

United States Department of the Interior Bureau of Land Management

Draft Environmental Assessment DOI-BLM-NM-P020-2020-1108-EA

Mosaic Potash Operations Brine Management

Department of the Interior
Bureau of Land Management
Pecos District
Carlsbad Field Office
620 E Greene Street
Carlsbad, NM 88220
Phone: (575) 234-5972
FAX: (575) 885-9264

Confidentiality Policy

Any comments, including names and street addresses of respondents, you submit may be made available for public review. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.



TABLE OF CONTENTS

1. Purpose and Need for Action	6
1.1 Background of Proposed Action	6
1.2 Purpose and Need for Action	6
1.3 Decision to be Made	6
1.4 Conformance with Applicable Land Use Plan(s)	7
1.5 Relationship to Statutes, Regulations, or Other Plans	7
1.6 Scoping, Public Involvement, and Issues	8
1.6.1 Issues Considered but Not Analyzed	9
2. Proposed Action and Alternative(s)	10
2.1 Existing Facilities and Conditions	10
2.1.1 Tailings Management Area	10
2.1.1.1 Salt Stack	10
2.1.1.2 Clay Settling Pond	10
2.1.1.3 24-Inch Brine Pipeline	11
2.1.1.4 Laguna Uno and Laguna Grande	11
2.2 Proposed Action	11
2.3 No Action	12
2.4 Alternatives Considered but Eliminated from Detailed Study	12
3. Affected Environment and Environmental Consequences	14
3.1 Vegetation	14
3.1.1 Affected Environment	14
3.1.2 Chihuahuan Desert Scrub (CDS)	14
3.1.3 Closed Alkali Basin (CAB)	14
3.1.4 BLM Sensitive Species	15
3.1.5 Impacts from the Proposed Action	15
Direct and Indirect Impacts	15
Cumulative Impacts	15
Mitigation Measures	15
3.2 Wildlife	16
3.2.1 Affected Environment	16
MIGRATORY BIRDS	16
SHOREBIRDS	17
3.2.2 Impacts from the Proposed Action	18
Direct and Indirect Impacts	18
TERRESTRIAL FAUNA	18
SHOREBIRDS	18
MIGRATORY BIRDS	19
Cumulative Impacts	19
Mitigation Measures and Residual Impacts	19
3.3 Threatened and Endangered Species	20

3.3.1 Affected Environment.....	20
3.3.2 Impacts from the Proposed Action.....	21
Direct and Indirect Impacts	21
Cumulative Impacts.....	21
Mitigation Measures and Residual Impacts	21
3.4 Cultural Resources	21
3.4.1 Affected Environment.....	21
3.4.2 Impacts from the Proposed Action.....	22
Direct and Indirect Impacts	22
Cumulative Impacts.....	22
Mitigation Measures	22
3.5 Water Resources	22
3.5.1 Affected Environment.....	22
3.5.1.1 Surface Water Resources	22
3.5.1.1.1. Climate	22
3.5.1.1.2. Drainage Basin Characteristics	23
3.5.1.1.3. Stream Flow	23
3.5.1.1.4. Surface Water Use	24
3.5.1.1.5. Surface Water Quality	24
3.5.1.1.6. Local Surface Water Hydrology.....	24
3.5.1.1.7. Watershed Characteristics	24
3.5.1.1.8. Major Surface Water Bodies within the Study Area	25
3.5.1.1.9. Springs and Seeps	25
3.5.1.1.10. Tailings Brine Water Chemistry	26
3.5.1.2 Groundwater Resources	26
3.5.1.2.1. Hydrogeologic Setting	26
3.5.1.2.2. Rustler Formation.....	27
3.5.1.2.3. Quaternary Deposits	27
3.5.1.2.4. Shallow Groundwater System	28
3.5.2 Impacts from the Proposed Action.....	31
Direct and Indirect Impacts	31
Surface Water:.....	31
Springs and Seeps:	31
Groundwater:	31
Cumulative Impacts.....	31
Mitigation Measures and Residual Impacts	32
3.6 Area of Critical Environmental Concern	32
3.6.1 Affected Environment.....	32
3.6.2 Impacts from the Proposed Action.....	32
Direct and Indirect Impacts	32
Cumulative Impacts.....	32
Mitigation Measures	32
3.7 Mineral Resources.....	33
3.7.1 Affected Environment.....	33

3.7.2 Impacts from the Proposed Action	33
Direct and Indirect Impacts	33
Cumulative Impacts.....	33
Mitigation Measures	33
4. Supporting Information	34
4.1 List of Preparers	34
4.2 References	34

Appendices

Appendix A: USFWS Threatened and Endangered Letter 02ENNM00-2020-SLI-1519

Appendix B: Water Quality Data

Figures

Figure 1-1: Site Location Map

Figure 2-1: Mine Facilities

Figure 2-2: Laguna Uno Secondary Clay Settling Facility

Figure 3-1: Vegetation Communities

Figure 3-2: Sheer Pincushion Cactus Survey Area

Figure 3-3: Shorebird Observations at Laguna Uno, Fall 2018

Figure 3-4: Salt Playa Proposed Area of Critical Environmental Concern

Figure 3-5.1: Nash Draw Delineation

Figure 3-5.2: Electrical Conductivity in the Pecos River (September 1998)

Figure 3-5.3: Electrical Conductivity in the Pecos River in the Vicinity of the Site (IMC 2001)

Figure 3-5.4: TDS Concentrations in Surface Water

Figure 3-5.5: TDS Concentrations in Spring Discharge Water

Figure 3-5.6: Geologic Map of Southern Nash Draw

Figure 3-5.7: Rustler Formation Descriptions

Figure 3-5.8: Wells, Piezometers, and Soil Borings

Figure 3-5.9: Hydrogeologic Cross Section A-A'

Figure 3-5.10: Hydrogeologic Cross Section B-B'

Figure 3-5.11: Hydrogeologic Cross Section C-C'

Figure 3-5.12: Hydrogeologic Cross Section D-D'

Figure 3-5.13: Adjusted Potentiometric Surface of the Culebra Dolomite

Figure 3-5.14: TDS Concentrations in Groundwater

Figure 3-5.15: January 2021 Equivalent Freshwater Head Elevations and Flow Directions Laguna Grande Area

Tables

Table 3.2.1: Shorebird Abundance and Species Richness within 200 m of Point Count Locations at Laguna Uno during 2018 Fall Survey 18

Table 3.3.1: Federally Threatened, Endangered, or Proposed Species NASH DRAW, NM (FWS Consultation #02ENNM00-2020-SLI-1519) 20

Table 3.5.1: Design Storm Depths for Nash Draw, Eddy County, New Mexico 23

Table 3.5.2: Surface Water Bodies 25

1. PURPOSE AND NEED FOR ACTION

1.1 Background of Proposed Action

Mosaic Potash Carlsbad Inc. (Mosaic) is seeking approval to amend the approved Mine and Reclamation Plan (Mine Plan), originally approved by U.S. Bureau of Land Management (BLM) in 1979 and most recently updated in September 2015. Mosaic proposes to revise the tailings management system by allowing Laguna Uno to be used as a secondary clay settling pond during typical operations. A detailed description of the current Salt Stack operation is provided in Section 2 (Proposed Action and Alternatives).

Per Discharge Permit DP-1399, issued by the New Mexico Environment Department (NMED) Ground Water Quality Bureau, brine and residual clay flowing off the Salt Stack is discharged to the Clay Settling Pond (CSP), except during periods when the Brine Pipeline is shutdown or upset conditions occur within or upgradient of the CSP, brine will be diverted to the clay settling area within Laguna Uno as stated in III.2.C of the Discharge Permit. Before the construction of the Clay Settling Dike (CSD) and creation of the CSP, Laguna Uno served as the primary clay settling area for runoff from the Salt Stack. Currently, Mosaic is only discharging brine to Laguna Uno under conditions approved by the Discharge Permit.

As part of the proposed action, Laguna Uno would be used as an additional clay settling area in conjunction with the existing CSP. As part of the renewal of the discharge permit, Mosaic has requested approval by NMED of increased discharge of brine to Laguna Uno. The location of the proposed project is shown in Figure 1-1. Mosaic requests the change to provide operational flexibility and improve the quality of brine delivered to Laguna Grande.

The change in tailings management is predicted to disturb an estimated maximum of 88 acres of public lands adjacent to Laguna Uno over the life of the mine, due to increasing the deposition footprint (See Section 2.2, Proposed Action; Figure 2.2). All new disturbance is within the previously approved disturbance footprint.

1.2 Purpose and Need for Action

The Purpose of the action is to provide operational flexibility by responding to Mosaic's request to revise the Mine Plan. Mosaic seeks approval to re-implement utilization of Laguna Uno, in addition to the use of the CSP, to clarify brine by allowing intermittent discharge of the brine stream to Laguna Uno due to the operational demands posed by variations in suspended and dissolved solids loads in the discharge stream.

Leasable Minerals are administered under the Mineral Leasing Act of 1920, as amended and supplemented (30 USC 181, et seq.), the Mineral Leasing Act for Acquired Lands of 1947, as amended and supplemented (30 USC 351, et seq.), and the Geothermal Steam Act of 1970, as amended and supplemented (30 USC 1001, et seq.). These include coal, phosphate, asphalt, sulfur, potassium, sodium, oil, gas, and geothermal. These acts encourage the efficient, orderly, and environmentally sound development of the nation's mineral resources. The Need for the action is for BLM to process Mosaic's application to amend the Mine and Reclamation Plan in accordance with applicable statutes listed above and the Federal Land Policy and Management Act (FLPMA) of 1976 (Public Law 94-579).

1.3 Decision to be Made

Based on the information provided in this environmental assessment (EA), the BLM Field Manager will determine whether revising the tailings management system by allowing Laguna Uno to be used as a secondary clay settling pond during typical operations will have significant impacts on the environment. If

this EA finds that there will not be a significant impact to the environment, then the BLM will sign a finding of no significant impact (FONSI) with a Decision Record detailing whether the BLM approves the project with/without mitigation measures or whether to proceed with a No Action Alternative. Choosing the No Action Alternative would essentially deny the project.

1.4 Conformance with Applicable Land Use Plan(s)

It is the policy of the BLM to make mineral resources available for disposal and to encourage exploration and development of mineral resources to meet national, regional, and local needs. This policy is established by the FLPMA of 1976 where it states that for public lands “...*management be on the basis of multiple use and sustained yield...*” and “...*in a manner which recognizes the Nation’s need for domestic sources of minerals, food, timber, and fiber from the public lands including implementation of the Mining and Minerals Policy Act of 1970 (84 Stat. 1876, 30 U.S.C. 21a) as it pertains to the public lands.*” (FLPMA Sec 102. (7) and (12), respectively).

The proposed action is a waste maintenance activity and, as such, is provided for in the 1988 Carlsbad Resource Management Plan (RMP) which states that the “*BLM will encourage and facilitate the development by private industry of public land mineral resources so that national and local needs are met, and environmentally sound exploration, extraction, and reclamation practices are used*” (1988 Carlsbad RMP, p. 13). The RMP also commits the BLM to “*process mineral patent applications, permits, operating plans, mineral exchanges, leases, and other use authorizations for public lands in a timely and efficient manner.*” (1988 Carlsbad RMP, p. 14).

The proposed action falls within the Federal mineral estate that is managed by the BLM Carlsbad Field Office (CFO) and open to solid leasable minerals for which the RMP states: “*prospecting, leasing, and development may continue under standard terms and conditions or with special stipulations to protect sensitive resource values*” (1988 Carlsbad RMP, p. 18). In conformance with this guidance, the proposed action incorporates the most up-to-date stipulations attached by the CFO.

The 1988 Carlsbad RMP, as amended by the 1997 Carlsbad Resource Management Plan Amendment (RMPA; BLM 1997), has been reviewed and it has been determined that the proposed action, with proper mitigation, conforms with the land use plan terms and conditions as required by 43 CFR 1610.5-3.

1.5 Relationship to Statutes, Regulations, or Other Plans

The proposed action has been reviewed and determined to be in compliance with threatened and endangered species management guidelines outlined in the January 1996 Biological Assessment (Cons. #2-22-96-F-128) and the September 2006 Biological Assessment (Cons. #22420-2007-TA-0033). An official species list was obtained from the U.S. Fish and Wildlife Service (USFWS). BLM determined that no listed species are expected to be present in the study area, due to lack of suitable habitat (See Section 3.3). The official species list (consultation code 02ENNM00-2020-E-03335) is included in Appendix A. No further consultation with USFWS is required.

Compliance with Section 106 responsibilities of the National Historic Preservation Act is adhered to by following the BLM – New Mexico State Historic Preservation Officer protocol agreement, which is authorized by the National Programmatic Agreement between the BLM, the *Advisory Council on Historic Preservation*, and the *National Conference of State Historic Preservation Officers*, and other applicable BLM handbooks.

Additionally, the Proponent (Mosaic) is required to comply with all applicable Federal, State, and local laws and regulations, and to obtain all necessary permits needed to perform the proposed action. The discharge is permitted under Discharge Permit DP-1399, issue by New Mexico Environment Department Groundwater Quality Bureau (GWQB). Mosaic has requested a modification to the permit.

1.6 Scoping, Public Involvement, and Issues

The CFO publishes National Environmental Policy Act (NEPA) projects on the E-Planning website. Currently, all NEPA actions are available for the public to view on the E-Planning website at: (https://eplanning.blm.gov/epl-front-office/eplanning/lup/lup_register.do).

The CFO uses Geographic Information Systems (GIS) in order to identify resources that may be affected by the proposed action. A map of the project area is prepared to display the resources in the area and to identify potential issues. Resources in the project area include air quality, range, soils, vegetation, noxious weeds, cultural resources, hydrology, cave and karst, and wildlife.

The proposed action is very similar to a previous action that the BLM approved for Mosaic. The action was to construct the Clay Settling Pond and storm water drainage ditch along with a 24-inch pipeline to decant brine from the CSD to the northern end of Laguna Grande. The action was proposed around 1998 and approved in 2004. The environmental effects of that action were analyzed and documented in the 2004 EA "Environmental Assessment Modification to IMC Potash Tailings Management System – Project No. NM-080-2003-0776" submitted by Golder Associates Inc. The EA disclosed and analyzed various natural resources that the project would affect.

The 2004 EA evaluated the currently approved brine management plan (the Proposed Action in the 2004 EA). The 2004 EA evaluated the impacts on the physiography, geology, soils, vegetation, wildlife, threatened and endangered species, visual resources, surface water, groundwater, cultural resources, socio-economic resources, and mineral resources. The 2004 EA evaluated the current approved brine management system, which included constructing the clay settling pond and embankment, construction of a 6-mile pipeline to convey brine from the Salt Stack to Laguna Grande and associated access road. The 2004 EA also evaluated an alternative to utilize Laguna Uno for clay settling.

The study area for the 2004 EA included 2,100 acres in Nash Draw and included the area covered by the current proposed action. The 2004 EA determined that there would be no significant impacts from either the approved action or from the alternative to use Laguna Uno.

Utilizing Laguna Uno as a secondary clay settling pond during typical operations would affect much of the same resources, and the 2004 EA is almost sufficient to disclose the impacts of this proposed action. There is a subset of resources that need to be analyzed in addition to satisfy the requirements set forth by the NEPA regulations.

This EA will be tiered to the existing 2004 EA for the initial construction of the Clay Settling Pond. The 2004 EA will be available upon request to the public and will also be available on the ePlanning website.

The proposed action was evaluated by CFO resource specialists in order to identify any issues associated with the project. After close examination with the approved EA Modification to IMC Potash Tailings Management System – Project No. NM-080-2003-0776, the CFO resource staff have included the following issues that are of concern to the proposed action:

- Would utilizing Laguna Uno as a secondary clay settling pond during typical operations affect the Scheer's pincushion cactus, which is now a BLM Sensitive Species?
- Five cultural resource sites that should be updated along within the area that needs to be surveyed. The recorded sites are LA 122048, LA 122049, LA 122050, and LA 98820. In addition, unrecorded bombing target will need to be recorded. Depending on the update of that site, additional mitigation measures may be necessary. How will utilizing Laguna Uno as a secondary clay settling pond during typical operations affect these sites that are eligible for nomination into the National Register of Historic Places? Would any data recovery be possible to mitigate the effects?
- How will utilizing Laguna Uno as a secondary clay settling pond during typical operations affect surface and groundwater resources?

- How will utilizing Laguna Uno as a secondary clay settling pond during typical operations affect wildlife, in particular, how will it affect shorebird habitat?
- A portion of Laguna Uno is within the area nominated for designation as the Salt Playas Area of Critical Environmental Concern (ACEC). The area was nominated based on significant cultural and fish and wildlife resources. The 2018 Draft Resource Management Plan (BLM 2018) preferred management alternative (Alternative C) does not designate the Salt Playa as an ACEC, but it does recommend special management conditions. Will utilizing Laguna Uno as a secondary clay settling pond during typical operations affect cultural values and fish and wildlife resources?

Four comment letters were received:

- Mr. Kyle R. Smith, representing Intrepid Potash – New Mexico LLC, raised concerns with the discharge permit issued by GWQB.
- NMED submitted comments indicating that a modification of the discharge permit will be required, and concern related to groundwater, surface water and habitat for shorebirds.
- USFWS submitted a letter requesting compliance with the Endangered Species Act (Section 7).
- Mr. Tom Vandekraats, representing United Salt Carlsbad, LLC, submitted a letter supporting the proposal and suggested that the proposal would improve water quality in Laguna Grande.

1.6.1 Issues Considered but Not Analyzed

The BLM has considered many other issues but has determined that the 2004 EA No. NM-080-2003-0776 is sufficient for most of the resources commonly associated with the Field Office except for the ones listed above in Section 1.6.

2. PROPOSED ACTION AND ALTERNATIVE(S)

2.1 Existing Facilities and Conditions

This section describes the facilities that may be affected by the proposed action. A more detailed description of the mine facilities can be found in the Carlsbad Mine Plan (Arcadis 2015).

2.1.1 Tailings Management Area

The Tailings Management Area (TMA) includes the Salt Stack, Clay Settling Pond, 24-Inch Brine Pipeline, Laguna Uno, Laguna Grande, and associated dikes.

2.1.1.1 Salt Stack

The potash tailings, consisting of salts and fine sediments, are discharged in a slurry to the Salt Stack. Solid salts settle out upon discharge and the remaining brine and suspended solids travel down the Salt Stack via overland flow. Tailings that are deposited in the Salt Stack begin as two separate streams. The first stream originates at the tailings wash screen and is primarily comprised of coarse salt tailings. The second stream originates at the thickener underflow pump and is comprised of fine salt tailings and insoluble fine particles. The two tailing streams are combined with additional plant make-up brine and then deposited on the Salt Stack. The additional brine is made up from fresh water pumped from offsite production water supply wells and dissolved salts from the mining operation.

Mosaic manages deposition and growth of the Salt Stack with a series of management dikes and retention structures. Currently, Mosaic expects to store an additional 111 million tons of tailings solids (equivalent to approximately 28 million cubic yards of storage based on historic deposition and accumulation rates) at the Salt Stack through the life of mine (Golder 2017 and Golder 2018a).

The Salt Stack currently covers an area of approximately 1,000 acres (Figure 2-1). The north-south length of the Salt Stack is approximately 1.5 miles, and the east-west width is approximately 0.75 miles. The southern toe of the Salt Stack is defined by the Salt Stack Contingency Dike (SSCD). The SSCD limits the expansion of the Salt Stack and diverts brine flows to the Clay Settling Pond. The SSCD was designed to intercept and divert brine flows through a concrete open channel weir. The concrete open channel weir provides a pathway for brine and surface water flow to the Clay Settling Pond. Immediately north of the SSCD is Salt Stack Dike No. 1 (SD1), which was designed as the primary brine diversion structure to divert and decant brine and suspended clay particles into the clay settling area. SD1 was breached in 2014 and is no longer maintained.

Currently, after deposition on the Salt Stack has occurred, brine can be diverted to Laguna Uno through four, 12-inch diameter culverts at the north end of the CSP impoundment. Mosaic has constructed a decant structure designed to replace the culverts. The decant has been approved by the New Mexico Office of the State Engineer (NMOSE) but is not yet operational. When operational, the decant can be used to divert flow from the CSP to Laguna Uno.

2.1.1.2 Clay Settling Pond

The Clay Settling Pond currently covers an area of approximately 150 acres (Figure 2-1). Clay particles settle out in the Clay Settling Pond and the clarified brine is then decanted into the 24-inch Brine Pipeline. The eastern and southern extents of the Clay Settling Pond are defined by the CSD. The CSD was designed to contain settled solids, brine, and surface water flow in the Clay Settling Pond. Mosaic has raised the CSD height by five feet, from elevation 3,033 feet to 3,038 feet (Golder 2018b). As part of the dike raise, Mosaic constructed a surface water diversion channel along the west side of the Clay Settling Pond to divert surface water runoff from the adjacent watershed. The project also included construction

and modification of associated structures including the spillway, inlet structure, access road, and toe drain.

2.1.1.3 24-Inch Brine Pipeline

Mosaic uses a 24-inch diameter high density polyethylene (HDPE) brine pipeline to convey clarified brine from the Clay Settling Pond approximately five miles south to Laguna Grande (Figure 2-1). The tailings brine is made up of fresh water pumped from offsite production water supply wells and dissolved salts from the mining operation. The types of salt dissolved in the brine generally include halite (95 percent), langbeinite (3 percent), polyhalite (1.5 percent), sylvite (0.5 percent), and other minor constituents.

2.1.1.4 Laguna Uno and Laguna Grande

Laguna Uno is an approximately 1,000-acre natural playa located south of the Salt Stack. It was used historically as a tailings facility. Currently, Mosaic prevents tailings from entering Laguna Uno but is permitted to use it as a contingency discharge area during upset conditions in the Clay Settling Pond. Mosaic uses the SSCD and the CSD to manage tailings and surface water flows upstream of Laguna Uno. There are two, small, un-engineered dikes at the southern end of Laguna Uno to contain the footprint: the Southwest Laguna Uno dike and the Southeast Laguna Uno dike.

Laguna Grande covers an area of approximately 4,500 acres and consists of salt harvesting ponds in the main body of the lake and a surface water settling pond in the north. Mosaic owns the majority of the surface estate of Laguna Grande, and Laguna Grande has contained potash tailings since the 1930s. Mosaic conveys clarified brine from the Clay Settling Pond to Laguna Grande through the 24-inch Brine Pipeline. Brine discharged to Laguna Grande is directed into evaporation cells and is evaporated to produce salt which is harvested periodically by third-party salt harvesting companies. Mosaic constructed the Southwest Laguna Grande Dike (SWLGD) and the Pond 4 Dike at Laguna Grande to enhance tailings and brine management operations (Figure 2-1). The SWLGD and Pond 4 Dike also prevent brine and surface water flows from impacting the Pecos River. The salt harvesting companies use a series of internal dikes to manage salt harvesting operations. The Pond 4 Dike separates the northern portion of Laguna Grande (referred to as Pond 4) from the southern portion (referred to as Ponds 1, 2, and 3) where active salt harvesting operations take place. Mosaic constructed the SWLGD in 2009 at the southwestern boundary of Laguna Grande.

2.2 Proposed Action

The Mine and Reclamation Plan was originally approved in 1979, and Mosaic prepared a comprehensive update to the plan in September 2015. The current tailings management system was approved in 2004 and included constructing a CSD and pond and installing a 24-inch HDPE pipeline to route brine to salt harvesting ponds in Laguna Grande (Figure 2-1). The approved plan included using Laguna Uno as an additional clay settling location exclusively during maintenance activities and upset conditions.

Mosaic encountered challenges with rapid accumulation of salt and clay in the CSP and difficulty maintaining clear brine discharge to Laguna Grande. United Salt Corporation and New Mexico Salt both have salt mining operations within the Laguna Grande basin that benefit from the removal of clay from the brine discharged to Laguna Grande.

Due to the operational inefficiencies with the CSP, Mosaic proposes to revise the tailings management system by allowing Laguna Uno to be used as an additional clay settling pond during typical operations. Mosaic is also implementing and evaluating operational and physical modifications to make the existing clay settling facility more efficient. Mosaic has implemented improvements to the CSP designed to improve efficiency, including:

- The CSD was raised by 5 feet in 2019. Raising the dike increases the storage capacity of the CSD, increasing the retention time and removal of clay particles from the brine prior to discharge to Laguna Grande.

- Mosaic replaced the original “stop log” outlet structure with a stainless-steel telescopic valve. The new outlet provides improved control of flows to the discharge pipe, reducing the clay particles that are transported to Laguna Grande (Golder 2018b).

Use of Laguna Uno as a clay settling area was considered within the options presented in the 2004 EA as a stand-alone alternative to the Laguna Grande alternative (Golder 2004) and was not selected as a preferred option, due in part to concerns about capacity and the potential impact on vegetation and wildlife habitat. The rationale behind the selection of the preferred alternative described in the 2004 EA has been changed by the following factors:

- The tailings production rate is significantly reduced from the rate forecasted at the time of the 2004 EA due to the shutdown of the muriate of potash (MOP) plant in 2014.
- Based on survey data (2001, 2009, 2013, 2017) tailings accumulation rates and storage are significantly lower than what was forecasted at the time of the 2004 EA.
- Operational history for the CSP since beginning operations in 2006 demonstrates a need for an intermittent alternative storage location to allow the system to operate and clarify brine as intended.
- Engineering controls and impoundment construction can be designed to avoid wildlife habitat areas, which have been better defined since 2004.
- Improvements to the existing CSP to improve the settling of clay are currently being implemented and investigated by Mosaic and use of Laguna Uno will aid in the overall clay management of the facility.

The proposed action would designate Laguna Uno as an intermittent clay settling area used to support the operations of the CSP on an as-needed basis. Runoff from the Salt Stack would be diverted to Laguna Uno for settling, evaporation, and clarification. Based on operational experience, dikes around Laguna Uno would likely need to be approximately six feet high to provide containment of clay, brine, and storm events. This option would require construction of three containment saddle dikes along the south and southwest end of Laguna Uno as shown in Figure 2-2. Two dikes (Dikes 1 and 2) were constructed years ago and are non-jurisdictional because they are lower than six feet high.

All aspects of the proposed action are detailed in Figure 2-2.

2.3 No Action

The BLM NEPA Handbook (H-1790-1; BLM 2008) states that for EAs on externally initiated proposed actions, the No Action Alternative generally means that the proposed activity will not take place. This option is provided in 43 CFR 3162.3-1 (h) (2). This alternative would deny the approval of the proposed application, and all current land and resource uses would continue to occur uninterrupted in the proposed project area.

Under the No Action Alternative, BLM would not approve the proposed revision. Mosaic would continue to discharge brine to Laguna Uno, but only during periods when the Brine Pipeline is shut down or upset conditions occur within or up gradient of the CSP.

2.4 Alternatives Considered but Eliminated from Detailed Study

Other alternatives to the proposed action are to construct a new clay settling pond in a new area. Several alternative locations were considered (Golder 2019).

- Alternative 1 – Lindsey Lake Clay Settling Area (East/West Dike) to Elevation 2,985 Feet

- Alternative 2 – Laguna Uno Clay Settling Area
 - Alternative 2A – Laguna Uno Option 1 (Entire Basin)
 - Alternative 2B – Laguna Uno CSA Option 2 (West Side Only)
- Alternative 3 – Laguna Dos and Laguna Cuatro Clay Settling Area
- Alternative 4 – Laguna Tres Clay Settling Area
- Alternative 5 – North Laguna Grande Clay Settling Area
- Alternative 6 – Additional Clay Settling Area
- 2004 EA Location Alternatives Considered but Not Analyzed in Detail
 - Deep Well Injection Facility
 - Northern Clay and Brine Pond Site Facility

With the exception of the Laguna Uno location, each of the alternative locations listed above would require large increases in the disturbance footprint (i.e., approximately 178 to 1,600 acres). Each alternative location other than Laguna Uno would remove a corresponding amount of habitat. BLM and NMED have indicated that they do not want to disturb additional habitat. In addition, the previously undisturbed alternate locations would likely require a liner system. Assuming a cost of approximately \$1.68 per square foot (RSMeans 2018) for a composite geotextile liner, the cost would range from \$13 to \$117 million. Each of these alternatives would require more new disturbance, additional permitting, and cost, while providing no additional benefits when compared to the proposed action.

Mosaic has evaluated improvements to the process at the plant and modifications to the Salt Stack to improve the efficiency to settle out insoluble particles on the Salt Stack before the brine reaches the CSP. The modifications are presented in detail in the Alternatives Report (Golder 2019). Modifications to the Salt Stack were eliminated due to technical difficulty and that they would not meet the purpose and need (to provide operational flexibility by responding to Mosaic's request to revise the Mine Plan to allow alternate discharge of the brine stream). Seven alternative modifications to the tailings distribution system were eliminated from further consideration as technically or economically infeasible or because they do not meet the purpose and need.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The No Action Alternative reflects the current situation within the project area and will serve as the baseline for comparing the environmental impacts of the analyzed alternative.

During the analysis process, the interdisciplinary team considered several resources and supplemental authorities. The interdisciplinary team determined that the resources discussed below would be affected by the proposed action.

3.1 Vegetation

3.1.1 Affected Environment

The vegetation study area is defined as Nash Draw from the Salt Stack to Laguna Grande. Golder (2001) conducted a baseline vegetation survey between June 18 and June 24, 2001. The survey delineated the dominant vegetation communities in the study area. There are two major natural vegetation types, (Figure 3-1). These are: Chihuahuan Desert Scrub (CDS), and Closed Alkali Basin (CAB). CDS communities were the most extensive communities within the study area. A significant portion of the study area consists of barren areas near the shorelines of the playa lakes.

No tree species were observed in the study area. Common shrub species include creosote bush (*Larrea tridentata*), honey mesquite (*Prosopis glandulosa*), white thorn acacia (*Acacia constricta*), tarbush (*Flourensia cernua*), hairy crinklemat (*Tiquila hispidissima*), four wing saltbush (*Atriplex canescens*), and Javelina bush (*Condalia ericoides*). Succulents were distributed sporadically throughout the study area. These included several species of pincushion cactus (*Coryphantha spp.*), Turk's head cactus (*Echinocactus horizonthalius*), prickly-pear (*Opuntia spp.*), Yucca (*Yucca spp.*), and christmas cholla (*Cylindropuntia leptocaulis*). Common grasses and forbs included red three awn (*Aristidaa purpurea*), alkali sacaton (*Sporobolus airoides*), cane bluestem (*Bothriochloa barbinodis*), spike pappussgrass (*Enneapogon desvauxii*), and Mexican lovegrass (*Eragrostis secundiflora*).

3.1.2 Chihuahuan Desert Scrub (CDS)

Dick-Peddie (1993) describes the CDS boundaries as being defined by the contiguous ranges of creosotebush (*Larrea tridentata*) and tarbush (*Fluorensia cernua*). The CDS type occurs on loamy, calcareous, and gypsiferous soils. The CDS forms on the areas above the high-water marks of the playa lakes. These communities generally consist of sparse cover, low density, and low diversity.

Based on Dick-Peddie's (Dick-Peddie 1993) vegetation community classification system for New Mexico, two CDS communities (characterized by different vegetation patterns and species) were identified in the study area:

Larrea tridentata- *Acacia constricta*-*Gutierrezia sarothrae*. This community occurs primarily on shallow, calcareous soils. The community type includes a significant component of gypsophilic species. This community is often intermixed with *Larrea tridentata*- *Fluorensia cernua*-*Erioneuron pulchellum* communities, with the *Larrea tridentata*-*Acacia constricta*-*Gutierrezia sarothrae* community occupying the shallower soils. There are generally broad ecotonal areas at the boundaries with the CAB and Gypsum Bedrock communities.

3.1.3 Closed Alkali Basin (CAB)

The CAB community occurs along internally drained basins with broad, flat, or gentle slopes. The bottoms of the basins are generally low permeability, resulting in accumulation of salts as inflows evaporate. The CAB vegetation type occurs around the edges of the playa lakes and in the bottom of the drainages. The soils are extremely saline and often have a caliche layer near the surface. These communities are

dominated by halophytes (salt-loving species). The most common species include iodinebush (a.k.a., pickleweed, *Allenrolfea occidentalis*), black seepweed (*Suaeda nigrescens*), four-wing saltbush (*Atriplex canescens*), and alkali sacaton (*Sporobolus airoides*).

The CAB type occurs along all the playa lakes within the study area well above the ordinary high-water marks of the lakes. These communities generally consist of sparse cover, low density, and low diversity. Based on Dick-Peddie's vegetation community classification system for New Mexico, the two communities that exist in the study area are described below.

Allenrolfea occidentalis. This community is dominated by iodinebush and occurs above the ordinary high-water marks of the playa lakes and in the lower elevations of depressions that probably collect standing water after precipitation events. Near the lake edges there is a monoculture of iodinebush, which is dwarfed and scattered, but becomes more abundant farther from the lake edges as the salinity decreases. Near the boundary with the adjacent *Atriplex canescens* community, scattered patches of black seepweed and alkali sacaton exist. This community generally has less than 15 percent ground cover.

Atriplex canescens-Suaeda nigrescens- Sporobolus airoides. This community exists topographically above the iodinebush community. The vegetation is dominated by four-wing saltbush with black seepweed and alkali sacaton in the herbaceous layer. Although described as a riparian vegetation type, this community normally occurs on arid soils that contain standing water for only very brief periods following extreme precipitation events.

3.1.4 BLM Sensitive Species

There is habitat for one BLM New Mexico Sensitive species: the Scheer's pincushion cactus (*Coryphantha robustispina ssp. scheeri*). There are documented occurrences in Nash Draw, south of Laguna Uno. Golder performed a survey in May 2020 of potential habitat within the potentially inundated area and a 500-foot buffer. The survey followed CFO Special Status Plant Species protocols (BLM 2020). No individuals were found during the survey. Documentation is available in the project record. Figure 3-2 shows the area surveyed.

3.1.5 Impacts from the Proposed Action

Direct and Indirect Impacts

The main impact will be the additional habitat inundated by brine. A maximum of 88 acres of CAB and CDS vegetation will be converted to bare mineral soil.

Cumulative Impacts

The current project includes conversion of a maximum of 88 acres of CAB and CDS into bare mineral soils. Mosaic already has approximately 9,000 acres for various settling and evaporation ponds at this location. There are no active oil and gas wells in the area of the Salt Stack.

