Specification Aggregates Quarry Amendment
Exhibit G (Rule 6.4.7) – Water Information

The additional of the 64.1 acres to this mining permit will not change the previously approved water requirements or sources of water for the mine. Martin Marietta operates under a decreed plan for augmentation (originally decreed in Division 1 Water Court Consolidated Case Nos. 90CW0215 and 91CW0047 and subsequently amended in Water Court Case No. 13CW3053) which was previously filed with DRMS on March 12, 2018. Depletions from dust control required for the amended area will be replaced under this plan.

Martin Marietta commissioned a detailed hydrologic assessment of the Specification Aggregates Quarry amendment area in April 2021. The attached memo (**Exhibit G1**) summarizes that assessment, which concludes, "*Based on our review of the surface and ground water hydrology at the Spec Agg quarry site as described above, we conclude that mining the additional 48 acres will very likely not result in any significant change or impacts to neighboring lands and water users."* Mining the additional 48 acres included in this amendment is expected to have very limited, if any, effect on the local surface water or groundwater.

The amendment area was reviewed by the Colorado Division of Water Resources as part of a rezoning application with Jefferson County. A letter dated January 4, 2022 from DWR is attached, which concludes that the water is included in a plan for augmentation that is decreed in Division 1 Water Court. The letter is attached as **Exhibit G2**.

Martin Marietta will employ best practices and follow all state and local requirements on the site to limit any potential contamination of the site or the ground water system. Best practices included in the dewatering operation will mitigate any potential of contamination of the ground water system during operation. To minimize water level impacts, the enlarged Quarry Pit Reservoir will only be dewatered to the extent necessary to facilitate mining. Otherwise, Martin Marietta expects to maintain water levels in a similar manner to current operations.

The Specification Aggregates Quarry currently operates under Colorado Discharge Permit System General Permit COG500000 certification number COG-500479, which is administered by the Colorado Water Quality Control Division. This permit details the permitted outfalls for process water and stormwater runoff, discharge limitations, monitoring requirements and reporting requirements. The amendment area will be included in this certification and there are no anticipated changes to the outfalls for process water or stormwater runoff. Compliance with the terms of this certification demonstrate that water quality is being protected.

A technical revision (TR03) was approved by DRMS on May 11, 2018 that allows for impounding water in the main pit. In 2018, a leakage test was completed to determine whether the quarry pit was intercepting groundwater. It was determined over the 90-day period that the quarry pit exceeds the Colorado Division of Water Resources Design Standard for lined reservoirs. The detailed water balance completed during this test indicates that very little groundwater leakage

to or from the pit is occurring. The Liner Test Completion Report and the Letter of Approval from the Division of Water Resources were previously submitted to DRMS, but have been included as **Exhibit G3** to this amendment application.

MEMORANDUM

BBA Water Consultants, Inc.

To: James Sharn, Martin Marietta

From: Jeff Clark and Chris Sanchez

Subject: Spec Agg Quarry – Hydrology Assessment of Potential Land Exchange with Jefferson County

Job: 1204.01

Date: April 9, 2021

Introduction

Martin Marietta Materials Real Estate Investments Inc. ("MM") is the owner of the Specification Aggregates Quarry ("Spec Agg"), which is located in Jefferson County southwest of Golden, Colorado. MM acquired the property from Lafarge West, Inc. in 2011 and has operated the quarry since. The Spec Agg quarry is an industrial facility that produces various rock products, concrete, asphalt and other construction-related materials. Aside from incidental use for washing certain classes of aggregate, the principal use of water on site is for dust suppression to comply with its Air Quality Permit.

We understand that MM is proposing a land exchange with Jefferson County, where Jefferson County would receive lands once a part of the former Heritage Square site and MM would receive a 64-acre parcel located between the current quarry property and I-70 to the south. Approximately 48 acres of the 64 acres would be mined; the remaining 16 acres would be buffer. As a part of its review of the proposed land exchange, Jefferson County has requested an assessment of the hydrologic impacts from the planned mining of the expanded area.

This memorandum provides a summary of the current surface and ground water hydrology of the existing quarry and an assessment of the projected changes to that hydrology from the proposed addition of 48 acres of mining area.

Water Operations at Spec Agg Quarry

The water supply system for the quarry operations comes from water stored in two on-site reservoirs. Magic Mountain Reservoir ("MMR") and the Spec Agg Quarry Pit Reservoir ("Quarry Pit"). These reservoirs capture and store water flowing down Jackson Gulch and runoff from the property (see Figure 1). Diversions through the Apex Feeder Ditch off of Apex Gulch help fill MMR. Water flowing in Jackson Gulch is captured first in the Quarry Pit which can then pumped up and over the rim of the Quarry Pit into MMR. Water is then used directly from MMR for on-site operations such as dust-suppression, washing, concrete production, etc. Additionally, the stored water in both reservoirs can be used to replace water rights obligations to Clear Creek from mining operations at other MM facilities and to make wintertime return flow obligation replacements associated with the Fisher, Kershaw and Manhart Ditch change of use water rights decree.

The current decreed storage capacities of MMR and the Quarry Pit are 147 ac-ft and 320 ac-ft, respectively[1].

Future Mining Plan

Under the proposed land exchange, MM will receive 64 acres of land located immediately south of the existing quarry. Of the total 64 acres, 48 acres will be mined, resulting in a larger quarry pit, and, eventually, a larger reservoir. The same open pit mining approach currently used to mine the Quarry Pit will be employed in these new areas. We have reviewed the potential impact to local ground and surface water hydrology from adding 48 acres of mined area to this pit. As explained below, these current and future changes in the pit are not impactful to nearby water users, with the limited potential exception of one water supply well discussed further below. The Quarry Pit reservoir which occupies the bottom of the pit will increase in depth and potential storage capacity. MM is not aware of any impact to any neighboring wells resulting from the existing quarry over the last 50 years, nor has any been documented in the area.

Surface Water Hydrology

Existing Pit Hydrology

All water in the Jackson Gulch drainage basin is collected in the Quarry Pit and then pumped into MMR. The current Jackson Gulch drainage basin that drains into the pit has been estimated to be around 289 acres of total area. Of this total drainage basin area, approximately 150 acres are associated with the current quarry mined area. Total inflows into the Quarry Pit have varied over the years. An analysis of the past five years of inflow data collected at the pit demonstrate relatively little surface inflow, with an average annual inflow volume into the pit of approximately 60 ac-ft per year, a maximum annual inflow volume of 122 ac-ft and a minimum annual inflow volume of 23 ac-ft.

Future Mining Effect on Surface Water Inflows

Approximately 42 acres of the additional 48 acres of mining area is presently outside the Jackson Gulch drainage, and will become part of the watershed to the Quarry Pit.. The additional 42 acres of pit area will increase inflows into the quarry slightly, resulting in an approximately 15% increase in drainage area into the pit. Accordingly, an estimated 15% increase in surface water inflows into the pit compared to the current inflow tributary to Jackson Gulch.

Any increase in surface water inflows accruing to the Quarry Pit and MMR will either be used at the Spec Agg quarry under MM's existing water rights or will be passed through MMR and released downstream for other water users.

Since all water inflows would continue to be administered by the Colorado Division of Water Resources ("DWR") in accordance with water rights decrees, there will be no detrimental effect

[1] Case Nos. 90CW215/91CW047, 99CW093 and 13CW3053, Water Division No. 1.

to other downstream and nearby water rights from the proposed expansion. No other significant changes in surface water hydrology are expected for any adjacent properties.

Ground Water Hydrology

Geo-hydrology Setting

The geologic material below the 64-acre parcel is Precambrian Gneiss (Migmatitic Quartzo-Feldspathic Gneiss) based on available geologic mapping (Geologic map of the Morrison quadrangle, Jefferson County, Colorado I-790-A). The geologic material can generally be referred to as Precambrian bedrock. There are significant local geological structural faults, including the Golden Fault, located east of the proposed quarry excavation area (see Figure 2). West of the faulting, including the quarry location, Precambrian bedrock is present. East of the faulting, Paleozoic and younger sedimentary formations are present, consisting of sandstone, claystone and shale. The geologic mapping indicates a significant amount of offset between the Precambrian bedrock and the sedimentary bedrock to the east of the faulting. The Precambrian bedrock is fractured, and those fractures control the limited ground water flow which occurs within the Precambrian bedrock.

The ground water flow mechanisms on either side of the fault separating the Precambrian bedrock on the west from the adjacent Paleozoic and younger sedimentary rocks are very different. West of the fault, including the Quarry Pit, ground water flows only through the limited fractures in the bedrock formation. These fractures provide secondary porosity, meaning that the formation material itself has no porosity or permeability. In contrast, the sedimentary formations east of the faulting have primary porosity, meaning that there are void spaces between the sand and clay material of the sedimentary formations and ground water can flow through the void spaces more readily over larger distances. At this location, the sedimentary bedrock units include the Fountain and Lyons formations, which consist of coarse-grained sandstone. Evidenced of greater hydraulic conductivity in these formations includes more abundant water supply wells east of this fault.

Fractured flow through the Precambrian bedrock is controlled by the limited fractures in the formation. The fractures result in relatively little ground water storage, and the fractures may or may not be interconnected. If the fractures are interconnected, then ground water flow and water level changes may extend for significant distances in the formation. If the fractures are not interconnected, then there may only be isolated zones of localized ground water flow. Significant differences identified in ground water elevations over short distances from the quarry in fractured bedrock systems indicate limited to no interconnectedness of the fractures.

The significant differences in rock properties east and west of the fault will limit the ability of water level changes to propagate between the two units.

Geologic faults such as the Golden Fault can function as either conduits to ground water flow or barriers to ground water flow. Regardless of how the local faulting controls ground water flow, the fault will further limit the ability of water level changes to extend across the fault, because the fault will either block the water level changes to the extent the fault functions as a barrier to ground water flow, or if it is a conduit to ground water flow, then water moving through the fault will buffer any water level change between the formations. Because of the differing hydraulic

properties of the material and because of the faulting, it is our opinion that any water level changes that may occur in the Precambrian bedrock will not extend across the Golden fault. As a result, any water flow related to the Quarry Pit is generally limited to the area west of the Golden fault.

