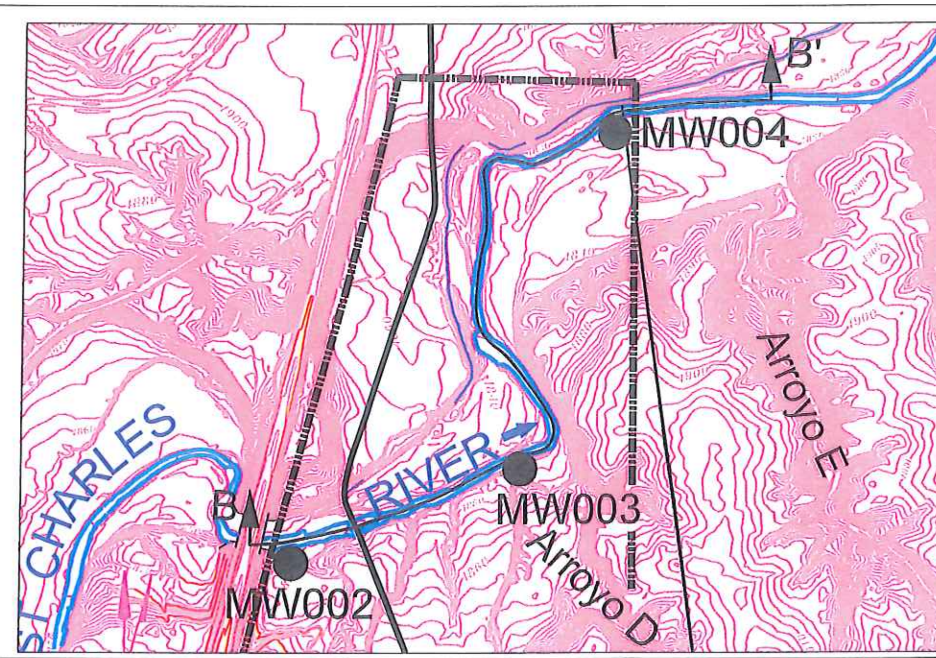
GCC PUEBLO CEMENT PLANT PUEBLO,COLORADO

BY: JAMES D. GILL, PE

Logs Completions

G4





Plan (NTS)

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MONITOR WELLS PROFILE

GCC
PUEBLO CEMENT PLANT
PUEBLO,COLORADO

BY:
JAMES D. GILL, PE

RIVER PROFILE

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