The CDS and CAB are not scarce habitat. The area inundated is a small fraction of the total CAB habitat on the CFO.

Mitigation Measures

No mitigation is required.

3.2 Wildlife

3.2.1 Affected Environment

The wildlife study area is defined as Nash Draw from the Salt Stack to Laguna Grande. Large ungulate species present in the region include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), and pronghorn (*Antilocapra americana*). Other mammals frequently identified in the area include coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), kangaroo rat (*Dipodomys spp.*), and various other small rodents and carnivores (Findley et al. 1975). Avian species observed within the region include Red-tailed Hawk (*Buteo jamaicensis*), Scaled Quail (*Callipepla squamata*), Burrowing Owl (*Athene cunicularia*), Roadrunner (*Geococcyx californianus*), and Chihuahuan Raven (*Corvus cryptoleucus*) (Peterson 1990). Common reptiles and amphibians are bullsnake (*Pituophis melanoleucus*), western diamondback rattlesnake (*Crotalus atrox*), coachwhip (*Masticophis flagellum*), Couch's spadefoot (*Scaphiopus couchii*), ornate box turtle (*Terrapene ornata*), yellow mud turtle (*Kinosternon flavescens*), collared lizard (*Crotaphytus collaris*), and the Texas horned lizard (*Phrynosoma cornutum*) (Degenhardt et al. 1996).

Dick-Peddie (1993) points out that the best vegetative conditions for wildlife habitat in the Chihuahuan Desert region are those that contain more grass and fewer shrubs. Very little habitat remains in the study area that can be considered good habitat in these terms, as most of it has been converted from grassland to shrubland through decades of overgrazing, soil erosion, and fire suppression. Today, most wildlife of the area is found in the denser brush of the CDS or in and around sources of fresh water. Relatively few species are found in the CAB habitat due to limited structural diversity and the chemical limitations caused by salt.

MIGRATORY BIRDS

Two migratory bird species on the USFWS Birds of Conservation Concern (BCC) list were identified as potentially occurring in the study area (IPaC Species List Appendix A): Black-throated Sparrow (*Amphispiza bilineata*) and Lark Bunting (*Calamospiza melanocorys*). Both species were observed during the 2018 shorebird survey. The New Mexico Avian Conservation Partners developed two conservation lists based on distribution, threats, global population size, New Mexico population trend, and importance of New Mexico to breeding or wintering. The two lists contain species that are of the highest conservation concern in New Mexico. Level 1 includes species of high conservation concern in either the SC or BC category (SC1 and BC1, respectively). For the most part, these are species facing moderate to severe threats and showing unknown or declining local population trends. They are considered to be species in need of immediate conservation action. Level 2 species are considered to be of moderate or potential conservation concern. Both species are listed as Level 2. The Lark Bunting prefers grassland habitats. It occurs in CDS but is considered non-breeding (The Cornell Lab 2000). Black-throated Sparrow's preferred habitat is arid desert hillsides and scrub (BISON 2020). Black-throated Sparrows are common in desert scrub habitat associated with washes, low hills, and alluvial fans, but avoid lowland desert floors or sinks (New Mexico Avian Conservation Partners 2020).

Two BLM New Mexico Sensitive species were observed during the shorebird surveys:

- Burrowing Owl (*Athene cunicularia*)
- Loggerhead Shrike (*Lanius ludovicianus*)

Both species were observed in CDS habitat outside (east and south) of the area predicted to be inundated (GL Environmental 2014, Golder Associates Ltd. 2019).

SHOREBIRDS

The mine is located along the migration pathway of migratory birds known as the Central Flyway. Because there is very little water in the west Texas/southeast New Mexico desert area, Laguna Grande and Laguna Uno attract significant numbers of migratory waterfowl, especially during the Fall and Spring migration seasons. Mosaic manages the risks to migratory birds posed by brine in Laguna Grande and Laguna Uno through hazing efforts as part of their Avian and Bat Protection Plan to minimize avian and bat mortalities (Golder 2004).

Shorebird surveys of the project area were performed in 2001, 2013, and 2018 (Barry 2001, GL Environmental 2014, Golder Associates Ltd. 2019). The 2001 and 2013 surveys used different methodologies; however, both surveys identified high-quality shorebird habitat along the eastern edge of Laguna Uno in section 19 (Figure 3-3). Barry (2001) identified approximately 41 acres of high-quality habitat. The 2014 survey described all of Laguna Uno and the existing clay settling area as high-quality shorebird habitat but did not quantify the area of high-quality habitat (Figure 6; GL Environmental 2014). The 2014 study also identified Laguna Quatro as high-quality habitat.

Barry (2001) surveyed the area shown in Figure 3-3 in June 2001 during the post-breeding period and identified four species of shorebird with a count of 137 individuals from 4 locations for an average of 34.25 individuals per sample point. The survey differed from the other surveys in that sampling was only conducted in the morning and was not replicated. At the area described by Barry as the Upper Playa, including a spring-fed “shorebird pond”, 21 individuals were recorded.

The 2013 survey included 66 survey points in Nash Draw. Five points were sampled along the east edge of Laguna Uno. During the four sampling events in the fall, 12 species of shorebird were recorded, totaling 1,290 individuals averaging 64.5 individuals/sample point per event. Six points were sampled at Laguna Quatro. During the four sampling events, six species of shorebird were recorded, totaling 410 individuals averaging 17.1 individuals/sample point per event.

The 2018 survey was conducted in the fall (4 sampling events) and identified 10 species of shorebird. The average number of individuals per survey along the eastern shore of Laguna Uno was 344 (Golder Associates Ltd. 2019). At the five survey points approximately corresponding to the five points along the east edge of Laguna Uno in the 2013 survey, 1,317 individuals were observed, averaging 69.3 individuals/sample point per event. At survey Point PC-11 (approximate location of Barry’s Upper Playa), 241 individuals were observed per survey. As Figure 3-3 shows, most of the individual observations were within the Laguna Uno clay brine footprint and outside of the area identified by Barry (2001) as high-quality shorebird habitat. Table 3.2.1 presents the shorebird observations during the 2018 survey.

Table 3.2.1: Shorebird Abundance and Species Richness within 200 m of Point Count Locations at Laguna Uno during 2018 Fall Survey

Common Name	Scientific Name	Abundance (Number of Individuals)				
		Replicate 1 (13 September)	Replicate 2 (27 September)	Replicate 3 (10 October)	Replicate 4 (24 October)	Total
Snowy Plover	<i>Charadrius nivosus</i>	7	6	30	10	53
Killdeer	<i>Charadrius vociferus</i>	-	-	-	-	-
Stilt Sandpiper	<i>Calidris himantopus</i>	-	-	1	-	1
Sanderling	<i>Calidris alba</i>	1	2	1	-	4
Dunlin	<i>Calidris alpina</i>	-	-	-	1	1
Baird's Sandpiper	<i>Calidris bairdii</i>	36	4	-	-	41
Least Sandpiper	<i>Calidris minutilla</i>	19	269	319	215	822
Semipalmated Sandpiper	<i>Calidris pusilla</i>	3	-	-	-	3
Western Sandpiper	<i>Calidris mauri</i>	107	111	52	32	302
Unidentified <i>Calidris</i> Sandpiper	n/a	-	-	90	-	90
Greater Yellowlegs	<i>Tringa melanoleuca</i>	-	-	-	1	1
Total Abundance (Number of Individuals)		173	392	493	259	1,317
Average Abundance (Individuals/Survey Location)		43.25	78.4	98.6	51.8	69.3
Species Richness (Number of Species)		6	5	5	5	10

3.2.2 Impacts from the Proposed Action

Direct and Indirect Impacts

TERRESTRIAL FAUNA

A maximum of approximately 82 acres of CAB habitat and six acres of CDS could be inundated. The habitat that would be inundated is sparsely vegetated and is poor habitat for terrestrial fauna due to elevated salinity.

SHOREBIRDS

Approximately 17 acres of the area identified in the 2004 EA as high-quality shorebird habitat will be inundated; however, the observations of shorebird use in the 2018 study (Golder Associates Ltd. 2019) indicate that the majority of the high-quality habitat is not utilized, rather shorebirds utilize the previously shallowly inundated area along the shore of Laguna Uno (Figure 3-3). The 2004 EA also documented shorebird use along the shallow inundated area. Therefore, it is anticipated that, as the inundated area extends to the east, the shorebirds will continue to use the shallow inundated area along the expanded shoreline of Laguna Uno.

The proposed action is not expected to affect shorebird habitat in Nash Draw below Laguna Uno and the CSP for several reasons.

The location of brine discharge will be distributed between the CSP and Laguna Uno. The volume of brine discharged to Nash Draw will not change. Therefore, potential to affect shallow groundwater in Nash Draw will not change.

Available water quality data (GL Environmental 2014) show that the existing near surface water quality (in particular salinity) in Nash Draw below the brine management area is similar to the salinity of the brine discharged to the brine management area. The 2014 shorebird report presents surface water quality for

Laguna Uno and Nash Draw playa lakes. Nash Draw Lagunas ranged from 14.9 to 32.3% total ions (approx. 149,000 to 323,000 milligrams per liter [mg/L] total dissolved solids [TDS]; average 252,700 mg/L TDS). Monitoring data for discharge from CSP down the 24-inch pipeline, during the same period, ranges from 107,000 to 275,000 mg/L (average 232,000 mg/L). Therefore, seepage from Laguna Uno or the CSP will not affect the salinity in Nash Draw or the shorebird habitat at Laguna Quatro.

Surface flow from Laguna Uno to Laguna Dos and Quatro is not expected. Surface flows from Laguna Uno will be controlled by berms. However, if flow occurs from an extreme event, the flows would not negatively affect the playas, because the salinity in Laguna Uno is similar to that existing near the playas (GL Environmental 2014).

MIGRATORY BIRDS

A potential, but small effect is expected to the two BCC listed migratory species. The Lark Bunting does not breed in the area. The Black-throated Sparrow breeds in the CDS. Approximately six acres of CDS habitat in the area will potentially be lost to inundation. There will be no surface disturbance (construction) in CDS habitat, so there will be no potential for mortality or destruction of nests for breeding birds. The six acres of habitat is a minimal fraction of the CDS habitat in the area.

Nests of the two BLM sensitive species, loggerhead shrike and burrowing owl, would not be affected, because there would be no earthwork within the potentially disturbed area. Both species utilize CDS habitat year-round (BISON 2020). The Burrowing Owl is known to utilize desert scrub but prefers areas of short vegetation and prairie dog burrows (BISON 2020). No prairie dog colonies are known in the area. The six acres of CDS that may be disturbed is a small fraction of the total CDS habitat in the Nash Draw.

Cumulative Impacts

BLM considered the incremental impact of the proposed action when combined with past, present and reasonably foreseeable future actions. Other actions identified include oil and gas exploration and fire suppression.

From 2013 to 2020, CFO has approved approximately 800 applications – to- drill each year. The nearly sterile drill/well pads are typically maintained for 10-20 years and in the recent past there was no mitigation until the well is terminated and the pad allowed to revegetate. The roads tend to last longer except the portion that is a spur terminating at the dry well pad. The cumulative well pads account for approximately 2,240 acres of habitat conversion to bare caliche each year. For the previous decade, the average was closer to 600 APDs/year (BLM 2018). There are no active or proposed well pads in the vicinity of the area that will be disturbed by the proposed action (NMOCD 2020).

Nearby habitat is also converted to scrub from decades of fire suppression; and other areas are temporarily converted to bare soil or early successional habitat by the ubiquitous buried pipeline projects which frequently take three years to recover. At this time, the inventory of road miles and buried pipeline acreage in the CFO is incomplete, so there can be no cumulative assessment of the loss of habitat associated with road construction. Approximately 80,000 acres per year are chemically treated to suppress mesquite and support prairie or shin-oak habitats; however, 80,000 acres per year is insufficient to maintain the 2 million acres of BLM surface on a 5- or even 10-year rotation.

Generally, habitat is progressively lost to fragmentation and conversion at a rate greater than reclamation. There are no active oil and gas wells in the vicinity of the area disturbed by the proposed action. The proposed project is a miniscule portion of the currently authorized impacts from potash and oil and gas production on the CFO and in the Trans-Pecos region.

Mitigation Measures and Residual Impacts

Mosaic currently implements a monitoring plan and hazing program on Laguna Grande and Laguna Uno. No residual impacts are expected, and no additional mitigation is required.

3.3 Threatened and Endangered Species (T&E)

3.3.1 Affected Environment

The Threatened and Endangered (T&E) species study area is defined as Nash Draw from the Salt Stack to Laguna Grande. An official list of species that are threatened, endangered, or proposed for listing were requested from the USFWS New Mexico Ecological Services Field Office in Albuquerque, New Mexico. The species list (Consultation #02ENNM00-2020-SLI-1519) is attached as Appendix A and summarized on Table 3.3-1. The USFWS list includes eleven species (four flora and seven fauna) listed as “federally threatened or endangered,” which potentially occur in Eddy County, New Mexico.

Table 3.3.1: Federally Threatened, Endangered, or Proposed Species NASH DRAW, NM (FWS Consultation #02ENNM00-2020-SLI-1519)

Common Name	Scientific Name	Federal Status
Krenzler's hedgehog cactus	<i>Echinocereus fendleri</i> var. <i>Kuenzleri</i>	Threatened
Lee's pincushion cactus	<i>Coryphantha [Escobaria] sneedii</i> var. <i>lee</i>	Threatened
Sneed pincushion cactus	<i>Coryphantha sneedii</i> var. <i>sneedii</i>	Threatened
Gypsum wild-buckwheat	<i>Eriogonum gypsophilum</i>	Threatened
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened
Texas Hornshell	<i>Popenaias popeii</i>	Endangered
Least Tern	<i>Sterna antillarum</i>	Endangered
Northern Aplomado Falcon	<i>Falco femoralis septentrionalis</i>	Endangered
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Pecos bluntnose shiner	<i>Notropis simus pecosensis</i>	Threatened
Pecos gambusia	<i>Gambusia nobilis</i>	Endangered

Four listed species (Mexican Spotted Owl, Lee's pincushion cactus, Kuenzler's hedgehog cactus, and Northern Aplomado Falcon) were determined to not exist in the study area due to lack of suitable habitat. The Mexican Spotted Owl occurs in mixed conifer forests and outlying areas directly adjacent to forested areas (USFWS 2008). Both cactus species are found on shallow limestone soils at elevations greater than 4,000 feet above mean sea level (BISON 2020). The Lee's pincushion cactus occurs on limestone shelves in the steep rugged terrain of the Guadalupe mountains. The Kuenzler's hedgehog cactus is found in Pinyon-juniper vegetation communities (BISON 2020). None of these habitat types exist in the vicinity of the proposed action.

Sneed pincushion cactus occurs in limestone areas of broken terrain and steep slopes in CDS. The only known locations in New Mexico are in Dona Ana County.

The Northern Aplomado Falcon prefers grasslands with dense grass cover and scattered shrubs and requires large amounts of avian biomass for foraging (BISON 2020). The current habitat in the project area has little grass cover and is barren or dominated by shrubs, which is not the preferred habitat for this species.

Southwestern Willow Flycatcher is associated with dense woody riparian and wetlands and riparian habitat (BISON 2020). No suitable habitat is found in the study area and no individuals were observed during field surveys (Marron and Associates 2000, Barry 2001, GL Environmental 2014, Golder Associates Ltd. 2019).

Least tern's preferred habitat is along freshwater rivers and streams where its preferred food-small fish are abundant and can be readily harvested (BISON 2020). Suitable areas with large densities of fish do not occur in the study area, largely due to high concentrations of salt.

Pecos gambusia is restricted to springs on the west side of the Pecos River. Pecos bluntnose shiner exists in the Pecos River north of Carlsbad (BISON 2020). No populations are known south of Carlsbad.

Texas hornshell is a freshwater mussel found in medium to large rivers. There is no suitable habitat in the study area (NMDGF 2020).

Gypsum wild buckwheat is restricted to almost pure gypsum that is sparsely vegetated. There is no suitable habitat and no populations have been identified in the study area, despite several surveys (Golder 2001, Marron and Associates 2000, and Knight 1993).

3.3.2 Impacts from the Proposed Action

Direct and Indirect Impacts

The area potentially disturbed by the proposed action contains no suitable habitat and no potential to impact Threatened and Endangered species or critical habitat.

Cumulative Impacts

Generally, habitat is progressively lost to fragmentation and conversion at a rate greater than reclamation. The proposed project is a miniscule portion of the currently authorized impacts from potash and oil and gas production on the CFO and in the Trans-Pecos region and arguably it is an insignificant contribution. No cumulative effects to Threatened and Endangered species would occur because no Threatened and Endangered species would be impacted by the proposed action.

Mitigation Measures and Residual Impacts

No mitigation is required.

3.4 Cultural Resources

3.4.1 Affected Environment

Pursuant to the BLM National Environmental Policy Act Handbook (BLM 1988), the proposed project must be reviewed for potential impacts on cultural resources protected by the Antiquities Act of 1906 (PL 59 209), the National Historic Preservation Act of 1966, as amended (PL 89-665), the Archaeological Resources Protection Act of 1979 (PL 96-95), and Executive Order 11593.

Most of the study area has been previously surveyed for cultural resources. BLM reviewed the previous studies and identified a 70-acre Area of Potential Effect (APE). Paleowest Resources (Paleowest) conducted a Class III Archeological Inventory of the study area in May and July 2020 (Paleowest 2020). In addition to the survey, the BLM requested the revisit and update of four previously recorded archaeological sites (LA98820, LA122048, LA122049, and LA122050) as well as the recording of a previously unrecorded archaeological site (LA196852) visible on aerial imagery.

The archaeological inventory of the survey area resulted in the discovery of four Isolated Manifestations (IMs) which are recommended not eligible for NRHP listing. Four archaeological sites were updated: LA98820, 122048, 122049, and 122050. LA98820 was separated into two archaeological sites (LA98820 and LA197356). LA122048 and LA 122049 are considered or presumed destroyed. LA122050 was relocated and found to be essentially the same as the previous recording. A new archaeological site (LA196852) located outside the survey was recorded at the request of the BLM. The National Register of Historic Places (NRHP) eligibility of the archaeological sites was evaluated under criteria set forth in 36 CFR 60.4 and provided in the BLM Manual 8100-1.

The eligibility evaluations resulted in LA98820 and LA197356 being recommended as eligible for inclusion in the NRHP. LA197356 is outside the APE for the project and no additional management is recommended. The portion of LA98820 within the APE was shovel tested and all shovel tests were negative. This portion has previously been impacted by fluctuating lake levels as well as previous archaeological testing. Although LA98820 will be impacted, the portion of the site to be impacted does not contribute to the site's eligibility. Therefore, no additional management is recommended for this site. LA122050 is recommended not eligible for inclusion in the NRHP. LA196852 is recommended undetermined for inclusion in the NRHP. LA122049 was not relocated and is presumed destroyed. LA122048 was relocated and is highly disturbed; the site should be considered destroyed. As such, no official NRHP eligibility recommendation can be made for these two sites. The IMs are recommended not eligible for inclusion in the NRHP, and data collected on those items during survey has essentially exhausted their research potential.

Listings of the State Register of Cultural Properties (SRCP) and the NRHP were also consulted. No listed properties in the SRCP or the NRHP are in or near the Project Area.

3.4.2 Impacts from the Proposed Action

Direct and Indirect Impacts

PaleoWest recommended site LA98820 and LA197356 as eligible for inclusion in the NRHP. LA197356 is outside the APE while the portion of LA98820 within the APE is non-contributing. All remaining sites are outside the APE and will not be affected by the proposed action. LA196852 is recommended as undetermined for the NRHP pending additional research on the site and its local significance as a WWII air force target, but is outside the APE and will not be affected by the proposed action.

The implementation of the management recommendations presented by PaleoWest will result in no adverse effect to historic properties within the Brine Management project area.

Cumulative Impacts

No cumulative effects to cultural resources would occur because no cultural resources would be impacted by the proposed action.

Mitigation Measures

If undocumented cultural resources are discovered during construction anywhere within the survey area, construction would immediately cease, and the appropriate land managing archaeologist would be contacted. No work would occur within 100 feet (30 m) of the discovery until further notice from the given land managing agency is provided. If human remains are encountered during the project, excavation must cease in the vicinity and the appropriate law enforcement and land managing agency be contacted immediately.

3.5 Water Resources

3.5.1 Affected Environment

The water resources study area is defined as Nash Draw from the Salt Stack to Laguna Grande including the area between Laguna Grande and the Pecos River.

3.5.1.1 Surface Water Resources

3.5.1.1.1. Climate

Southeastern New Mexico is an arid to semi-arid region on the fringe of the Chihuahuan Desert that receives approximately 12 inches of precipitation annually (Hunter 1985). Over 75 percent of the precipitation normally falls between May and October and is derived from convection storms which are fed by summer monsoon flows of moisture from the Gulf of Mexico. Winter precipitation is generally of

little consequence, averaging one-half inch per month or less for the period of November through March. Snowfall in the area is generally quite low, averaging approximately 3.25 inches per year for the Carlsbad station, little of which remains on the ground for any length of time.

Design storm events have been developed for the site, using the Precipitation Frequency Atlas of the western United States (NOAA Atlas 14 Volume 1, Version 5.0 2011) for 6-hour and 24-hour re-occurrence interval storm depths and the probable maximum precipitation estimates (developed using CO-NM REPS GIS Tool 2018) for the probable maximum precipitation (PMP) storm depths as shown below on Table 3.5.1. The PMP values in Table 3.5.1 apply to the entire SWLGD watershed, about 370 square miles.

Table 3.5.1: Design Storm Depths for Nash Draw, Eddy County, New Mexico

Duration	Storm Re-occurrence Period						
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	PMP
2-hr.							8.94"
6-hr.	1.80"	2.40"	2.88"	3.56"	4.11"	4.69"	13.40"
24-hr.	2.18"	2.92"	3.52"	4.36"	5.04"	5.77"	14.58"
72-hr.							19.34"

The region has high rates of evaporation, with over 100 inches of Class A pan evaporation per year, eight to 10 times greater than precipitation, and monthly evaporation rates of approximately four to six inches per month during the winter months and 13 to 18 inches per month during the summer months.

3.5.1.1.2. Drainage Basin Characteristics

Drainage basins in the immediate vicinity of the surface water study area are dominated by karstic subsidence features, which produce large, closed basins. The study area includes the southern portion of Nash Draw in the area between the Salt Stack to the North and the Pecos River to the south. Within these closed basins, smaller depressions exist that do not regularly contribute surface water to the overall basin watershed, except when the area is inundated by large storm events. Drainages in the basins typically have relatively steep but moderately channeled headwaters. These headwaters rapidly transition into broad alluvial plains, which convey the water to ephemeral drainages which in turn typically lead to a closed drainage basin. Many of the closed drainages contain ephemeral playa lakes. Others are drained by sinkholes or open fissures. A basin delineation map for Nash Draw is shown in Figure 3.5-1, based on topographic mapping, aerial photos, and limited field reconnaissance. Those watersheds that were identified as closed and not directly contributing to the playa lakes or facilities within the study area are differentiated in this map from contributing watersheds.

The study area is bounded on the southwest by the Pecos River, which in the vicinity of the study area has a drainage area of approximately 18,800 square miles. Nash Draw is a closed basin and does not contribute runoff to the Pecos River watershed.

3.5.1.1.3. Stream Flow

The closest point of the Pecos River is southwest of Laguna Grande at approximately river mile 440.6, as estimated from the river distance downstream of Brantley Dam which is located at river mile 478.5. A major tributary of the Pecos River, the Black River, enters the Pecos River near the study area at river mile 436.2. Flows within the Pecos River are strongly controlled by two upstream dams operated by the U.S. Bureau of Reclamation, the Avalon Dam approximately 3 miles north of Carlsbad and the Brantley Dam approximately 11 miles northwest of Carlsbad. Both dams allow the diversion of significant amounts of stream flow for irrigation. There is no other significant diversion between these dams and the state line. Additional low head dams along the Pecos divert water for irrigation use. Mean annual flow in the Pecos River for 2020 ranged from 93.4 cubic feet/second (cfs) at the Carlsbad Main Canal at Head near Carlsbad (USGS 08403500) to 117.7 cfs below Brantley Dam (USGS 08401500). Mean annual flow in

the Pecos River for 2020 ranged from 20.4 cfs below Dark Canyon (USGS 08405200) to 53.1 cfs near Malaga (USGS 08406500). A mean flow of 0.123 cfs was reported below the Avalon Dam in the Pecos River (USGS 08404000) in 2020 (USGS WaterWatch).

There are no major perennial streams within the study area. Some of the playa lakes are connected by drainage ditches constructed by the New Mexico Highway Department. Several short, well-defined arroyos exist within the study area, but flow only in immediate response to significant precipitation events.

3.5.1.1.4. Surface Water Use

Approximately 60 percent of all water use in Eddy County is supplied by surface water, and of the total water use approximately 85 percent is associated with irrigated agriculture (NMOSE 2019). Estimates based on water use analysis performed by the NMOSE (Wilson 1997) indicate that approximately 27.0 million gallons per day (Mgal/day) of water is returned to surface water in Eddy County, approximately 26.5 Mgal/day of which is returned to the Upper Pecos-Black River watershed.

3.5.1.1.5. Surface Water Quality

The Pecos River is the only source of potable surface water in the vicinity of the study area. The quality of the water is fair, and it is used extensively for irrigation upstream of the study area. There are no surface water diversions within or downstream of the study area to the state line. The water quality in the Pecos River consistently increases in salinity as it flows south through New Mexico due to a number of influences, including irrigation runoff, wastewater discharges, natural evaporation, and inflows of naturally briny groundwater. From Malaga Bend downstream, Pecos River water is of limited utility due to high salinity.

There are no indications that any of the surface waters within the study area reach the Pecos River. Electrical conductivity surveys (IMC 1998, 2001) performed along the Pecos River adjacent to the study area show that the river salinity does not change significantly until the Malaga Bend area, approximately five miles down-gradient from the study area (Figures 3.5-2 and 3.5-3). Published studies (Robinson and Lang 1938, Theis 1942) indicate that discharge of brine from the “brine aquifer” (Unnamed Member of the Rustler Formation) to the Pecos River occurs in the Malaga Bend area. Further investigations conducted by Brokaw et al. (1972) have also relied on this conclusion.

The salt concentration in the Pecos River in the vicinity of the study area apparently has dropped slightly since the initiation of the mining activities in Nash Draw. Based on U.S. Geological Survey (USGS) data from 1960 through 2020 at the Pecos River near Malaga station (USGS 08406500), a slight decrease in the salt concentration can be observed over the last 60 years.

3.5.1.1.6. Local Surface Water Hydrology

The surface water study area comprises much of the southwestern portion of Nash Draw and extends to the Pecos River. As shown in Figure 2-1, the Mosaic processing facility is at the northern edge of the study area. Extending southwards from the plant is the Salt Stack, where solid-phase salt and clay tailings are deposited. The Salt Stack gradually transitions to the clay settling area where the finer clay portions of the tailings settle out, and this terminates at the CCSD. South of the tailings area is a circular chain of playa lakes. Counterclockwise from the northernmost, these features are commonly called Laguna Dos, Laguna Cuatro, Laguna Tres, Tamarisk Flats, and Lindsey Lake. Laguna Grande, in the southern half of the hydrologic study area, is the ultimate hydrologic sink for Nash Draw.

3.5.1.1.7. Watershed Characteristics

The surface water study area is entirely within the lower portion of Nash Draw and is typical of a karstic closed basin watershed. The stream network is poorly defined, many waters are ephemeral, and connections between waters are few and temporary. Channels typically form narrow arroyos that transition rapidly to broad alluvial fans.

For the purpose of stormwater run off analysis, partially-isolated watersheds or closed basins have been identified and delineated within Nash Draw (Figure 3.5-1). Estimation of appropriate runoff coefficients

have included an assessment of the reduction in the runoff volume due to both closed basin features within the Nash Draw basin and subsurface karstic features. The most current basin delineation in 2020 indicates that the total area contributing runoff to the Laguna Grande basin is approximately 368 square miles. The most recent estimate of stormwater runoff volume reporting to SWLGD is 10,542 acre-feet for the 100-year, 24-hour event (Golder 2020).

3.5.1.1.8. Major Surface Water Bodies within the Study Area

There are seven significant depressions and playa lakes within the surface water study area, including Laguna Uno. These lakes can be characterized as shallow, saline playa lakes, supplied by runoff and groundwater discharge. The playa lakes show a consistent drop in elevation from northeast to southwest, from Laguna Uno (3,011 feet above mean sea level [ft-amsl]) to Laguna Grande (2,956 ft-amsl). Descriptions of the depressions and playa lakes in the surface water study area are provided in Table 3.5.2.

Table 3.5.2: Surface Water Bodies

Playa Lake or Depression	Aerial Extent (acres)	Average Depth (feet)	Watershed Area (acres)	Comments
Laguna Uno	300 (summer) to 700 (winter)	2	8,600	Laguna Uno is a natural depression and currently serves as the evaporation pond for Mosaic's tailings brine under upset conditions.
Laguna Dos	75	<1	2,000	Water levels are fairly stable through the year indicating connection with shallow groundwater.
Laguna Cuatro	185	<1	1,600	Connected by a ditch to Laguna Tres.
Laguna Tres	Dry (summer) 900 (winter)	<1	2,500	
Lindsey Lake	110	Unknown	110	Lindsey Lake has overflow discharge to Tamarisk Flats.
Tamarisk Flats	215	<1	6,300	
Laguna Grande	3,200 (including area used in salt harvesting)	2	5,600 north 8,000 south	Salt harvesting occurs on the southern portion of the lake and water levels are controlled by pumping, construction of dikes, and evaporation.

The water quality of the playa lakes was investigated in 2001 as part of the Hydrogeology Baseline Study (Golder 2002a), and they have been sampled periodically by mine personnel. All of the playa lakes contain poor quality water and are generally slightly more saline than the tailings brine. As shown on Figure 3.5-4, the median TDS concentrations of the individual playa lakes are shown to be slightly greater than the tailings brine. Available water quality data for the playa lakes is presented in Appendix B.

3.5.1.1.9. Springs and Seeps

The majority of non-mining related surface water flow within the study area is generated by springs and seeps, which were investigated in 2001 as part of the Hydrogeology Baseline Study (Golder 2002a) and are sampled periodically by mine personnel. All of the springs observed flow independently of precipitation events, and all of the springs and seeps are typically of very poor quality but are generally less saline than the tailings brine. The springs investigated in 2001 included the following:

Surprise Spring. Surprise Spring is located in the northern end of Laguna Grande. It has been mentioned in documents dating to the early-1900s, so presumably predates any mining activities in the area. Flow from Surprise Spring was estimated at 200 gallons per minute (gpm) and is not believed to vary significantly seasonally (Lambert and Harvey 1987). Chemical analysis of the spring discharge indicates a relation to the local surface water and tailings brine discharge (Lambert and Harvey 1987).

Seeps East and Northeast of Laguna Grande. A series of Rustler Formation outcrops seep small amounts of water to Laguna Grande during much of the year. The seeps are distributed over an area along the northeast side of the lake and the rate of discharge is difficult to estimate.

Springs Near Lindsey Lake. A series of small springs along the northern end of Lindsey Lake provides a constant source of inflow to this lake. The springs are located near a steep section along the western divide of Nash Draw. Estimated flow is approximately 125 gpm. Other springs occurring along the eastern side of the lake may be related to seepage from Laguna Uno.

Springs North and East of Laguna Uno. North of Laguna Uno and east of the clay settling area, springs emerge from the Tamarisk Member for about one mile along the eastern edge of the tailings. The springs ultimately discharge into Laguna Uno. The total discharge from the springs is estimated at approximately 900 gpm. Similar to other springs in this area of Nash Draw, the discharge is quite saline, but is less concentrated than the mine tailings discharge.

All of the springs and seeps contain poor quality water and have salinity levels within the ranges observed in the tailings brine. As shown on Figure 3.5-5, the median TDS concentrations of the individual springs generally fall within the 250,000 to 360,000 mg/L range. Two exceptions are the Section 19 Pond spring located north and east (upgradient) of Laguna Uno at approximately 152,000 mg/L and the Laguna Dos spring located south and east (cross gradient) of Laguna Uno at approximately 151,000 mg/L. Available water quality data for the springs is presented in Appendix B.

3.5.1.1.10. Tailings Brine Water Chemistry

The major ion composition of the Mosaic tailings discharge is presented in Appendix B. The TDS concentrations of tailings brine samples collected between 2012 and 2020 range between 107,000 to 401,000 mg/L (Figure 3.5-4). More recent brine samples from 2020 showed a decrease in TDS concentrations with measured values between 269,000 mg/L (June 2020) and 284,000 mg/L (December 2020). Both of these values fall within the range of TDS values measured in the brine samples historically at the site.

3.5.1.2 Groundwater Resources

3.5.1.2.1. Hydrogeologic Setting

The groundwater study area comprises much of the southwestern portion of Nash Draw and extends to the Pecos River. The geologic map of the southern Nash Draw is shown on Figure 3.5-6, and Figure 3.5-7 presents a shallow stratigraphic column that was developed based on individual geologic units encountered within the Mosaic monitoring well network and nearby wells and soil borings. Additional descriptions of each of the geologic units are provided with the shallow stratigraphic column and are based in part on information provided in various hydrogeologic reports specific to the Nash Draw area (Vail 2012 and 2014, Vine 1963). As shown on Figure 3.5-7, the geologic units immediately underlying the study area consist of the Permian Rustler Formation and Quaternary deposits. Geologic cross sections for the study area are provided in Figures 3.5-8, 3.5-9, 3.5-10, 3.5-11, and 3.5-12. The base for the groundwater system underlying Nash Draw is considered to be the top of the Salado Formation at a depth between 300 to 500 feet below ground surface. The salt of the Salado Formation has a very low permeability, and the weight of the overburden is sufficient to cause plastic flow of the salt and prevent the development of cracks and crevices (Hendrickson and Jones 1952), resulting in a low permeability which prevents vertical communication with underlying units.

A generalized subdivision of the Rustler Formation is provided in Figure 3.5-7. Primary components are gypsum and/or anhydrite, with dolomitic limestone, siltstone, and halite. In the majority of Nash Draw, the upper section of the Rustler formation is eroded down to the Tamarisk Member, although the overlying Magenta Member is exposed along the lateral borders of Nash Draw. Surficial sediments are also present locally. Hydrogeological units within the Nash Draw above the Salado Formation are discussed in following sections.