The direction of ground water flow in the Precambrian bedrock is generally from the higher elevation areas to the west of the 64-acre parcel to the lower elevation areas to the east of the 64-acre parcel. The Golden Fault likely limit the eastward flow of ground water past the fault.

Existing Ground Water Conditions at Quarry Pit

In order to assess the magnitude of any ground water inflows or outflows, a leakage test was completed for the Quarry Pit in 2018. The leakage test was also conducted to ascertain whether it was intercepting ground water and exposing it to evaporation losses. During the leakage test, a detailed water balance was completed which demonstrated that the inflows (e.g. measured surface water inflows, calculated precipitation over the pit area) and outflows (e.g. pumping from the pit and calculated evaporation) closely correlated to the measured change in storage volume on a daily basis over a 90-day period. It was determined that over the 90-day period, the leakage rate for the pit was 20.7 % lower than the DWR's Design Standard for reservoir liners, indicating that very little groundwater leakage to or from the pit is occurring. This confirms that the fracturing within the bedrock is of limited extent and does not act as a significant conduit for the transmission of water is the vicinity of the Quarry Pit.

The limited number of existing water supply wells in the area suggests that not all well bores encounter productive fractures in the formation and productive fracture sets are limited and disconnected. The limited number of wells in the area completed in this Precambrian bedrock, and the low reported yield of these wells suggests that the ground water flow beneath the 64-acre parcel is limited.

The State's well permit database was used to identify well records within 1 mile of the 64-acre parcel, as summarized below.

Well Records Located within 1 mile of 64-acre Parcel Boundary

Permit No.	Well Status	Well Depth (ft)	Water Level (ft)	Water Elevation (ft)	Geology	Comment
7767-F	Constructed	160	143	6116	Precambrian hard rock	MM Well
48601-F	Constructed	360	12	7165	Precambrian hard rock	Cancelled Permit No. 107397
172124	Constructed	175	21	6293	Sedimentary	
10214-FR	Constructed	745	50	5293	Sedimentary	Owned by MM
10214-F	Abandoned	356	18	6325	Sedimentary	Replaced by Permit No. 10214-FR
31995-FR	Constructed	140	19	6469	Sedimentary	
49367-MH	Monitoring	30	16	6438	Qal and Sedimentary	Monitoring well
230800	Monitoring	50	12	5137	Qal and/or Sedimentary	Monitoring well
11163-A	Constructed	600	140	6777	Sedimentary	Well mislocated
107397	Cancelled	N/A	N/A	N/A	N/A	Cancelled by Permit No. 48601

There are well records for two water supply wells within one mile of the 64-acre area completed in the Precambrian bedrock formation. One of those wells is owned by MM which leaves only one well, Permit No. 48601-F. This permit is for the same well structure that was previously permitted under Permit No. 107397, as presented in Figure 2.

The other well records are for cancelled well permits, abandoned wells, sedimentary wells or are located east of the offset associated with the local structural faulting and the Golden Fault. As explained above, we do not expect that water levels in these wells will be impacted by the quarry expansion.

Future Mining Effect on Ground Water Conditions

Potential Quantitative Water Level Changes

The Precambrian bedrock beneath the 64-acre parcel has limited fracturing and interconnection of fractures. As a result, the existing Quarry Pit has likely already intercepted any localized water-bearing fracture zones, and the quantitative impact associated with mining an additional 48 acres the expansion to the 64-acre parcel will be limited to any additional water level change that may occur resulting from the expansion. MM is not aware of any impact to any neighboring well resulting from the existing quarry over the last 50 years. The direction of mining expansion to the south, southwest relative to the known nearby wells indicates that it is unlikely that new impacts will occur from the addition of 48 acres to the pit.

Potential Impacts to Nearby Wells

As shown on the above table, only 3 three existing production wells were identified within 1 mile of the expansion area that were completed in the same Precambrian bedrock as the existing mine and the additional 48 acres. Two of those three wells are owned by MM. Accordingly, there is only one well (Permit No. 48601-F), not owned by MM that may warrant additional monitoring. Wells to the east of the Golden Fault were not considered because the fault most likely mutes any potential impacts from communicating across the fault.

Permit No. 48601-F is located as shown on Figure 2, approximately 4,400 feet west of the quarry. Based on the location of the well, at a higher elevation and approximately 4,400 feet from the existing mine workings, and the discontinuous nature of the bedrock fractures, there is little potential for this well to be impacted by the mine expansion. The elevation of the static ground water surface in the well is 7,165 feet and the bottom of the well is at an elevation of 6,817 feet. In contrast, the rim of the quarry is at an elevation of approximately 6,900 feet and the bottom of the quarry will be an elevation of approximately 6,230 feet. The difference in ground water elevation between the well and the existing Spec Agg Reservoir water surface is approximately 935 feet. This difference in ground water elevation suggests that the well is constructed in a disconnected fracture system, and as a result, there will likely be zero feet of water level change in this well as result of current and proposed future mining. We further note that the shallow water level in the well of 18 feet, suggests that the water level in the well is controlled by surface water influences within the local drainage, including precipitation and runoff which locally recharges the fractured aquifer system in close proximity to the well. That recharge source will also buffer any potential water level changes.

MM is not aware of any impact to any neighboring well resulting from the existing quarry, including Permit No. 48601-F and the wells operated by MM. The lack of impacts resulting from the existing quarry makes it unlikely that impacts will occur from mining the additional 48 acres.

Potential Water Quality Changes

Water quality changes to either ground or surface water quality are unlikely to occur. No fuel storage will be located on or near the 64 acres, the quarry has a Spill Prevention and Control plan, and all personnel are trained in spill prevention and control. Fuel for the equipment is and will be stored with containment at the main facility. No additional fuel storage facilities are proposed. Stormwater runoff is regulated by CDPHE permits that set strict limits for any discharge. All discharge is either controlled through settling ponds or through best management sediment control devices.

Water Quality Sampling Results

On February 16, 2021, water quality samples were taken at both the Quarry Pit and MMR. The purpose of the water quality sampling was to determine a current baseline for water quality in the reservoirs. Samples were collected by MM staff and analyzed by SGS Laboratory in Lakewood, CO. The parameters analyzed were based on agricultural water standards presented in CDPHE WQCC 5 CCR 1002-41. In addition, specific conductance, antimony, calcium, potassium, magnesium, sodium, sulfate, chloride, alkalinity, nitrate, total dissolved and total suspended solids, and hydrocarbons were also measured to more clearly determine the water quality in the surface water reservoirs.

The results for the samples taken at the Quarry Pit and MMR can be found in the attached Table 1. Upon review of the water quality samples, all parameters analyzed against CDPHE's agricultural water quality standards fell below the limits set forth in WQCC 5 CCR 1002-41 for samples from both reservoirs. No hydrocarbons were detected in either of the samples from the Quarry Pit or MMR. The analyzed parameters with the greatest noted differences between the

Quarry Pit and MMR samples were alkalinity, chloride, specific conductivity, and total suspended solids.

This analysis shows that water quality at the site is of a quality which meets the agricultural water standards in Colorado Department of Public Health and Environment ("CDPHE") Water Quality Control Commission ("WQCC") 5 CCR 1002-41 and that the proposed mining expansion will likely have very limited impact on the quality of the local surface water system as it currently exists.

As discussed above, the mining of the additional 48 acres will lead to slightly more water being captured in the Quarry Pit and the water quality of the additional inflows will likely be of similar quality to the water sampled in the Quarry Pit. Considering the expected inflows are expected to be approximately 15% greater, mining the additional 48 acres is expected to have very limited, if any, effect on the local surface or ground water.

Water Supply Protections and Potential Mitigations

To minimize water level impacts, the enlarged Quarry Pit Reservoir will only be dewatered to the extent necessary to facilitate mining. Otherwise, MM expects to maintain water levels in a similar manner to current operations. If water level changes do occur in neighboring wells to the point that actions are needed, mitigations to local wells could include setting a well pump to a deeper pump setting depth, re-drilling a well to a greater depth, installing a water treatment system, installing a cistern and either reconfiguring well pumps to operate a lower flow rates or hauling water, if necessary, or other solutions. It is very unlikely that any such mitigations will be necessary. To the extent they are necessary, these solutions are all feasible and MM is committed to work with neighboring well users.

MM will employ best practices and follow all state and local requirements on the site to limit any potential contamination of the site or the ground water system. Best practices included in the dewatering operation will mitigate any potential of contamination of the ground water system during operation. After expansion of the mine, the Spec Agg Reservoir will have no more impact on the water quality than any existing pond or lake.

Conclusions

Based on our review of the surface and ground water hydrology at the Spec Agg quarry site as described above, we conclude that mining the additional 48 acres will very likely not result in any significant change or impacts to neighboring lands and water users. We recommend that MM be prepared to mitigate any impacts should they occur, although again, this is unlikely to be necessary. MM is not aware of any impact to any neighboring well resulting from the existing quarry, including Permit No. 48601-F, and the wells operated by MM. The lack of impacts resulting from the existing quarry makes it unlikely that impacts will occur from mining the additional 48 acres.