3.5.1.2.2. Rustler Formation

Lower Member (Unnamed Member). The lower, Unnamed Member of the Rustler consists of about 100 feet of siltstone, mudstone, and gypsum with its top about 200 feet below ground surface. The member is believed to be, in part, the residuum of dissolution of the upper part of salt of the underlying Salado Formation (Robinson and Lang 1938). The Salado Formation, which underlies the Rustler Formation, is composed principally of halite with minor amounts of shale. Subsidence in Nash Draw and at Laguna Grande is attributed to dissolution of halite, anhydrite and gypsum in the Rustler and Salado Formations, as well as dissolution of the Magenta Dolomite and Culebra Dolomite Members of the Rustler Formation. The lower part of this unit is locally a water-bearing zone isolated from the overlying Culebra Dolomite Member. This is the “brine aquifer” (Robinson and Lang 1938, Havens and Wilkins 1980) and contains brines with a TDS concentration of 218,300 mg/L (Kelly 2000). Although the “brine aquifer” has sufficient yield to be classified as an aquifer, the water quality does not meet drinking water standards (Golder 2002b), and the groundwater quality standards in 20.6.2.3101 and 20.6.2.3103 NMAC do not apply for this unit.

Culebra Dolomite Member (Culebra). The Culebra Dolomite is a relatively permeable dolomite and limestone unit with minor anhydrite and/or gypsum lenses, this unit has been identified as the principal water-bearing units in the vicinity of the Nash Draw. In the study area it is 30 to 40 feet thick, with its top between 5 to 50 feet below ground surface. In the study area the Culebra Dolomite Member contains brines with TDS values of 232,200 to 424,000 mg/L and thus the groundwater quality standards in 20.6.2.3101 and 20.6.2.3103 NMAC do not apply for this unit (Appendix B).

Tamarisk Member (Tamarisk). The Tamarisk Member consists of 0 to 120 feet of anhydrite and gypsum with some fine-grained clastics. This unit is exposed in the southern section of Nash Draw. Laguna Uno is located within this unit and therefore potential seepage from this pond may migrate within this unit, due to its karstic nature and discharge into underlying units. The unit is generally a confining unit, except for flows in isolated fissures and caverns.

Magenta Dolomite Member (Magenta). The Magenta Dolomite is a 20-foot thick, pink dolomite, interlaminated with pale-green anhydrite. The Magenta Dolomite is present in outcrops along the sides of Nash Draw. Only scattered, broken remnants remain on the floor of the draw. Cooper and Glanzman (1971) noted that the Gatuna Formation and the Magenta Dolomite may yield small quantities of water to wells in Nash Draw; the Culebra Dolomite was identified as the principal water-bearing unit in the area. Where present in the study area, this unit is above the water table.

Forty-niner Member (Forty-niner). The Forty-niner Member consists of 40 to 65 feet of gypsum siltstone and anhydrite along the margins of the study area. It is not present in the middle and southern portion of the study area. This unit is generally considered as a confining unit when present below the water table.

3.5.1.2.3. Quaternary Deposits

Of the Quaternary rocks in the investigated area, the Gatuna Formation of Pleistocene age, and the playa lake deposits, alluvium, and caliche of Holocene age are the only units that contain water. The volume of water in these sediments varies but is generally believed to be quite small.

Gatuna Formation. The Gatuna Formation is generally not more than about five feet thick, but locally reaches a thickness of 200 feet (Hendrickson and Jones 1952). Observed precipitous lateral changes in thickness, as well as mixed lithology have led some workers to conclude that the Gatuna is generally associated with collapse features (Geohydrology Associates 1979). In general, the Gatuna Formation consists of moderate reddish-orange friable sandstone, siltstone, and conglomerate. Because of its erratic distribution, there is no known continuous saturated zone within the Gatuna Formation (Mercer 1983). The conglomerate unit within the Gatuna Formation occurs in discrete, discontinuous lenses and does not occur as a continuous hydrostratigraphic unit in the area between Laguna Grande and the Pecos River. It is important to note that these conglomerate lenses containing potentially perched groundwater are discrete, disconnected zones that do not represent a single continuous hydrostratigraphic layer. TDS concentrations observed in wells completed with the conglomerate are generally high, with concentrations ranging between approximately 125,000 and 358,000 mg/L.

Caliche. Caliche is a near-surface accumulation of calcareous and clastic material that forms a resistant mantle. Its thickness varies, from 0 to 32 feet thick around, to the west and south of Laguna Grande (Golder 2002b). Where present in a depressed area with a high water table, it may locally act as a water-bearing unit. TDS concentrations within the caliche are shown to range from approximately 65,000 to 115,000 mg/L and thus the groundwater quality standards in 20.6.2.3101 and 20.6.2.3103 NMAC do not apply for this unit.

Surficial Deposits and Alluvium. The surficial deposits are composed of locally derived material deposited by sheet wash or by discontinuous arroyos. These deposits are present throughout the region and usually are only a veneer over the underlying bedrock. Stream deposited alluvium is present along the Pecos River, mostly along the west side of the river. The alluvium is composed of sand, gravel, silt, and clay and is as much as 200 feet thick. Playas within the study area contain alluvium and eolian sands that have been reworked by shallow lake waters. Playa deposits consist of silt, sand, and gypsum with deposits that can exceed 55 feet at Laguna Grande (Robinson and Lang 1938).

Where present, water associated with the surficial deposits is perched or semi-perched, spotty, and greatly dependent on local conditions. The water in the playa deposits usually is localized and water movement is restricted. Groundwater within the alluvium is generally of better water quality, with TDS concentrations typically below about 7,000 mg/L.

3.5.1.2.4. Shallow Groundwater System

The groundwater impacted by the proposed action is confined to the shallow groundwater system and includes the Culebra and Quaternary deposits. Within the study area, groundwater flow is typically described in four separate geographical areas as shown on Figure 3.5-6. These areas include the following:

- The northern area - from the Mosaic tailings (Salt Stack) to Laguna Grande
- The central and eastern area - Laguna Grande and its surroundings
- The area to the west of Laguna Grande
- The area to the south of Laguna Grande

Groundwater in the Northern Area. The tailings and the playa lakes are located on top of the gypsum of the Tamarisk Member, which contains dissolution features. The Culebra underlies the Tamarisk and contains water that is interpreted to be related to the playa lakes (Lambert and Harvey 1987). The flow from the Tamarisk to the Culebra may occur vertically downward through the gypsum or it may discharge laterally through playa lake deposits in contact with the underlying Culebra in locations where the Tamarisk is not present. Three piezometers were installed at locations east and west of the Salt Stack, and immediately downgradient of the Salt Stack Contingency Dike in 2013 and are monitored as part of the DP-1399 program. The boring logs and well construction logs for the three piezometers indicate that they are all completed within the Tamarisk Member of the Rustler Formation. Available water quality data for these piezometers indicates that the TDS concentrations range from approximately 190,000 mg/L (western piezometer) to approximately to over 300,000 mg/L (eastern and central piezometers). The water quality does not meet drinking water standards (Golder 2002b), and the groundwater quality standards in 20.6.2.3101 and 20.6.2.3103 NMAC do not apply for this area.

In the southern portion of the northern area, there is evidence that the groundwater in the Culebra is influenced by surface water. In well WIPP 29, about 4,000 feet north of Laguna Grande, where the Culebra Dolomite is at a depth of about 12 feet below ground surface, even though the water is under confined conditions its chemical and isotopic compositions suggest influence from surface runoff, playa-lake waters, and “nearby potash refining operations” (Lambert and Harvey 1987).

Groundwater in the Central and Eastern Area. The direction of groundwater flow in the central and eastern area has been determined from the potentiometric contour map of the area (Figure 3.5-13). The data on which this map is based are water levels measured in the wells drilled during the Golder

Hydrogeology Baseline Study (Golder 2002b). Geological cross sections through this area are presented in Figures 3.5-8, 3.5-9, 3.5-10, 3.5-11 and 3.5-12.

In all wells tested the water levels in the central area were found to be above or at Laguna Grande level, indicating the potential for discharge of the groundwater to Laguna Grande. Discharges of springs and seeps to Laguna Grande are visible, particularly along the northeastern and northwestern portions of the lake.

Well LG-11, drilled to the east of Laguna Grande (Figure 3.5-13) and outside the impact of the playa lakes, contained water with comparatively low salinity (TDS = 14,731 mg/L) and a water level lower than the Laguna Grande wells (LG-22 and LG-7A) to the west of it (Golder 2002b). Based on these observations, it is interpreted that impacts from the playa lake waters and the discharges from the potash mining industry is limited to the topographically low areas adjacent to the playa lakes, and that these waters do not communicate with water bodies in the topographically elevated areas along the eastern boundaries of Nash Draw.

In well LG-10 drilled to the east of Laguna Grande (Figure 3.5-13), the Culebra Dolomite Member was found to be dry. The Culebra in this well is slightly elevated (about 30 feet higher than in LG-9, 1,000 feet to the northeast). This offset acts as a barrier in the Culebra Dolomite Member, creates a barrier to the flow in this unit (the only water bearing unit in this area) to the west.

The TDS concentrations for the wells located nearest Laguna Uno in the vicinity of Laguna Grande and Laguna Tres are shown on Figure 3.5-14 in relation to the tailings brine TDS concentrations. As shown, the TDS concentrations of wells LG-8a, 8b, 8c, and LG-12 generally fall within the 228,000 to 326,000 mg/L range. These values fall within the range of TDS values measured in the brine samples historically at the site. For the wells located immediately east (LG-7a, 7b) and west (LG-9a, 9b) of Laguna Grande, the TDS concentrations are relatively lower, ranging between approximately 53,400 and 127,000 mg/L.

Groundwater in the Western Area. The area west of Laguna Grande and adjacent to the Pecos River is underlain by alluvial river deposits, playa lake sediments, and caliche. The Gatuna Formation is the principal shallow water-bearing unit in the western area. The Gatuna Formation unit is composed of locally-derived fluvial sand, silt, clay, and some gravel that were generally transported short distances from outcrops of sandstone, shale, and limestone adjacent to Nash Draw. Some of the gravels within the Gatuna Formation are of mixed meta-sedimentary or igneous lithology, indicating a more distant source. The Gatuna Formation is characterized by numerous caliche development zones which are similar in texture, mineralogy and age to caliche zones that are common in the Ogallala Formation. The unit locally has high permeability where well-sorted gravelly or cobbly zones are present (Brokaw et al. 1972). Since Gatuna Formation fluvial materials were deposited over an irregular surface, thickness and texture are irregular and textural subunits are laterally discontinuous. The available soil boring logs and water level and water quality data associated with the Mosaic monitoring well network and nearby wells and soil borings suggest that there is a possibility of discrete water-bearing units existing within the Gatuna Formation between Laguna Grande and the Pecos River. In particular, wells screened within the discontinuous conglomerate lenses within the Gatuna Formation appear to show confined/semi-confined characteristics, with water levels observed to rise several tens of feet when the formation is penetrated during drilling. It is important to note that these conglomerate lenses containing potentially perched groundwater are discrete, disconnected zones that do not represent a single continuous hydrostratigraphic layer. In contrast, the undifferentiated silt, clay, and sand water-bearing unit within the Gatuna Formation appears to be a single continuous hydrostratigraphic layer and unconfined based on drilling logs that indicate that the static groundwater levels observed after individual wells are completed are near the levels observed during drilling.

Between 2001 and 2020, 14 monitoring wells (LG-1, LG-2, LG-3, LG-4, LG-25, LG-26, LG-27, LG-28, LG-29, LG-30, LG-31, LG-32, LG-34, and LG-35) were installed in the area to the west and south of Laguna Grande (Figure 3.5-15). The January 2021 potentiometric surface indicates a southwesterly groundwater flow direction toward the Pecos River in the area of monitoring wells LG-1, LG-26, LG-30, and LG-32, that then transitions to a southerly or south-southeasterly gradient near wells LG-25, LG-34,

and LG-35 (Figure 3.5-15). TDS concentrations observed in wells completed within the conglomerate are generally high, with concentrations ranging between approximately 125,000 and 358,000 mg/L. TDS concentrations within the caliche are shown to range from approximately 65,000 to 115,000 mg/L. Thus, the groundwater quality standards in 20.6.2.3101 and 20.6.2.3103 NMAC do not apply for these two units. Groundwater within the alluvium adjacent to the Pecos River is generally of better water quality, with TDS concentrations typically below about 7,000 mg/L.

Available surface water and groundwater elevation data in the area suggests that the stretch of Pecos River near LG-25 is a gaining stretch where the underlying shallow water-bearing unit is contributing to surface water in the area. In contrast, the stretch of Pecos River near LG-30 appears to be a losing stretch where the surface water in the Pecos River is contributing to the underlying shallow water-bearing unit in the area. The area near well LG-26 appears to be both gaining and losing depending on the time of year. Mosaic collects surface water quality samples from three sampling stations on the Pecos River within the western area designated as River 1, River 2, and River 3. The constituent concentration trends at all three Pecos River sampling locations show seasonal fluctuations with both decreasing and increasing trends, depending on season, as opposed to a long-term increasing trends. For example, constituent concentration trends at station River 1 show a seasonal increase between August 2013 and April 2014, but then the trend reverses and constituent concentrations decrease between April 2014 and October 2014. All three Pecos River sampling locations show these same seasonal fluctuations over time. TDS concentrations specifically fluctuate between about 3,200 and 5,700 mg/L.

Groundwater in the Southern Area. South of Laguna Grande, in wells LG-5a and LG-23, the Culebra, which is the only water bearing unit in this area, contains water that has a similar chemical and isotopic composition to Laguna Grande brine (Golder 2002b). Available water quality data for these two wells indicates that the TDS concentrations range from approximately 250,000 mg/L at LG-23 to over 400,000 mg/L at LG-5. Further to the south, one mile north of Malaga Bend, the Culebra was found to be dry in well LG-24. Based upon the drill hole data and surface mapping it is interpreted that the Culebra Dolomite is elevated by one or more faults, and as a result does not contain water south (about 1.2 miles south of Laguna Grande) of the southern boundary of Nash Draw. If the southern Nash Draw boundary forms a groundwater flow boundary, then the presumed pathway of the groundwater flow from the Culebra south of Laguna Grande is to the west, toward the alluvium bordering the Pecos River. Water from the Culebra probably mixes in the low-permeability alluvium with fresher water from the Pecos River and from local recharge. There is no indication that the briny groundwater is reaching the Pecos River.

Electrical conductivity surveys performed along the Pecos River adjacent to the study area (IMC 1998 and 2001) show that the river salinities remain essentially constant from north of Nash Draw to the Malaga Bend area, approximately 15 river miles downstream from the proposed action. No springs or seeps were observed in this segment of the river during the course of the surveys. These surveys support the results of earlier hydrologic studies of the area. These studies conclude that discharge of brine to the Pecos River in the Malaga Bend area is from the “brine aquifer” in the lower member of the Rustler Formation, which is isolated from the overlying shallow water bearing units and Laguna Grande (Robinson and Lang 1938, Havens and Wilkins 1980, and Kelly 2000).

Based on USGS survey data from 1960 through 2020 at the Pecos River near Malaga station (USGS 08406500), a slight decrease in the salt concentration can be observed for the last 60 years. Based on USGS survey data for Malaga Bend (USGS 08406500), from 1960 to 2013 a decrease in specific conductivity and in concentrations of potassium, chloride, and sodium has been documented. The decrease presumably results from increased management of the river by irrigation and flood control dams. This decrease in concentrations corresponds with a time period in which the salt volume discharged in Nash Draw from the potash mining industry increased. Taken as a whole, published and unpublished data indicate that potash mining in Nash Draw has not degraded Pecos River water quality.

Groundwater Supply. Due to the highly mineralized water in the study area, there are no known potable water supply wells. There is a non-potable water supply well in the alluvium along the east side of the Pecos River that supplies process water for salt harvesting operations in Laguna Grande. Otherwise, there are no known water supply wells in the alluvium on the east side of the river from NM Highway 31

downstream to the state line. Water from the Culebra is used for irrigation regionally. However, the Culebra aquifer produces only brine in Nash Draw and is not used for water supply.

3.5.2 Impacts from the Proposed Action

Direct and Indirect Impacts

SURFACE WATER:

All of the playa lakes contain poor quality water and are generally slightly more saline than the tailings brine. As shown on Figure 3.5-4, the median TDS concentrations of the individual playa lakes are shown to be slightly greater than the tailings brine. The maximum observed TDS values for Laguna Uno and Laguna Tres exceed the maximum TDS values for the brine. Therefore, we conclude that discharging brine at Laguna Uno would have no deleterious impacts to the downgradient playa lakes.

SPRINGS AND SEEPS:

All of the springs and seeps contain poor quality water and have salinity levels within the ranges observed in the tailings brine. As shown on Figure 3.5-5, the median TDS concentrations of the individual springs generally fall within the 250,000 to 360,000 mg/L range. Two exceptions are the Section 19 Pond spring located north and east (upgradient) of Laguna Uno at approximately 152,000 mg/L and the Laguna Dos spring located south and east (cross gradient) of Laguna Uno at approximately 151,000 mg/L. The median TDS values from Laguna Uno Springs and Tamarisk Flats Springs are above the median brine discharge value, while Lindsey Lake Springs, Laguna Tres Springs, Surprise Spring, and Laguna Grande Springs are less than the median brine discharge value, but still within the range of observed brine TDS concentrations. Additionally, it is important to note that all of the observed TDS concentrations for Laguna Uno are greater than the median brine TDS value. Therefore, we conclude that discharging brine at Laguna Uno would have no deleterious impacts to the downgradient springs and seeps in Nash Draw.

GROUNDWATER:

The TDS concentrations for the wells located nearest Laguna Uno in the vicinity of Laguna Grande and Laguna Tres are shown on Figure 3.5-14 in relation to the tailings brine TDS concentrations. As shown, the TDS concentrations of wells LG-8a, 8b, 8c and LG-12 generally fall within the 228,000 to 326,000 mg/L range. These values fall within the range of TDS values measured in the brine samples historically at the site. For the wells located immediately east (LG-7a, 7b) and west (LG-9a, 9b) of Laguna Grande, the TDS concentrations are relatively lower, ranging between approximately 53,400 and 127,000 mg/L. The groundwater quality standards in 20.6.2.3101 and 20.6.2.3103 NMOC do not apply for these waters. Because of the existing poor groundwater quality in the area and the extremely high TDS concentrations in the playa lakes that contribute recharge to the shallow groundwater system, it is our opinion that discharging brine at Laguna Uno would have no deleterious impacts to downgradient groundwater quality in Nash Draw.

Cumulative Impacts

The only other activity with the potential to impact groundwater is oil and gas exploration. From 2013 to 2020, CFO has approved approximately 800 applications – to-drill (APD) each year. For the previous decade, the average was closer to 600 APDs/year (BLM 2018). There are no active or proposed well pads in the vicinity of the area that will be disturbed by the proposed action. There are 60 wells listed as active in the vicinity of Laguna Grande and 16 proposed wells (NMOC 2020). The BLM, NMED, and the New Mexico Oil Conservation Division (NMOC) have put in place numerous requirements for oil and gas producers so that drilling fluids, hydraulic fracturing fluids, and produced water and hydrocarbons remain within the well bore and do not enter groundwater or any other formations. These include BLM regulations covered under 43 CFR 3160, Onshore Orders 1, 2, and 7, 43 CFR 3162.3-3, 43 CFR 3162.3-5, and NTL-3A; NMOC regulations under NMOC 19.15.26; and the state's primacy agreement under the Safe Drinking Water Act. With these requirements in place, including the use of casing and cementing measures, contamination of groundwater resources is highly unlikely. There have been no documented instances of groundwater contamination attributed to well drilling in the Pecos District, which

further supports this conclusion. The regulatory program discussed above and standard terms and conditions would greatly reduce risks, including cumulative impacts, to groundwater from the projected future well development. The combined impacts of the proposed action are expected to be negligible.

Mitigation Measures and Residual Impacts

No mitigation is required.

3.6 Area of Critical Environmental Concern

3.6.1 Affected Environment

The Area of Critical Environmental Concern study area is defined as Nash Draw from the alt Stack to Laguna Grande. A portion of Laguna Uno (See Figure 3-4) is within the area nominated for designation as the Salt Playas ACEC. The Salt Playa ACEC was nominated based on significant cultural and fish and wildlife resources. Specifically, playas attracted Native Americans during wet periods, as evidenced by the large number of sites surrounding the salt playas. Shells from freshwater clams, brought from the nearby Pecos River, have been found on the edges of the playas. Salt playas were also prime hunting sites due to the freshwater springs found along the edges. Salt playas are important to local plant and animal communities. They serve as essential stops for migratory shore birds and as water recharge areas which accumulate rain and snow. Most of the salt playas contain water year-round and many have a spring system associated with them. They provide specialized habitat for invertebrates, vertebrates, and birds (BLM 2018). As noted in Section 3.2 (Wildlife) the eastern edge of the existing Laguna Uno is used by shorebirds.

The 2018 Draft Resource Management Plan preferred management alternative (Alternative C) does not designate the Salt Playa as an ACEC, but it does recommend special management conditions.

Relevance and importance values for this ACEC were associated with two resource categories, cultural values and fish or wildlife resources. Given that the theme of Alternative C relies on management restrictions and/or direction to address resource conflict rather than geographic separation of uses or focused use or preservation areas, the interdisciplinary team determined that these relevance and importance values could be adequately protected with existing regulations and proposed management prescriptions for the area, even with the allowance of multiple uses in the area. Such management prescriptions for this area would include limiting noise levels during the nesting season, buffering surface-disturbing activities from the edge of playas and floodplains (BLM 2018 Appendices C and T), and limiting travel to existing routes. For this reason, geographic separation was not deemed to be warranted.

3.6.2 Impacts from the Proposed Action

Direct and Indirect Impacts

The draft management plan proposed that the area not be defined as an ACEC. Furthermore, the plan states that leasable minerals are an acceptable use for the geographic area and that standard conditions in the RMP for potash mining are sufficient to protect the quality of shorebird habitat and cultural resources. The effect to shorebird habitat (Section 3.2) and cultural resources (Section 3.4) are discussed in the appropriate resource section.

Cumulative Impacts

No cumulative effects to ACEC would occur because no ACEC would be impacted by the proposed action.

Mitigation Measures

There are no mitigation measures for this project, as currently proposed.

3.7 Mineral Resources

3.7.1 Affected Environment

The mineral resources study area is defined as Nash Draw from the Salt Stack to Laguna Grande. The only federal mineral resources in the study area, other than the potash, are salt and oil and gas. United Salt Company and New Mexico Salt currently utilize the southern portion of Laguna Grande to harvest salt from the brines.

Oil and gas are important federal mineral resources in the study area. Drilling is only permitted in the designated potash area if it complies with the 2012 Secretarial Order for Potash. The 2012 Secretarial Order addresses new technologies and other issues associated with oil and gas and potash leasing and development. The purpose of the Secretarial Order is to promote efficient development of the resources while minimizing conflicts between the industries and ensuring safe operations, although there are wells in and around Laguna Grande. Additionally, oil and gas pipelines and well access roads development is significant in the study area and surrounding areas.

3.7.2 Impacts from the Proposed Action

Direct and Indirect Impacts

The proposed action may result in a reduction in the volume of brine to Laguna Grande for use by the salt companies. However, the improved flexibility to manage suspended solids will reduce insoluble clay particles resulting in reduced loading to the salt companies' operations. The improved quality of brine will reduce maintenance requirements, while reducing cost for United Salt to clarify the brine.

Cumulative Impacts

No cumulative effects to mineral resources would occur because no mineral resources would be impacted by the proposed action.

Mitigation Measures

There are no mitigation measures for this project, as currently proposed.

4. SUPPORTING INFORMATION

4.1 List of Preparers

Name	Job Title, Role in this EA	Agency
Mike Bellitto	Senior Consultant/Restoration Ecologist - Preparer	Golder Associates Inc.
Robert Salaz	Geologist - Preparer	BLM-CFO
Todd Stein	Senior Hydrologist	Golder Associates Inc.
Emily Clark	Senior Project Manager	Golder Associates Inc.
Marresa Bovee	Staff Hydrogeologist	Golder Associates Inc.
Katie Sandbom	Botanist	BLM-CFO

Annette Ibarra, Environmental Engineer, Mosaic provided supporting information for development of the EA.

4.2 References

Arcadis, U.S. 2015. Mosaic Potash Carlsbad Inc., Mine and Reclamation Plan Update, Eddy county, New Mexico. Prepared for Mosaic Potash Carlsbad Inc. September 2015.

Biota Information System of New Mexico (BISON). 2020.
<http://www.wildlife.state.nm.us/conservation/bison-m/> Accessed October 29, 2020.

Barry, D. 2001. Shorebird habitat and avian threatened and endangered species survey in Nash Draw, Carlsbad, New Mexico, prepared in support of IMC Potash Tailings Management and Evaporation Pond relocation for Golder Associates and IMC Potash Carlsbad, Inc.

Brokaw, Arnold L., C.L. Jones, M.E. Cooley, and W.H. Hays. 1972. Geology and hydrology of the Carlsbad potash area, Eddy and Lea Counties, New Mexico. USGS (Open File Report) OFR 4339-1.

Cooper, James B. and V.M. Glanzman. 1971. *Geohydrology of Project Gnome Site, Eddy County, New Mexico*. U.S. Geological Survey Professional Paper 712-A.

Degenhardt, W.G., C.W. Painter, and A.H. Price. 1996. Amphibians and reptiles of New Mexico. University of New Mexico Press, Albuquerque.

Dick-Peddie, W. A. 1993. New Mexico vegetation: past, present, and future. University of New Mexico Press, Albuquerque. 244 pp.

Findley, James S., Arthur H. Harris, Don E. Wilson, and Clyde Jones. 1975. Mammals of New Mexico. University of New Mexico Press. Albuquerque.

GL Environmental, Inc. 2014. Nash Draw Shorebird Habitat Evaluation – Document ID 4847-6181-3020.2. Prepared for Department of the Interior Bureau of Land Management Pecos District. August 20, 2014.

Geohydrology Associates, Inc. 1979. *Water-resources study of the Carlsbad Potash area, New Mexico*, for the U.S. Bureau of Land Management. Albuquerque NM : Geohydrology.

- Water-resources study of the Carlsbad Potash area, New Mexico*, for the U.S. Bureau of Land Management. Albuquerque NM : Geohydrology.
- Golder Associates Inc. (Golder). 2001. Baseline vegetation survey IMC potash tailings management expansion plan area, New Mexico, prepared for IMC Potash Company. Lakewood CO: Golder.
- Golder. 2002a. IMC Carlsbad Engineering Baseline Report prepared for IMC Potash Company. Lakewood CO: Golder.
- Golder. 2002b. IMC Carlsbad Hydrogeology Baseline Report prepared for IMC Potash Company. Lakewood CO: Golder.
- Golder Associates Inc. 2004. Environmental Assessment, Modification to IMC Potash Tailings Management System. Submitted to the Bureau of Land Management, Carlsbad Field Office. January 2, 2004.
- Golder Associates Inc. 2017. Technical Memorandum Re: Tailings Production Design Criteria. Submitted to Mosaic Potash Carlsbad Inc. July 12, 2017.
- Golder Associates Inc. 2018a. Technical Memorandum Re: Salt Stack Survey and 20-Year Conceptual Layout. Submitted to Mosaic Potash Carlsbad Inc. January 30, 2018.
- Golder Associates Inc. 2018b. Design Report: Clay Settling Dike (D-659) Stage 2 Raise. Submitted to the New Mexico Office of the State Engineer Dam Safety Bureau. April 19, 2018.
- Golder Associates Inc. 2019. Mosaic Brine Management Alternatives Report. Submitted to Mosaic Potash Carlsbad Inc. and Bureau of Land Management, Carlsbad Field Office. February 20, 2019.
- Golder Associates Ltd. 2019. Technical Report: Laguna Uno 2018 Fall Shorebird Survey. Submitted to Mosaic Potash Carlsbad Inc. January 30, 2018.
- Golder Associates Inc. 2020. Surface Water Management Alternatives Analysis. Submitted to Mosaic Potash Carlsbad Inc. May 5, 2020.
- Havens, John S. and D.W. Wilkins. 1980. Experimental salinity alleviation at Malaga Bend of the Pecos River, Eddy County, New Mexico; prepared in cooperation with the Pecos River Commission. USGS Water-Resources Investigations 80-4.
- Hendrickson, G.E. and R.S. Jones. 1952. Geology and ground-water resources of Eddy County, New Mexico. New Mexico. Bureau of Mines and Mineral Resources. (Ground-water Report 3). Socorro, NM : New Mexico Institute of Mining & Technology.
- Hunter, R.L. 1985. A regional water balance for the Waste Isolation Pilot Plant (WIPP) site and surrounding area. Albuquerque NM : Sandia National Laboratories.
- IMC Potash Company. 2001. Resistivity profiles along the Pecos River. IMC unpublished data.
- IMC Potash Company. 1998. Resistivity profiles along the Pecos River. IMC unpublished data.
- Kelly, T.E. 2000. Natural solution of Salado Salt, southeastern New Mexico. Solution Mining Research Institute Fall 2000 Meeting, San Antonio Texas, 15-18 October.
- Mercer, Jerry W. 1983. Geohydrology of the proposed Waste Isolation Pilot Plant site, Los Medanos area, southeastern New Mexico. USGS Water-Resources Investigations Report 83-4016.

- Knight, P.J. 1993. A status review of gypsum wild buckwheat. Albuquerque NM: U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office.
- Lambert, Steven J. and Dixie M. Harvey. 1987. Stable-isotope geochemistry of groundwaters in the Delaware basin of Southeastern New Mexico. SAND 87-0138; UC-70. Albuquerque NM: Sandia National Laboratories. Marron and Associates, Inc.
- Marron and Associates. 2000. *A report on the biological resources of the NM 128 study area from the junction of NM 31 and NM 128 to milepost 10.7*, prepared for The Larkin Group and the New Mexico State Highway and Transportation Department.
- New Mexico Avian Conservation Partners. 2020. Bird Conservation Plan. Available online: <http://avianconservationpartners-nm.org/bird-conservation-plan-2/> Accessed November 17, 2020.
- NMDGF (New Mexico Division of Game and Fish). 2020. Texas Hornshell Mussel. Wildlife Notes.
- New Mexico Office of the State Engineer Water Use and Conservation Bureau (NMOSE). 2019. New Mexico Water Use by Categories 2015 Technical Report 55. May.
- New Mexico Oil Conservation Division (NMOCD). 2020. OCD Permitting, Operator Data. <https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx> . Accessed November 12, 2020.
- Paleowest. 2020. A Class III Archeological Inventory of 70 Acres for the Brine Management Laguna Uno Project, Eddy County, New Mexico. Technical Report No. 20-338. September 2020.
- Peterson, Roger Tory Brine Management Class III. 1990. A Field Guide to Western Birds: A Completely New Guide to Field Marks of All Species Found in North America West of the 100th Meridian and North of Mexico. Houghton Mifflin Company, New York.
- Robinson, Thomas W. and Walter B. Lang. 1938. Geology and ground-water conditions of the Pecos River Valley in the vicinity of Laguna Grande de la Sal, New Mexico, with special reference to the salt content of the river water, in Twelfth and Thirteenth Biennial Reports of the State Engineer of New Mexico for the Fiscal Years July 1, 1934 to June 30, 1938.
- RSMeans. 2018. RSMeans Data from Gordian. Accessed online December 2018. <https://www.rsmeansonline.com/SearchData>.
- The Cornell Lab. 2020. Lark Bunting Life History In: All About Birds. Lark Bunting (*Calamospiza melanocorys*), Available online. Accessed November 17, 2020. https://www.allaboutbirds.org/guide/Lark_Bunting/lifehistory.
- Theis, Chars V., Arthur M. Morgan, William E. Hale, and Omar J. Loeltz. 1942.
- Ground-water hydrology of areas in the Pecos Valley, New Mexico, in The Pecos River Joint Investigation; Reports of the participating agencies. Washington D.C. National Resources Planning Board.
- U.S. Bureau of Land Management (BLM). 1988. Carlsbad Resource Management Plan. Bureau of Land Management New Mexico, Pecos District, Carlsbad Field Office.
- U.S. Bureau of Land Management (BLM). 1997. Carlsbad approved resources management plan, amendment and record of decision. Washington, DC: U.S. Bureau of Land Management.
- U.S. Bureau of Land Management (BLM). 2008. 2008. BLM National Environmental Policy Act Handbook H-1790-1. Available at: https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_Handbook_h1790-1.pdf.

- U.S. Bureau of Land Management (BLM). 2018. Draft Resource Management Plan and Environmental Impact Statement. Carlsbad Field Office, Pecos District, New Mexico.
- U.S. Bureau of Land Management (BLM). 2020. CFO SSPS Survey Specifications. Provided by K. Sandbom, January 2, 2020.
- U.S. Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. Division of Migratory Bird Management, Arlington Virginia, 85 pp.
- Vail, Scott. 2012. Geologic Relationships Between the Laguna Grande Evaporation Pond and the Pecos River, Eddy County, New Mexico and Potential for Groundwater Impacts. For Mosaic Potash Carlsbad Inc. January.
- Vail, Scott. 2014. Geology and Hydrology of the Rustler Formation (Permian) in Nash Draw, Eddy County, New Mexico. April.
- Vine, J.D. 1963. Surface geology of the Nash Draw quadrangle, Eddy County, New Mexico: U.S. Geological Survey, Bulletin 1141-B, 46 p.
- Wilson, B.C. 1997. Water use by categories in New Mexico counties and river basins, and irrigated acreage in 1995 (Technical Report). Santa Fe NM: original Mexico State Engineer Office.

APPENDIX A

USFWS Threatened and Endangered Letter 02ENNM00-2020-SLI-1519



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna Road Ne

Albuquerque, NM 87113-1001

Phone: (505) 346-2525 Fax: (505) 346-2542

<http://www.fws.gov/southwest/es/NewMexico/>

http://www.fws.gov/southwest/es/ES_Lists_Main2.html

In Reply Refer To:

September 22, 2020

Consultation Code: 02ENNM00-2020-SLI-1519

Event Code: 02ENNM00-2020-E-03335

Project Name: Mosaic Brine Managment

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

Thank you for your recent request for information on federally listed species and important wildlife habitats that may occur in your project area. The U.S. Fish and Wildlife Service (Service) has responsibility for certain species of New Mexico wildlife under the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et seq.), the Migratory Bird Treaty Act (MBTA) as amended (16 USC 701-715), and the Bald and Golden Eagle Protection Act (BGEPA) as amended (16 USC 668-668c). We are providing the following guidance to assist you in determining which federally imperiled species may or may not occur within your project area and to recommend some conservation measures that can be included in your project design.