Exhibit G1

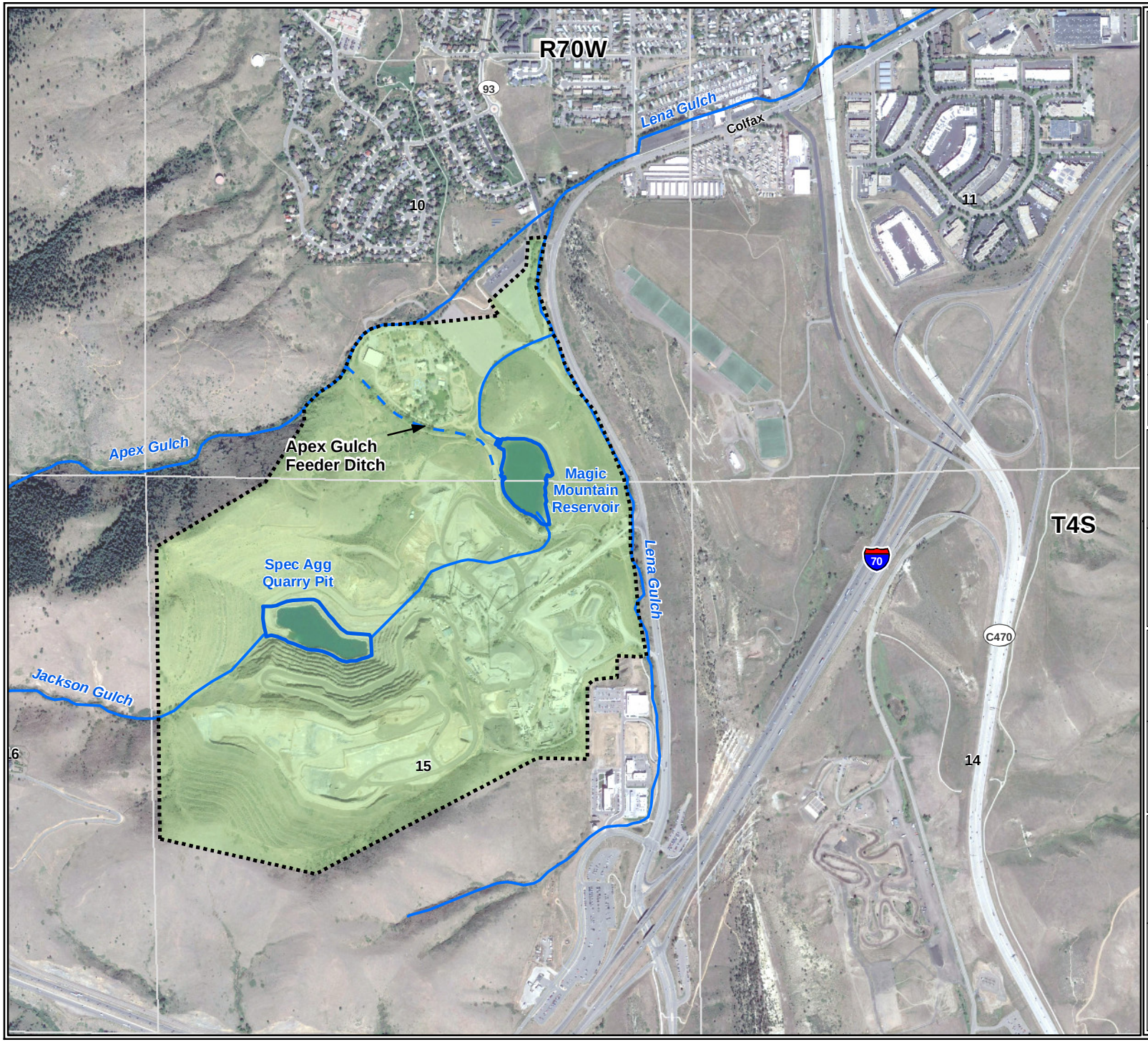

Figure 1
Martin Marietta Materials, Inc.

Spec Agg Quarry Water Facilities Map

Date: 3/12/2021 | Job No. 1204.01

303.806.8952 | www.bbawater.com

BBA water consultants
Bishop-Brogden Associates, Inc.

Legend

Approx. Current Property Boundary

Aerial Photo Date: 9/12/2019 Google Earth
Data Source: CDSS, CDOT, USGS, BLM

N
W E
S

0 650 1,300
Feet

Overview Map

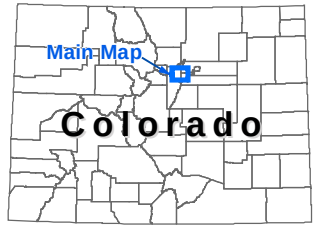

Exhibit G1

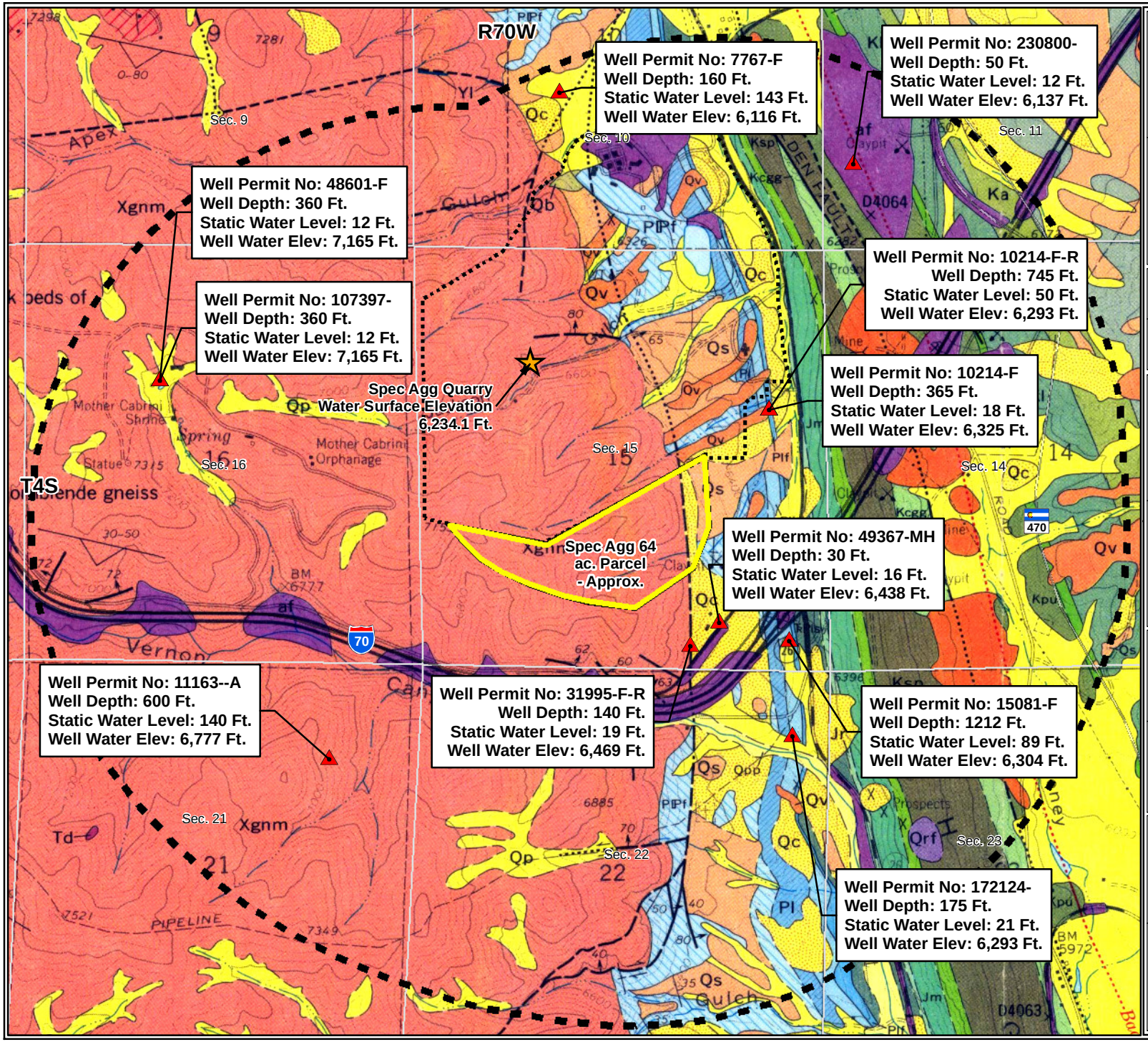

Figure 2
Martin Marietta Spec Agg Quarry Well Location and Geologic Map

Date: 2/25/2021 | Job No. 1204.01

303.806.8952 | www.bbawater.com

BBA Water Consultants, Inc.

Legend

- Well Permit
- Quarry Pit Center Point
- Ground Water Contour (20-ft. Interval)
- 1-Mile Buffer
- 64 ac. Parcel
- Property Boundary

Geologic Map: I-790-A, 24K, USGS, 1972
Data Source: CDSS, CDOT, USGS, BLM

N
W E
S

0 650 1,300 2,600
Feet

Overview Map

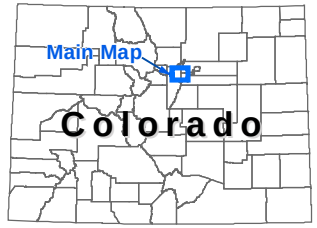

Table 1
Martin Marietta Materials, Inc.
Water Quality Sampling for Spec Ag Pit and Magic Mountain Reservoir

		Samples			
Parameter	**Units**	**Quarry Pit**	**Magic Mountain Reservoir**	**CDPHE Reg. 1002-41 Limit**	**Units**
Nitrite & Nitrate (NO 2+NO 3 -N)	mg/l	8.22	7.95	100	mg/l
Nitrogen, Nitrite	mg/l	< 0.0040	< 0.10	10	mg/l
Aluminum	ug/l	< 50	< 50	5	mg/l
Iron	ug/l	77	128	5	mg/l
Lithium	ug/l	61.6	87.2	2.5	mg/l
Fluoride	mg/l	0.45	0.42	2	mg/l
Zinc	ug/l	10.3	< 20	2	mg/l
Boron	ug/l	< 40	< 80	0.75	mg/l
Copper	ug/l	< 2.0	< 4.0	0.2	mg/l
Manganese	ug/l	3.7	10.7	0.2	mg/l
Nickel	ug/l	< 2.0	< 4.0	0.2	mg/l
Arsenic	ug/l	< 0.40	< 1.0	0.1	mg/l
Beryllium	ug/l	< 0.60	< 0.60	0.1	mg/l
Chromium	ug/l	< 2.0	< 4.0	0.1	mg/l
Lead	ug/l	0.82	< 1.0	0.1	mg/l
Vanadium	ug/l	< 20	< 40	0.1	mg/l
Cobalt	ug/l	< 1.0	< 1.0	0.05	mg/l
Selenium	ug/l	1.8	1.5	0.02	mg/l
Cadmium	ug/l	< 0.30	< 0.30	0.01	mg/l
Mercury	ug/l	< 0.10	< 0.10	0.01	mg/l
pH	su	8.22	7.95	6.5-8.5	
Alkalinity, Total as CaCO3	mg/l	110	< 5.0		
Antimony	ug/l	< 0.80	< 0.80		
Calcium	ug/l	63500	74100		
Chloride	mg/l	47.5	87.7		
Magnesium	ug/l	66200	56800		
Nitrogen, Nitrate	mg/l	0.19	0.4		
pH (Field)	su	8.7	8.35		
Potassium	ug/l	5970	6990		
Sodium	ug/l	19200	26700		
Solids, Total	mg/l	691	624		
Solids, Total Dissolved	mg/l	643	961		
Solids, Total Suspended	mg/l	< 5.0	693		
Specific Conductivity	umhos/cm	952	125		
Specific Conductivity (Field)	umhos/cm	998	1031		
Sulfate	mg/l	304	235		
1,2-Dichloroethane-D4	%	97	96		
4-Bromofluorobenzene	%	97	96		
Benzene	ug/l	ND	ND		
Dibromofluoromethane	%	95	96		
Ethylbenzene	ug/l	ND	ND		
Toluene	ug/l	ND	ND		
Toluene-D8	%	95	94		
Xylene (total)	ug/l	ND	ND		

Notes:
[1] Water quality samples were taken at the Spec Agg Quarry Pit and Magic Mountain Reservoir by Martin Marietta Staff on February 16, 2021 and analyzed by SGS Laboratories in Lakewood, CO.
[2] All CDPHE agricultural water quality limits are found in CDPHE's WQCC 5 CCR 1002-41.

COLORADO
Division of Water Resources
Department of Natural Resources

January 4, 2022

Cassidy Clements
Jefferson County Planning and Zoning
Transmission via email: cclement@jeffco.us

Re: Spec Agg Quarry
Case No. 21-140315RZ
Pt. S ½ Section 15, T4S, R70W, 6th P.M.
Water Division 1, Water Districts 7 and 9

Dear Ms. Clements:

We have reviewed the above referenced proposal for a rezoning. The submitted material does not qualify as a "subdivision" as defined in section 30-28-101(10)(a), C.R.S. Therefore, pursuant to the State Engineer's March 4, 2005 and March 11, 2011 memorandums to county planning directors, this office will only perform a cursory review of the referral information and provide comments. The comments will not address the adequacy of the water supply plan for this property or the ability of the water supply plan to satisfy any County regulations or requirements.

The subject application seeks to rezone 64 acres within a parcel totaling approximately 153 acres owned by Jefferson County. The 64 acres are proposed to be included in a Land Exchange with Martin Marietta Materials ("Applicant"). The subject application seeks to rezone the 64 acres from Agricultural-Two Zone District to the Planned Development Zone District to accommodate mining activities. The property is currently unimproved.

The subject property is located south of, and immediately adjacent to, the Applicant's existing Specification Aggregates Quarry. The Applicant operates the Specification Aggregates Quarry under Colorado Division of Reclamation Mining and Safety (DRMS) permit no. M-1974-004. The existing DRMS permit is proposed to be amended to include the subject property. The Applicant proposes to mine 48 out of the 64 acres of the property. The remaining 16 acres will be an undisturbed buffer area. Only mining activities will be allowed on the subject property, all processing activities will be located within the existing Specification Aggregates Quarry permit area. The property is proposed to be mined using the "mine from behind" technique and concurrent reclamation. The Specification Aggregates Quarry, including the subject property, is proposed to be transferred to Jefferson County upon cessation of mining and reclamation for open space, reservoir, and recreational purposes.

Water for mining operations and dust control purposes will be obtained from the Spec Agg Pit and the Magic Mountain Reservoirs located within the existing Specification Aggregates Quarry site. The two reservoirs are included in a plan for augmentation originally decreed in Division 1 Water Court Consolidated Case Nos. 90CW0215 and 91CW0047 and subsequently amended in Water Court Case No. 13CW3053. The augmentation plan replaces depletions at the Specification Aggregates Quarry site due to evaporation from the Magic Mountain Reservoir, Spec Agg Pit and Spec Agg Sedimentation Ponds, and operational losses from dust control, concrete batching and other

industrial uses associated with the site. Total depletions at the covered facilities are limited to 200 acre-feet per year. Depletions are replaced using the Applicant's water rights previously changed for augmentation use, water leased from Coors Brewing Company, and water released from Magic Mountain Reservoir and/or the Spec Agg Pit. Magic Mountain Reservoir has a decreed storage volume of 147 acre-feet, and the Spec Agg Pit has a decreed storage volume of 320 acre-feet. The Spec Agg Sedimentation Ponds were constructed to contain stormwater runoff from the quarry area and have a decreed surface area of 1.1 acres. The Memorandum prepared by Bishop Brogden Associates, Inc., states that the proposed mining activities on the subject property are expected to increase surface drainage flows to the Spec Agg Pit. Any increase in surface water flows accruing to the Spec Agg Pit are proposed to either be stored under the Applicant's existing water rights or released downstream. Any unauthorized inflows must be released to the stream as soon as practical, but within 72 hours unless a different timeframe is approved in writing by the water commissioner or division engineer.

This office has no concerns regarding the proposed rezoning request so long as the existing plan for augmentation is operated in accordance with its decreed terms and conditions. Should you or the applicant have any questions regarding this matter, please contact Javier Vargas-Johnson of this office at 303-866-3581 ext. 8227 or javier.vargasjohnson@state.co.us.

Sincerely,

Sarah Brucker, P.E.
Water Resources Engineer

Cc: Applicant (Martin Marietta Materials, Inc., james.sharn@martinmarietta.com)
Owner (Jefferson County Open Space, thoby@co.jefferson.co.us)
Agent (Otten Johnson Robison Neff & Ranonetti, PC, bconnolly@ottenjohnson.com)
Referral file no. 29039

Exhibit G3

Phillip Courtney
Land Manager

November 20, 2019

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

By Electronic Mail

RE: Spec Agg Quarry M-1974-004

Dear Mr. Scott:

In response to your request on November 19, 2019 regarding the leak test results for water storage in the Spec Agg Quarry main pit, I have attached two documents:

- Liner Test Completion Report completed by Bishop Brogden Associates, Inc.
- Letter of Approval from the Division of Water Resources

The report and approval letter demonstrate that the Spec Agg Quarry Pit meets the design standard for ground water seepage for lined reservoirs in accordance with the 1999 State Engineer Office guidelines.

Please let me know if you have any questions or need any additional information.

Sincerely,

Phillip J. Courtney
Land Manager

Rocky Mountain Division
1627 Cole Boulevard, Suite 200, Lakewood, CO 80401
t. (720) 612-6232 m. (303) 902-0964 e. phillip.courtney@martinmarietta.com
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Exhibit G3

BBA water consultants

BISHOP-BROGDEN ASSOCIATES, INC.

Christopher J. Sanchez
Jeffrey A. Clark
Daniel O. Niemela
Jonathan D. George
Michael A. Sayler
Charles E. Stanzione

October 23, 2018

Mr. Corey DeAngelis, P.E., Division 1 Engineer
Colorado Division of Water Resources
810 9th Street, Suite 200
Greeley, CO 80631

Re: Martin Marietta Spec Agg Pit (WDID 01073031) Leakage Test Completion Letter Pursuant to Case No. 13CW3053

Dear Corey:

On behalf of our client Martin Marietta ("MM"), we are writing to inform you of the completion of a leakage test for MM's Specification Aggregate Quarry Pit ("Spec Agg Pit"), as required under the water rights decreed in Case No. 13CW3053 ("the Decree"). This letter presents a summary of the leakage test results, and requests approval of the test for purposes of storing water under the water rights granted in this case.

The Spec Agg Pit

The Spec Agg Pit is an excavated hard rock quarry pit located in Jefferson County on Jackson Gulch (a tributary to Lena Gulch and Clear Creek) which captures and stores water flowing down Jackson Gulch. The general locations of the Spec Agg Quarry property and the Spec Agg Pit are shown in the Figures 1 and 2 of the Decree (incorporated here for reference). The decree in Case No. 13CW3053 granted MM a junior water storage right with an October 30, 2015 appropriation date for the Spec Agg Pit in the amount of 320 acre-feet (af), conditional, for commercial and industrial purposes, reclamation of mined lands, irrigation, dust control, concrete and asphalt production, rock washing, replacement of return flows, augmentation and exchange. In addition, the Spec Agg Pit may serve as an alternate place of storage for Magic Mountain Reservoir, as an exchange-to point for the exchanges in the Consolidated Decree in Case Nos. 90CW215 and 91CW47 and an alternate point of diversion on Lena Gulch to deliver water into Magic Mountain Reservoir.

In order to store water in the Spec Agg Pit under these water rights, the Decree Paragraph 21 requires that;

> "*At least 63 days prior to initially storing water in the Spec Agg Pit under this Decree, Applicant shall demonstrate to the Division Engineer that the Pit satisfies the Colorado*

> *Division of Water Resources' Reservoir Administration Guidelines as they apply to liners for subgrade storage*."

As you know, with regard to hard rock quarries, the Division of Water Resources ("DWR") Reservoir Administration Guidelines state the following[1]:

> *"Rock quarries in low permeability material that seek to store water are tested in accordance with the Liner Guidelines discussed above as applied to lined excavations into high permeability material where the excavation intercepts ground water. They are also subject to the same two-tiered accounting approach discussed above."*

Per the lining criteria referenced in the guidelines[2],

> *"A water balance must be done to demonstrate that the balance of the inflows (e.g., precipitation and ground water) and outflows (e.g., evaporation) equals the change in storage volume by a minimum of a 90-day test…The applicant shall demonstrate that during a 90-day test period the unregulated ground water inflow to the pit does not exceed the Performance Standard. Demonstration of inflows less than the Performance Standard shall be sufficient cause for a determination that the applicant has constructed a lined reservoir and is entitled to store water."*

On April 2nd, 2018, we provided the former Division 1 Engineer, David Nettles, a letter summarizing our proposal for conducting the Spec Agg leakage test. The summary letter included information for the leakage test methodology and accounting, completion reporting and timeline for the test. This letter was assigned to Ioana Comaniciu, Water Resources Engineer for the Division of Water Resources, who visited the site on June 20th, 2018 while the leakage test was in progress to review the site and the proposed leakage test plan. Mr. Nettles and Ms. Comaniciu agreed with and approved the leakage test plan.