FEDERALLY-LISTED SPECIES AND DESIGNATED CRITICAL HABITAT

Attached is a list of endangered, threatened, and proposed species that may occur in your project area. Your project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make "no effect" determinations. If you determine that your proposed action will have "no effect" on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

If you determine that your proposed action may affect federally-listed species, consultation with the Service will be necessary. Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take "after-the-fact." For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

The scope of federally listed species compliance not only includes direct effects, but also any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects that may occur in the action area. The action area includes all areas to be affected, not merely the immediate area involved in the action. Large projects may have effects outside the immediate area to species not listed here that should be addressed. If your action area has suitable habitat for any of the attached species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts.

Candidate Species and Other Sensitive Species

A list of candidate and other sensitive species in your area is also attached. Candidate species and other sensitive species are species that have no legal protection under the ESA, although we recommend that candidate and other sensitive species be included in your surveys and considered for planning purposes. The Service monitors the status of these species. If significant declines occur, these species could potentially be listed. Therefore, actions that may contribute to their decline should be avoided.

Lists of sensitive species including State-listed endangered and threatened species are compiled by New Mexico state agencies. These lists, along with species information, can be found at the following websites:

Biota Information System of New Mexico (BISON-M): www.bison-m.org

New Mexico State Forestry. The New Mexico Endangered Plant Program:
www.emnrd.state.nm.us/SFD/ForestMgt/Endangered.html

New Mexico Rare Plant Technical Council, New Mexico Rare Plants: nmrareplants.unm.edu

Natural Heritage New Mexico, online species database: nhnm.unm.edu

WETLANDS AND FLOODPLAINS

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. These habitats should be conserved through avoidance, or mitigated to ensure that there would be no net loss of wetlands function and value.

We encourage you to use the National Wetland Inventory (NWI) maps in conjunction with ground-truthing to identify wetlands occurring in your project area. The Service's NWI program website, www.fws.gov/wetlands/Data/Mapper.html integrates digital map data with other resource information. We also recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands.

MIGRATORY BIRDS

The MBTA prohibits the taking of migratory birds, nests, and eggs, except as permitted by the Service's Migratory Bird Office. To minimize the likelihood of adverse impacts to migratory birds, we recommend construction activities occur outside the general bird nesting season from March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until the young have fledged.

We recommend review of Birds of Conservation Concern at website www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BCC.html to fully evaluate the effects to the birds at your site. This list identifies birds that are potentially threatened by disturbance and construction.

BALD AND GOLDEN EAGLES

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA on August 9, 2007. Both the bald eagle and golden eagle (*Aquila chrysaetos*) are still protected under the MBTA and BGEPA. The BGEPA affords both eagles protection in addition to that provided by the MBTA, in particular, by making it unlawful to "disturb" eagles. Under the BGEPA, the Service may issue limited permits to incidentally "take" eagles (e.g., injury, interfering with normal breeding, feeding, or sheltering behavior nest abandonment). For information on bald and golden eagle management guidelines, we recommend you review information provided at www.fws.gov/midwest/eagle/guidelines/bgepa.html.

On our web site www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm, we have included conservation measures that can minimize impacts to federally listed and other sensitive species. These include measures for communication towers, power line safety for raptors, road and highway improvements, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

We also suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding State fish, wildlife, and plants.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. For further consultation on your proposed activity, please call 505-346-2525 or email nmesfo@fws.gov and reference your Service Consultation Tracking Number.

Attachment(s):

- Official Species List
- Migratory Birds

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New Mexico Ecological Services Field Office

2105 Osuna Road Ne

Albuquerque, NM 87113-1001

(505) 346-2525

Project Summary

Consultation Code: 02ENNM00-2020-SLI-1519

Event Code: 02ENNM00-2020-E-03335

Project Name: Mosaic Brine Managment

Project Type: MINING

Project Description: Revise BLM-approved operating plan by allowing discharge of brine to previously approved Laguna Uno during typical operations.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/32.37495586505151N103.92423426796921W>



Counties: Eddy, NM

Endangered Species Act Species

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Least Tern <i>Sterna antillarum</i> Population: interior pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505	Endangered
Mexican Spotted Owl <i>Strix occidentalis lucida</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Northern Aplomado Falcon <i>Falco femoralis septentrionalis</i> Population: U.S.A (AZ, NM) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1923	Experimental Population, Non- Essential
Piping Plover <i>Charadrius melodus</i> Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Southwestern Willow Flycatcher <i>Empidonax traillii extimus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered

Fishes

NAME	STATUS
<p>Pecos Bluntnose Shiner <i>Notropis simus pecosensis</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/4362</p>	Threatened
<p>Pecos Gambusia <i>Gambusia nobilis</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/460</p>	Endangered

Clams

NAME	STATUS
<p>Texas Hornshell <i>Popenaias popeii</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/919</p>	Endangered

Flowering Plants

NAME	STATUS
<p>Gypsum Wild-buckwheat <i>Eriogonum gypsophilum</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/7770</p>	Threatened
<p>Kuenzler Hedgehog Cactus <i>Echinocereus fendleri</i> var. <i>kuenzleri</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/2859</p>	Threatened
<p>Lee Pincushion Cactus <i>Coryphantha sneedii</i> var. <i>leei</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/2504</p>	Threatened
<p>Sneed Pincushion Cactus <i>Coryphantha sneedii</i> var. <i>sneedii</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/4706</p>	Endangered
<p>Wright's Marsh Thistle <i>Cirsium wrightii</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/8963</p>	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Black Throated Sparrow <i>Amphispiza bilineata</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 15 to Sep 5
Lark Bunting <i>Calamospiza melanocorys</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

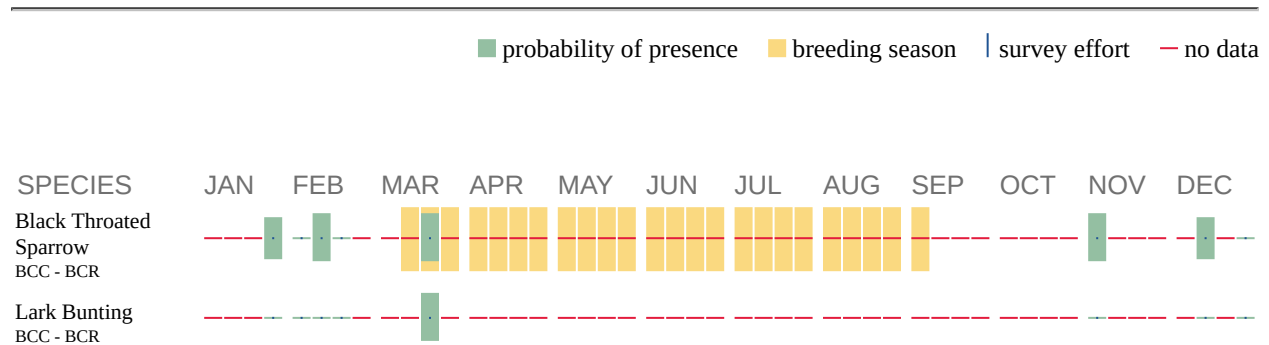
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
 2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
 3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).
-

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

APPENDIX B
Water Quality Data

MOSAIC BOREHOLE HYDROCHEMICAL SUMMARY

					Percent								mg/L							mmol					
Borehole	Screen or Open Interval [ft bgs]	Sample Name	Date Collected	Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	Total Ions	K	Mg	Na	Ca	Cl	SO4	Total Ions	K	Mg	Na	Ca	Cl	SO4
LG-1	29 to 39	LG1-2939-2205	5/22/2000	1.041	0.1	0.08	0.24	1.61	0.16	3.11	0.58	5.88	832.8	2498.4	16760.1	1665.6	32375.1	6037.8	60169.8	21.30	102.81	728.70	41.54	913.26	62.89
LG1	29 to 39	LG1-2939-0806	6/8/2000	1.041	0.1	0.08	0.24	1.74	0.16	3.17	0.78	6.27	832.8	2498.4	18113.4	1665.6	32999.7	8119.8	64229.7	21.30	102.81	787.54	41.54	930.88	84.58
LG-2	0 to 42	LG2-042-0606	6/6/2000	1.16	0	0	0.07	0.02	0.07	0.29	0.12	0.57	0	812	232	812	3364	1392	6612	0.00	33.42	10.09	20.25	94.89	14.50
LG-3	12 to 17	LG3-1217-2505	5/25/2000	1.059	0	0	0.42	2.3	0.12	4.31	0.92	8.07	0	4447.8	24357	1270.8	45642.9	9742.8	85461.3	0.00	183.04	1059.00	31.69	1287.53	101.49
LG-4	48 to 62	LG4-4862-0806	6/8/2000	1.091	0.09	0.07	0.35	3.8	2.09	6.18	1.45	14.03	763.7	3818.5	41458	22801.9	67423.8	15819.5	152085.4	19.53	157.14	1802.52	568.63	1901.94	164.79
LG-5	38 to 49	LG5-3849-2905	5/29/2000	1.238	3.79	3.15	1.6	6.42	0.01	15.6	2.47	33.04	38997	19808	79479.6	123.8	193128	30578.6	362115	997.37	815.14	3455.63	3.09	5447.90	318.53
LG5 (duplicate)	38 to 49	LG5-3849-2905-B	5/29/2000	1.236	3.85	3.2	1.59	6.44	0.01	15.7	2.43	33.22	39552	19652.4	79598.4	123.6	194052	30034.8	363013.2	1011.56	808.74	3460.80	3.08	5473.96	312.86
LG5 (analyzed later)	38 to 49	LG5-3849-2905	5/29/2000	1.236	3.75	3.11	1.58	6.59	0.01	15.75	2.51	33.3	38439.6	19528.8	81452.4	123.6	194670	31023.6	365238	983.11	803.65	3541.41	3.08	5491.40	323.16
LG5A	36 to 40	LG5A-3640-0906	6/9/2000	1.24	3.8	3.35	1.63	6.43	0.02	15.62	2.6	33.45	41540	20212	79732	248	193688	32240	367660	1062.40	831.77	3466.61	6.18	5463.70	335.83
LG-6	10 to 20	LG6A-1902	2/19/2001	1.1677	1.69	1.4	0.58	6.41	0.08	12.3	0.92	23.38	16347.8	6772.66	74849.57	934.16	143627.1	10742.84	253274.13	418.10	278.71	3254.33	23.30	4051.54	111.90
LG-7A	18.5 to 27.5	LG7A-1702	2/17/2001	1.0846	0.9	0.75	0.27	3.37	0.2	6.56	0.63	12.68	8134.5	2928.42	36551.02	2169.2	71149.76	6832.98	127765.88	208.04	120.51	1589.17	54.09	2007.05	71.18
LG-7B	7.5 to 12.5	LG7B-2702	2/17/2001	1.0618	0.54	0.45	0.26	2.44	0.2	4.83	0.6	9.32	4778.1	2760.68	25907.92	2123.6	51284.94	6370.8	93226.04	122.20	113.61	1126.43	52.96	1446.68	66.36
LG-8A	65 to 75	LG8A-1002	2/10/2001	1.1928	0.64	0.53	0.6	8.08	0.05	13.65	1.53	25.08	6321.84	7156.8	96378.24	596.4	162817.2	18249.84	291520.32	161.68	294.52	4190.36	14.87	4592.87	190.10
LG-8B	30.6 to 35.6	LG8B-1102	2/11/2001	1.1628	0.49	0.41	0.46	7.16	0.06	12.05	1.21	21.84	4767.48	5348.88	83256.48	697.68	140117.4	14069.88	248257.8	121.93	220.12	3619.85	17.40	3952.54	146.56
LG-8C	6.5 to 11.5	LG8C-1002	2/10/2001	1.156	0.45	0.38	0.5	6.8	0.12	11.65	1.13	21.03	4392.8	5780	78608	1387.2	134674	13062.8	237904.8	112.35	237.86	3417.74	34.59	3798.98	136.07
LG-8C	6.5 to 11.5	NS3C-1502	2/15/2001	1.1499	0.45	0.37	0.47	6.58	0.1	11.29	1.02	20.28	4254.63	5404.53	75663.42	1149.9	129823.71	11728.98	228025.17	108.81	222.41	3289.71	28.68	3662.16	122.18
LG-9A	10 to 30	LG9A-2302	2/23/2001	1.0589	0.39	0.33	0.16	2.55	0.21	4.71	0.58	8.93	3494.37	1694.24	27001.95	2223.69	49874.19	6141.62	90430.06	89.37	69.72	1174.00	55.45	1406.89	63.98
LG-9B	2.5 to 5.0	LG9B-2302	2/23/2001	1.0314	0.1	0.08	0.13	1.51	0.2	2.77	0.49	5.28	825.12	1340.82	15574.14	2062.8	28569.78	5053.86	53426.52	21.10	55.18	677.14	51.44	805.92	52.64
LG-11	31 to 51	ENV11	7/28/2001	1.009	0.01	0.01	0.06	0.32	0.13	0.61	0.34	1.48	100.9	605.4	3228.8	1311.7	6154.9	3430.6	14832.3	2.58	24.91	140.38	32.71	173.62	35.74
LG-12	26 to 36	LG12	7/15/2001	1.2089	2.57	2.14	0.72	7.65	0.03	14.44	2	29.55	25870.46	8704.08	92480.85	362.67	174565.16	24178	326161.22	661.65	358.19	4020.91	9.04	4924.26	251.85
LG-13	19.5-29.5	LG13-1603IMC	3/16/2001	1.23	3.1	2.57	1	7.57	0.04	16.13	1.56	31.97	31611	12300	93111	492	198399	19188	355101	808.47	506.17	4048.30	12.27	5596.59	199.88
LG-14	40 to 66	LG14-1203-IMC	3/12/2001	1.196	2.07	1.72	0.76	7.69	0.05	14.66	1.44	28.39	20571.2	9089.6	91972.4	598	175333.6	17222.4	314787.2	526.12	374.06	3998.80	14.91	4945.94	179.40
LG-16A	6 to 11	LG16A-2203IMC	3/22/2001	1.152	1.9	1.58	0.48	5.78	0.12	11.16	1.06	22.08	18201.6	5529.6	66585.6	1382.4	128563.2	12211.2	232473.6	465.51	227.56	2895.03	34.47	3626.61	127.20
LG-16B	25-35	LG16B-2403IMC	3/24/2001	1.252	4.43	3.68	1.75	6.12	0.02	15.48	3.3	34.78	46073.6	21910	76622.4	250.4	193809.6	41316	379982	1178.35	901.65	3331.41	6.24	5467.13	430.38
LG17	20-24	LG17-1903IMC	3/19/2001	1.197	2.29	1.07	0.61	7.93	0.04	13.61	1.94	27.49	12807.9	7301.7	94922.1	478.8	162911.7	23221.8	301644	327.57	300.48	4127.05	11.94	4595.53	241.89
LG-19	21-26	LG19-1903IMC	3/19/2001	1.154	0.68	0.56	0.66	6.15	0.06	10.51	2.05	20.67	6462.4	7616.4	70971	692.4	121285.4	23657	230684.6	165.28	313.43	3085.70	17.27	3421.31	246.43
LG-20	1 to 4	LG20-1203-IMC	3/12/2001	1.235	3.88	3.23	1.49	6.85	0.01	15.93	2.61	34	39890.5	18401.5	84597.5	123.5	196735.5	32233.5	371982	1020.22	757.26	3678.15	3.08	5549.66	335.77
LG-21	14-24	LG21-2603IMC	3/26/2001	1.233	3.26	2.7	2.44	4.79	0.03	15.13	2.54	30.89	33291	30085.2	59060.7	369.9	186552.9	31318.2	340677.9	851.43	1238.07	2567.86	9.22	5262.42	326.23
LG-22	36.11 to 56.11	LG22-3103IMC	3/31/2001	1.212	2.63	2.18	0.92	7.3	0.04	14.69	1.78	29.54	26421.6	11150.4	88476	484.8	178042.8	21573.6	326149.2	675.74	458.86	3846.78	12.09	5022.36	224.73
LG-23	47.5-75.0	LG23	7/12/2001	1.227	3.25	2.7	1.35	6.66	0.03	15.33	1.88	31.2	33129	16564.5	81718.2	368.1	188099.1	23067.6	342946.5	847.29	681.67	3552.97	9.18	5306.04	240.29
LG-25	11.0 to 26.0	LG25-0807	7/12/2001	1.0025	0	0	0.04	0.03	0.06	0.13	0.18	0.44	0	401	300.75	601.5	1303.25	1804.5	4411	0.00	16.50	13.08	15.00	36.76	18.80

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-1																	
1/26/04	LG-1	24.12	2966.78	2942.66	NA	NA	20	65,300	19,000	1,490	2,820	1,131	34,700	5,800	568	135.5	7.28
4/19/04	LG-1	22.82	2966.78	2943.96	8.56	6.57	21	65,000	18,800	1,490	2,790	1,086	34,600	5,900	568	135	7.07
7/6/04	LG-1	23.52	2966.78	2943.26	8.4	6.58	21	65,800	19,000	1,480	2,810	1,126	35,000	6,000	568	135	7
10/21/04	LG-1	NA	2966.78	NA	NA	NA	NA	65,900	19,100	1,500	2,810	1,118	35,200	5,800	568	135.5	7.01
2/2/05	LG-1	21.67	2966.78	2945.11	8.55	6.35	20.2	65,600	19,100	1,580	2,270	1,118	35,400	5,800	568	135	7.12
4/11/05	LG-1	21.21	2966.78	2945.57	8.53	6.34	20.7	65,800	19,200	1,610	2,160	1,084	35,800	5,600	568	135	7
7/12/05	LG-1	21.68	2966.78	2945.10	8.72	6.26	20.3	66,100	19,200	1,580	2,210	1,115	35,800	5,800	568	138.5	7.26
10/13/05	LG-1	20.60	2966.78	2946.18	8.92	6.25	19.4	68,300	19,900	1,700	2,590	1,102	36,600	6,100	559	137.5	6.98
1/20/06	LG-1	20.22	2966.78	2946.56	NA	NA	NA	69,630	20,640	1,690	2,600	1,170	37,400	5,800	549	139.5	6.87
4/2/06	LG-1	20.45	2966.78	2946.33	9.21	6.89	20	70,730	20,750	1,850	2,580	1,130	38,200	5,900	538	142	6.94
7/18/06	LG-1	21.76	2966.78	2945.02	9.38	6.44	21.4	72,810	21,400	1,710	2,710	1,250	39,720	5,700	529	149.5	7.03
10/23/06	LG-1	20.49	2966.78	2946.29	9.27	6.59	19.9	73,265	21,260	1,690	2,806	1,200	39,690	6,300	529	150	6.97
1/31/07	LG-1	21.05	2966.78	2945.73	9.49	6.61	19.8	73,307	21,390	1,810	2,740	1,320	39,880	5,850	529	151	6.98
4/10/07	LG-1	20.78	2966.78	2946.00	9.68	6.58	21.3	75,349	22,150	1,870	2,975	1,320	40,700	6,020	524	155.3	6.92
8/10/07	LG-1	20.00	2966.78	2946.78	9.85	6.9	20.1	77,345	22,400	1,635	3,156	1,236	42,400	6,200	530	158.5	7.04
10/10/07	LG-1	20.40	2966.78	2946.38	9.8	7.06	20.4	77,742	22,580	1,676	3,249	1,325	42,098	6,500	524	160	7.18
1/2/08	LG-1	20.10	2966.78	2946.68	9.92	6.54	20.4	76,383	21,820	1,670	3,291	1,361	41,815	6,100	543	160	7.11
4/28/08	LG-1	20.50	2966.78	2946.28	10.05	6.71	19.9	77,476	21,560	1,682	3,543	1,385	42,750	6,236	534	165.0	7.36
8/6/08	LG-1	21.20	2966.78	2945.58	10.12	7.16	21.0	78,102	22,231	1,576	3,403	1,471	42,897	6,204	533	170.0	7.12
11/17/08	LG-1	20.60	2966.78	2946.18	133.4 ³	6.40	20.5	83,682	23,140	1,630	3,528	1,534	46,590	6,925	558	175.0	7.04
2/25/09	LG-1	21.00	2966.78	2945.78	58.5 ³	6.46	21.3	83,764	23,505	1,589	3,572	1,552	46,731	6,488	545	174.8	6.92
5/19/09	LG-1	21.45	2966.78	2945.33	120.4	6.31	22.3	83,308	22,900	1,590	3,787	1,570	46,635	6,490	561	174.5	6.80
8/31/09	LG-1	20.50	2966.78	2946.28	115.5	6.36	21.4	80,726	22,443	1,596	3,729	1,493	45,226	5,910	548	173.3	6.88
11/2/09	LG-1	21.20	2966.78	2945.58	114.1	6.39	21.0	78,574	21,350	1,682	3,572	1,435	44,434	5,997	540	170.2	6.93
1/11/10	LG-1	21.00	2966.78	2945.78	112.6	6.39	19.9	80,026	22,064	1,564	3,634	1,607	44,577	6,256	540	166.7	6.84
5/11/10	LG-1	20.70	2966.78	2946.08	110.9	6.40	21.8	78,863	21,141	1,591	3,661	1,761	44,395	6,002	520	166.7	6.84
8/3/10	LG-1	20.10	2966.78	2946.68	103.7	6.47	22.0	88,019	22,642	1,604	3,491	1,887	50,000	7,075	264	170.0	7.41
11/16/10	LG-1	20.30	2966.78	2946.48	--	6.60	19.4	80,979	24,482	1,883	3,766	2,166	54,614	6,968	264	160.0	6.93
1/26/11	LG-1	20.80	2966.78	2945.98	--	6.17	12.3	84,340	22,642	1,698	3,491	1,981	50,943	6,887	264	160.0	6.93
5/2/11	LG-1	21.40	2966.78	2945.38	--	6.19	25.0	81,594	21,822	1,708	3,321	2,087	51,233	6,546	256	160.0	7.03
7/5/11	LG-1	22.20	2966.78	2944.58	--	6.24	25.1	85,104	22,770	1,898	3,890	2,467	51,233	7,116	256	180.0	6.91
10/12/11	LG-1	22.65	2966.78	2944.13	109.2	6.56	21.3	82,827	20,873	1,708	3,226	2,087	48,387	6,072	256	160.0	7.31
1/31/12	LG-1	22.30	2966.78	2944.48	110	6.37	19.9	88,962	24,528	1,792	3,774	2,830	48,113	6,509	--	160.0	7.18
4/24/12	LG-1	22.40	2966.78	2944.38	108.1	6.31	21.3	82,453	21,698	764	3,585	2,736	49,057	6,981	256	150.0	7.01
7/18/12	LG-1	22.60	2966.78	2944.18	110.2	6.49	22.6	95,865	23,496	1,880	3,853	3,008	54,511	6,955	263	170.0	6.98
11/26/12	LG-1	22.00	2966.78	2944.78	114	6.45	22.7	93,985	25,376	1,692	3,853	3,289	56,391	6,861	263	170.0	7.03
11/26/12	LG-1	22.00	2966.78	2944.78	114	6.45	22.7	90,856	23,810	1,761	4,381	3,368	50,708	6,516	521	199.2	7.10
02/26/13	LG-1	21.90	2966.78	2944.88	115.2	5.60	21.1	92,575	25,376	1,786	4,229	3,665	60,150	7,895	263	170.0	6.84
02/26/13	LG-1	21.90	2966.78	2944.88	115.2	5.60	21.1	92,847	23,872	1,735	4,441	4,108	51,831	6,543	529	200.0	6.82
04/29/13	LG-1	22.20	2966.78	2944.58	114.6	6.00	23.7	101,313	22,514	1,970	4,315	4,034	48,780	6,848	273	180.0	7.05
04/29/13	LG-1	22.20	2966.78	2944.58	114.6	6.00	23.7	92,896	24,151	1,845	4,391	3,708	51,816	6,669	527	200.8	6.94
08/01/13	LG-1	21.75	2966.78	2945.03	115.2	5.85	21.6	92,958	24,095	1,790	4,320	3,812	52,076	6,533	553	204.2	6.99
10/30/13	LG-1	21.70	2966.78	2945.08	117.4	6.18	20.7	94,335	24,985	1,743	4,282	4,153	52,237	6,616	532	192.5	7.20
02/12/14	LG-1	21.70	2966.78	2945.08	121.4	6.13	20.1	95,838	25,037	1,771	4,364	4,106	53,390	6,840	550	210.8	6.93
04/28/14	LG-1	21.78	2966.78	2945.00	121.4	6.15	21.9	103,774	23,585	1,509	3,962	3,868	55,660	7,453	274	140.0	6.79
07/22/14	LG-1	22.40	2966.78	2944.38	117.6	5.82	21.9	98,113	28,302	1,792	4,340	4,057	48,113	6,698	274	140.0	7.21

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-1 (continued)																	
10/28/14	LG-1	17.53	2966.78	2949.25	NA	NA	20.3	97,170	17,925	1,038	2,925	2,925	57,547	7,358	283	180.0	7.20
01/13/15	LG-1	17.51	2966.78	2949.27	123.1	7.04	17.2	86,509	22,642	1,887	4,057	3,962	48,113	6,321	255	170.0	6.98
05/04/15	LG-1	17.45	2966.78	2949.33	128.1	6.32	22.4	101,313	21,576	854	3,752	3,752	60,976	7,598	255	170.0	7.23
05/04/15	LG-1	17.45	2966.78	2949.33	128.1	6.32	22.4	96,623	24,484	1,707	4,493	4,343	55,347	9,475	328	150.0	6.43
07/09/15	LG-1	18.80	2966.78	2947.98	123.1	6.29	22.6	81,801	23,358	1,848	4,409	4,146	51,595	6,023	285	166.0	6.69
10/15/15	LG-1	18.12	2966.78	2948.66	138.6	6.32	21.8	105,214	28,119	1,825	5,149	5,484	56,797	5,782	298	168.0	6.46
01/07/16	LG-1	17.91	2966.78	2948.87	106.1	NA	20.1	114,784	23,691	1,359	4,353	5,014	63,361	6,116	303	166.0	6.92
04/07/16	LG-1	17.68	2966.78	2949.10	106.3	NA	21.4	113,994	28,452	1,724	5,134	5,978	63,021	4,198	343	146.0	7.41
08/09/16	LG-1	18.63	2966.78	2948.15	192.3	NA	22.5	103,545	24,813	1,931	4,646	4,767	58,769	5,765	272	160.0	6.52
12/05/16	LG-1	18.41	2966.78	2948.37	197.7	NA	19.2	93,779	20,891	1,653	3,751	4,234	53,853	6,500	249	166.0	6.68
03/14/17	LG-1	18.75	2966.78	2948.03	111.44	6.63	20.3	83,458	20,561	1,832	3,850	3,897	50,467	6,028	239	164.0	6.72
05/12/17	LG-1	19.13	2966.78	2947.65	82.03	6.39	20.6	68,246	14,502	2,009	3,033	1,972	38,863	4,057	216	125.0	6.56
07/28/17	LG-1	19.67	2966.78	2947.11	99.71	6.45	21.6	81,345	19,508	1,970	3,636	3,371	48,769	4,754	246	179.0	7.27
11/11/17	LG-1	19.39	2966.78	2947.39	118.22	6.37	20.6	83,081	22,117	2,108	4,140	4,036	56,711	7,221	261	117.0	6.53
02/21/18	LG-1	19.60	2966.78	2947.18	123.15	6.40	20.5	90,800	21,700	2,090	4,140	3,860	63,000	5,940	272	117.0	6.81
04/06/18	LG-1	19.70	2966.78	2947.08	106.93	6.49	21.2	89,300	21,200	2,090	4,030	3,640	49,000	7,040	288	111.0	7.10
07/27/18	LG-1	20.10	2966.78	2946.68	109.62	6.71	21.2	91,300	21,700	2,120	3,990	3,640	52,000	4,370	256	110.0	6.49
10/05/18	LG-1	19.79	2966.78	2946.99	122.505	6.97	21.5	95,700	23,900	2,230	4,100	3,880	59,000	5,660	268	120.0	6.80
01/12/19	LG-1	19.04	2966.78	2947.74	152.89	6.59	19.9	101,000	25,100	2,170	4,370	4,150	56,500	6,250	280	125.0	6.69
04/05/19	LG-1	19.23	2966.78	2947.55	141.255	6.39	20.9	99,400	25,800	2,220	4,440	3,790	56,000	5,470	317	121.0	6.64
07/26/19	LG-1	19.98	2966.78	2946.80	108.352	6.59	21.4	92,400	20,200	1,820	3,380	2,700	53,000	5,710	244	107.0	7.12
11/02/19	LG-1	15.82	2966.78	2950.96	105.619	6.54	20.2	92,000	23,800	2,230	4,280	3,280	49,500	4,710	244	123.0	6.62
01/29/20	LG-1	20.20	2966.78	2946.58	85.986	6.78	20.8	94,000	23,800	2,250	4,320	3,120	56,000	5,720	272	122.0	6.97
04/28/20	LG-1	20.10	2966.78	2946.68	86.19	6.79	22.7	91,700	22,600	2,030	4,230	2,900	54,000	5,210	272	117.0	6.81
07/29/20	LG-1	20.90	2966.78	2945.88	102.323	6.28	21.3	88,300	24,800	2,140	4,790	2,910	52,000	5,130	300	113.0	6.47
10/29/20	LG-1	20.84	2966.78	2945.94	99.87	6.59	22.4	99,100	24,000	2,000	4,340	3,100	67,000	6,720	252	126.0	6.68
LG-2																	
1/26/04	LG-2	25.77	2974.52	2948.75	NA	NA	21.0	9,400	1,900	640	430	49	3,300	2,800	520	17.0	7.11
4/19/04	LG-2	24.41	2974.52	2950.11	1.26	6.77	21.0	9,200	1,900	640	400	44	3,100	2,800	510	16.5	7.23
7/6/04	LG-2	24.95	2974.52	2949.57	1.25	6.69	21.0	9,400	1,900	610	400	46	3,200	2,900	520	16.5	7.17
10/21/04	LG-2	NA	2974.52	NA	NA	NA	NA	9,400	1,900	650	420	47	3,300	2,800	530	16.8	7.23
2/2/05	LG-2	23.18	2974.52	2951.34	1.34	6.68	20.6	9,800	2,000	700	470	46	3,400	2,900	510	17.1	7.21
4/11/05	LG-2	22.55	2974.52	2951.97	1.39	6.81	20.4	10,000	2,100	650	480	45	3,700	2,700	510	17.9	7.17
7/12/05	LG-2	19.40	2974.52	2955.12	1.7	6.65	20.2	12,200	2,500	720	530	62	4,900	3,200	483	21.9	7.22
10/13/05	LG-2	18.21	2974.52	2956.31	2.11	6.55	19.9	14,400	3,100	960	710	81	6,300	3,000	485	26.2	7.1
1/19/06	LG-2	17.93	2974.52	2956.59	NA	NA	NA	16,255	3,545	1,100	825	92	7,100	3,300	490	29.1	7.00
4/2/06	LG-2	17.89	2974.52	2956.63	2.37	7.12	19.9	16,805	3,650	1,060	840	104	7,550	3,300	500	30.3	7.02
7/18/06	LG-2	20.10	2974.52	2954.42	2.38	6.97	20.7	16,560	3,660	980	835	107	7,580	3,100	498	30.0	7.20
10/19/06	LG-2	18.75	2974.52	2955.77	2.26	6.98	20.9	16,185	3,600	950	795	107	7,240	3,200	490	30.0	7.07
1/31/07	LG-2	18.63	2974.52	2955.89	2.3	6.82	20.6	16,123	3,520	950	759	110	7,210	3,280	490	29.4	7.03
4/10/07	LG-2	17.80	2974.52	2956.72	2.54	6.52	21.7	17,413	3,890	1,184	876	117	8,110	3,080	500	32.5	7.00
8/10/07	LG-2	17.80	2974.52	2956.72	3.34	7.13	19.8	23,711	5,350	1,712	1,003	127	12,220	3,020	466	45.3	7.06
10/10/07	LG-2	18.30	2974.52	2956.22	4.16	7.30	23.2	29,159	6,715	2,120	1,350	144	15,455	3,110	442	60.0	7.22
1/2/08	LG-2	17.95	2974.52	2956.57	4.79	6.51	20.8	32,705	7,605	2,311	1,467	177	17,920	2,960	442	70.0	6.96
4/28/08	LG-2	17.95	2974.52	2956.57	5.19	6.85	19.7	35,395	8,620	2,376	1,686	103	19,350	2,990	451	73.6	7.34
8/4/08	LG-2	19.53	2974.52	2955.00	5.61	7.50	20.8	37,791	9,339	2,395	1,650	249	21,137	2,750	452	78.6	7.10
11/17/08	LG-2	19.35	2974.52	2955.17	65.8 ³	6.40	20.7	41,004	10,351	2,432	1,640	350	23,203	2,758	450	84.5	6.91
2/25/09	LG-2	19.13	2974.52	2955.40	75.2 ³	6.42	20.5	41,164	10,456	2,370	1,710	388	23,211	2,763	443	85.1	6.85