Leakage Test Methodology and Accounting

As is required by the DWR guidelines, the inflows, water level elevation, and outflows were recorded daily for the Spec Agg Pit throughout the 90-day test. Water level measurements were necessary due to existing water stored in the Pit under previous free river conditions.

All known inflows into the pit were from surface inflows from Jackson Gulch and precipitation over the quarry pit area. To account for surface inflows from Jackson Gulch, a 12-inch ramp flume, stilling well, float and datalogger were installed at the bottom of the Spec Agg Pit, just above the reservoir area. The location of the flume can be seen in Figure 3. Additionally, inflows from precipitation were calculated daily based upon multiplying the precipitation recorded at the nearby NOAA Golden 3SW (USC00053387) weather station (location shown in Figure 3) by the water surface area in the bottom of the pit. Note that this does not include any precipitation in the quarry pit 'cone' above the water line (frustum) that may result in inflows into the pit.

[1] DWR Reservoir Administration Guidelines (October 2011) at page 32.
[2] State Engineer Guidelines for Lining Criteria for Gravel Pits (August 1999) at page 2.

A pressure transducer was installed in the Spec Agg Pit and connected to the same datalogger as the flume float to record water level readings during the test.

All known outflows from the pit were due to evaporation and pumping from the pit. The recorded water level values were used to calculate reservoir surface area and estimated gross evaporation using the stage-area-capacity table shown in Table 1. Evaporation losses were assumed to equal 2.45 ac-ft per acre per year (per Paragraph 6.2.1 of the decree in Case No.13CW3053 and Consolidated Case Nos. 90CW215 and 91CW047). Monthly evaporation distribution was based upon DWR SWSP guidelines for elevations below 6,500 feet as shown on Table 2. The pit is equipped with a pump and pipeline to lift the water out of the quarry and all pumping from the pit was recorded with a totalizing flow meter. The meter is located at the rim of the quarry, which is representative of the water actually discharged out of the pit. Pumping of water from the pit was the only known removal of water from the pit throughout the test period.

The daily inflows (Jackson Gulch inflows and precipitation) and outflows (evaporation and pumping) were compared to the change in storage volume calculated in the pit based upon the daily water level readings and the stage-area-capacity table shown in Table 1. Any difference between the water balance of inflows and outflows with the measured change in volume were considered to be the daily unregulated flow into (positive balance) or out of (negative balance) the pit.

Determination of Leakage Rates and Comparison to State Criterion

Allowable leakage rates for the Spec Agg Pit were determined based on the wetted ground surface area of the pit and the State's Design and Performance Standards. For the Design Standard, the criteria allows for a design leakage of 0.03 $ft^3/day/ft^2$ multiplied by the face area of the pit walls added to 0.0015 $ft^3/day/ft^2$ multiplied by the area of the bottom of the pit. The Performance Standard leakage rate is three times that of the Design Standard.

The Spec Agg Pit has been mined with 35 ft mining steps or 'lifts'. The walls of the pit are vertical in each lift. The water level of the pit during the entirety of the test was within the first mining lift which has a perimeter of 2,330 ft and a pit floor area of 4.5 acres. Therefore, the total leakage area for the Spec Agg pit was calculated daily as the depth of water, in feet, multiplied by the 2,330 ft perimeter for the pit walls, which was then added to 196,020 ft^2 for the pit floor.

Leakage Testing, Completion and Reporting

The leakage test began on April 11th, 2018 and was completed on July 10th, totaling 90 days. Table 3 presents a daily summary of the measured inflows, precipitation, evaporation, pumping and change in storage data collected and calculated during the test.

As shown in Table 3, the total measured inflows from Jackson Gulch during the testing period were 269,898 gallons. Total inflows due to precipitation during the test period were calculated to be approximately 799,072 gallons. Evaporation from the pit was calculated to be 1,324,013 gallons over the 90-day period. The totalizing flow meter reading at the beginning of the test was 11,855,500 gallons and the meter reading at the end of the test was 12,581,500 gallons indicating that a total of 726,000 gallons were pumped from the pit during the 90-day test. Based on these data, we have determined a leakage volume of approximately 922,390 gallons for the 90-day liner

test period or **a daily leakage of approximately 1,370 ft^3/day. The design and performance standard for the pit over the testing period were calculated to be 2,208 ft^3/day and 6,623 ft^3/day respectively**. Therefore, the observed leakage rate of the Spec Agg Pit is significantly less than both the Design (62%) and Performance Standard (20.7%) leakage rates.

Accordingly, it is our opinion that this test demonstrates that the Spec Agg Pit can be considered 'lined' consistent with State Engineers Office standards. We believe that this conclusion meets the criteria required by the decree in Case No. 13CW3053, and the Spec Agg Pit should be allowed to store water as authorized by this decree. We respectfully request a letter from your office approving the Spec Agg Pit as meeting the lining criteria and allowing storage under this decree.

Please do not hesitate to contact us with any questions.

Yours very truly,

BISHOP-BROGDEN ASSOCIATES, INC.

David M. Heintz, P.E.
Water Resources Engineer

Jeffrey A. Clark
Principal

DMH/JAC/jeb
Enclosures
cc: James Sharn
1204.01

Table 1
Martin Marietta
Spec Agg Pit Stage-Area-Capacity Table

Staff Gage/Stage (ft)	Volume (ac-ft)	Surface Area (ac)	Perimeter (ft)
6209.7	0	0	0
6210	1.35	4.5	2,330
6211	5.85	4.5	2,330
6212	10.35	4.5	2,330
6213	14.85	4.5	2,330
6214	19.35	4.5	2,330
6215	23.85	4.5	2,330
6216	28.35	4.5	2,330
6217	32.85	4.5	2,330
6218	37.35	4.5	2,330
6219	41.85	4.5	2,330
6220	46.35	4.5	2,330
6221	50.85	4.5	2,330
6222	55.35	4.5	2,330
6223	59.85	4.5	2,330
6224	64.35	4.5	2,330
6225	68.85	4.5	2,330
6226	73.35	4.5	2,330
6227	77.85	4.5	2,330
6228	82.35	4.5	2,330
6229	86.85	4.5	2,330
6230	91.35	4.5	2,330
6231	95.85	4.5	2,330
6232	100.35	4.5	2,330
6233	104.85	4.5	2,330
6234	109.35	4.5	2,330
6235	113.85	4.5	2,330
6236	118.35	4.5	2,330
6237	122.85	4.5	2,330
6238	127.35	4.5	2,330
6239	234.4	8	2,706
6240	242.4	8	2,706
6241	250.4	8	2,706
6242	258.4	8	2,706
6243	266.4	8	2,706
6244	274.4	8	2,706
6245	282.4	8	2,706
6246	290.4	8	2,706
6247	298.4	8	2,706
6248	306.4	8	2,706
6249	314.4	8	2,706
6250	322.4	8	2,706

Notes:
Stage area capacity table was developed using aerial imagery to determine surface area and mined bench height information from MM to determine depth.

Table 2
Martin Marietta
Spec Agg Pit Decreed Evaporation Rate

	Percent	Total Monthly (ft)	Days	Daily (ft)
Jan	3%	0.074	31	0.002
Feb	4%	0.086	28	0.003
Mar	6%	0.135	31	0.004
April	9%	0.221	30	0.007
May	12%	0.294	31	0.009
June	15%	0.355	30	0.012
July	15%	0.368	31	0.012
August	14%	0.331	31	0.011
Sept	10%	0.245	30	0.008
Oct	7%	0.172	31	0.006
Nov	4%	0.098	30	0.003
Dec	3%	0.074	31	0.002
Total	100%	2.450	365	0.080

Notes:
Evaporation is equal 2.45 ac-ft per acre per year (per Paragraph 6.2.1 of the decree in Case No.13CW3053 and Consolidated Case Nos. 90CW215 and 91CW047). Monthly evaporation distribution will be based upon SB 89-120 guidelines for elevations below 6,500 feet.

Table 3
Martin Marietta
Spec Agg Pit 90-day Leakage Test Summary Table

				Inflows			Outflows				Leakage				
	BOD Quarry Water Level (ft) [1]	Quarry Surface Area (ac) [2]	BOD Volume (ac-ft) [3]	Inflow Volume (ac-ft) [4]	Golden Station Precipitation (in) [5]	Precipitation Inflows (ac-ft) [6]	Evaporation Rate (ft) [7]	Evaporation Volume (ac-ft) [8]	Outflow Pump Meter Reading (gal) [9]	Outflow Pump Volume (ac-ft) [10]	Measured Change in Storage (ac-ft) [11]	Calculated Change in Storage (ac-ft) [12]	Leakage Rate (ac-ft) [13]	Performance Standard (ac-ft/day) [14]	Design Standard (ac-ft/day) [15]
11-Apr	6237.156	4.5	123.552	0.020	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.135	-0.013	-0.122	0.152	0.051
12-Apr	6237.126	4.5	123.417	0.020	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.135	-0.013	-0.122	0.152	0.051
13-Apr	6237.096	4.5	123.282	0.020	0.000	0.000	0.007	0.033	11,855,500	0.000	0.081	-0.013	0.094	0.152	0.051
14-Apr	6237.114	4.5	123.363	0.019	0.000	0.000	0.007	0.033	11,855,500	0.000	0.054	-0.014	0.068	0.152	0.051
15-Apr	6237.126	4.5	123.417	0.018	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.054	-0.015	-0.039	0.152	0.051
16-Apr	6237.114	4.5	123.363	0.018	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.126	-0.015	-0.111	0.152	0.051
17-Apr	6237.086	4.5	123.237	0.018	0.000	0.000	0.007	0.033	11,855,500	0.000	0.031	-0.015	0.047	0.152	0.051
18-Apr	6237.093	4.5	123.269	0.018	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.140	-0.015	-0.124	0.152	0.051
19-Apr	6237.062	4.5	123.129	0.018	0.000	0.000	0.007	0.033	11,855,500	0.000	0.077	-0.015	0.092	0.152	0.051
20-Apr	6237.079	4.5	123.206	0.007	0.118	0.044	0.007	0.033	11,855,500	0.000	0.103	0.018	0.085	0.152	0.051
21-Apr	6237.102	4.5	123.309	0.004	0.441	0.165	0.007	0.033	11,855,500	0.000	-0.063	0.136	-0.199	0.152	0.051
22-Apr	6237.088	4.5	123.246	0.004	0.000	0.000	0.007	0.033	11,855,500	0.000	0.072	-0.029	0.101	0.152	0.051
23-Apr	6237.104	4.5	123.318	0.004	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.225	-0.029	-0.196	0.152	0.051
24-Apr	6237.054	4.5	123.093	0.005	0.720	0.270	0.007	0.033	11,855,500	0.000	0.279	0.242	0.037	0.152	0.051
25-Apr	6237.116	4.5	123.372	0.006	0.000	0.000	0.007	0.033	11,855,500	0.000	0.013	-0.027	0.040	0.152	0.051
26-Apr	6237.119	4.5	123.386	0.007	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.162	-0.026	-0.136	0.152	0.051
27-Apr	6237.083	4.5	123.224	0.007	0.000	0.000	0.007	0.033	11,855,500	0.000	0.014	-0.026	0.040	0.152	0.051
28-Apr	6237.086	4.5	123.237	0.007	0.000	0.000	0.007	0.033	11,855,500	0.000	0.099	-0.026	0.125	0.152	0.051
29-Apr	6237.108	4.5	123.336	0.007	0.000	0.000	0.007	0.033	11,855,500	0.000	0.081	-0.026	0.107	0.152	0.051
30-Apr	6237.126	4.5	123.417	0.006	0.000	0.000	0.007	0.033	11,855,500	0.000	-0.005	-0.027	0.022	0.152	0.051
1-May	6237.125	4.5	123.413	0.005	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.126	-0.038	-0.088	0.152	0.051
2-May	6237.097	4.5	123.287	0.005	0.539	0.202	0.009	0.043	11,855,500	0.000	-0.009	0.165	-0.174	0.152	0.051
3-May	6237.095	4.5	123.278	0.029	1.441	0.540	0.009	0.043	11,855,500	0.000	0.202	0.526	-0.324	0.152	0.051
4-May	6237.14	4.5	123.480	0.044	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.212	0.001	-0.212	0.152	0.051
5-May	6237.093	4.5	123.269	0.033	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.130	-0.009	-0.121	0.152	0.051
6-May	6237.064	4.5	123.138	0.026	0.000	0.000	0.009	0.043	11,855,500	0.000	0.049	-0.016	0.066	0.152	0.051
7-May	6237.075	4.5	123.188	0.022	0.000	0.000	0.009	0.043	11,855,500	0.000	0.032	-0.021	0.053	0.152	0.051
8-May	6237.082	4.5	123.219	0.019	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.090	-0.024	-0.066	0.152	0.051
9-May	6237.062	4.5	123.129	0.018	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.013	-0.025	0.011	0.152	0.051
10-May	6237.059	4.5	123.116	0.020	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.117	-0.022	-0.095	0.152	0.051
11-May	6237.033	4.5	122.999	0.015	0.000	0.000	0.009	0.043	11,855,500	0.000	0.121	-0.028	0.149	0.152	0.051
12-May	6237.06	4.5	123.120	0.012	0.130	0.049	0.009	0.043	11,855,500	0.000	0.032	0.018	0.013	0.152	0.051
13-May	6237.067	4.5	123.152	0.012	0.118	0.044	0.009	0.043	11,855,500	0.000	0.058	0.014	0.044	0.152	0.051
14-May	6237.08	4.5	123.210	0.014	0.402	0.151	0.009	0.043	11,855,500	0.000	-0.063	0.122	-0.185	0.152	0.051
15-May	6237.066	4.5	123.147	0.013	0.051	0.019	0.009	0.043	11,855,500	0.000	0.018	-0.011	0.029	0.152	0.051
16-May	6237.07	4.5	123.165	0.012	0.000	0.000	0.009	0.043	11,855,500	0.000	0.104	-0.031	0.134	0.152	0.051
17-May	6237.093	4.5	123.269	0.010	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.248	-0.032	-0.215	0.152	0.051
18-May	6237.038	4.5	123.021	0.010	0.020	0.007	0.009	0.043	11,855,500	0.000	0.202	-0.025	0.228	0.152	0.051
19-May	6237.083	4.5	123.224	0.010	0.650	0.244	0.009	0.043	11,855,500	0.000	-0.122	0.211	-0.333	0.152	0.051
20-May	6237.056	4.5	123.102	0.011	0.228	0.086	0.009	0.043	11,855,500	0.000	-0.081	0.054	-0.135	0.152	0.051
21-May	6237.038	4.5	123.021	0.012	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.045	-0.031	-0.014	0.152	0.051
22-May	6237.028	4.5	122.976	0.010	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.126	-0.032	-0.094	0.152	0.051
23-May	6237.000	4.5	122.850	0.010	0.051	0.019	0.009	0.043	11,855,500	0.000	0.158	-0.013	0.171	0.152	0.051
24-May	6237.035	4.5	123.008	0.009	0.000	0.000	0.009	0.043	11,855,500	0.000	0.054	-0.034	0.088	0.152	0.051
25-May	6237.047	4.5	123.062	0.009	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.157	-0.034	-0.123	0.152	0.051
26-May	6237.012	4.5	122.904	0.007	0.000	0.000	0.009	0.043	11,855,500	0.000	0.171	-0.035	0.206	0.152	0.051
27-May	6237.05	4.5	123.075	0.007	0.000	0.000	0.009	0.043	11,855,500	0.000	0.126	-0.035	0.161	0.152	0.051
28-May	6237.078	4.5	123.201	0.007	0.071	0.027	0.009	0.043	11,855,500	0.000	-0.288	-0.009	-0.279	0.152	0.051
29-May	6237.014	4.5	122.913	0.007	0.000	0.000	0.009	0.043	11,855,500	0.000	0.126	-0.036	0.162	0.152	0.051
30-May	6237.042	4.5	123.039	0.007	0.031	0.012	0.009	0.043	11,855,500	0.000	0.063	-0.024	0.087	0.152	0.051
31-May	6237.056	4.5	123.102	0.007	0.000	0.000	0.009	0.043	11,855,500	0.000	-0.108	-0.036	-0.072	0.152	0.051
1-Jun	6237.032	4.5	122.994	0.005	0.000	0.000	0.012	0.053	11,855,500	0.000	0.058	-0.048	0.107	0.152	0.051
2-Jun	6237.045	4.5	123.053	0.005	0.000	0.000	0.012	0.053	11,855,500	0.000	0.112	-0.048	0.161	0.152	0.051
3-Jun	6237.07	4.5	123.165	0.004	0.000	0.000	0.012	0.053	11,855,500	0.000	-0.108	-0.049	-0.059	0.152	0.051
4-Jun	6237.046	4.5	123.057	0.004	0.000	0.000	0.012	0.053	11,855,500	0.000	0.193	-0.050	0.243	0.152	0.051
5-Jun	6237.089	4.5	123.251	0.004	0.000	0.000	0.012	0.053	11,855,500	0.000	-0.009	-0.050	0.041	0.152	0.051
6-Jun	6237.087	4.5	123.242	0.004	0.000	0.000	0.012	0.053	11,855,500	0.000	0.054	-0.050	0.104	0.152	0.051
7-Jun	6237.099	4.5	123.296	0.003	0.000	0.000	0.012	0.053	11,855,500	0.000	-0.050	-0.050	0.001	0.152	0.051
8-Jun	6237.088	4.5	123.246	0.002	0.000	0.000	0.012	0.053	12,563,400	2.172	-0.112	-2.223	2.111	0.152	0.051
9-Jun	6237.063	4.5	123.134	0.002	0.000	0.000	0.012	0.053	12,563,400	0.000	0.238	-0.051	0.289	0.152	0.051
10-Jun	6237.116	4.5	123.372	0.002	0.000	0.000	0.012	0.053	12,563,400	0.000	-0.180	-0.052	-0.128	0.152	0.051
11-Jun	6237.076	4.5	123.192	0.001	0.000	0.000	0.012	0.053	12,563,400	0.000	0.027	-0.052	0.079	0.152	0.051
12-Jun	6237.082	4.5	123.219	0.001	0.000	0.000	0.012	0.053	12,563,400	0.000	0.009	-0.052	0.061	0.152	0.051
13-Jun	6237.084	4.5	123.228	0.001	0.000	0.000	0.012	0.053	12,563,400	0.000	0.108	-0.053	0.161	0.152	0.051
14-Jun	6237.108	4.5	123.336	0.000	0.000	0.000	0.012	0.053	12,563,400	0.000	-0.063	-0.053	-0.010	0.152	0.051
15-Jun	6237.094	4.5	123.273	0.000	0.012	0.004	0.012	0.053	12,563,400	0.000	-0.104	-0.049	-0.055	0.152	0.051
16-Jun	6237.071	4.5	123.170	0.000	0.000	0.000	0.012	0.053	12,563,400	0.000	0.041	-0.053	0.094	0.152	0.051
17-Jun	6237.08	4.5	123.210	0.000	0.799	0.300	0.012	0.053	12,563,400	0.000	0.040	0.246	-0.206	0.152	0.051
18-Jun	6237.089	4.5	123.251	0.003	0.161	0.061	0.012	0.053	12,581,500	0.056	-0.130	-0.045	-0.086	0.152	0.051
19-Jun	6237.06	4.5	123.120	0.005	0.350	0.131	0.012	0.053	12,581,500	0.000	0.099	0.083	0.016	0.152	0.051
20-Jun	6237.082	4.5	123.219	0.008	0.000	0.000	0.012	0.053	12,581,500	0.000	-0.122	-0.046	-0.076	0.152	0.051
21-Jun	6237.055	4.5	123.098	0.010	0.000	0.000	0.012	0.053	12,581,500	0.000	0.122	-0.044	0.165	0.152	0.051
22-Jun	6237.082	4.5	123.219	0.009	0.012	0.004	0.012	0.053	12,581,500	0.000	-0.045	-0.039	-0.006	0.152	0.051
23-Jun	6237.072	4.5	123.174	0.010	0.000	0.000	0.012	0.053	12,581,500	0.000	-0.193	-0.044	-0.150	0.152	0.051
24-Jun	6237.029	4.5	122.981	0.010	0.091	0.034	0.012	0.053	12,581,500	0.000	0.198	-0.009	0.207	0.152	0.051
25-Jun	6237.073	4.5	123.179	0.011	0.000	0.000	0.012	0.053	12,581,500	0.000	-0.014	-0.042	0.028	0.152	0.051
26-Jun	6237.07	4.5	123.165	0.011	0.000	0.000	0.012	0.053	12,581,500	0.000	0.027	-0.042	0.069	0.152	0.051
27-Jun	6237.076	4.5	123.192	0.010	0.000	0.000	0.012	0.053	12,581,500	0.000	0.027	-0.044	0.071	0.152	0.051
28-Jun	6237.082	4.5	123.219	0.010	0.000	0.000	0.012	0.053	12,581,500	0.000	0.265	-0.044	0.309	0.152	0.051
29-Jun	6237.141	4.5	123.485	0.009	0.000	0.000	0.012	0.053	12,581,500	0.000	-0.221	-0.045	-0.176	0.152	0.051
30-Jun	6237.092	4.5	123.264	0.008	0.000	0.000	0.012	0.053	12,581,500	0.000	-0.072	-0.046	-0.026	0.152	0.051
1-Jul	6237.076	4.5	123.192	0.008	0.000	0.000	0.012	0.053	12,581,500	0.000	0.238	-0.045	0.284	0.152	0.051
2-Jul	6237.129	4.5	123.431	0.007	0.000	0.000	0.012	0.053	12,581,500	0.000	0.027	-0.046	0.073	0.152	0.051
3-Jul	6237.135	4.5	123.458	0.000	0.000	0.000	0.012	0.053	12,581,500	0.000	-0.144	-0.053	-0.091	0.152	0.051
4-Jul	6237.103	4.5	123.314	0.000	0.091	0.034	0.012	0.053	12,581,500	0.000	-0.045	-0.019	-0.026	0.152	0.051
5-Jul	6237.093	4.5	123.269	0.000	0.012	0.004	0.012	0.053	12,581,500	0.000	-0.171	-0.049	-0.122	0.152	0.051
6-Jul	6237.055	4.5	123.098	0.000	0.000	0.000	0.012	0.053	12,581,500	0.000	0.220	-0.053	0.274	0.152	0.051
7-Jul	6237.104	4.5	123.318	0.000	0.000	0.000	0.012	0.053	12,581,500	0.000	0.072	-0.053	0.125	0.152	0.051
8-Jul	6237.12	4.5	123.390	0.000	0.000	0.000	0.012	0.053	12,581,500	0.000	0.157	-0.053	0.211	0.152	0.051
9-Jul	6237.155	4.5	123.548	0.000	0.000	0.000	0.012	0.053	12,581,500	0.000	-0.175	-0.053	-0.122	0.152	0.051
10-Jul	6237.116	4.5	123.372	-	-	-	-	-	12,581,500	-	-	-	-	-	-
Total (ac-ft)	-	-	-	0.83	6.54	2.45	0.90	4.06	-	2.23	-0.18	-3.01	2.83	13.69	4.56
Total (gallons)	-	-	-	269,898	-	799,072	-	1,324,013	-	726,000	-58,653	-981,043	922,390	4,459,486	1,486,495
												Rate (cuft/day)	**1,370**	**6,624**	**2,208**