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-2 (continued)																	
5/19/09	LG-2	19.55	2974.52	2954.97	67.8	6.42	20.9	41,545	10,660	2,348	1,861	413	23,310	2,685	447	85.5	6.78
8/25/09	LG-2	17.03	2974.52	2957.49	70	6.30	23.3	42,628	10,778	2,290	1,773	465	24,130	2,917	459	86.7	6.81
11/2/09	LG-2	18.07	2974.52	2956.45	70.8	6.22	21.0	44,938	11,610	2,401	1,761	539	25,494	2,864	448	93.2	6.72
1/11/10	LG-2	17.09	2974.52	2957.43	71.3	6.24	20.3	45,786	11,962	2,350	1,793	585	25,757	3,068	452	93.2	6.73
5/11/10	LG-2	17.45	2974.52	2957.07	73.3	6.33	20.1	47,611	11,921	2,299	1,855	730	27,490	3,042	457	98.9	6.74
8/3/10	LG-2	16.30	2974.52	2958.22	68.5	6.40	20.2	53,185	13,514	2,606	1,834	840	28,958	3,475	232	99.0	7.42
11/16/10	LG-2	16.70	2974.52	2957.82	--	5.84	18.1	55,663	13,553	2,227	1,549	968	31,946	3,582	242	100.0	6.85
1/26/11	LG-2	17.00	2974.52	2957.52	--	6.10	17.6	50,578	14,451	2,216	1,541	963	34,862	3,565	241	100.0	6.82
5/4/11	LG-2	17.65	2974.52	2956.87	--	6.12	20.1	55,039	12,597	2,326	1,647	1,163	33,915	3,779	242	110.0	6.93
7/5/11	LG-2	18.95	2974.52	2955.57	--	6.15	22.1	60,078	14,535	2,229	1,647	1,163	31,008	3,585	242	120.0	6.78
10/12/11	LG-2	19.60	2974.52	2954.92	79.6	6.53	21.6	58,624	15,504	2,132	1,744	1,357	33,915	3,682	242	110.0	7.35
1/31/12	LG-2	17.70	2974.52	2956.82	86.1	6.14	20.5	65,029	16,378	2,505	1,927	1,638	35,645	3,854		120.0	7.21
4/24/12	LG-2	16.20	2974.52	2958.32	91.7	6.23	20.5	64,491	18,234	1,536	1,823	2,015	42,226	4,415	250	120.0	6.96
7/18/12	LG-2	14.20	2974.52	2960.32	77.5	6.5	24.7	60,385	15,385	2,212	1,731	1,827	34,615	3,942	250	110.0	7.00
11/26/12	LG-2	12.20	2974.52	2962.32	62.1	6.54	24.2	45,437	12,621	1,650	1,359	1,456	25,243	3,689	233	88.0	7.01
11/26/12	LG-2	12.20	2974.52	2962.32	62.1	6.54	24.2	45,662	12,086	1,715	1,605	1,377	25,156	3,443	468	93.3	7.16
02/27/13	LG-2	10.50	2974.52	2964.02	59.7	5.10	21.1	44,066	11,673	1,556	1,265	1,265	20,428	3,405	224	77.0	6.90
02/27/13	LG-2	10.50	2974.52	2964.02	59.7	5.10	21.1	41,422	10,969	1,575	1,449	1,468	22,320	3,371	450	84.3	6.92
04/29/13	LG-2	10.55	2974.52	2963.97	54.5	6.15	22.0	39,844	8,496	1,758	1,270	1,270	18,555	3,223	225	80.0	7.13
04/29/13	LG-2	10.55	2974.52	2963.97	54.5	6.15	22.0	39,242	10,436	1,543	1,396	1,187	21,081	3,330	448	81.4	7.09
07/31/13	LG-2	11.10	2974.52	2963.42	56.7	5.84	22.0	37,739	9,944	1,515	1,262	1,295	20,206	3,229	481	78.4	7.08
10/29/13	LG-2	10.20	2974.52	2964.32	52.1	6.02	21.9	35,299	9,408	1,397	1,121	1,124	18,658	3,228	456	68.5	7.40
02/12/14	LG-2	11.45	2974.52	2963.07	53.3	6.11	20.5	35,190	9,096	1,593	1,148	1,122	18,678	3,268	475	70.0	7.07
04/28/14	LG-2	13.00	2974.52	2961.52	52	6.02	22.2	36,399	8,708	1,370	969	2,055	18,591	3,425	225	41.0	6.89
07/22/14	LG-2	14.20	2974.52	2960.32	50.1	6.02	21.4	34,489	9,538	1,445	1,060	963	14,451	2,794	222	51.0	7.33
10/27/14	LG-2	9.96	2974.52	2964.56	NA	NA	21.6	34,104	7,514	1,252	925	751	16,378	2,794	231	54.0	7.27
01/12/15	LG-2	10.81	2974.52	2963.71	49.9	6.67	19.9	37,476	8,611	1,566	1,076	939	16,634	3,229	235	56.0	7.12
04/29/15	LG-2	11.25	2974.52	2963.27	47.5	6.40	20.4	33,922	7,941	1,471	1,078	882	21,569	3,039	231	57.0	7.29
04/29/15	LG-2	11.25	2974.52	2963.27	47.5	6.40	20.4	30,980	7,902	1,412	1,088	837	17,059	2,510	247	42.7	6.41
07/08/15	LG-2	12.32	2974.52	2962.20	49.8	6.38	21.1	34,412	8,157	1,412	1,108	873	18,431	2,755	247	46.7	6.90
10/15/15	LG-2	12.60	2974.52	2961.92	41.5	6.65	22.8	36,755	9,189	1,623	1,183	972	18,573	3,187	255	54.1	6.67
10/15/15	LG-2	12.60	2974.52	2961.92	41.5	6.65	22.8	33,786	9,155	1,621	1,155	949	17,184	2,913	255	53.9	6.67
03/01/16	LG-2	12.21	2974.52	2962.31	42.1	NA	22.8	39,202	10,214	1,780	1,304	1,060	20,914	2,802	253	52.7	7.02
04/07/16	LG-2	12.33	2974.52	2962.19	42.4	NA	20.3	34,115	10,459	1,769	1,349	1,046	21,505	3,715	262	69.9	6.98
08/09/16	LG-2	14.48	2974.52	2960.04	99.9	NA	22	50,678	11,822	1,957	1,560	1,250	25,872	3,401	252	79.0	6.64
12/05/16	LG-2	13.76	2974.52	2960.76	110.5	NA	20.2	50,241	11,357	1,790	1,473	1,261	28,874	3,705	246	102.0	6.64
03/15/17	LG-2	14.32	2974.52	2960.20	79.95	6.48	20.9	53,689	12,718	1,748	1,670	1,583	30,097	3,913	268	103.0	6.75
05/13/17	LG-2	14.82	2974.52	2959.70	83.5	6.25	23.9	54,119	13,506	1,753	1,724	1,801	31,609	3,851	272	107.0	6.42
07/28/17	LG-2	15.60	2974.52	2958.92	73.92	6.31	23.6	58,598	15,370	1,892	1,921	2,113	32,949	3,852	269	117.0	7.16
11/11/17	LG-2	15.16	2974.52	2959.36	105.91	6.33	21.2	72,996	17,748	1,775	2,071	2,920	45,802	5,162	317	101.0	6.58
02/21/18	LG-2	15.48	2974.52	2959.04	110.79	6.38	20.5	77,800	20,300	1,980	2,410	3,600	52,000	5,180	300	103.0	6.64
04/07/18	LG-2	15.63	2974.52	2958.89	100.23	6.36	20.4	77,600	18,900	1,780	2,220	3,360	42,000	6,680	352	99.0	6.96
07/28/18	LG-2	15.98	2974.52	2958.54	108.85	6.62	20.8	83,500	21,300	1,850	2,470	4,090	46,000	3,990	304	104.0	6.42
10/06/18	LG-2	14.97	2974.52	2959.55	125.002	6.80	21.6	95,500	23,700	1,900	2,590	4,950	50,000	5,460	292	116.0	6.81
01/12/19	LG-2	14.32	2974.52	2960.20	157.667	6.73	20.7	91,100	24,700	1,910	2,790	5,840	51,000	6,270	344	121.0	6.66
04/06/19	LG-2	14.55	2974.52	2959.97	148.372	6.49	20.8	94,200	24,900	1,820	2,690	5,820	52,000	6,020	371	118.0	6.50

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-2 (continued)																	
07/26/19	LG-2	15.47	2974.52	2959.05	116.849	6.48	20.9	95,800	25,200	1,770	2,630	6,170	52,000	6,210	356	110.0	7.10
11/02/19	LG-2	15.82	2974.52	2958.70	111.409	6.50	21.1	99,900	26,000	1,770	2,790	6,550	52,500	5,820	316	128.0	6.63
01/29/20	LG-2	15.85	2974.52	2958.67	93.085	6.95	20.9	101,000	28,300	1,980	3,120	7,370	56,000	6,910	312	130.0	6.95
04/28/20	LG-2	15.62	2974.52	2958.90	90.04	6.45	23.2	105,000	26,700	1,550	2,800	6,960	57,000	6,600	328	131.0	6.74
07/29/20	LG-2	16.95	2974.52	2957.57	105.641	6.31	21.3	108,000	25,200	1,670	2,680	6,550	57,000	6,860	410	128.0	6.44
10/29/20	LG-2	17.35	2974.52	2957.17	110	6.45	21.6	109,000	27,600	1,480	2,780	7,280	69,000	6,950	324	138.0	6.50
LG-5																	
1/26/04	LG-5	18.80	2972.42	2953.62	NA	NA	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/19/04	LG-5	15.43	2972.42	2956.99	off scale	7.11	21.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/6/04	LG-5	16.11	2972.42	2956.31	17.64	6.49	21.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/2/05	LG-5	14.35	2972.42	2958.07	35.64	6.52	21.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/11/05	LG-5	14.37	2972.42	2958.05	30.72	6.44	21.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/8/05	LG-5	NA	2972.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/11/05	LG-5	15.88	2972.42	2956.54	34.9	6.3	21.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/2/05	LG-5	16.01	2972.42	2956.41	33.14	6.9	20.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/13/05	LG-5	16.57	2972.42	2955.85	35.2	6.43	20.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11/14/05	LG-5	17.12	2972.42	2955.30	35.4	6.38	20.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/23/05	LG-5	17.28	2972.42	2955.14	34.4	6.51	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1/19/06	LG-5	NA	2972.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/7/06	LG-5	17.48	2972.42	2954.94	34.68	6.89	20.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/10/06	LG-5	17.62	2972.42	2954.80	35.28	6.94	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/2/06	LG-5	17.81	2972.42	2954.61	35.20	6.94	20.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5/12/06	LG-5	18.01	2972.42	2954.41	23.48	6.93	25.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/25/06	LG-5	16.02	2972.42	2956.40	33.78	6.49	23.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/20/06	LG-5	18.60	2972.42	2953.82	NA	6.28	21.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1/31/07	LG-5	16.54	2972.42	2955.88	17.52	6.63	20.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/1/07	LG-5	NA	2972.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/16/07	LG-5	18.68	2972.42	2953.74	17.00	6.74	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/10/07	LG-5	16.80	2972.42	2955.62	13.64	6.61	19.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5/4/07	LG-5	17.10	2972.42	2955.32	34.18	6.62	21.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/2/07	LG-5	17.10	2972.42	2955.32	34.10	7.27	20.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/12/07	LG-5	17.20	2972.42	2955.22	34.80	6.55	21.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1/7/08	LG-5	17.50	2972.42	2954.92	34.48	6.58	21.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/28/08	LG-5	18.00	2972.42	2954.42	34.72	6.84	21.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/8/08	LG-5	NA	2972.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11/25/08	LG-5	15.00	2972.42	2957.42	380 ³	6.30	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/25/09	LG-5	15.10	2972.42	2957.32	off scale	6.52	21.8	304,900	55,900	11	15,570	41,560	160,100	31,276	878	747.5	6.77
5/20/09	LG-5	15.90	2972.42	2956.52	490.8	6.36	21.8	303,000	54,400	10	16,306	41,265	159,600	30,910	865	745.1	6.75
8/31/09	LG-5	14.90	2972.42	2957.52	357.2	6.43	22.3	308,300	54,800	13	19,704	40,568	159,600	33,110	858	761.1	6.8
11/3/09	LG-5	14.95	2972.42	2957.47	389.8	6.42	21.1	309,600	54,600	9	20,009	42,298	158,800	33,322	893	727.0	6.8
1/12/10	LG-5	14.63	2972.42	2957.79	396.2	6.33	19.4	311,400	53,400	8	21,042	41,678	158,300	36,377	957	738.2	6.81
5/12/10	LG-5	15.10	2972.42	2957.32	380	6.41	21.1	311,800	51,900	8	21,997	41,965	158,700	36,580	1,004	761.7	6.75
8/4/10	LG-5	14.20	2972.42	2958.22	182.7	6.61	22.3	307,448	53,883	32	26,149	34,073	174,326	42,789	555	650.0	6.75
11/16/10	LG-5	14.20	2972.42	2958.22	--	6.67	20.9	325,949	53,006	33	28,481	31,646	189,873	47,468	617	600.0	6.63
1/26/11	LG-5	12.50	2972.42	2959.92	--	6.16	19.8	307,267	48,183	9	26,856	30,016	221,169	49,763	632	700.0	6.67
5/3/11	LG-5	16.25	2972.42	2956.17	--	6.38	18.6	330,116	49,089	<50	27,712	29,295	229,612	49,089	428	660.0	7.69
7/5/11	LG-5	16.70	2972.42	2955.72	--	6.28	31.5	340,711	54,545	25	29,249	34,783	158,103	43,478	664	740.0	6.59
10/13/11	LG-5	16.53	2972.42	2955.89	189.2	6.32	22.1	313,043	NA	NA	NA	NA	NA	NA	NA	710.0	NA

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-5 (continued)																	
2/1/12	LG-5	16.70	2972.42	2955.72	184.9	6.46	21.1	252,463	NA	NA	NA	NA	NA	NA	NA	640.0	6.61
4/25/12	LG-5	16.90	2972.42	2955.52	186.1	6.38	21.7	303,175	NA	NA	NA	NA	NA	NA	NA	630.0	6.56
7/18/12	LG-5	16.52	2972.42	2955.90	185.7	6.44	24.9	342,314	NA	NA	NA	NA	NA	NA	721	610.0	6.54
11/26/12	LG-5	16.70	2972.42	2955.72	181.60	6.55	19.30	310,317	NA	NA	NA	NA	NA	NA	738	660.0	6.52
11/26/12	LG-5	16.70	2972.42	2955.72	181.60	6.55	19.30	314,700	NA	NA	NA	NA	NA	NA	1,381	765.0	6.75
02/26/13	LG-5	16.80	2972.42	2955.62	181.4	5.62	21.5	309,524	NA	NA	NA	NA	NA	NA	746	630.0	6.55
02/26/13	LG-5	16.80	2972.42	2955.62	181.4	5.62	21.5	318,600	NA	NA	NA	NA	NA	NA	1,369	776.7	6.72
04/30/13	LG-5	17.05	2972.42	2955.37	183	5.68	24.7	320,635	NA	NA	NA	NA	NA	NA	746	660.0	6.54
04/30/13	LG-5	17.05	2972.42	2955.37	183	5.68	24.7	312,700	NA	NA	NA	NA	NA	NA	1,395	775.0	6.75
08/01/13	LG-5	16.17	2972.42	2956.25	186.3	6.24	22.3	311,500	NA	NA	NA	NA	NA	NA	1,464.0	767.5	6.73
11/11/13	LG-5	16.10	2972.42	2956.32	189.4	5.91	21.3	319,300	NA	NA	NA	NA	NA	NA	1,450	741.0	6.80
02/14/14	LG-5	15.48	2972.42	2956.94	188.2	6.02	21.4	317,000	NA	NA	NA	NA	NA	NA	1,403	803.3	6.73
05/06/14	LG-5	15.50	2972.42	2956.92	173.1	6.00	23.1	353,365	NA	NA	NA	NA	NA	NA	705	460.0	6.61
07/23/14	LG-5	16.20	2972.42	2956.22	180.3	5.97	22.6	317,447	NA	NA	NA	NA	NA	NA	679	390	6.68
10/29/14	LG-5	11.12	2972.42	2961.30	NA	NA	20.8	319,838	NA	NA	NA	NA	NA	NA	672	660	6.61
01/14/15	LG-5	11.16	2972.42	2961.26	214	6.58	18.0	316,775	28,502	33	27,687	31,759	171,010	45,603	651	620.0	6.61
04/29/15	LG-5	12.71	2972.42	2959.71	219	6.40	23.6	344,855	32,958	34	27,331	30,547	176,849	43,408	641	650.0	6.56
04/29/15	LG-5	12.71	2972.42	2959.71	219	6.40	23.6	325,563	49,920	31	26,447	31,833	157,556	34,405	740	508.0	6.30
07/08/15	LG-5	15.40	2972.42	2957.02	213	5.62	21.4	330,033	53,465	34	27,640	33,086	204,620	38,696	677	416.0	6.47
10/21/15	LG-5	16.01	2972.42	2956.41	217	5.99	20.6	311,410	49,128	32	24,802	34,073	153,724	38,035	776	454.0	6.44
10/21/15	LG-5	16.01	2972.42	2956.41	217	5.99	20.6	343,083	49,802	33	25,296	34,387	161,265	40,870	792	523.0	6.47
03/03/16	LG-5	16.48	2972.42	2955.94	157.3	NA	21.7	287,402	41,969	35	24,646	30,630	170,079	33,465	732	364.0	6.48
04/08/16	LG-5	16.71	2972.42	2955.71	NA	NA	NA	314,652	50,761	26	24,500	30,504	152,122	75,260	817	439.0	6.45
08/10/16	LG-5	16.05	2972.42	2956.37	334	NA	21.8	332,779	53,827	30	24,709	33,195	173,045	37,271	882	521.0	6.42
12/02/16	LG-5	15.06	2972.42	2957.36	337	NA	19.6	288,644	46,924	32	21,530	28,233	151,420	37,934	670	623.0	6.46
03/14/17	LG-5	15.22	2972.42	2957.20	207.75	6.46	21.7	314,873	49,051	23	22,152	31,092	155,063	36,392	672	572.0	6.54
05/12/17	LG-5	15.17	2972.42	2957.25	203.73	6.51	23.8	325,340	48,441	22	20,464	29,576	153,477	37,570	703	562.0	6.42
07/28/17	LG-5	14.65	2972.42	2957.77	209.16	7.28	21.8	325,833	56,167	42	21,500	33,000	170,000	34,750	667	755.0	6.90
11/10/17	LG-5	15.29	2972.42	2957.13	217.18	6.40	20.5	315,833	51,250	21	21,167	31,000	171,667	47,333	725	246.0	6.49
02/20/18	LG-5	16.04	2972.42	2956.38	200.15	6.27	20.8	392,000	60,200	35	30,900	44,300	210,000	49,800	920	293.0	6.49
04/06/18	LG-5	15.77	2972.42	2956.65	193.45	6.33	21.3	384,000	52,300	27	28,600	34,200	192,000	62,200	1,050	268.0	6.65
07/27/18	LG-5	15.59	2972.42	2956.83	200.28	6.43	21.7	409,000	55,500	<50	31,700	43,300	192,000	42,900	970	266.0	6.40
10/05/18	LG-5	15.43	2972.42	2956.99	209.662	5.89	21.7	401,000	60,200	36	34,700	45,900	204,000	46,400	940	286.0	6.47
01/11/19	LG-5	15.15	2972.42	2957.27	235.577	5.81	20.1	406,000	57,600	40	34,700	42,700	214,000	54,000	1,250	282.0	6.44
04/05/19	LG-5	15.65	2972.42	2956.77	218.748	6.10	20.5	397,000	57,200	40	33,900	43,200	208,000	49,600	1,280	281.0	6.44
07/27/19	LG-5	14.73	2972.42	2957.69	192.158	6.43	22.0	398,000	58,400	40	28,500	41,200	212,000	54,100	860	256.0	6.47
11/01/19	LG-5	14.49	2970.94	2956.45	174.703	6.36	21.3	406,000	57,500	36	30,000	41,600	198,000	45,800	1,620	290.0	6.58
01/28/20	LG-5	14.55	2970.94	2956.39	181.76	6.39	20.4	385,000	53,500	37	38,000	39,400	190,000	52,600	990	280.0	6.44
04/27/20	LG-5	14.44	2970.94	2956.50	191.00	6.30	23.1	394,000	50,300	33	38,800	41,400	198,000	48,900	1,190	283.0	6.37
07/28/20	LG-5	15.21	2970.94	2955.73	180.27	6.31	21.6	384,000	47,400	30	39,900	37,400	190,000	51,700	1,370	275.0	6.34
10/28/20	LG-5	15.44	2970.94	2955.50	180.30	6.34	19.8	401,000	47,800	36	39,200	34,800	200,000	49,500	1,080	272.0	6.61
LG-23																	
1/26/04	LG-23	23.11	2973.22	2950.11	NA	NA	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/19/04	LG-23	22.64	2973.22	2950.58	off scale	7.06	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/6/04	LG-23	22.71	2973.22	2950.51	16.18	6.43	21.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/2/05	LG-23	16.31	2973.22	2956.91	32.06	6.32	20.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/11/05	LG-23	16.32	2973.22	2956.90	28	6.17	20.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/8/05	LG-23	16.85	2973.22	2956.37	NA	6.12	20.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-23 (continued)																	
7/11/05	LG-23	17.77	2973.22	2955.45	28.8	6.15	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/2/05	LG-23	18.48	2973.22	2954.74	32.74	6.68	20.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/13/05	LG-23	18.88	2973.22	2954.34	33.4	6.05	19.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11/14/05	LG-23	19.21	2973.22	2954.01	33.28	6.19	19.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/23/05	LG-23	19.44	2973.22	2953.78	33.4	6.33	19.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1/19/06	LG-23	NA	2973.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/7/06	LG-23	19.78	2973.22	2953.44	32.90	6.49	19.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/10/06	LG-23	19.97	2973.22	2953.25	33.70	6.83	19.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/2/06	LG-23	20.04	2973.22	2953.18	33.52	6.84	20.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5/12/06	LG-23	20.29	2973.22	2952.93	33.10	6.80	25.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7/25/06	LG-23	20.11	2973.22	2953.11	9.36	7.17	24.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/26/06	LG-23	18.45	2973.22	2954.77	NA	7.04	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1/31/07	LG-23	21.48	2973.22	2951.74	23.98	6.51	19.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/1/07	LG-23	NA	2973.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/16/07	LG-23	21.45	2973.22	2951.77	16.38	6.51	19.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/10/07	LG-23	20.70	2973.22	2952.52	13.40	6.58	19.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5/4/07	LG-23	21.40	2973.22	2951.82	33.30	6.54	20.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/2/07	LG-23	21.50	2973.22	2951.72	33.48	7.21	19.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/12/07	LG-23	21.50	2973.22	2951.72	34.10	6.58	21.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1/7/08	LG-23	21.70	2973.22	2951.52	32.46	8.22	20.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/28/08	LG-23	22.10	2973.22	2951.12	32.54	6.90	21.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/8/08	LG-23	22.00	2973.22	2951.22	33.80	6.79	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11/25/08	LG-23	20.20	2973.22	2953.02	37.36 ³	6.30	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2/26/09	LG-23	20.10	2973.22	2953.12	off scale	6.33	22.6	279,200	59,000	48	12,800	31,505	153,100	22,430	579	697.5	6.66
5/20/09	LG-23	20.40	2973.22	2952.82	360	6.22	22.0	284,500	57,400	34	13,629	33,065	156,000	23,995	595	696.7	6.60
8/31/09	LG-23	15.50	2973.22	2957.72	369	6.25	22.4	276,700	57,000	60	15,451	31,762	150,100	21,987	602	663.3	6.66
11/4/09	LG-23	16.25	2973.22	2956.97	386.2	6.22	21.5	283,500	58,300	36	15,825	32,405	152,100	24,509	605	681.7	6.65
1/12/10	LG-23	16.40	2973.22	2956.82	376.6	6.22	20.1	289,200	58,900	31	16,271	33,051	155,200	25,412	609	695.4	6.64
5/12/10	LG-23	16.82	2973.22	2956.40	382	6.24	20.8	291,100	57,700	27	17,015	33,918	155,700	26,324	624	704.1	6.61
8/4/10	LG-23	16.41	2973.22	2956.81	331.8	6.39	21.3	289,516	62,903	105	19,355	33,871	185,484	26,613	339	650.0	6.72
11/16/10	LG-23	16.80	2973.22	2956.42	--	6.55	20.8	318,548	61,290	97	19,355	33,065	217,742	31,452	363	590.0	6.56
1/26/11	LG-23	17.00	2973.22	2956.22	--	6.11	19.0	304,103	51,488	17	17,699	29,767	193,081	31,376	378	680.0	6.61
5/3/11	LG-23	20.20	2973.22	2953.02	--	6.25	18.6	304,103	56,315	100	17,699	29,767	185,036	30,571	378	690.0	6.57
7/5/11	LG-23	18.80	2973.22	2954.42	--	6.13	32.5	327,448	60,995	88	21,669	36,116	160,514	28,892	401	730.0	6.55
10/13/11	LG-23	21.37	2973.22	2951.85	351.2	7.06	22.1	295,345	NA	NA	NA	NA	NA	NA	NA	680.0	NA
2/1/12	LG-23	21.10	2973.22	2952.12	347	6.32	20.6	330,113	NA	NA	NA	NA	NA	NA	NA	640.0	6.61
4/25/12	LG-23	21.20	2973.22	2952.02	349.6	6.26	21.9	314,010	NA	NA	NA	NA	NA	NA	510	590.0	6.55
7/19/12	LG-23	21.20	2973.22	2952.02	334	6.44	22.0	424,000	NA	NA	NA	NA	NA	NA	510	600.0	6.54
11/28/12	LG-23	21.00	2973.22	2952.22	356.8	6.29	20.2	388,000	NA	NA	NA	NA	NA	NA	530	640.0	6.51
11/28/12	LG-23	21.00	2973.22	2952.22	356.8	6.29	20.2	294,900	NA	NA	NA	NA	NA	NA	787	725.9	6.70
02/26/13	LG-23	21.00	2973.22	2952.22	344.6	5.79	21.8	312,097	NA	NA	NA	NA	NA	NA	530	620.0	6.50
02/26/13	LG-23	21.00	2973.22	2952.22	344.6	5.79	21.8	232,200	NA	NA	NA	NA	NA	NA	796	733.3	6.67
04/30/13	LG-23	21.20	2973.22	2952.02	337.2	5.86	22.9	304,032	NA	NA	NA	NA	NA	NA	540	630.0	6.54
04/30/13	LG-23	21.20	2973.22	2952.02	337.2	5.86	22.9	295,300	NA	NA	NA	NA	NA	NA	810	723.3	6.71
08/01/13	LG-23	21.00	2973.22	2952.22	340.2	6.28	22.5	291,800	NA	NA	NA	NA	NA	NA	837	726.7	6.71
11/11/13	LG-23	20.80	2973.22	2952.42	349	5.77	21.1	294,500	NA	NA	NA	NA	NA	NA	873	704.5	6.84

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-23 (continued)																	
02/14/14	LG-23	20.29	2973.22	2952.93	359.4	5.89	22.2	298,200	NA	NA	NA	NA	NA	NA	821	750.0	6.73
05/05/14	LG-23	20.25	2973.22	2952.97	164.7	6.17	24.9	330,882	NA	NA	NA	NA	NA	NA	441	460.0	6.54
07/23/14	LG-23	20.55	2973.22	2952.67	321.8	5.83	23	339,901	NA	NA	NA	NA	NA	NA	443	420.0	6.5
10/29/14	LG-23	15.64	2973.22	2957.58	NA	NA	21.5	270,833	NA	NA	NA	NA	NA	NA	400	570.0	6.73
01/14/15	LG-23	16.55	2973.22	2956.67	234	6.98	18.6	339,138	27,363	91	20,730	31,509	157,546	30,680	406	610.0	6.62
05/06/15	LG-23	16.92	2973.22	2956.30	226	7.03	21.7	331,667	34,167	92	22,500	29,167	175,000	37,500	425	560.0	6.64
05/06/15	LG-23	16.92	2973.22	2956.30	226	7.03	21.7	311,667	55,833	84	22,000	34,333	156,667	25,917	425	508.0	6.30
07/07/15	LG-23	18.67	2973.22	2954.55	224	5.98	22.4	308,013	55,342	81	22,287	32,805	190,317	23,957	534	506.0	6.45
10/21/15	LG-23	19.74	2973.22	2953.48	231	6.01	20.8	301,932	53,462	81	20,290	31,804	170,692	20,612	228	495.0	6.42
03/03/16	LG-23	20.07	2973.22	2953.15	164.1	NA	21.8	292,135	41,493	103	26,565	41,172	149,278	26,404	457	376.0	6.50
04/08/16	LG-23	20.20	2973.22	2953.02	166.4	NA	20.2	274,637	54,927	75	20,113	32,229	151,858	12,682	493	430.0	6.47
08/10/16	LG-23	20.64	2973.22	2952.58	347	NA	21.8	286,179	56,992	70	21,057	33,415	165,854	27,398	488	555.0	6.48
12/02/16	LG-23	19.61	2973.22	2953.61	347	NA	19.6	291,099	53,007	138	19,166	30,313	153,970	30,473	417	594.0	6.43
03/14/17	LG-23	19.51	2973.22	2953.71	211.48	6.46	22.2	278,977	51,559	69	19,424	30,376	150,280	31,655	448	547.0	6.54
05/12/17	LG-23	19.61	2973.22	2953.61	207.98	6.54	24.6	294,976	49,109	65	17,909	30,470	149,109	32,172	454	548.0	6.41
07/28/17	LG-23	19.51	2973.22	2953.71	208.7	6.52	6.52	300,833	56,250	68	20,750	34,167	165,000	31,500	467	634.0	6.92
11/10/17	LG-23	19.47	2973.22	2953.75	220.63	6.31	20.6	303,333	50,583	57	18,250	30,833	180,000	48,917	608	238.0	6.44
02/20/18	LG-23	19.95	2973.22	2953.27	226.12	6.31	21.1	359,000	65,400	82	24,700	40,300	192,000	40,100	610	280.0	6.48
04/06/18	LG-23	20.07	2973.22	2953.15	207.51	6.25	21.1	382,000	61,600	74	23,000	37,500	174,000	46,200	600	266.0	6.74
07/27/18	LG-23	20.90	2973.22	2952.32	217.19	6.38	22	379,000	61,300	88	24,200	37,700	196,000	36,400	620	270.0	6.32
10/05/18	LG-23	20.47	2973.22	2952.75	218.463	6.15	22.2	369,000	67,400	82	24,900	41,600	184,000	31,600	590	285.0	6.51
01/11/19	LG-23	19.33	2973.22	2953.89	246.477	5.53	20.8	383,000	66,000	94	26,200	41,000	184,000	39,100	840	255.0	6.48
04/05/19	LG-23	19.74	2973.22	2953.48	227.1	5.77	20.63	367,000	62,700	103	24,400	45,700	176,000	38,000	1,120	291.0	6.46
07/26/19	LG-23	17.25	2973.22	2955.97	205.463	6.39	21.6	363,000	58,500	141	21,200	42,600	220,000	34,300	990	250.0	6.55
11/01/19	LG-23	19.00	2973.22	2954.22	183.795	6.38	21	375,000	55,400	78	21,700	33,700	180,000	31,600	1,050	286.0	6.46
01/28/20	LG-23	19.80	2973.22	2953.42	201.178	6.31	20.2	368,000	57,100	75	23,900	35,700	180,000	38,000	540	283.0	6.48
04/27/20	LG-23	19.07	2973.22	2954.15	218.1	6.35	22.2	364,000	59,600	73	26,700	37,800	190,000	35,300	560	289.0	6.47
07/28/20	LG-23	19.65	2973.22	2953.57	202.873	6.43	21.6	359,000	69,600	84	26,900	44,200	190,000	39,700	1,150	254.0	6.41
10/28/20	LG-23	19.81	2973.22	2953.41	199.8	6.33	19.7	377,000	58,700	83	27,000	37,500	198,000	33,900	600	284.0	6.72
LG-25																	
1/26/04	LG-25	24.26	2972.92	2948.66	NA	NA	20.0	5800	1000	490	300	28	1600	2100	470	10.1	7.20
4/19/04	LG-25	23.64	2972.92	2949.28	0.704	6.88	22.0	4800	800	420	230	9	1400	1700	436	9.0	7.33
7/6/04	LG-25	dry	2972.92	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
10/21/04	LG-25	dry	2972.92	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
2/2/05	LG-25	23.12	2972.92	2949.80	0.68	6.89	19.8	4700	800	420	220	7	1400	1600	390	8.9	7.31
4/11/05	LG-25	22.71	2972.92	2950.21	0.658	6.95	20.9	4600	800	390	230	7	1400	1500	390	8.5	7.32
7/12/05	LG-25	23.09	2972.92	2949.83	0.682	6.92	20.2	4800	800	370	220	8	1400	1800	410	8.9	7.41
10/13/05	LG-25	23.05	2972.92	2949.87	0.669	6.77	20.0	4800	800	380	230	8	1400	1700	400	8.5	7.37
1/19/06	LG-25	21.46	2972.92	2951.46	NA	NA	NA	4650	800	400	210	8	1400	1600	390	8.2	7.37
4/5/06	LG-25	22.30	2972.92	2950.62	0.707	7.27	20.4	5095	880	420	236	9	1500	1800	420	9.1	7.20
7/18/06	LG-25	22.73	2972.92	2950.19	0.728	7.08	21.6	5290	890	400	260	11	1580	1900	416	9.4	7.36
10/23/06	LG-25	22.36	2972.92	2950.56	0.733	7.04	20.9	5450	925	460	267	13	1570	1960	425	9.8	7.24
1/31/07	LG-25	22.43	2972.92	2950.49	0.718	7	20.5	5190	880	404	232	12	1513	1900	416	9.2	7.21
4/10/07	LG-25	21.76	2972.92	2951.16	0.721	6.9	20.7	5213	890	516	251	12	1510	1900	410	9.5	7.16
8/10/07	LG-25	22.40	2972.92	2950.52	7.3	7.39	20.3	5482	885	542	264	11	1580	1948	420	9.5	7.31
10/10/07	LG-25	22.30	2972.92	2950.62	7.4	7.54	21.4	5579	902	604	280	11	1584	1940	430	10.0	7.47
1/2/08	LG-25	22.00	2972.92	2950.92	7.38	7.02	20.4	5454	870	618	273	12	1613	1810	430	10.0	7.29

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-25 (continued)																	
4/28/08	LG-25	22.25	2972.92	2950.67	7.64	7.3	19.9	5,711	870	634	293	7	1,607	2,037	438	10.0	7.66
8/6/08	LG-25	22.50	2972.92	2950.42	7.67	7.73	21.7	5,587	901	625	270	8	1,610	1,906	446	8.0	7.33
11/17/08	LG-25	21.90	2972.92	2951.02	8.16 ³	6.8	20.4	5,847	868	676	260	8	1,655	2,111	448	10.4	7.18
2/25/09	LG-25	22.40	2972.92	2950.52	9.8 ³	6.83	21.1	5,764	860	695	257	8	1,695	1,985	441	10.0	7.17
5/19/09	LG-25	22.54	2972.92	2950.38	16.65	6.69	27.5	6,014	898	671	309	9	1,743	2,120	441	9.9	7.21
8/25/09	LG-25	22.00	2972.92	2950.92	8.38	6.8	25.9	5,561	887	463	300	7	1,688	1,958	431	9.5	7.16
11/2/09	LG-25	22.50	2972.92	2950.42	8.08	6.78	21.7	5,684	876	647	282	7	1,686	1,929	428	9.5	7.13
1/11/10	LG-25	22.04	2972.92	2950.88	8.03	6.77	19.4	5,764	914	660	287	8	1,685	1,952	430	9.5	7.12
5/11/10	LG-25	22.40	2972.92	2950.52	8.25	6.86	21.4	5,795	868	644	286	7	1,729	1,997	441	9.6	7.14
8/3/10	LG-25	22.25	2972.92	2950.67	8.28	6.91	20.9	6,050	970	720	290	<25	2,000	2,200	210	7.5	7.71
11/16/10	LG-25	21.30	2972.92	2951.62	--	7.01	10.0	5,920	950	700	280	8	2,100	2,200	220	12.0	7.17
1/26/11	LG-25	21.90	2972.92	2951.02	--	6.57	19.3	6,010	990	700	280	10	2,000	2,300	220	9.5	7.14
5/2/11	LG-25	22.15	2972.92	2950.77	--	6.64	25.0	6,230	900	640	260	<10	2,000	2,300	220	7.9	7.28
7/5/11	LG-25	22.72	2972.92	2950.20	--	6.64	25.0	6,210	1,000	670	270	8	1,900	2,200	220	7.9	7.18
10/12/11	LG-25	21.84	2972.92	2951.08	4.94	6.88	22.4	6,400	1,000	650	270	<10	2,000	2,400	220	6.4	7.59
1/31/12	LG-25	21.10	2972.92	2951.82	5.09	6.74	20.4	6,670	1,100	770	310	9	2,000	2,200	NA	8.7	7.51
4/24/12	LG-25	21.10	2972.92	2951.82	5.03	6.86	21.9	6,650	1,100	740	300	8	2,000	2,300	200	8.4	7.37
7/18/12	LG-25	21.62	2972.92	2951.30	4.82	7.02	22.7	6,520	1,000	720	260	6	1,900	2,300	180	7.7	7.32
11/26/12	LG-25	21.80	2972.92	2951.12	4.72	6.78	24.3	6,010	950	630	260	19	1,700	2,400	180	7.9	7.35
11/26/12	LG-25	21.80	2972.92	2951.12	4.72	6.78	24.3	5,933	848	668	297	8	1,661	2,229	370	9.7	7.45
02/27/13	LG-25	21.80	2972.92	2951.12	4.52	6.52	19.4	6,090	890	590	240	ND	1,700	2,200	180	7.3	7.21
02/27/13	LG-25	21.80	2972.92	2951.12	4.52	6.52	19.4	5,778	900	641	292	7	1,572	2,141	375	9.5	7.24
04/29/13	LG-25	21.90	2972.92	2951.02	4.39	6.61	22.0	5,930	800	610	230	7	1,600	2,000	190	8.3	7.41
04/29/13	LG-25	21.90	2972.92	2951.02	4.39	6.61	22.0	5,770	893	619	295	7	1,557	2,171	380	9.5	7.50
07/31/13	LG-25	21.55	2972.92	2951.37	4.33	6.09	21.8	5,606	848	660	279	8	1,508	2,062	402	9.3	7.35
10/30/13	LG-25	21.00	2972.92	2951.92	4.2	6.67	21.3	5,588	819	638	291	9	1,491	2,105	392	9.0	7.63
02/12/14	LG-25	21.80	2972.92	2951.12	4.27	6.90	20.8	5,557	829	643	271	10	1,488	2,080	394	9.0	7.39
04/28/14	LG-25	22.10	2972.92	2950.82	4.02	6.86	21.1	5,260	790	540	210	8	1,500	1,900	200	5.7	7.18
07/22/14	LG-25	22.35	2972.92	2950.57	3.85	6.21	22.6	5,090	808	569	220	7	1,297	1,697	200	5.3	7.33
10/27/14	LG-25	19.95	2972.92	2952.97	NA	NA	22.2	5,370	760	520	190	9	1,400	1,900	200	6.0	7.46
03/11/15	LG-25	20.89	2972.92	2952.03	7.5	7.35	18.2	5,371	808	628	277	8	1,492	1,933	376	9.0	7.19
05/04/15	LG-25	21.25	2972.92	2951.67	7.71	6.76	22.5	5,950	910	650	250	51	1,700	2,000	198	6.9	7.74
05/04/15	LG-25	21.25	2972.92	2951.67	7.71	6.76	22.5	6,080	906	614	259	11	1,520	1,580	268	7.4	7.27
07/09/15	LG-25	21.54	2972.92	2951.38	8.03	7.01	21.9	6,128	938	656	280	ND	1,697	1,996	248	7.8	7.24
10/21/15	LG-25	21.00	2972.92	2951.92	8.54	6.54	21.7	5,669	1,031	725	280	11	1,804	1,774	224	8.3	7.07
03/01/16	LG-25	21.32	2972.92	2951.60	7.07	NA	20.5	6,590	1,153	753	343	69	1,958	2,107	207	7.7	7.49
04/14/16	LG-25	21.67	2972.92	2951.25	7.13	NA	21.2	6,773	1,219	743	305	<200	1,998	2,478	216	10.7	7.43
08/09/16	LG-25	21.66	2972.92	2951.26	13.33	NA	21.6	6,866	1,066	678	281	8	1,774	1,840	219	9.2	7.20
12/05/16	LG-25	21.57	2972.92	2951.35	13.53	NA	20.7	6,487	1,047	632	269	50	2,164	2,193	211	12.4	7.13
03/14/17	LG-25	21.73	2972.92	2951.19	10.99	7.02	21.9	6,555	1,184	698	293	20	1,801	2,458	231	12.1	7.02
05/12/17	LG-25	21.77	2972.92	2951.15	9.71	7.31	22.4	6,940	1,100	646	272	<10	2,200	2,100	228	8.5	6.89
07/29/17	LG-25	21.85	2972.92	2951.07	10.84	6.78	22.6	6,720	1,160	685	286	50	1,900	2,150	212	8.6	7.70
11/11/17	LG-25	21.91	2972.92	2951.01	11.74	6.97	21.2	6,760	1,050	607	249	20	2,020	2,430	264	9.2	6.47
02/21/18	LG-25	21.81	2972.92	2951.11	10.85	7.08	21.0	6,600	1,180	680	305	48	2,000	2,310	236	9.1	7.00
04/07/18	LG-25	22.00	2972.92	2950.92	9.67	6.94	20.6	6,530	1,090	640	270	<50	2,040	2,500	268	8.8	7.54
07/29/18	LG-25	22.05	2972.92	2950.87	9.42	7.00	21.9	6,690	1,110	646	275	8	1,880	1,600	220	8.8	7.15
10/06/18	LG-25	21.99	2972.92	2950.93	10.44	7.02	21.9	6,550	1,200	699	289	124	1,860	2,210	216	9.1	7.36

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-25 (continued)																	
01/12/19	LG-25	21.76	2972.92	2951.16	12.314	6.94	20.9	6,410	1,140	696	294	18	1,840	2,260	224	8.9	7.22
04/06/19	LG-25	21.72	2972.92	2951.20	11.196	6.96	20.2	6,120	1,130	678	280	11	2,000	2,680	322	8.7	7.22
07/27/19	LG-25	21.79	2972.92	2951.13	9.238	7.11	21.6	6,370	1,150	681	278	22	1,600	1,980	248	7.8	7.54
11/02/19	LG-25	22.07	2972.92	2950.85	7.94	7.23	20.7	6,490	1,070	608	266	7	1,880	1,970	220	9.0	7.15
01/29/20	LG-25	21.66	2972.92	2951.26	6.719	7.92	20.9	6,500	1,150	754	307	9	1,920	2,030	216	9.1	7.38
04/28/20	LG-25	21.75	2972.92	2951.17	5.926	9.42	23.9	6,600	1,100	627	272	12	1,970	1,980	236	9.0	7.09
07/29/20	LG-25	22.00	2972.92	2950.92	7.821	6.90	21.6	6,650	1,050	677	257	8	1,870	2,210	293	8.9	6.95
10/29/20	LG-25	22.26	2972.92	2950.66	11.66	7.11	21.9	6,420	1,050	595	247	16	1,830	1,900	220	8.8	7.03
LG-26																	
1/26/04	LG-26	17.35	2952.61	2935.26	NA	NA	20	9,300	2,400	400	390	43	3,700	2,100	510	17.1	7.35
4/19/04	LG-26	15.63	2952.61	2936.98	1.37	6.99	20.5	9,200	2,300	400	370	43	3,700	2,100	480	17.1	7.46
7/6/04	LG-26	17.08	2952.61	2935.53	1.37	7.01	21	9,200	2,300	400	390	43	3,700	2,100	505	17.1	7.31
10/21/04	LG-26	NA	2952.61	NA	NA	NA	NA	7,900	1,900	400	350	40	2,900	2,000	480	14.5	7.36
2/2/05	LG-26	15.87	2952.61	2936.74	1.94	6.71	20.2	13,900	3,600	630	570	56	6,100	2,600	500	26.7	7.45
4/11/05	LG-26	32.39	2952.61	2920.22	3.68	6.8	20.8	25,200	6,800	880	800	92	12,400	3,900	510	50.4	7.25
7/11/05	LG-26	16.30	2952.61	2936.31	6.07	6.64	20.3	43,700	12,000	1,330	1,710	165	23,100	5,100	476	88.3	7.29
10/13/05	LG-26	16.19	2952.61	2936.42	7.26	6.55	19.7	53,800	15,100	1,650	2,330	191	29,000	5,300	448	110.0	7.06
1/20/06	LG-26	15.63	2952.61	2936.98	NA	NA	NA	44,680	12,340	1,360	1,850	155	23,400	5,300	456	90.0	7.25
4/2/06	LG-26	16.19	2952.61	2936.42	7.45	6.99	20.0	56,200	16,500	1,650	2,224	212	29,750	5,600	437	110.5	7.08
7/19/06	LG-26	17.21	2952.61	2935.40	6.99	6.69	20.1	54,550	15,180	1,370	2,170	208	29,950	5,400	451	105.0	7.20
10/19/06	LG-26	16.30	2952.61	2936.31	6.72	6.64	19.7	50,195	14,640	1,500	2,085	194	26,000	5,500	461	100.0	7.12
1/31/07	LG-26	16.28	2952.61	2936.33	8.17	6.79	20.0	61,987	18,250	1,700	2,421	270	33,160	5,920	443	128.5	7.05
4/10/07	LG-26	16.60	2952.61	2936.01	5.2	7.2	21.1	34,270	9,673	1,165	1,421	136	17,350	4,260	483	70.0	7.13
8/10/07	LG-26	16.60	2952.61	2936.01	6.01	7.05	19.6	39,828	11,300	1,203	1,620	149	20,870	4,410	461	80.0	7.23
10/10/07	LG-26	16.80	2952.61	2935.81	8.26	7.28	20.8	65,065	19,249	1,621	2,762	273	34,620	6,280	433	131.0	7.10
1/2/08	LG-26	16.50	2952.61	2936.11	6.32	7.38	20.2	47,014	13,232	1,375	1,990	183	24,560	5,400	457	95.0	7.11
4/30/08	LG-26	16.80	2952.61	2935.81	10.62	6.86	20.7	62,090	18,019	1,573	2,710	267	33,580	5,670	452	136.0	7.51
8/8/08	LG-26	17.55	2952.61	2935.06	8.01	7.28	20.5	61,021	17,605	1,474	2,493	275	33,010	5,900	440	129.0	7.17
11/17/08	LG-26	16.10	2952.61	2936.51	7.12 ³	6.55	20.4	46,974	13,756	1,198	1,680	192	24,610	5,260	463	96.0	7.16
2/25/09	LG-26	16.70	2952.61	2935.91	38.8 ³	6.66	20.7	51,544	14,672	1,335	2,019	210	27,645	5,387	460	107.8	7.11
5/19/09	LG-26	17.02	2952.61	2935.59	118.8	6.61	21.1	76,751	22,810	1,678	2,985	407	42,209	6,423	398	158.2	6.94
8/31/09	LG-26	16.80	2952.61	2935.81	109.9	6.51	21.1	76,554	22,652	1,596	3,025	406	42,411	6,224	400	159.5	6.97
11/4/09	LG-26	16.90	2952.61	2935.71	111.4	6.53	20.7	76,378	22,981	1,582	2,903	410	42,251	6,011	400	159.1	6.95
1/12/10	LG-26	16.70	2952.61	2935.91	111.7	6.51	19.7	79,136	23,535	1,598	3,031	453	44,197	6,088	391	160.5	6.94
5/12/10	LG-26	16.58	2952.61	2936.03	116.4	6.44	20.6	81,409	24,079	1,550	3,066	548	45,722	6,214	383	173.3	6.92
8/3/10	LG-26	16.30	2952.61	2936.31	106.4	6.51	20.7	79,340	26,415	1,698	3,019	575	53,744	7,170	189	180.0	7.46
12/1/10	LG-26	15.61	2952.61	2937.00	--	6.75	19.7	70,209	20,873	1,518	2,562	474	37,002	6,736	209	130.0	7.13
1/26/11	LG-26	16.20	2952.61	2936.41	--	6.3	21.5	66,954	19,157	1,553	2,490	441	38,314	6,513	220	130.0	7.14
5/3/11	LG-26	16.70	2952.61	2935.91	--	6.38	21.0	67,912	20,115	1,437	2,299	469	45,977	6,992	144	150.0	7.02
7/6/11	LG-26	17.50	2952.61	2935.11	--	6.23	22.4	65,679	21,989	1,530	2,390	516	40,153	6,405	220	150.0	7.25
10/12/11	LG-26	17.80	2952.61	2934.81	90.5	6.68	20.3	63,958	20,076	1,434	2,390	402	42,065	6,214	220	130.0	7.31
2/1/12	LG-26	17.30	2952.61	2935.31	104	6.52	21.0	80,472	23,585	1,604	2,736	519	42,453	6,792	NA	160.0	7.34
4/25/12	LG-26	17.40	2952.61	2935.21	91.2	6.52	21.9	66,990	21,359	913	2,330	427	41,748	6,893	230	130.0	7.16
7/19/12	LG-26	17.80	2952.61	2934.81	106.6	6.77	22.1	88,469	24,575	1,701	2,647	510	51,040	7,656	208	160.0	7.08
11/26/12	LG-26	17.40	2952.61	2935.21	96	6.57	21.1	77,969	22,989	1,437	2,490	546	40,230	5,556	220	140.0	7.03
11/26/12	LG-26	17.40	2952.61	2935.21	96	6.57	21.1	73,990	21,725	1,539	2,790	447	40,977	6,256	427	157.5	7.05

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-26 (continued)																	
02/27/13	LG-26	17.10	2952.61	2935.51	103	5.24	21	81,333	25,714	1,429	2,571	600	46,667	7,143	210	150.0	7.02
02/27/13	LG-26	17.10	2952.61	2935.51	103	5.24	21	78,340	23,119	1,560	2,915	653	43,500	6,351	403	169.8	7.02
05/01/13	LG-26	17.20	2952.61	2935.41	88	5.88	21.9	69,327	NA	NA	NA	NA	NA	NA	221	130.0	7.26
05/01/13	LG-26	17.20	2952.61	2935.41	88	5.88	21.9	67,082	19,920	1,455	2,577	444	36,527	5,898	435	140.0	7.06
08/02/13	LG-26	16.90	2952.61	2935.71	104	6.35	20.8	78,660	23,291	2,227	2,821	641	43,025	6,393	437	167.5	7.18
10/30/13	LG-26	16.44	2952.61	2936.17	93.5	6.03	21	68,905	20,687	1,415	2,522	482	37,285	6,260	423	140.0	7.35
02/18/14	LG-26	16.44	2952.61	2936.17	86.8	5.25	22.2	62,623	18,128	1,401	2,348	392	34,383	5,699	453	137.0	7.09
04/28/14	LG-26	16.80	2952.61	2935.81	89.2	6.26	21.7	60,940	19,194	1,344	2,111	576	26,871	5,470	221	100.0	7.03
07/21/14	LG-26	17.25	2952.61	2935.36	84.5	6.10	22.4	66,411	19,194	1,344	2,111	441	30,710	5,374	221	89.0	7.10
10/27/14	LG-26	14.86	2952.61	2937.75	NA	NA	22.1	54,808	17,308	1,250	1,923	442	28,846	5,288	231	94.0	7.36
03/11/15	LG-26	15.20	2952.61	2937.41	119.1	6.92	18.6	60,724	17,839	1,380	2,332	534	33,048	5,315	461	129.5	6.97
05/05/15	LG-26	15.00	2952.61	2937.61	91.9	6.07	21.4	69,866	18,234	1,344	2,111	710	33,589	6,046	227	120.0	7.43
05/05/15	LG-26	15.00	2952.61	2937.61	91.9	6.07	21.4	67,850	19,290	1,276	2,274	681	35,509	5,019	246	111.0	6.65
07/02/15	LG-26	15.34	2952.61	2937.27	125.5	6.29	21.9	67,271	18,798	1,326	2,281	709	37,214	4,924	252	85.4	6.80
10/09/15	LG-26	14.57	2952.61	2938.04	132	6.08	22.5	97,856	29,916	1,603	3,364	1,603	55,918	6,477	231	166.0	6.61
10/09/15	LG-26	14.57	2952.61	2938.04	132	6.08	22.5	97,106	30,065	1,578	3,324	1,569	56,022	6,508	250	157.0	6.57
02/15/16	LG-26	14.33	2952.61	2938.28	90.6	NA	22.8	90,308	26,002	1,454	3,038	1,594	51,258	6,617	252	125.0	6.97
04/14/16	LG-26	16.87	2952.61	2935.74	92.3	NA	21.7	91,611	28,503	1,497	3,203	1,849	56,244	6,511	252	138.0	7.16
08/08/16	LG-26	15.83	2952.61	2936.78	208	NA	23.5	109,982	34,196	1,645	4,113	2,754	60,074	6,414	233	203.0	6.62
11/30/16	LG-26	15.34	2952.61	2937.27	173.8	NA	20.6	64,641	18,232	1,308	2,247	1,050	36,832	5,773	236	117.0	6.78
03/15/17	LG-26	15.39	2952.61	2937.22	140.72	6.63	20.9	116,279	31,814	1,507	4,149	3,005	64,186	7,600	227	212.0	6.84
05/12/17	LG-26	15.72	2952.61	2936.89	37.7	6.61	22.8	108,182	29,364	1,309	3,709	2,909	65,455	7,427	244	211.0	6.49
07/28/17	LG-26	16.16	2952.61	2936.45	141.65	8.20	21.3	103,704	33,426	1,435	4,176	3,130	68,519	8,185	248	250.0	7.09
11/11/17	LG-26	15.95	2952.61	2936.66	151.26	6.30	20.3	117,159	31,089	1,328	3,856	3,017	73,801	9,317	240	149.0	6.72
02/20/18	LG-26	15.95	2952.61	2936.66	158.51	6.40	20.4	131,000	36,300	1,590	4,790	3,870	91,000	8,680	272	154.0	6.98
04/06/18	LG-26	16.11	2952.61	2936.50	146.63	6.35	20.7	131,000	33,500	1,450	4,440	3,500	68,000	10,100	276	146.0	7.07
07/28/18	LG-26	16.59	2952.61	2936.02	153.27	6.44	20.8	136,000	37,200	1,550	4,930	4,000	76,000	6,890	268	147.0	6.54
10/06/18	LG-26	16.45	2952.61	2936.16	167.902	6.52	20.9	136,000	38,200	1,570	4,940	4,290	75,000	9,310	252	158.0	6.82
01/11/19	LG-26	15.64	2952.61	2936.97	189.986	6.20	20.3	143,000	39,300	1,670	5,570	4,720	76,000	10,500	312	161.0	6.72
04/05/19	LG-26	15.73	2952.61	2936.88	196.68	6.24	20.19	150,000	50,600	1,960	6,960	6,100	89,000	9,260	337	160.0	6.57
07/26/19	LG-26	16.15	2952.61	2936.46	157.116	6.42	21.2	155,000	43,000	1,490	5,720	5,930	91,000	9,030	312	152.0	7.00
11/02/19	LG-26	16.35	2952.61	2936.26	149.882	6.47	20.1	159,000	40,100	1,350	5,570	5,360	93,000	8,590	292	174.0	6.55
01/28/20	LG-26	15.98	2952.61	2936.63	160.712	6.75	20.1	157,000	41,900	1,480	5,930	5,690	85,000	10,500	280	172.0	6.86
04/27/20	LG-26	16.06	2952.61	2936.55	146.80	6.34	22.4	157,000	40,100	1,310	5,870	5,840	87,000	9,440	276	163.0	6.74
07/28/20	LG-26	16.83	2952.61	2935.78	167.62	6.45	21.1	174,000	40,500	1,300	5,890	5,930	88,000	10,300	342	169.0	6.38
10/28/20	LG-26	16.81	2952.61	2935.80	160.20	6.37	19.5	158,000	42,100	1,380	5,950	6,080	85,000	9,990	280	174.0	6.53
LG-27																	
1/26/04	LG-27	33.24	2959.40	2926.16	NA	NA	20	12,200	3,600	380	320	55	5,000	2,200	1,111	22.5	7.58
4/19/04	LG-27	32.57	2959.40	2926.83	1.72	7.16	20.5	11,600	3,400	360	280	50	4,700	2,200	1,011	21	7.53
7/6/04	LG-27	34.65	2959.40	2924.75	1.69	7.1	21	11,700	3,500	350	270	49	4,700	2,200	1,051	21.1	7.52
10/21/04	LG-27	NA	2959.40	NA	NA	NA	NA	11,500	3,400	380	300	54	4,800	1,900	1,067	21	7.6
2/2/05	LG-27	32.92	2959.40	2926.48	1.77	7.09	20.2	11,700	3,400	370	270	50	4,800	2,200	981	21.6	7.46
4/11/05	LG-27	32.92	2959.40	2926.48	1.72	7.16	20.4	11,700	3,400	380	250	50	4,900	2,100	1,056	21.6	7.69
7/11/05	LG-27	32.65	2959.40	2926.75	1.74	6.96	20.3	11,800	3,500	370	260	51	4,800	2,200	1,031	21.1	7.62
10/13/05	LG-27	32.43	2959.40	2926.97	1.72	7.21	19.6	11,700	3,500	370	280	49	4,800	2,100	1,051	21	7.61
1/20/06	LG-27	31.90	2959.40	2927.50	NA	NA	NA	11,730	3,450	360	253	50	4,500	2,500	1,031	21	7.69
4/2/06	LG-27	NA	2959.40	NA	NA	NA	NA	lost	lost	lost	lost	lost	lost	lost	lost	lost	lost

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-27 (continued)																	
7/19/06	LG-27	33.23	2959.40	2926.17	1.758	7.07	21.6	11,765	3,460	370	275	54	4,900	2,100	1,011	21.3	7.55
10/19/06	LG-27	32.18	2959.40	2927.22	1.691	6.97	19.6	12,175	3,500	380	275	55	4,835	2,500	1,051	21.3	7.6
1/31/07	LG-27	31.20	2959.40	2928.20	1.742	7.21	19.7	12,473	3,660	420	294	69	5,570	1,800	1,100	23.1	7.4
4/10/07	LG-27	31.17	2959.40	2928.23	1.709	7.43	20.9	11,797	3,440	395	262	52	4,735	2,300	1,022	21	7.47
8/10/07	LG-27	31.90	2959.40	2927.50	17.14	7.54	20.6	11,850	3,450	380	280	49	4,840	2,275	960	21.3	7.37
10/10/07	LG-27	32.00	2959.40	2927.40	18.86	7.58	28.5	13,135	3,909	409	361	58	5,576	2,254	947	24	7.42
4/30/08	LG-27	30.80	2959.40	2928.60	17.98	7.36	22.4	11,912	3,450	396	324	62	4,970	2,134	961	22.4	7.73
8/8/08	LG-27	32.90	2959.40	2926.50	17.56 ⁺	7.99	21.3	11,880	3,480	402	280	59	4,872	2,199	981	22.4	7.36
11/17/08	LG-27	32.90	2959.40	2926.50	18.19 ^s	7.18	20.8	11,804	3,268	390	268	55	4,970	2,261	988	22.1	7.46
2/26/09	LG-27	30.50	2959.40	2928.90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5/20/09	LG-27	30.99	2959.40	2928.41	17.89	7.15	20.1	11,797	3,369	317	295	52	4,971	2,155	1,064	21.9	7.59
8/25/09	LG-27	31.24	2959.40	2928.16	18.7	7.15	23.6	12,204	3,516	402	319	56	5,294	1,959	1,098	22.0	7.55
11/4/09	LG-27	31.40	2959.40	2928.00	18.16	7.27	21.3	11,875	3,356	382	293	52	5,021	2,134	1,063	22.0	7.53
1/12/10	LG-27	30.46	2959.40	2928.94	17.87	7.21	19.8	11,965	3,397	390	296	52	5,047	2,145	1,064	22.0	7.59
5/12/10	LG-27	30.10	2959.40	2929.30	18.33	7.25	21.3	11,722	3,100	388	295	52	5,067	2,174	1,077	22.1	7.62
8/3/10	LG-27	30.10	2959.40	2929.30	18.22	7.32	21.1	12,575	3,194	389	259	<50	5,589	2,495	519	24.0	8.02
11/17/10	LG-27	30.50	2959.40	2928.90	--	7.36	21.2	11,577	3,593	419	269	55	6,088	2,395	549	25.0	7.69
1/26/11	LG-27	29.70	2959.40	2929.70	--	7.05	21.2	12,874	3,693	429	289	57	5,788	2,196	559	42.0	7.73
5/3/11	LG-27	30.35	2959.40	2929.05	--	7.18	21.5	12,475	3,493	459	289	53	5,489	2,196	768	25.0	6.67
7/6/11	LG-27	31.90	2959.40	2927.50	--	7.15	22.5	12,724	3,678	408	268	68	5,865	2,286	577	24.0	7.79
10/12/11	LG-27	32.55	2959.40	2926.85	10.54	7.34	21.5	11,630	NA	NA	NA	NA	NA	NA	NA	24.0	NA
2/1/12	LG-27	31.10	2959.40	2928.30	10.47	7.07	20.6	11,321	3,491	406	264	51	4,906	1,981	NA	24.0	7.80
4/25/12	LG-27	31.00	2959.40	2928.40	10.64	7.08	22.0	12,375	3,693	429	279	60	5,888	2,295	550	23.0	7.71
7/19/12	LG-27	32.19	2959.40	2927.21	10.61	7.40	21.3	12,004	3,671	466	278	50	5,853	2,183	546	25.0	7.62
11/26/12	LG-27	31.40	2959.40	2928.00	10.45	7.31	21.7	11,377	3,693	399	269	57	4,990	1,996	559	19.0	7.56
11/26/12	LG-27	31.40	2959.40	2928.00	10.45	7.31	21.7	12,255	3,402	394	320	52	5,298	2,128	1,102	23.2	7.66
02/27/13	LG-27	30.70	2959.40	2928.70	10.43	5.18	20.9	12,673	3,564	406	277	56	6,040	2,376	554	19.0	7.58
02/27/13	LG-27	30.70	2959.40	2928.70	10.43	5.18	20.9	12,370	3,413	428	309	56	5,298	2,206	1,100	23.0	7.66
05/01/13	LG-27	30.55	2959.40	2928.85	10.58	6.24	22.7	11,881	3,564	446	267	64	5,050	2,079	554	25.0	7.81
05/01/13	LG-27	30.55	2959.40	2928.85	10.58	6.24	22.7	12,513	3,582	399	323	62	5,308	2,178	1,103	23.1	7.72
08/02/13	LG-27	30.24	2959.40	2929.16	10.55	7.14	22.1	12,464	3,509	422	305	57	5,328	2,167	1,127	23.0	7.67
10/30/13	LG-27	31.25	2959.40	2928.15	10.63	6.57	22.1	12,294	3,452	424	319	55	5,326	2,085	1,056	22.1	7.69
10/27/14	LG-27	31.43	2959.40	2927.97	NA	NA	21.8	11,806	3,671	417	278	57	5,754	2,083	565	19.0	7.80
03/11/15	LG-27	28.58	2959.40	2930.82	19.67	8.06	19.9	10,582	2,930	374	278	45	4,576	1,815	940	20.7	7.42
05/08/15	LG-27	27.80	2959.40	2931.60	18.61	7.39	22.7	12,974	3,593	419	279	69	6,088	1,697	589	19.0	8.05
05/08/15	LG-27	27.80	2959.40	2931.60	18.61	7.39	22.7	12,275	3,503	397	282	68	5,589	1,557	609	17.8	7.30
07/01/15	LG-27	28.66	2959.40	2930.74	19.65	6.75	25.6	11,933	3,590	396	287	60	6,213	1,440	621	17.7	7.32
10/21/15	LG-27	28.50	2959.40	2930.90	20.1	6.99	21.3	13,807	3,787	468	298	61	5,720	1,627	661	21.2	7.35
03/01/16	LG-27	27.63	2959.40	2931.77	14.29	NA	22.3	12,525	3,629	465	287	59	5,424	2,110	542	16.9	7.56
04/06/16	LG-27	27.58	2959.40	2931.82	14.32	NA	23.6	12,475	3,912	449	295	<200	6,287	2,295	579	18.6	7.59
08/08/16	LG-27	29.36	2959.40	2930.04	26.4	NA	22.9	10,556	3,370	412	265	64	5,185	1,491	496	21.8	7.43
11/30/16	LG-27	27.60	2959.40	2931.80	27.2	NA	19.5	11,144	3,274	372	254	63	5,473	1,861	547	20.8	7.29
03/14/17	LG-27	27.13	2959.40	2932.27	18.77	7.44	20.9	11,920	3,031	339	231	54	5,455	1,980	546	21.8	7.21
LG-28																	
02/02/06	LG-28	9.48	2962.52	2953.04	33	7.14	18.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
03/10/06	LG-28	9.68	2962.52	2952.84	33	6.57	20.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-28 (continued)																	
04/02/06	LG-28	9.79	2962.52	2952.73	33	6.65	20.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
05/11/06	LG-28	9.98	2962.52	2952.54	24	6.58	20.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
07/19/06	LG-28	10.47	2962.52	2952.05	31	6.34	21.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/26/06	LG-28	10.75	2962.52	2951.77	NA	6.45	19.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
01/31/07	LG-28	9.65	2962.52	2952.87	25	6.28	20.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
02/01/07	LG-28	NA	2962.52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
03/16/07	LG-28	9.70	2962.52	2952.82	16	6.37	20.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
04/10/07	LG-28	9.12	2962.52	2953.40	17	6.05	17.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
05/04/07	LG-28	7.60	2962.52	2954.92	33	6.08	20.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
08/02/07	LG-28	9.60	2962.52	2952.92	33	6.93	20.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/11/07	LG-28	9.80	2962.52	2952.72	33	6.50	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
01/04/08	LG-28	10.10	2962.52	2952.42	33	6.51	19.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
04/28/08	LG-28	10.20	2962.52	2952.32	33	6.54	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
08/06/08	LG-28	10.00	2962.52	2952.52	33	6.77	21.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11/25/08	LG-28	8.90	2962.52	2953.62	361 ³	6.13	20.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
02/25/09	LG-28	9.30	2962.52	2953.22	off scale	6.17	21.2	263,600	70,500	155	7,808	21,956	148,300	14,594	414	639.0	6.68
05/20/09	LG-28	9.61	2962.52	2952.91	392	5.89	21.1	260,600	68,300	133	8,010	21,804	147,600	14,530	414	631.7	6.53
08/31/09	LG-28	8.82	2962.52	2953.70	326	6.04	23.3	265,800	71,900	239	9,174	21,660	148,200	14,426	417	642.2	6.53
11/03/09	LG-28	9.51	2962.52	2953.01	259	6.19	20.6	263,600	70,600	181	9,146	22,098	146,600	14,743	417	635.8	6.52
01/12/10	LG-28	9.20	2962.52	2953.32	398	6.01	19.0	265,000	71,600	368	9,279	21,615	147,600	14,311	424	633.3	6.52
05/11/10	LG-28	8.80	2962.52	2953.72	361	6.04	23.4	263,600	70,300	180	9,530	22,088	147,000	14,263	423	625.0	6.47
08/03/10	LG-28	7.80	2962.52	2954.72	333	6.21	22.1	268,777	66,942	405	9,091	19,835	165,298	14,876	215	570.0	6.86
12/01/10	LG-28	8.35	2962.52	2954.17	--	6.33	20.8	268,719	77,371	483	10,815	23,295	216,306	16,639	233	440.0	6.58
01/26/11	LG-28	9.00	2962.52	2953.52	--	6.02	19.9	267,442	68,937	482	10,797	21,595	182,724	16,611	233	610.0	6.62
05/03/11	LG-28	9.50	2962.52	2953.02	--	6.02	20.4	271,595	71,429	374	9,967	19,934	199,336	16,611	241	590.0	6.66
07/05/11	LG-28	10.10	2962.52	2952.42	--	6.00	28.4	281,818	66,116	405	9,917	19,835	157,025	15,702	248	630.0	6.52
10/12/11	LG-28	10.34	2962.52	2952.18	328	6.58	23.2	276,033	NA	NA	NA	NA	NA	NA	NA	620.0	NA
01/31/12	LG-28	9.60	2962.52	2952.92	344	6.10	21.4	269,421	NA	NA	NA	NA	NA	NA	NA	560.0	6.64
04/25/12	LG-28	9.60	2962.52	2952.92	328	6.15	20.8	282,645	NA	NA	NA	NA	NA	NA	248	470.0	6.62
07/18/12	LG-28	18.10	2962.52	2944.42	335	6.20	23.3	285,484	NA	NA	NA	NA	NA	NA	242	490.0	6.57
11/27/12	LG-28	9.30	2962.52	2953.22	349	6.16	21.0	265,079	NA	NA	NA	NA	NA	NA	246	580.0	6.49
11/27/12	LG-28	9.30	2962.52	2953.22	349	6.16	21.0	264,800	NA	NA	NA	NA	NA	NA	495	641.7	6.55
02/27/13	LG-28	9.10	2962.52	2953.42	323.8	5.16	19.4	278,689	NA	NA	NA	NA	NA	NA	254	560.0	6.43
02/27/13	LG-28	9.10	2962.52	2953.42	323.8	5.16	19.4	269,600	NA	NA	NA	NA	NA	NA	497	650.0	6.54
04/29/13	LG-28	9.10	2962.52	2953.42	338.6	5.33	24.1	272,727	NA	NA	NA	NA	NA	NA	264	570.0	6.66
04/29/13	LG-28	9.10	2962.52	2953.42	338.6	5.33	24.1	266,900	NA	NA	NA	NA	NA	NA	502	645.8	6.61
08/01/14	LG-28	8.36	2962.52	2954.16	334	6.01	21.6	263,600	NA	NA	NA	NA	NA	NA	498	650.0	6.71
11/11/14	LG-28	9.36	2962.52	2953.16	347.6	5.46	21.3	268,500	NA	NA	NA	NA	NA	NA	516	631.6	6.92
02/13/14	LG-28	9.30	2962.52	2953.22	356.8	5.63	23.3	267,300	NA	NA	NA	NA	NA	NA	520	668.4	6.62
04/30/14	LG-28	9.50	2962.52	2953.02	340	5.66	20	284,167	NA	NA	NA	NA	NA	NA	267	420.0	6.61
07/22/14	LG-28	9.71	2962.52	2952.81	318.6	5.77	24	253,731	NA	NA	NA	NA	NA	NA	274	470.0	6.53
10/28/14	LG-28	*Inaccessible															
01/13/15	LG-28	*Inaccessible															
04/28/15	LG-28	*Inaccessible															
07/01/15	LG-28	*Inaccessible															
10/21/15	LG-28	*Inaccessible															