Notes:
[1] Beginning of the day water surface elevation measured by the pressure transducer.
[2] Beginning of the day pit surface area based upon the measured surface water elevation and the stage-area-capacity table presented in Table 1.
[3] Beginning of the day volume of water in storage based upon the measured surface water elevation and the stage-area-capacity table presented in Table 1.
[4] Measured inflows from Jackson Gulch through the 12 inch ramp flume.
[5] Total precipitation measured at the NOAA Golden 3SW (USC00053387) weather station.
[6] Equal to [2] multiplied by [5] divided by 12.
[7] Equal to daily evaporation rate calculated in Table 2.
[8] Equal to [2] multiplied by [7].
[9] Pump totalizing flow meter readings provided by MM.
[10] Equal to total measured pumping in [9] divided by 325,851 gallons per ac-ft.
[11] Equal to the following day minus the current day's measured volume in [3].
[12] Equal to ([4] + [6]) -([8] +[10]).
[13] Equal to [11] minus [12].
[14] Equal to 3 x 0.03 cuft/day/sqft x depth of water from Table 1 plus 0.0015 cuft/day/sqft x 3 x 4.5 acre pit bottom area.
[15] Equal to 0.03 cuft/day/sqft x depth of water from Table 1 plus 0.0015 cuft/day/sqft x 4.5 acre pit bottom area.

COLORADO
Division of Water Resources
Department of Natural Resources

John W. Hickenlooper
Governor

Robert Randall
Executive Director

Kevin G. Rein, P.E.
Director/State Engineer

November 15, 2018

Mr. Jeffrey A. Clark
Bishop-Brogden Associates, Inc.
333 West Hampden Avenue, Suite 1050
Englewood, Co 80110
Transmission via email: jclark@bbawater.com

RE: MARTIN MARIETTA MATERIAL, INC. SPECIFICATION AGGREGATE QUARRY MINE GROUNDWATER SEEPAGE EVALUATION (WDID 0702612)
SPEC AGG QUARRY PIT (WDID 0703031)
NW1/5 OF SECTIONS 15, TOWNSHIP 4 SOUTH, RANGE 70 WEST, 6TH P.M.
WATER DIVISION 1, WATER DISTRICT 7, JEFFERSON COUNTY

Dear Mr. Clark:

The purpose of this letter is to approve the groundwater seepage evaluation requested for the Specification Aggregate Quarry Pit ("Spec Agg Quarry Pit") (as shown on the attached Figures 2 and 3) located within the Specification Aggregate Quarry Mine. Spec Agg Quarry Pit is located in the NW1/4 of Section 15, Township 4 South, Range 70 West of the 6th P.M., and was originally mined under the Division of Reclamation Mining and Safety ("DRMS") Permit No. M1974-004). The decree in case no. 2013CW3053 granted a junior storage water right from Spec Agg Quarry Pit in the amount of 320 acre-feet for commercial, industrial, reclamation, irrigation, dust control, concrete production, augmentation, and exchange.

In order to allow the Spec Agg Quarry Pit to store water the decree in case no. 2013CW3053 required, a leak test to demonstrate that the pit satisfy the Colorado Division of Water Resource Reservoir Administration Guidelines as they apply to liner for subgrade storage. Therefore although, neither a clay liner, nor slurry wall was installed at the Spec Agg Quarry Pit due to low permeability material in the surrounding rocks a 90-day leak test was performed, as required by the decree in case no. 2013CW3053, to assess whether the volume of ground water seeping into the pit exceeds the State Engineer's allowable leakage rates as referenced in the August 1999 State Engineer Guidelines for Lining Criteria for Gravel Pits (1999 SEO Guidelines).

According to the 2011 State Engineer General Administration Guidelines for Reservoirs (2011 SEO Guidelines), rock quarries in low permeability material can be tested in accordance with the 1999 SEO Guidelines. The test was conducted between April 11, 2018 and July 10, 2018. A site inspection was performed by the SEO on June 20, 2018 to review site conditions and discuss the leakage test plan.

Your report dated October 23, 2018 provides the liner summary and the 90-day leak test results for the Spec Agg Quarry Pit. The test data provided indicates that ground water seepage into the Spec Agg Quarry Pit **is below the design standard** referenced in the 1999 SEO Guidelines. **Meeting the design standard requires that during operation of the Spec Agg Quarry Pit, all water inflows and outflows for the pit area must be accounted for on a monthly basis.**

In the event that the average daily unregulated ground water inflow to the Spec Agg Quarry Pit exceeds the Performance Standard referenced in the 1999 SEO Guidelines for two consecutive months, as evidenced by the accounting specified in the preceding paragraph, Martin Marietta Material, Inc. ("Martin Marietta") or their successor and the SEO shall begin to consult regarding the probable cause of the unregulated ground water

inflow, and the appropriate actions to be taken in response thereto. If the State or Division Engineer and Martin Marietta or their successor cannot reach an agreement on the appropriate actions to reduce the unregulated groundwater inflow to less than the Performance Standard within nine (9) months of the beginning of the consultations, the State or Division Engineer shall provide written notice to Martin Marietta or their successor to correct this problem. Martin Marietta or their successor shall have two (2) years from the date of such written notice to modify the pit to achieve an inflow less than the Performance Standard. If satisfactory modifications are not completed within the two year period, the State or Division Engineer may declare the Spec Agg Quarry Pit a well requiring a well permit and Water Court approved augmentation plan or State Engineer approved substitute water supply plan.

The inflow and outflow accounting referenced above shall begin to happen on a 48 hour basis following two consecutive months that the Performance Standard is exceeded and shall continue until Martin Marietta or their successor has demonstrated that at least the Performance Standard has been met.

This approval certifies that the Spec Agg Quarry Pit has achieved the design standard for ground water seepage for lined reservoirs in accordance with the 1999 SEO Guidelines. Water shall not be impounded in the Spec Agg Quarry Pit except pursuant to lawful diversions allowed by statute or decree. At all other times, Martin Marietta or their successor has the responsibility to ensure that all inflow of water into the pit from any source, including precipitation and ground water inflows is removed to prevent any out-of-priority storage of water or secure a Water Court approved augmentation plan or State Engineer approved substitute water supply plan to replace such out-of-priority storage. Prior to ANY use of this site, Martin Marietta or their successor will need to coordinate with Jason Smith, District 7 Water Commissioner, to review operations, measurement structures, and accounting.

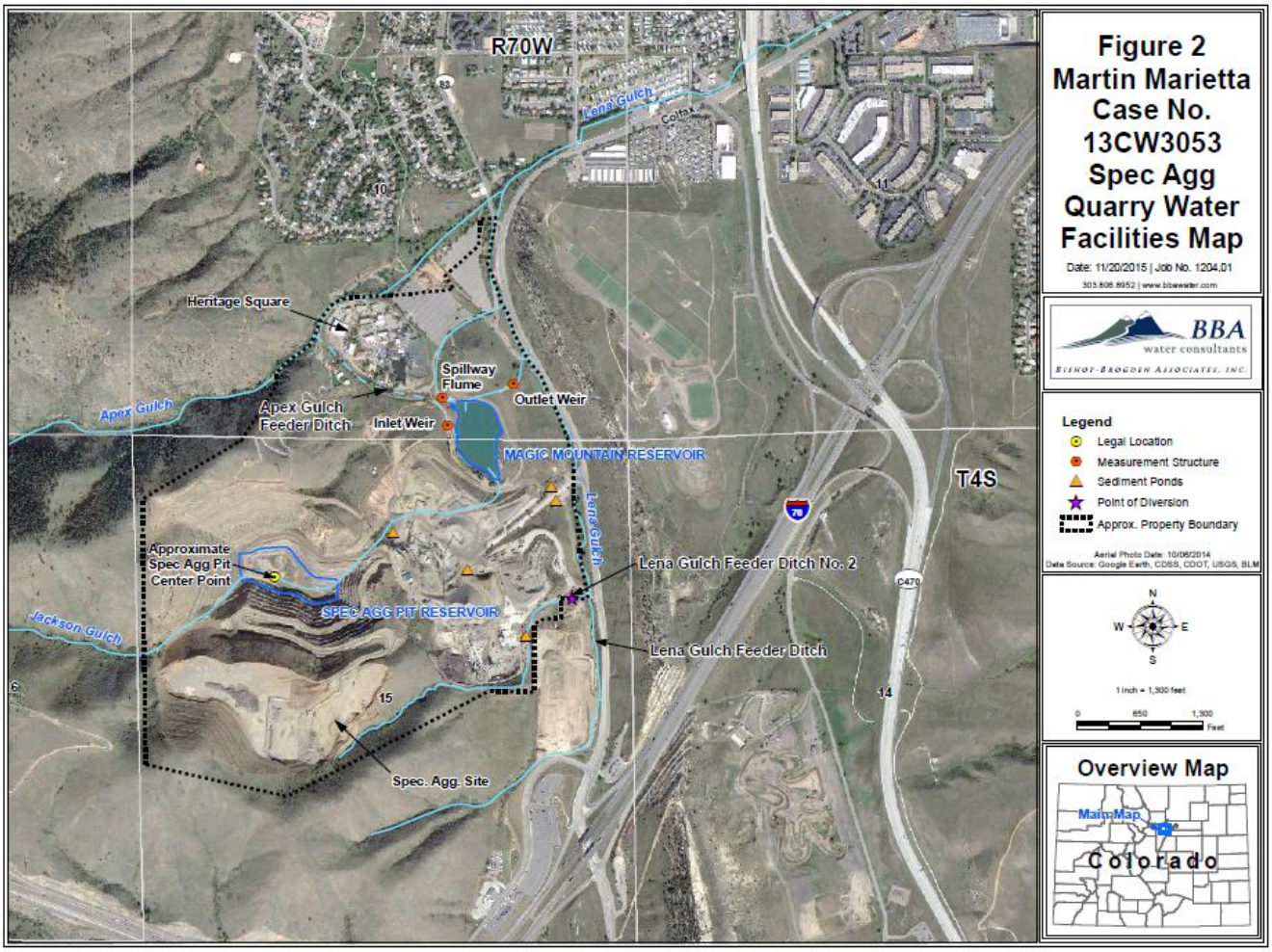
Please contact me at the number above or Corey Deangelis in Greeley at 970-352-8712 if you have any questions.

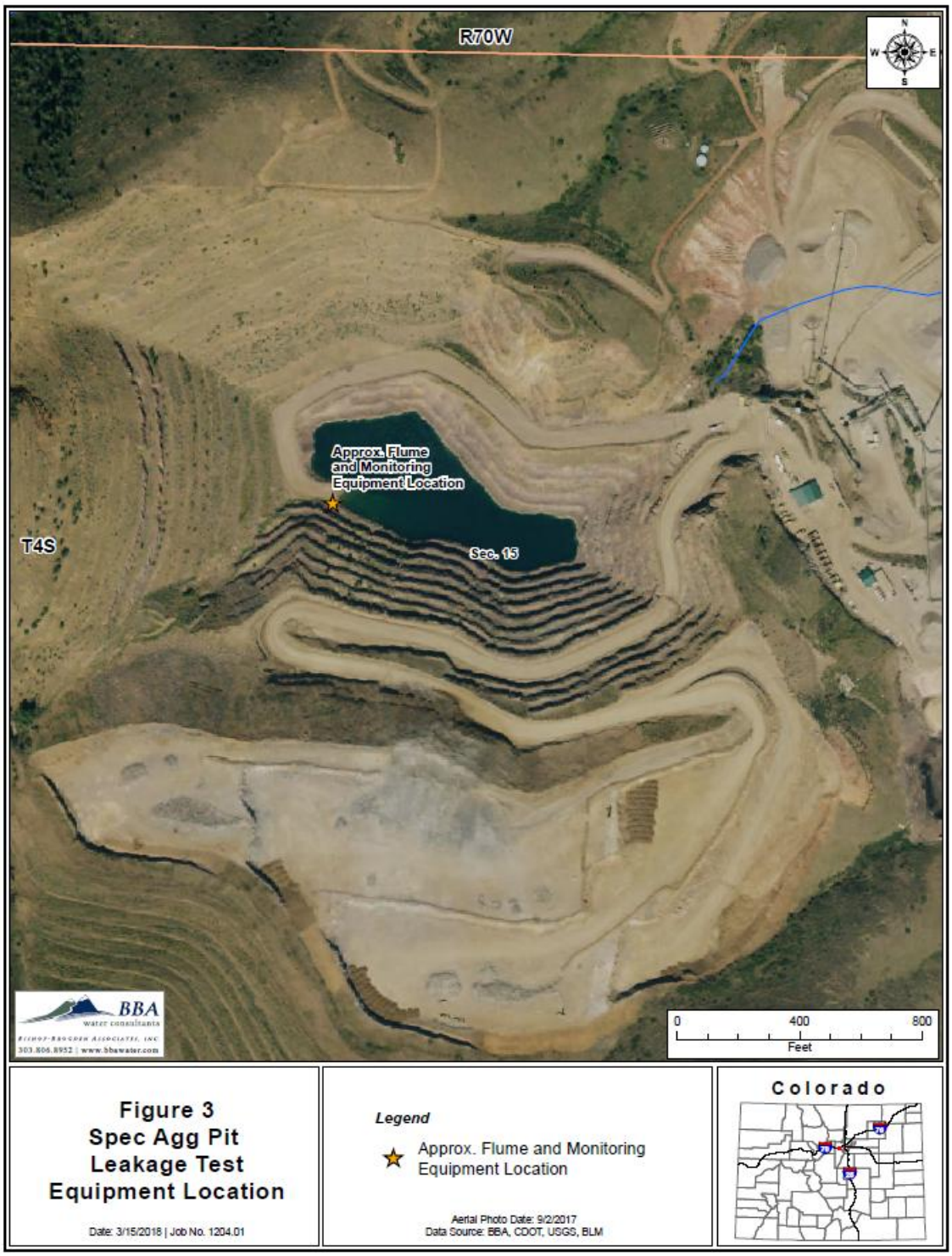
Sincerely,

Ioana Comaniciu, P.E.
Water Resource Engineer

Attachments: Figure 2 and 3

Ec: Corey Deangelis, Division Engineer, Water Division 1 (Corey.Deangelis@state.co.us)
Jason Smith, District 7 Water Commissioner (Jason.Smith2@state.co.us)
Louis Flink, Diversion Records Coordinator (Louis.Flink@state.co.us)
David Heintz, BBA (dheintz@bbawater.com)
WDID File (0702612 and 0703031)


R70W
T4S
Lena Gulch
Coltrax
Heritage Square
Spillway Flume
Outlet Weir
Apex Gulch
Apex Gulch Feeder Ditch
Inlet Weir
MAGIC MOUNTAIN RESERVOIR
Approximate Spec Agg Pit Center Point
SPEC AGG PIT RESERVOIR
Jackson Gulch
Lena Gulch Feeder Ditch No. 2
Lena Gulch Feeder Ditch
Spec. Agg. Site
10
11
14
15
6
Figure 2
Martin Marietta
Case No.
13CW3053
Spec Agg
Quarry Water
Facilities Map
Date: 11/20/2015 | Job No. 1204.01
303.806.8952 | www.bbawater.com
BBA
water consultants
BISHOP-BROGDEN ASSOCIATES, INC.
Legend
Legal Location
Measurement Structure
Sediment Ponds
Point of Diversion
Approx. Property Boundary
Aerial Photo Date: 10/06/2014
Data Source: Google Earth, CDSS, CDOT, USGS, BLM
N
W
E
S
1 inch = 1,300 feet
0
650
1,300
Feet
Overview Map
Main Map
Colorado


R70W
N
W
E
S
Approx. Flume and Monitoring Equipment Location
T4S
Sec. 15
BBA
water consultants
BISHOP-BROGDEN ASSOCIATES, INC
303.806.8952 | www.bbawater.com
0
400
800
Feet
Figure 3
Spec Agg Pit
Leakage Test
Equipment Location
Date: 3/15/2018 | Job No. 1204.01
Legend
Approx. Flume and Monitoring Equipment Location
Aerial Photo Date: 9/2/2017
Data Source: BBA, CDOT, USGS, BLM
Colorado