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-28 (continued)																	
03/03/16	LG-28	1.28	2962.52	2961.24	178.1	NA	21.9	265,625	60,609	375	9,786	18,586	149,671	15,049	271	391.0	6.54
04/14/16	LG-28	3.14	2962.52	2959.38	180.3	NA	19.3	270,973	63,507	362	10,235	19,044	151,007	15,352	344	374.0	6.52
08/09/16	LG-28	4.72	2962.52	2957.80	371.0	NA	23.2	250,000	67,442	364	11,794	20,266	159,468	16,944	332	520.0	6.30
12/02/16	LG-28	4.75	2962.52	2957.77	368.0	NA	19.3	261,589	62,169	362	10,762	18,709	144,040	19,205	290	449.0	6.46
03/14/17	LG-28	5.33	2962.52	2957.19	228.3	6.28	20.9	273,849	61,513	337	9,951	17,352	146,382	16,201	250	494.0	6.55
05/12/17	LG-28	5.70	2962.52	2956.82	219.7	6.49	22.9	248,151	59,244	330	9,285	17,256	149,548	16,270	263	505.0	6.31
07/28/17	LG-28	5.65	2962.52	2956.87	221.9	6.97	22.4	257,500	68,250	352	10,083	18,583	153,333	15,167	308	556.0	6.94
11/10/17	LG-28	5.57	2962.52	2956.95	236.7	6.14	20.7	267,500	61,833	315	8,917	17,333	146,667	17,917	317	236.0	6.48
02/20/18	LG-28	6.10	2962.52	2956.42	243.3	6.16	21.6	319,000	76,500	429	12,600	22,800	174,000	19,100	348	262.0	6.72
04/06/18	LG-28	6.17	2962.52	2956.35	224.6	6.12	21.4	328,000	78,900	401	12,300	23,200	180,000	21,900	450	256.0	6.6
07/28/18	LG-28	6.05	2962.52	2956.47	231.5	6.17	21.5	331,000	76,600	399	12,600	23,700	186,000	18,000	370	261.0	6.26
10/05/18	LG-28	5.58	2962.52	2956.94	252.9	6.35	21.8	330,000	82,700	414	13,700	26,200	190,000	20,600	370	275.0	6.4
01/11/19	LG-28	4.55	2962.52	2957.97	280.3	5.97	20.6	329,000	82,300	411	14,700	27,400	178,000	21,700	900	276.0	6.44
04/05/19	LG-28	5.08	2962.52	2957.44	267.9	6.18	20.69	347,000	81,100	492	18,200	33,800	194,000	22,100	366	282.0	6.34
07/26/19	LG-28	5.07	2962.52	2957.45	222.6	6.31	21.6	335,000	75,300	436	13,300	27,300	188,000	19,500	508	246.0	6.67
11/01/19	LG-28	6.11	2962.52	2956.41	201.7	6.34	21.2	358,000	80,600	346	12,200	24,600	172,000	17,700	420	283.0	6.38
01/28/20	LG-28	6.67	2962.52	2955.85	220.3	6.59	20.3	343,000	83,700	374	13,300	25,500	196,000	22,300	280	280.0	6.47
04/27/20	LG-28	6.29	2962.52	2956.23	219.7	6.24	23.8	349,000	84,600	363	13,300	26,000	188,000	20,900	670	285.0	6.39
07/28/20	LG-28	9.23	2963.455	2954.23	231.9	6.31	21.8	344,000	80,000	318	12,700	22,600	184,000	22,000	793	280.0	6.26
10/28/20	LG-28	9.25	2963.455	2954.21	250.7	6.64	19.4	328,000	82,100	334	13,800	23,300	188,000	20,100	300	278.0	6.39
LG-29																	
02/01/06	LG-29	18.83	2976.14	2957.31	13.26	7.10	20.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
03/10/06	LG-29	19.07	2976.14	2957.07	13.65	6.93	19.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
04/02/06	LG-29	19.28	2976.14	2956.86	14.49	7.02	20.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
05/11/06	LG-29	19.54	2976.14	2956.60	13.85	7.10	19.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
07/19/06	LG-29	19.30	2976.14	2956.84	15.52	6.63	22.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/26/06	LG-29	18.75	2976.14	2957.39	8.80	7.07	21.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
01/31/07	LG-29	18.59	2976.14	2957.55	13.92	6.52	20.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
02/01/07	LG-29	NA	2976.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
03/16/07	LG-29	18.61	2976.14	2957.53	13.88	6.73	19.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
04/10/07	LG-29	18.65	2976.14	2957.49	11.74	6.71	17.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
05/04/07	LG-29	17.10	2976.14	2959.04	9.76	6.86	19.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
08/02/07	LG-29	18.90	2976.14	2957.24	8.43	7.90	19.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/11/07	LG-29	14.80	2976.14	2961.34	14.68	6.77	21.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
01/07/08	LG-29	18.90	2976.14	2957.24	14.94	6.74	20.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
04/28/08	LG-29	15.50	2976.14	2960.64	10.92	6.98	19.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
08/06/08	LG-29	18.90	2976.14	2957.24	13.76	7.13	20.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11/25/08	LG-29	17.30	2976.14	2958.84	209.4 ³	6.36	20.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
02/25/09	LG-29	17.25	2976.14	2958.89	90.4 ³	6.34	20.5	140,400	43,600	2,039	4,031	3,045	82,800	4,741	282	320.2	6.86
05/20/09	LG-29	17.70	2976.14	2958.44	183.70	6.28	20.9	138,900	41,200	2,173	4,281	3,075	83,200	4,815	272	317.3	6.72
08/31/09	LG-29	17.60	2976.14	2958.54	190.40	6.22	26.1	156,700	47,900	1,857	4,465	4,603	92,700	4,970	308	358.0	6.79
11/04/09	LG-29	17.45	2976.14	2958.69	188.40	6.24	22.6	144,700	44,400	2,066	4,036	3,611	85,500	4,882	288	318.0	6.74
01/12/10	LG-29	17.03	2976.14	2959.11	187.10	6.20	19.4	148,900	46,300	1,007	4,242	3,928	88,100	5,113	290	333.2	6.69
05/12/10	LG-29	17.30	2976.14	2958.84	186.30	6.14	19.0	148,900	44,700	1,992	4,277	4,112	88,500	5,108	284	340.0	6.67
08/03/10	LG-29	16.52	2976.14	2959.62	173.60	6.37	21.2	156,475	48,561	1,978	4,047	4,676	98,921	5,935	144	330.0	7.14
11/16/10	LG-29	16.90	2976.14	2959.24	--	6.47	21.6	140,541	40,541	2,162	3,423	3,423	117,117	5,135	135	270.0	6.85
01/26/11	LG-29	17.20	2976.14	2958.94	--	6.03	19.4	150,000	44,545	2,545	4,091	3,818	90,909	5,091	145	290.0	6.78

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-29 (continued)																	
05/03/11	LG-29	17.85	2976.14	2958.29	--	6.12	18.0	134,862	37,615	2,661	3,211	2,202	91,743	4,037	211	270.0	7.25
07/05/11	LG-29	18.20	2976.14	2957.94	--	6.07	25.0	142,987	45,537	2,186	3,188	2,914	109,290	4,463	146	320.0	6.86
10/13/11	LG-29	18.50	2976.14	2957.64	172.9	6.06	21.2	158,470	46,448	2,004	3,734	4,098	100,182	5,100	146	300.0	7.11
01/31/12	LG-29	17.80	2976.14	2958.34	223.6	6.00	21.3	155,085	NA	NA	NA	NA	NA	NA	NA	310.0	6.89
04/25/12	LG-29	18.00	2976.14	2958.14	238.6	6.02	19.8	156,780	NA	NA	NA	NA	NA	NA	NA	300.0	6.86
07/18/12	LG-29	17.83	2976.14	2958.31	182.9	6.52	24.0	175,893	NA	NA	NA	NA	NA	NA	161	320.0	6.79
11/28/12	LG-29	17.90	2976.14	2958.24	188.3	6.33	19.5	169,340	NA	NA	NA	NA	NA	NA	160	340.0	6.81
11/28/12	LG-29	17.90	2976.14	2958.24	188.3	6.33	19.5	169,700	NA	NA	NA	NA	NA	NA	306	405.0	6.63
02/26/13	LG-29	18.00	2976.14	2958.14	246.8	5.50	20.5	179,464	NA	NA	NA	NA	NA	NA	161	340.0	6.67
02/26/13	LG-29	18.00	2976.14	2958.14	246.8	5.50	20.5	172,800	NA	NA	NA	NA	NA	NA	332	400.0	6.65
04/30/13	LG-29	18.20	2976.14	2957.94	183.0	5.22	20.5	163,921	NA	NA	NA	NA	NA	NA	148	350.0	6.94
04/30/13	LG-29	18.20	2976.14	2957.94	183.0	5.22	20.5	174,300	NA	NA	NA	NA	NA	NA	321	390.0	6.74
08/01/13	LG-29	17.75	2976.14	2958.39	251.2	5.90	21.6	178,700	NA	NA	NA	NA	NA	NA	322	408.5	6.83
11/11/13	LG-29	17.60	2976.14	2958.54	199.2	5.61	22	178,300	NA	NA	NA	NA	NA	NA	324	398.0	7.06
02/13/14	LG-29	17.62	2976.14	2958.52	196	5.68	22.2	177,000	NA	NA	NA	NA	NA	NA	326	428.0	6.75
05/07/14	LG-29	17.66	2976.14	2958.48	187.3	5.19	19.8	195,575	NA	NA	NA	NA	NA	NA	159	270.0	6.91
07/24/14	LG-29	17.95	2976.14	2958.19	242.8	5.62	21.3	214,000	NA	NA	NA	NA	NA	NA	320	190.0	6.82
10/29/14	LG-29	14.10	2976.14	2962.04	NA	NA	20.9	219,000	NA	NA	NA	NA	NA	NA	380	190.0	6.98
01/14/15	LG-29	13.62	2976.14	2962.52	268.8	6.95	19.6	197,208	49,738	1,483	5,236	9,599	122,164	6,719	166	400.0	6.91
04/29/15	LG-29	14.04	2976.14	2962.10	169.5	6.33	21.2	141,026	27,473	1,923	3,480	3,663	76,007	3,938	128	230.0	7.03
04/29/15	LG-29	14.04	2976.14	2962.10	169.5	6.33	21.2	134,615	40,110	2,592	3,810	3,874	79,670	3,370	187	208.0	6.53
07/08/15	LG-29	14.66	2976.14	2961.48	113.5	6.64	22.6	150,808	42,639	2,298	3,923	4,919	94,255	3,923	172	217.0	6.65
10/21/15	LG-29	15.20	2976.14	2960.94	315.6	6.02	21.2	170,667	48,444	1,947	4,044	6,747	95,111	5,093	167	259.0	6.34
03/01/16	LG-29	15.65	2976.14	2960.49	172.3	NA	19.6	226,109	58,362	1,067	5,452	12,543	122,867	8,003	222	270.0	6.56
04/14/16	LG-29	15.10	2976.14	2961.04	176.0	NA	19.3	208,621	62,931	1,086	5,526	12,759	132,759	8,879	267	335.0	6.77
08/10/16	LG-29	17.60	2976.14	2958.54	363.0	NA	21.2	219,449	60,241	947	5,516	12,478	134,251	7,427	207	432.0	6.36
12/02/16	LG-29	17.15	2976.14	2958.99	365.0	NA	20.3	212,276	48,338	810	4,399	10,060	122,762	8,448	188	374.0	6.52
03/14/17	LG-29	17.36	2976.14	2958.78	226.6	NR	21.1	204,467	60,052	997	5,481	12,285	121,993	7,457	196	428.0	6.58
05/12/17	LG-29	17.52	2976.14	2958.62	213.1	6.48	22.5	212,748	55,211	939	4,918	11,628	127,476	7,339	301	390.0	6.21
07/28/17	LG-29	17.46	2976.14	2958.68	214.8	6.82	22.1	219,130	60,696	1,043	5,243	11,913	125,217	7,235	243	420.0	6.91
11/10/17	LG-29	17.24	2976.14	2958.90	225.8	5.96	20.9	202,257	54,948	955	4,714	11,024	121,528	9,115	181	224.0	6.47
02/20/18	LG-29	17.34	2976.14	2958.80	232.0	6.28	21	240,000	66,500	1,180	6,060	14,000	150,000	8,620	244	230.0	6.7
04/06/18	LG-29	17.42	2976.14	2958.72	217.7	6.39	20.5	248,000	63,200	1,070	5,680	13,100	148,000	9,660	360	211.0	6.8
07/27/18	LG-29	17.55	2976.14	2958.59	213.9	5.94	22.3	255,000	67,200	1,110	6,130	14,000	146,000	7,910	250	219.0	6.72
10/05/18	LG-29	17.30	2976.14	2958.84	248.7	6.47	22.8	238,000	72,600	1,160	6,580	15,700	136,000	9,030	260	228.0	6.41
01/11/19	LG-29	17.11	2976.14	2959.03	279.3	6.14	20.6	257,000	71,700	1,120	6,940	15,900	144,000	9,740	228	233.0	6.52
04/05/19	LG-29	17.54	2976.14	2958.60	259.2	6.30	19.56	258,000	69,400	1,070	6,370	14,300	150,000	8,600	303	241.0	6.39
07/26/19	LG-29	17.53	2976.14	2958.61	219.0	6.44	21.2	260,000	72,200	1,080	6,160	15,600	174,000	8,660	384	208.0	6.82
11/01/19	LG-29	17.43	2976.14	2958.71	199.5	6.55	22.2	254,000	70,400	1,100	6,610	15,200	142,000	6,330	244	237.0	6.38
01/28/20	LG-29	17.41	2976.14	2958.73	215.7	6.75	20.7	255,000	69,100	1,140	6,850	15,100	144,000	9,540	236	232.0	6.63
04/27/20	LG-29	17.26	2976.14	2958.88	210.3	6.25	22.4	254,000	78,100	1,220	7,440	17,200	146,000	8,920	244	227.0	6.47
07/28/20	LG-29	17.59	2976.14	2958.55	223.4	6.25	21.5	246,000	67,600	1,070	6,330	14,200	142,000	10,500	288	226.0	6.18
10/28/20	LG-29	17.82	2976.14	2958.32	241.2	6.24	20.7	242,000	64,800	1,130	6,360	13,900	144,000	8,880	232	232.0	6.39
LG-30																	
07/18/06	LG-30	28.06	2968.55	2940.49	11.3	6.70	21.7	89,240	28,520	1,815	2,050	1,040	49,550	6,000	443	183.0	7.12
10/23/06	LG-30	27.03	2968.55	2941.52	11.3	6.57	20.2	91,845	29,450	1,916	2,130	1,070	50,550	6,450	463	190.0	6.96
01/31/07	LG-30	27.37	2968.55	2941.18	11.5	6.66	20.2	91,323	29,180	1,927	1,988	1,070	50,349	6,540	448	191.0	6.99

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-30 (continued)																	
04/10/07	LG-30	27.20	2968.55	2941.35	11.6	6.78	21.5	92,475	29,586	1,950	2,098	1,075	51,200	6,300	444	192.5	6.94
08/10/07	LG-30	28.70	2968.55	2939.85	11.8	6.73	20.2	94,996	30,580	1,630	2,180	1,065	52,900	6,375	444	198.0	7.08
10/10/07	LG-30	27.40	2968.55	2941.15	11.8	6.99	21.6	96,924	31,370	1,636	2,302	1,122	53,450	6,780	440	201.0	7.24
04/28/08	LG-30	27.55	2968.55	2941.00	12.2	6.92	21.4	97,600	31,600	1,610	2,422	1,187	53,700	6,809	440	210.5	7.43
03/02/09	LG-30	27.80	2968.55	2940.75	69.8 ³	6.56	20.3	100,700	32,200	1,499	2,152	1,340	56,207	7,067	433	211.5	6.93
05/20/09	LG-30	28.12	2968.55	2940.43	140.8	6.33	23.1	102,200	32,400	1,494	2,409	1,348	57,246	7,035	446	214.5	6.93
08/31/09	LG-30	27.70	2968.55	2940.85	141.7	6.43	21.5	103,900	33,300	1,505	2,540	1,392	58,115	6,815	444	219.0	6.99
11/03/09	LG-30	27.95	2968.55	2940.60	142.4	6.35	20.6	103,100	32,700	1,475	2,496	1,456	57,559	7,183	451	226.0	6.86
01/11/10	LG-30	27.90	2968.55	2940.65	142.1	6.36	19.9	106,100	33,800	1,470	2,597	1,554	59,110	7,310	446	220.0	6.86
05/11/10	LG-30	27.63	2968.55	2940.92	143.7	6.30	22.3	106,100	33,000	1,426	2,683	1,650	59,527	7,508	451	223.8	6.84
08/03/10	LG-30	27.21	2968.55	2941.34	132.4	6.54	23.1	120,148	32,348	1,386	2,495	1,664	80,407	8,226	222	230.0	7.42
11/16/10	LG-30	27.10	2968.55	2941.45	--	6.61	19.3	121,996	35,120	1,479	2,773	1,941	75,786	8,410	240	210.0	7.00
01/26/11	LG-30	27.60	2968.55	2940.95	--	6.31	17.1	113,889	32,407	1,481	2,870	2,037	69,444	8,333	241	220.0	6.92
05/02/11	LG-30	28.20	2968.55	2940.35	--	6.24	25.0	116,451	37,893	1,386	2,865	2,033	70,240	9,507	250	240.0	7.03
07/05/11	LG-30	27.72	2968.55	2940.83	--	6.21	25.0	118,299	36,969	1,479	3,235	2,495	66,543	7,948	259	250.0	6.93
10/12/11	LG-30	29.10	2968.55	2939.45	140.4	6.42	20.9	115,527	37,893	1,386	3,235	2,680	76,710	8,318	259	230.0	7.23
01/31/12	LG-30	28.70	2968.55	2939.85	144.2	6.43	21.0	126,606	35,780	1,284	3,486	3,028	70,642	8,165	NA	230.0	7.22
04/24/12	LG-30	28.90	2968.55	2939.65	147.2	6.31	21.9	121,101	30,275	624	3,761	3,394	73,394	8,165	268	190.0	7.08
07/18/12	LG-30	29.00	2968.55	2939.55	141.8	6.46	28.6	121,101	41,284	1,560	3,945	3,670	70,642	9,083	266	230.0	7.06
11/26/12	LG-30	28.65	2968.55	2939.90	141.6	6.47	21.3	124,771	39,450	1,284	3,486	3,578	77,982	8,532	275	240.0	6.84
11/26/12	LG-30	28.65	2968.55	2939.90	141.6	6.47	21.3	122,600	35,992	1,391	3,888	3,674	68,992	8,389	527	276.3	6.86
02/26/13	LG-30	28.50	2968.55	2940.05	147.3	5.53	20.8	126,606	38,532	1,284	3,670	3,761	77,064	8,532	275	230	6.89
02/26/13	LG-30	28.50	2968.55	2940.05	147.3	5.53	20.8	124,300	36,784	1,368	3,890	3,639	69,647	8,639	534	277.5	6.85
04/29/13	LG-30	28.82	2968.55	2939.73	145.5	5.65	23.8	131,193	33,945	1,651	4,220	4,587	73,394	8,349	275	250	7.06
04/29/13	LG-30	28.82	2968.55	2939.73	145.5	5.65	23.8	124,900	36,795	1,308	3,945	3,932	69,986	8,652	539	277.5	6.91
08/01/13	LG-30	26.30	2968.55	2942.25	147.3	6.16	21.8	123,700	36,349	1,352	3,901	4,228	68,919	8,575	565	277.5	7.00
10/30/13	LG-30	28.32	2968.55	2940.23	153.7	6.18	20.7	127,100	37,295	1,311	4,057	4,465	70,700	8,928	524	277.5	7.26
02/13/14	LG-30	28.20	2968.55	2940.35	153.8	5.62	20.5	127,800	37,904	1,306	4,073	4,583	70,060	9,030	562	291.9	6.91
04/28/14	LG-30	28.40	2968.55	2940.15	147.2	6.02	22.1	131,193	27,523	853	2,936	3,578	79,817	9,174	275	190	6.80
07/22/14	LG-30	28.90	2968.55	2939.65	145.60	5.94	23.2	129,358	37,615	1,193	3,853	4,587	51,376	6,697	284	190	6.94
10/28/14	LG-30	26.00	2968.55	2942.55	NA	NA	21	129,834	33,149	1,197	4,236	4,972	72,744	8,748	285	250	7.19
01/13/15	LG-30	26.30	2968.55	2942.25	165.60	6.87	18	141,284	37,615	1,284	4,128	4,862	75,229	9,083	284	250	7.12
05/04/15	LG-30	26.10	2968.55	2942.45	165.10	6.30	22.6	136,697	29,358	780	4,312	5,046	64,220	7,339	278	230	7.21
05/04/15	LG-30	26.10	2968.55	2942.45	165.10	6.30	22.6	131,193	37,156	1,211	4,459	5,156	71,560	14,037	319	218	6.41
07/08/15	LG-30	26.46	2968.55	2942.09	164.20	6.25	23.2	125,458	38,004	1,310	4,670	5,321	81,502	9,341	341	214	6.65
10/21/15	LG-30	26.10	2968.55	2942.45	165.40	5.92	21.4	140,741	36,481	1,287	4,370	5,528	80,556	8,981	319	262	6.52
10/21/15	LG-30	26.10	2968.55	2942.45	165.40	5.92	21.4	135,904	37,190	1,359	4,573	5,647	71,625	8,687	312	208	6.48
01/07/16	LG-30	26.33	2968.55	2942.22	118.60	NA	19.1	124,661	34,779	1,256	4,327	5,357	74,074	9,575	325	170	6.93
04/07/16	LG-30	26.26	2968.55	2942.29	121.90	NA	21.9	132,662	39,616	1,363	4,904	6,221	71,363	9,973	366	187	6.87
08/09/16	LG-30	17.11	2968.55	2951.44	298.00	NA	22.1	127,949	37,750	1,270	4,927	6,289	80,762	8,330	319	256	6.63
12/05/16	LG-30	26.65	2968.55	2941.90	267.00	NA	19.2	133,993	33,453	1,043	4,496	5,854	76,439	9,892	302	248	6.65
03/14/17	LG-30	26.90	2968.55	2941.65	166.65	6.41	20.6	134,892	37,860	1,160	5,198	6,853	77,338	10,072	309	267	6.69
05/12/17	LG-30	27.21	2968.55	2941.34	165.30	6.44	20.6	144,524	35,278	1,014	4,749	6,598	84,381	9,515	309	270	6.40
07/28/17	LG-30	27.50	2968.55	2941.05	126.97	6.26	21.6	140,794	40,162	1,119	5,442	7,509	85,740	10,379	325	304	7.02
11/11/17	LG-30	27.13	2968.55	2941.42	182.18	6.21	20.6	153,430	36,823	948	4,829	6,977	83,032	11,372	329	179	6.57
02/20/18	LG-30	27.30	2968.55	2941.25	189.10	6.28	20.8	171,000	46,200	1,250	6,460	8,960	100,000	11,500	388	185	6.97
04/06/18	LG-30	27.46	2968.55	2941.09	174.20	6.29	21.3	181,000	43,300	1,120	5,980	8,700	96,000	12,400	392	174	6.66

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-30 (continued)																	
07/28/18	LG-30	27.85	2968.55	2940.70	184.08	6.36	21.6	180,000	45,400	1,160	6,180	8,960	102,000	9,030	376	174	6.36
10/05/18	LG-30	27.63	2968.55	2940.92	197.70	6.69	21.6	178,000	48,100	1,220	6,440	9,870	96,000	10,300	360	185	6.48
01/12/19	LG-30	27.11	2968.55	2941.44	233.33	6.25	20.7	177,000	46,800	1,250	6,530	9,730	101,000	12,200	388	186	6.64
04/05/19	LG-30	27.22	2968.55	2941.33	207.47	6.28	20.81	175,000	56,700	1,430	7,510	11,100	100,000	10,700	449	182	6.47
07/26/19	LG-30	27.75	2968.55	2940.80	177.33	6.41	21.6	177,000	47,900	1,150	6,030	10,000	100,000	11,200	400	168	7.02
11/01/19	LG-30	27.87	2968.55	2940.68	161.69	6.43	20.4	189,000	48,300	1,160	6,310	9,840	96,000	12,600	600	192	6.51
01/28/20	LG-30	27.75	2968.55	2940.80	175.37	6.80	20.5	179,000	46,600	1,150	6,160	9,740	96,000	12,100	352	188	6.82
04/28/20	LG-30	27.69	2968.55	2940.86	180.20	6.40	22.9	177,000	45,400	1,080	5,930	9,430	99,000	10,900	400	184	6.65
07/29/20	LG-30	28.32	2967.15	2938.83	160.01	6.17	21.9	184,000	49,500	1,120	6,570	10,000	96,000	12,200	517	183	6.33
10/29/20	LG-30	28.04	2967.15	2939.11	158.20	6.49	21.4	180,000	47,700	1,040	5,990	9,870	98,000	11,700	360	192	6.40
LG-31																	
02/19/14	LG-31	47.90	2984.5	2936.60	86.8	5.25	22.2	26,355	5,690	2,431	1,184	24	14,900	1,986	234	55.7	7.30
05/07/14	LG-31	48.15	2984.5	2936.35	41.9	6.07	19.8	33,627	5,588	2,451	1,176	431	16,667	1,961	107.8	32.0	7.22
07/24/14	LG-31	49.83	2984.5	2934.67	42.1	5.89	24.4	33,855	5,479	2,250	1,076	32	15,656	1,859	107.6	38.0	7.39
10/27/14	LG-31	45.92	2984.5	2938.58	NA	NA	34.2	30,588	5,784	2,451	1,176	27	15,686	1,863	107.8	47.0	7.44
01/16/15	LG-31	45.90	2984.5	2938.60	42.2	7.85	22.3	30,556	5,556	2,480	1,190	70	14,881	1,786	109.0	57.0	7.42
05/08/15	LG-31	45.01	2984.5	2939.49	41.8	7.15	22.8	34,344	5,577	2,446	1,174	32	17,613	2,055	106.0	47.0	7.44
05/08/15	LG-31	45.01	2984.5	2939.49	41.8	7.15	22.8	28,963	5,744	2,554	1,311	30	15,264	1,663	51.0	38.7	6.81
07/07/15	LG-31	45.70	2984.5	2938.80	41.5	6.60	23.3	29,412	5,588	2,353	1,216	21	15,882	1,765	275.0	39.2	6.97
10/08/15	LG-31	46.70	2984.5	2937.80	41.5	7.32	23.8	26,851	5,726	2,507	1,194	31	15,795	1,885	122.0	47.0	7.2
03/01/16	LG-31	45.09	2984.5	2939.41	30.4	NA	23.5	29,864	5,438	2,383	1,138	32	15,759	1,897	112.8	39.6	7.24
04/06/16	LG-31	45.16	2984.5	2939.34	30.8	NA	27.1	29,105	5,221	2,163	1,052	24	15,929	1,878	129.8	48.1	7.19
08/08/16	LG-31	47.56	2984.5	2936.94	61.1	NA	24.5	27,184	5,524	2,359	1,146	30	15,825	1,767	120.4	50.0	7.19
12/01/16	LG-31	46.01	2984.5	2938.49	62.2	NA	22.6	27,083	5,317	2,302	1,101	99	16,071	2,034	115.1	48.1	6.85
03/14/17	LG-31	45.66	2984.5	2938.84	166.65	6.41	20.6	26,249	5,563	2,380	1,166	31	15,475	2,067	117.5	52.1	7.09
05/12/17	LG-31	46.10	2984.5	2938.40	165.3	6.44	20.6	24,976	5,327	2,244	1,083	<50	15,805	1,922	113.2	39.3	6.96
07/28/17	LG-31	47.39	2985.5	2938.11	37.6	7.36	22.4	26,772	5,571	2,333	1,122	98	16,142	1,831	161.4	49.3	7.43
11/11/17	LG-31	46.31	2985.5	2939.19	42.17	6.60	20.9	29,862	5,334	2,171	1,051	98	15,914	2,161	196.5	41.8	7.06
02/20/18	LG-31	47.32	2984.718	2937.40	43.51	6.97	20.8	27,400	5,620	2,390	1,150	70	16,000	2,010	128.0	42.0	7.33
04/06/18	LG-31	47.61	2984.718	2937.11	40.24	6.96	21.9	30,200	5,400	2,270	1,090	<100	15,800	2,360	180.0	40.0	7.22
07/27/18	LG-31	48.03	2984.718	2936.69	41.92	6.95	22.5	28,600	5,550	2,340	1,130	34	14,800	1,530	116.0	40.0	6.86
10/05/18	LG-31	47.90	2984.718	2936.82	45.833	6.94	22.3	28,100	5,830	2,530	1,210	48	16,200	1,900	116.0	42.2	7.06
01/11/19	LG-31	45.62	2984.718	2939.10	50.152	6.68	21.0	28,200	6,060	2,720	1,270	61	17,400	2,050	192.0	42.3	7.22
04/05/19	LG-31	45.65	2984.718	2939.07	44.828	6.79	22.0	29,800	5,770	2,210	1,160	26	16,400	2,030	146.0	41.1	7.18
07/26/19	LG-31	46.69	2984.718	2938.03	40.082	6.95	22.2	30,000	6,190	2,630	1,220	62	16,600	1,880	148.0	37.8	7.52
11/02/19	LG-31	48.30	2984.718	2936.42	36.843	7.08	21.2	26,700	5,700	2,450	1,160	31	16,400	2,030	124.0	42.7	7.14
01/29/20	LG-31	47.95	2984.718	2936.77	30.546	7.61	20.8	27,100	5,580	2,470	1,130	38	16,600	1,950	120.0	42.1	7.29
04/27/20	LG-31	46.81	2984.718	2937.91	38.71	6.93	23.3	28,000	5,570	2,370	1,140	40	15,000	1,790	116.0	39.7	7.16
07/28/20	LG-31	49.30	2984.718	2935.42	40.14	7.06	22.8	27,300	5,370	2,270	1,130	50	16,000	1,980	181.0	38.3	7.06
10/28/20	LG-31	50.22	2984.718	2934.50	38.92	7.07	20.0	27,700	5,420	2,420	1,130	32	15,200	1,800	104.0	41.9	7.31
LG-32																	
02/13/14	LG-32	20.17	2962.2	2942.03	129.6	6.23	20.6	101,800	31,542	1,126	3,507	596	55,700	9,074	380.0	231.3	7.22
04/30/14	LG-32	20.35	2962.2	2941.85	125.5	6.20	20.6	106,542	29,907	1,121	3,178	701	56,075	8,692	186.9	150.0	7.06
07/22/14	LG-32	20.60	2962.2	2941.60	125.3	6.02	22.1	105,214	30,726	1,117	3,166	633	54,935	8,007	195.5	150.0	7.14
10/28/14	LG-32	16.32	2962.2	2945.88	NA	NA	20.9	101,869	31,776	1,308	3,458	813	58,879	8,411	196.3	190.0	7.35
01/13/15	LG-32	16.58	2962.2	2945.62	135.9	6.93	16.7	106,679	30,612	1,206	3,247	631	61,224	8,720	186.0	200.0	7.34
05/05/15	LG-32	16.17	2962.2	2946.03	137.3	5.26	21.2	107,477	30,841	738	3,364	748	54,206	7,477	189.0	180.0	7.34

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
LG-32 (continued)																	
05/05/15	LG-32	16.17	2962.2	2946.03	137.3	5.26	21.2	107,477	32,617	1,159	3,598	687	57,944	9,907	221.0	169.0	6.68
07/08/15	LG-32	16.76	2962.2	2945.44	135.8	6.89	23.4	100,559	34,544	1,294	3,883	709	55,866	7,998	231.0	201.0	6.85
10/09/15	LG-32	16.71	2962.2	2945.49	135.5	6.63	21.1	107,376	32,586	1,279	3,511	715	56,956	7,535	220.0	185.0	6.78
10/09/15	LG-32	16.71	2962.2	2945.49	135.5	6.63	21.1	108,635	32,498	1,244	3,435	693	55,710	8,626	215.0	182.0	6.79
01/07/16	LG-32	16.29	2962.2	2945.91	100.4	NA	19.3	105,556	32,685	694	3,556	781	59,259	8,963	250.0	140.0	7.22
04/08/16	LG-32	16.30	2962.2	2945.90	103	NA	21.2	106,244	32,805	1,221	3,402	734	63,374	10,438	108.1	153.0	7.07
08/09/16	LG-32	17.33	2962.2	2944.87	211	NA	22.1	107,209	39,741	1,479	4,233	989	64,695	7,957	221.8	207.0	6.80
12/05/16	LG-32	16.71	2962.2	2945.49	213	NA	19.9	106,481	29,352	1,120	3,139	773	60,185	9,352	196.3	192.0	6.85
03/14/17	LG-32	17.21	2962.2	2944.99	136.45	6.76	20.5	109,462	35,065	1,299	3,803	946	61,224	9,276	204.1	201.0	6.92
05/12/17	LG-32	17.40	2962.2	2944.80	134.4	6.90	22.2	112,465	32,521	1,181	3,374	868	64,667	8,828	209.9	212.0	6.63
07/28/17	LG-32	17.65	2962.2	2944.55	132.39	6.59	22.2	103,160	33,736	1,171	3,429	916	65,985	8,169	219.3	288.0	7.27
11/10/17	LG-32	17.32	2962.2	2944.88	141.34	6.63	19.9	111,732	30,633	1,071	3,110	840	60,521	11,453	245.8	140.0	6.87
02/20/18	LG-32	17.72	2963.8	2946.08	145.53	6.30	20.6	120,000	35,700	1,280	3,750	1,070	65,000	10,100	236.0	144.0	7.13
04/06/18	LG-32	17.82	2963.8	2945.98	134.98	6.71	20.7	123,000	34,800	1,240	3,620	982	66,000	10,700	268.0	135.0	7.06
07/29/18	LG-32	18.05	2963.8	2945.75	137.82	6.65	21.1	121,000	34,500	1,200	3,580	1,010	67,000	7,540	228.0	134.0	6.65
10/05/18	LG-32	17.73	2963.8	2946.07	153.504	6.71	21	123,000	38,100	1,360	3,920	1,040	67,000	9,090	216.0	143.0	6.88
01/11/19	LG-32	17.22	2963.8	2946.58	161.008	6.39	20.3	123,000	37,500	1,380	3,950	1,150	64,000	10,400	244.0	143.0	6.90
04/05/19	LG-32	17.40	2963.8	2946.40	162.624	6.44	20.4	127,000	33,800	1,160	3,390	973	68,000	9,120	273.0	142.0	6.82
07/26/19	LG-32	17.71	2963.8	2946.09	137.367	6.71	21	Not tested	Not	Not tested	Not tested	Not tested	Not	Not	Not tested	Not tested	Not
11/01/19	LG-32	18.00	2963.8	2945.80	124.345	6.77	20.3	130,000	36,400	1,270	3,730	1,120	66,000	8,450	228	148.0	6.76
01/28/20	LG-32	18.00	2963.8	2945.80	137.174	7.20	20	126,000	37,000	1,300	3,750	1,130	68,000	10,200	216	146.0	7.15
04/27/20	LG-32	17.85	2963.8	2945.95	146.2	6.71	23	125,000	37,400	1,270	3,830	1,270	69,000	9,280	236	139.0	6.97
07/28/20	LG-32	18.30	2963.8	2945.50	134.744	6.78	21	126,000	35,200	1,180	3,640	1,100	74,000	10,800	278	143.0	6.68
10/28/20	LG-32	18.26	2963.8	2945.54	136.1	6.60	18.5	128,000	36,700	1,210	3,630	1,130	69,000	9,510	220	147.0	7
River 1																	
11/26/12	River 1	--	--	--	3.82	7.31	21.7	4,471	679	499	190	<10	1,397	1,597	140	3.82	7.31
11/26/12	River 1	--	--	--	3.82	7.31	21.7	4,558	673	523	241	7	1,333	1,618	272	7.80	8.05
02/27/13	River 1	--	--	--	3.49	4.84	12.6	4,350	640	430	170	11	1,200	1,400	130	5.70	7.90
02/27/13	River 1	--	--	--	3.49	4.84	12.6	4,226	633	476	216	8	1,234	1,500	265	7.10	8.09
05/01/13	River 1	--	--	--	--	--	--	5,234	788	598	253	11	1,547	1,864	289	9.00	8.08
08/02/13	River 1	--	--	--	2.34	7.28	27.8	3,292	534	367	155	12	995	1,083	244	6.00	7.73
11/11/13	River 1	--	--	--	3.07	7.56	13.6	3,611	567	399	161	10	1,057	1,275	236	6.30	7.41
02/18/14	River 1	--	--	--	3.26	5.49	17.2	4,004	591	459	209	7	1,110	1,489	231	7.00	8.25
04/30/14	River 1	--	--	--	4.02	8.18	21.5	5,230	880	510	220	17	1,800	1,600	130	5.90	7.90
10/27/14	River 1	--	--	--	NA	NA	21.8	3,660	520	400	150	10	860	1,200	200	4.40	8.06
01/12/15	River 1	--	--	--	5.7	8.32	7.1	4,390	670	500	190	17	1,100	1,400	190	5.30	8.10
05/04/15	River 1	--	--	--	--	--	--	4,290	683	458	202	13	1,040	1,290	168	5.82	7.87
07/09/15	River 1	--	--	--	--	--	--	4,140	744	461	213	18	1,240	1,360	156	6.30	7.71
10/09/15	River 1	--	--	--	--	--	--	3,600	587	414	144	11	940	1,250	160	5.10	8.30
03/01/16	River 1	--	--	--	--	--	--	4,232	727	483	165	<20.0	1,327	1,377	160	5.59	7.95
04/14/16	River 1	--	--	--	--	--	--	4,294	665	476	181	<20.0	1,124	1,535	124	6.84	8.01
08/09/16	River 1	--	--	--	--	--	--	4,980	738	482	197	7	1,429	1,667	123	5.06	7.78
12/05/16	River 1	--	--	--	--	--	--	4,524	620	424	169	20	1,190	1,587	190	7.20	8.05
03/15/17	River 1	--	--	--	--	--	--	4,090	681	454	186	20	1,240	1,680	188	7.82	7.99
05/13/17	River 1	--	--	--	--	--	--	4,213	670	438	182	<10	1,215	1,584	155	5.70	7.86
07/29/17	River 1	--	--	--	--	--	--	4,811	782	480	211	50	1,375	1,514	143	6.28	8.19
11/11/17	River 1	--	--	--	--	--	--	4,527	676	444	186	20	1,102	1,743	192	6.34	7.50

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
River 1 (continued)																	
02/21/18	River 1	--	--	--	--	--	--	4,380	736	481	202	37	1,300	1,710	232	6.18	7.72
04/07/18	River 1	--	--	--	--	--	--	3,160	720	486	203	<10.0	920	1,780	248	6.36	8.00
07/29/18	River 1	--	--	--	--	--	--	5,050	821	511	225	16	1,460	1,490	148	6.75	8.08
10/06/18	River 1	--	--	--	--	--	--	4,520	768	473	199	<10	1,500	1,700	168	6.72	8.16
01/12/19	River 1	--	--	--	--	--	--	4,070	772	547	222	7	1,260	1,680	252	6.51	7.95
04/06/19	River 1	--	--	--	--	--	--	4,790	648	430	177	<10	1,320	1,690	273	6.68	7.83
07/26/19	River 1	--	--	--	--	--	--	4,980	795	495	207	13	1,260	1,630	148	6.12	8.13
11/01/19	River 1	--	--	--	--	--	--	4,850	769	498	211	7	1,600	1,570	208	6.79	7.96
01/28/20	River 1	--	--	--	--	--	--	4,280	608	428	169	6	1,180	1,530	208	6.30	8.16
04/27/20	River 1	--	--	--	--	--	--	5,270	811	530	224	9	1,540	1,680	180	7.02	8.06
07/28/20	River 1	--	--	--	--	--	--	5,660	837	549	229	7	1,700	1,760	176	7.47	8.17
10/29/20	River 1	--	--	--	--	--	--	4,910	790	501	215	11	1,370	1,740	168	6.97	8.07
River 2																	
02/16/16	River 2	--	--	--	--	--	--	3,750	676	459	144	<20	1,260	1,141	151	5.14	7.10
04/14/16	River 2	--	--	--	--	--	--	4,166	727	480	188	<20	1,202	1,662	188	6.76	7.96
08/08/16	River 2	--	--	--	--	--	--	5,064	781	468	196	10	1,487	1,724	135	5.47	7.96
11/30/16	River 2	--	--	--	--	--	--	4,532	754	459	190	<20	1,394	1,633	187	8.22	7.93
03/14/17	River 2	--	--	--	--	--	--	5,147	841	483	220	12	1,362	1,762	92	9.18	7.60
05/12/17	River 2	--	--	--	--	--	--	4,936	723	429	182	11	1,288	1,625	174	6.39	7.99
07/28/17	River 2	--	--	--	--	--	--	5,264	871	501	224	<50	1,496	1,665	132	6.87	8.17
11/11/17	River 2	--	--	--	--	--	--	5,055	760	456	196	<20	1,416	1,725	207	6.94	7.54
02/20/18	River 2	--	--	--	--	--	--	4,610	865	516	219	73	1,440	1,590	208	6.81	8.20
04/06/18	River 2	--	--	--	--	--	--	4,900	809	512	218	12	1,460	1,760	188	6.93	7.97
07/28/18	River 2	--	--	--	--	--	--	5,340	883	515	230	18	1,660	1,620	148	7.18	8.04
10/06/18	River 2	--	--	--	--	--	--	5,060	862	482	206	13	1,500	1,840	168	7.47	8.02
01/11/19	River 2	--	--	--	--	--	--	4,750	885	565	236	11	1,560	1,710	268	7.22	7.96
04/05/19	River 2	--	--	--	--	--	--	5,000	773	458	197	14	1,640	1,540	254	6.97	7.82
07/26/19	River 2	--	--	--	--	--	--	5,160	860	495	211	14	1,600	1,660	160	6.60	8.11
11/01/19	River 2	--	--	--	--	--	--	4,860	841	518	219	8	1,600	1,720	192	7.30	7.92
01/28/20	River 2	--	--	--	--	--	--	4,640	690	480	189	9	1,340	1,560	196	6.59	8.24
04/27/20	River 2	--	--	--	--	--	--	5,590	868	530	230	14	1,780	1,690	176	7.31	8.04
07/28/20	River 2	--	--	--	--	--	--	5,580	960	537	247	13	1,830	1,680	185	7.67	8.07
10/28/20	River 2	--	--	--	--	--	--	5,460	909	530	225	12	1,580	1,840	172	7.71	8.21
River 3																	
11/11/17	River 3	--	--	--	--	--	--	4,458	676	451	187	<20	1,075	1,612	219	6.28	7.38
02/21/18	River 3	--	--	--	--	--	--	4,000	728	471	200	43	1,200	1,500	208	6.13	8.15
04/06/18	River 3	--	--	--	--	--	--	4,500	678	464	195	<10	1,320	1,680	204	6.06	7.65
07/29/18	River 3	--	--	--	--	--	--	5,050	801	511	222	10	1,420	1,540	144	6.51	8.10
10/05/18	River 3	--	--	--	--	--	--	4,490	732	447	190	<10	1,400	1,780	156	6.57	8.10
01/12/19	River 3	--	--	--	--	--	--	3,670	734	532	215	5	1,080	1,620	296	6.30	7.89
04/06/19	River 3	--	--	--	--	--	--	4,530	630	422	175	<10	1,220	1,510	244	6.12	7.85
07/26/19	River 3	--	--	--	--	--	--	4,830	765	477	199	10	1,340	1,600	192	5.97	8.08
11/01/19	River 3	--	--	--	--	--	--	4,620	767	521	224	7	1,240	1,540	164	6.66	7.92

MOSAIC DP-1399 GROUNDWATER AND SURFACE WATER MONITORING SUMMARY

Date ¹	Well	FIELD MEASUREMENTS						LABORATORY ANALYSES									
		Depth to Water (feet)	TOC Elevation ² (feet amsl)	WL Elevation (feet amsl)	Specific Conductivity (mS/cm)	pH (std. units)	Temperature (°C)	TDS (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)	Chloride (ppm)	Sulfate (ppm)	Alkalinity (ppm as CaCO ₃)	Specific Conductivity (mS/cm)	pH (std. units)
River 3 (continued)																	
01/29/20	River 3	--	--	--	--	--	--	4,490	753	597	229	9	1,180	1,520	208	6.25	8.14
04/28/20	River 3	--	--	--	--	--	--	5,530	850	545	242	9	1,680	1,790	188	7.57	8.07
07/29/20	River 3	--	--	--	--	--	--	5,490	823	569	225	8	1,630	1,760	215	7.30	8.20
10/29/20	River 3	--	--	--	--	--	--	4,960	791	504	211	9	1,420	1,680	172	7.01	8.25
24" Brine Pipeline Effluent																	
11/26/12	24" Line	--	--	--	--	--	--	382,000	110,000	77	7,200	43,000	190,000	42,000	130	680.0	7.5
11/26/12	24" Line	--	--	--	--	--	--	320,800	89,000	21	6,210	37,194	156,600	31,684	213	765	7.8
04/29/13	24" Line	--	--	--	--	--	--	401,000	NA	NA	NA	NA	NA	NA	350	670	7.4
04/29/13	24" Line	--	--	--	--	--	--	317,800	79,700	11	8,542	36,503	149,100	43,959	306	778	7.9
07/31/13	24" Line	--	--	--	--	--	--	301,500	156,500	30	7,901	29,444	156,500	26,090	462	728	7.9
08/01/13	24" Line	--	--	--	--	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
02/18/14	24" Line	--	--	--	--	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
04/30/14	24" Line	--	--	--	--	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
07/22/14	24" Line	--	--	--	--	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
10/27/14	24" Line	--	--	--	--	--	--	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
01/16/15	24" Line	--	--	--	--	--	--	107,000	32,000	110	1,600	8,300	66,000	7,000	180	210	7.84
04/04/16	24" Line	--	--	--	--	--	--	273,183	77,193	377	359	16,625	142,022	62,072	127	385	7.5
06/12/17	24" Line	--	--	--	--	--	--	271,667	83,333	433	3,983	13,583	150,000	20,250	208	538	7.18
10/26/17	24" Line							274,590	79,180	261	3,410	18,279	170,492	26,066	262	662	7.37
02/20/18	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
04/06/18	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
07/27/18	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
10/05/18	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
07/27/19	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
11/02/19	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
01/29/20	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
04/28/20	24" Line	--	--	--	NA	NA	NA	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
06/22/20	24" Line	--	--	--	NA	NA	NA	269,000	63,700	417	9,100	21,200	122,000	48,400	200	207,000	7.54

TABLE B-3

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Section19 Pond																	
Section19 Pond	601221, 3582966	12/20/2013	1.096		0.67	0.24	4.8	0.13	8.33	0.8	7343	2630	52608	1425	91297	8768	164071
Section19 Pond	601220, 3582956	2/13/2014	1.096		1.03	0.25	4.7	0.13	8.33	1.12	11289	2740	51512	1425	91297	12275	170538
Section19 Pond	601218, 3582964	4/14/2014	1.096		0.8495	0.256	5.2837	0.1386	9.2	0.96	9311	2806	57909	1519	100832	10522	182899
Laguna Uno																	
Laguna Uno	collected by IMC	5/18/2000	1.391	4.57	3.8	0.94	7.82	0.01	15.57	3.65	52848	13073	108756	139	216538	50762	442117
Laguna Uno	collected by IMC	5/26/2000	1.399	4.24	3.52	0.89	8.19	0.01	15.86	3.5	49231	12448	114547	140	221820	48952	447137
Laguna Uno	collected by IMC	3/16/2001	1.214	2.84	2.36	0.54	8.04	0.05	14.54	2.22	28650	6556	97606	607	176516	26951	336885
Laguna Uno	collected by Mosaic	6/30/2008	1.204	2.49	2.07	0.58	9.3	0.04	15.93	2.68	24923	6983	111972	482	191797	32267	368424
Laguna Uno	collected by Mosaic	7/7/2008	1.2	2.71	2.25	0.51	9.19	0.04	15.93	2.4	27000	6120	110280	480	191160	28800	363840
Laguna Uno	collected by Mosaic	7/14/2008	1.18	2.29	1.91	0.41	8.66	0.05	14.8	2	22538	4838	102188	590	174640	23600	328394
Laguna Uno	collected by Mosaic	7/21/2008	1.6	2.1	1.74	0.41	8.08	0.04	13.87	1.84	27840	6560	129280	640	221920	29440	415680
Laguna Uno	collected by Mosaic	7/28/2008	1.192	1.99	1.65	0.34	9.79	0.05	16.2	1.88	19668	4053	116697	596	193104	22410	356527
Laguna Uno	collected by Mosaic	8/4/2008	1.196	2.49	2.07	0.44	9.22	0.04	15.87	2.04	24757	5262	110271	478	189805	24398	354973
Laguna Uno	collected by Mosaic	8/11/2008	1.21	2.6	2.16	0.52	9.3	0.05	16.07	2.36	26136	6292	112530	605	194447	28556	368566
Laguna Uno	collected by Mosaic	8/19/2008	1.192	2.49	2.07	0.47	9.03	0.04	15.53	2.24	24674	5602	107638	477	185118	26701	350210
Laguna Uno	collected by Mosaic	9/1/2008	1.188	2.27	1.88	0.44	9.23	0.04	15.73	2.04	22334	5227	109652	475	186872	24235	348797
Laguna Uno	collected by Mosaic	9/8/2008	1.1	0.94	0.78	0.21	5.86	0.07	9.47	1.2	8580	2310	64460	770	104170	13200	193490
Laguna Uno	collected by Mosaic	9/15/2008	1.096	0.83	0.69	0.17	5.93	0.07	9.47	1.08	7562	1863	64993	767	103791	11837	190814
Laguna Uno	collected by Mosaic	9/29/2008	1.172	1.22	1.01	0.31	8.07	0.07	12.93	1.8	11837	3633	94580	820	151540	21096	283507
Laguna Uno	collected by Mosaic	1/11/2010	1.112	2.32	1.93	0.27	6.13	0.09	10.8	1.6	21462	3002	68166	1001	120096	17792	231518
Laguna Uno	collected by Mosaic	1/18/2010	1.132	1.38	1.15	0.33	6.76	0.09	11.33	1.48	13018	3736	76523	1019	128256	16754	239305
Laguna Uno	collected by Mosaic	1/25/2010	1.14	1.99	1.65	0.35	7.64	0.07	13.07	1.68	18810	3990	87096	798	148998	19152	278844
Laguna Uno	collected by Mosaic	2/1/2010	1	0	0	0	0.02	0.01	0.01	0.04							
Laguna Uno	collected by Mosaic	2/8/2010	1.124	1.44	1.19	0.29	6.42	0.07	10.8	1.4	13376	3260	72161	787	121392	15736	226711
Laguna Uno	collected by Mosaic	2/15/2010	1.12	1.49	1.24	0.3	6.74	0.07	11.33	1.44	13888	3360	75488	784	126896	16128	236544
Laguna Uno	collected by Mosaic	2/22/2010	1.136	1.71	1.42	0.35	7.45	0.12	12.6	1.64	16131	3976	84632	1363	143136	18630	267869
Laguna Uno	collected by Mosaic	2/22/2010	1.132	1.58	1.31	0.32	7.07	0.08	11.93	1.48	14829	3622	80032	906	135048	16754	251191
Laguna Uno	collected by Mosaic	3/1/2010	1.128	2.05	1.7	0.19	6.5	0.27	10.93	1.6	19176	2143	73320	3046	123290	18048	239023
Laguna Uno	collected by Mosaic	3/8/2010	1.156	1.6	1.33	0.35	7.63	0.07	12.8	1.6	15375	4046	88203	809	147968	18496	274897
Laguna Uno	collected by Mosaic	3/15/2010	1.136	1.66	1.38	0.32	7.19	0.06	12.13	1.56	15677	3635	81678	682	137797	17722	257190
Laguna Uno	collected by Mosaic	3/22/2010	1.16	1.71	1.42	0.39	8.3	0.06	13.87	1.84	16472	4524	96280	696	160892	21344	300208
Laguna Uno	collected by Mosaic	3/29/2010	1.18	1.77	1.47	0.45	8.63	0.05	14.53	1.92	17346	5310	101834	590	171454	22656	319190
Laguna Uno	collected by Mosaic	4/5/2010	1.188	1.99	1.65	0.46	8.82	0.05	14.8	2.2	19602	5465	104782	594	175824	26136	332402
Laguna Uno	collected by Mosaic	4/12/2010	1.208	2.77	2.3	0.6	9.13	0.04	15.67	3.04	27784	7248	110290	483	189294	36723	371822
Laguna Uno	collected by Mosaic	4/26/2010	1.196	2.43	2.02	0.59	8.95	0.01	15.47	2.56	24159	7056	107042	120	185021	30618	354016
Laguna Uno	collected by Mosaic	5/10/2010	1.204	3.04	2.52	0.65	8.86	0.04	15.6	3.04	30341	7826	106674	482	187824	36602	369748
Laguna Uno	collected by Mosaic	5/17/2010	1.204	3.04	2.52	0.68	8.64	0.04	15.33	3.08	30341	8187	104026	482	184573	37083	364692
Laguna Uno	collected by Mosaic	5/24/2010	1.22	3.43	2.85	0.75	8.82	0.03	15.73	3.56	34770	9150	107604	366	191906	43432	387228
Laguna Uno	collected by Mosaic	6/7/2010	1.212	3.32	2.75	0.71	8.64	0.04	15.53	3.2	33330	8605	104717	485	188224	38784	374144
Laguna Uno	collected by Mosaic	6/14/2010	1.208	3.65	3.03	0.74	8.36	0.04	15.33	3.32	36602	8939	100989	483	185186	40106	372306
Laguna Uno	collected by Mosaic	6/21/2010	1.22	3.54	2.94	0.76	8.51	0.04	15.33	3.6	35868	9272	103822	488	187026	43920	380396
Laguna Uno	collected by Mosaic	6/28/2010	1.208	3.48	2.89	0.74	8.38	0.03	15.13	3.48	34911	8939	101230	362	182770	42038	370252
Laguna Uno	collected by Mosaic	7/12/2010	1.14	1.38	1.15	0.3	7.13	0.07	11.6	1.76	13110	3420	81282	798	132240	20064	250914
Laguna Uno	collected by Mosaic	7/19/2010	1.18	1.74	1.45	0.42	8.46	0.06	14	2.12	17110	4956	99828	708	165200	25016	312818
Laguna Uno	collected by Mosaic	7/26/2010	1.068	0.61	0.5	0.26	4.1	0.09	6.67	1.2	5340	2777	43788	961	71236	12816	136918

TABLE B-3

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Laguna Uno (continued)																	
Laguna Uno	collected by Mosaic	8/2/2010	1.14	1.38	1.15	0.31	7.79	0.08	12.67	1.76	13110	3534	88806	912	144438	20064	270864
Laguna Uno	collected by Mosaic	8/9/2010	1.18	1.94	1.61	0.55	8.42	0.04	14.2	2.52	18998	6490	99356	472	167560	29736	322612
Laguna Uno	collected by Mosaic	8/16/2010	1.188	2.05	1.7	0.46	8.9	0.04	14.8	2.44	20196	5465	105732	475	175824	28987	336679
Laguna Uno	collected by Mosaic	8/23/2010	1.18	1.94	1.61	0.43	8.3	0.05	13.87	2.24	18998	5074	97940	590	163666	26432	312700
Laguna Uno	collected by Mosaic	8/30/2010	1.192	2.05	1.7	0.46	8.86	0.06	14.67	2.52	20264	5483	105611	715	174866	30038	336978
Laguna Uno	collected by Mosaic	9/6/2010	1.192	2.05	1.7	0.51	8.96	0.05	15	2.48	20264	6079	106803	596	178800	29562	342104
Laguna Uno	collected by Mosaic	9/13/2010	1.192	2.21	1.84	0.51	9.26	0.04	15.47	2.64	21933	6079	110379	477	184402	31469	354739
Laguna Uno	collected by Mosaic	9/20/2010	1.18	2.05	1.7	0.46	8.77	0.05	14.67	2.36	20060	5428	103486	590	173106	27848	330518
Laguna Uno	collected by Mosaic	9/27/2010	1.176	2.02	1.68	0.45	8.26	0.08	13.87	2.32	19757	5292	97138	941	163111	27283	313522
Laguna Uno	collected by Mosaic	10/4/2010	1.176	2.07	1.72	0.45	8.56	0.05	14.27	2.44	20227	5292	100666	588	167815	28694	323282
Laguna Uno	collected by Mosaic	10/18/2010	1.188	2.16	1.79	0.5	8.66	0.05	14.67	2.4	21265	5940	102881	594	174280	28512	333472
Laguna Uno	collected by Mosaic	10/25/2010	1.176	2.1	1.74	0.44	7.88	0.06	13.47	2.08	20462	5174	92669	706	158407	24461	301879
Laguna Uno	collected by Mosaic	11/1/2010	1.184	2.1	1.74	0.48	8.86	0.05	14.8	2.48	20602	5683	104902	592	175232	29363	336374
Laguna Uno	collected by Mosaic	11/8/2010	1.196	2.16	1.79	0.48	9.04	0.05	15.13	2.48	21408	5741	108118	598	180955	29661	346481
Laguna Uno	collected by Mosaic	11/15/2010	1.192	1.94	1.61	0.46	9.36	0.05	15.47	2.4	19191	5483	111571	596	184402	28608	349852
Laguna Uno	collected by Mosaic	12/6/2010	1.184	2.16	1.79	0.46	9.07	0.05	15.33	2.2	21194	5446	107389	592	181507	26048	342176
Laguna Uno	collected by Mosaic	12/14/2010	1.148	7.85	6.52	0.41	4.57	0.09	12.93	1.64	74850	4707	52464	1033	148436	18827	300317
Laguna Uno	collected by Mosaic	12/27/2010	1.176	1.44	1.19	0.36	0.68	0.12	2.19	1.36	13994	4234	7997	1411	25754	15994	69384
Laguna Uno	collected by Mosaic	1/10/2011	1.172	1.66	1.38	0.44	8.58	0.06	14.33	1.92	16174	5157	100558	703	167948	22502	313041
Laguna Uno	collected by Mosaic	1/17/2011	1.204	3.43	2.85	1.06	8.08	0.03	16.13	2.72	34314	12762	97283	361	194205	32749	371675
Laguna Uno	collected by Mosaic	1/24/2011	1.12	1.71	1.42	0.37	6.2	0.13	10.93	1.36	15904	4144	69440	1456	122416	15232	228592
Laguna Uno	collected by Mosaic	2/14/2011	1.168	1.44	1.19	0.41	7.97	0.09	13.33	1.68	13899	4789	93090	1051	155694	19622	288146
Laguna Uno	collected by Mosaic	2/21/2011	1.152	1.38	1.15	0.42	7.97	0.08	13.33	1.64	13248	4838	91814	922	153562	18893	283277
Laguna Uno	collected by Mosaic	2/28/2011	1.164	1.6	1.33	0.44	8.28	0.07	14	1.68	15481	5122	96379	815	162960	19555	300312
Laguna Uno	collected by Mosaic	3/7/2011	1.172	1.66	1.38	0.43	8.44	0.07	14.33	1.6	16174	5040	98917	820	167948	18752	307650
Laguna Uno	collected by Mosaic	4/4/2011	1.192	1.77	1.47	0.51	9.51	0.06	16.13	1.84	17522	6079	113359	715	192270	21933	351878
Laguna Uno	collected by Mosaic	4/11/2011	1.208	2.21	1.84	0.63	9.19	0.05	16.13	2.08	22227	7610	111015	604	194850	25126	361434
Laguna Uno	collected by Mosaic	4/18/2011	1.2	2.6	2.16	0.74	8.8	0.05	16	2.28	25920	8880	105600	600	192000	27360	360360
Laguna Uno	collected by Mosaic	4/25/2011	1.214	2.71	2.25	0.76	8.95	0.05	16.33	2.32	27315	9226	108653	607	198246	28165	372212
Laguna Uno	collected by Mosaic	5/2/2011	1.224	3.65	3.03	0.99	8.09	0.03	15.87	3.04	37087	12118	99022	367	194249	37210	380052
Laguna Uno	collected by Mosaic	5/16/2011	1.208	3.15	2.62	0.83	8.65	0.06	16.33	2.44	31650	10026	104492	725	197266	29475	373634
Laguna Uno	collected by Mosaic	5/30/2011	1.2	2.71	2.25	0.71	8.82	0.06	16	2.32	27000	8520	105840	720	192000	27840	361920
Laguna Uno	collected by Mosaic	6/20/2011	1.2	2.38	1.97	0.6	9.12	0.04	15.33	3.08	23640	7200	109440	480	183960	36960	361680
Laguna Uno	collected by Mosaic	6/27/2011	1.208	4.01	3.33	0.99	8.05	0.04	16.33	2.68	40226	11959	97244	483	197266	32374	379554
Laguna Uno	collected by Mosaic	7/25/2011	1.216	2.1	1.74	0.66	9.73	0.02	16	3.4	21158	8026	118317	243	194560	41344	383648
Laguna Uno	collected by Mosaic	7/25/2011	1.188	3.04	2.52	0.52	8.55	0.04	15	2.72	29938	6178	101574	475	178200	32314	348678
Laguna Uno	collected by Mosaic	7/25/2011	1.104	2.07	1.72	0.32	5.42	0.07	9.87	1.32	18989	3533	59837	773	108965	14573	206669
Laguna Uno	collected by Mosaic	8/8/2011	1.216	3.82	3.17	0.8	8.45	0.04	16.53	2.32	38547	9728	102752	486	201005	28211	380730
Laguna Uno	collected by Mosaic	8/15/2011	1.18	1.38	1.15	0.41	8.93	0.06	14.8	1.64	13570	4838	105374	708	174640	19352	318482
Laguna Uno	collected by Mosaic	9/5/2011	1.188	2.32	1.93	0.5	8.35	0.06	14.53	2.08	22928	5940	99198	713	172616	24710	326106
Laguna Uno	collected by Mosaic	9/19/2011	1.076	1.05	0.87	0.25	4.31	0.09	7.33	1.12	9361	2690	46376	968	78871	12051	150317
Laguna Uno	collected by Mosaic	9/26/2011	1.16	1.99	1.65	0.39	7.75	0.06	13.33	1.68	19140	4524	89900	696	154628	19488	288376
Laguna Uno	collected by Mosaic	10/17/2011	1.168	2.49	2.07	0.49	7.78	0.07	14	1.76	24178	5723	90870	818	163520	20557	305666
Laguna Uno	collected by Mosaic	11/7/2011	1.18	2.6	2.16	0.54	8.57	0.04	15.33	1.92	25488	6372	101126	472	180894	22656	337008
Laguna Uno	collected by Mosaic	11/28/2011	1.132	2.07	1.72	0.4	6.68	0.09	12.07	1.28	19470	4528	75618	1019	136632	14490	251757

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Laguna Uno (continued)																	
Laguna Uno	collected by Mosaic	12/5/2011	1.104	2.07	1.72	0.32	5.42	0.07	9.87	1.32	18989	3533	59837	773	108965	14573	206669
Laguna Uno	collected by Mosaic	2/20/2012	1.16	2.16	1.79	0.44	7.96	0.05	13.8	1.88	20764	5104	92336	580	160080	21808	300672
Laguna Uno	collected by Mosaic	2/27/2012	1.212	5.12	4.25	1.29	7.29	0.01	16.4	3.32	51510	15635	88355	121	198768	40238	394627
Laguna Uno	collected by Mosaic	3/8/2012	1.16	1.85	1.54	0.44	8.02	0.05	13.67	1.88	17864	5104	93032	580	158572	21808	296960
Laguna Uno	collected by Mosaic	3/12/2012	1.156	2.05	1.7	0.43	8.01	0.05	13.8	1.8	19652	4971	92596	578	159528	20808	298132
Laguna Uno	collected by Mosaic	3/19/2012	1.188	2.43	2.02	0.49	8.62	0.05	14.87	2.28	23998	5821	102406	594	176656	27086	336560
Laguna Uno	collected by Mosaic	3/26/2012	1.184	2.9	2.41	0.47	8.91	0.05	15.73	2.12	28534	5565	105494	592	186243	25101	351530
Laguna Uno	collected by Mosaic	4/2/2012	1.192	2.49	2.07	0.49	9.59	0.04	16.33	2.36	24674	5841	114313	477	194654	28131	368090
Laguna Uno	collected by Mosaic	4/16/2012	1.136	2.21	1.84	0.31	7.34	0.07	12.4	2	20902	3522	83382	795	140864	22720	272186
Laguna Uno	collected by Mosaic	4/23/2012	1.192	5.81	4.82	0.57	7.73	0.04	16	2.64	57454	6794	92142	477	190720	31469	379056
Laguna Uno	collected by Mosaic	4/30/2012	1.224	3.15	2.62	2.27	6.96	0	16.4	4.48	32069	27785	85190	0	200736	54835	400615
Laguna Uno	collected by Mosaic	5/7/2012	1.188	3.04	2.52	0.52	8.55	0.04	15	2.72	29938	6178	101574	475	178200	32314	348678
Laguna Uno	collected by Mosaic	5/14/2012	1.04	0.69	0.57	0.18	3.12	0.11	5.33	0.72	5928	1872	32448	1144	55432	7488	104312
Laguna Uno	collected by Mosaic	6/4/2012	1.172	2.65	2.2	0.39	8.08	0.05	14	2.16	25784	4571	94698	586	164080	25315	315034
Laguna Uno	collected by Mosaic	6/26/2012	1.172	2.82	2.34	0.44	8.1	0.06	14.33	2.12	27425	5157	94932	703	167948	24846	321011
Laguna Uno	collected by Mosaic	7/2/2012	1.172	2.71	2.25	0.42	8.08	0.06	14.13	2.16	26370	4922	94698	703	165604	25315	317612
Laguna Uno	collected by Mosaic	7/9/2012	1.208	3.26	2.71	0.72	9.16	0.04	16.47	3	32737	8698	110653	483	198958	36240	387768
Laguna Uno	collected by Mosaic	7/16/2012	1.208	3.12	2.59	0.69	9.1	0.03	16.33	2.8	31287	8335	109928	362	197266	33824	381003
Laguna Uno	collected by Mosaic	7/23/2012	1.212	3.87	3.21	0.84	8.75	0.03	16.33	3.4	38905	10181	106050	364	197920	41208	394627
Laguna Uno	collected by Mosaic	8/6/2012	1.204	4.04	3.35	0.79	8.67	0.02	16.13	3.48	40334	9512	104387	241	194205	41899	390578
Laguna Uno	collected by Mosaic	8/13/2012	1.208	3.43	2.85	0.73	9.08	0.02	16.33	3.2	34428	8818	109686	242	197266	38656	389097
Laguna Uno	collected by Mosaic	8/27/2012	1.116	1.82	1.51	0.28	6.31	0.1	10.8	1.52	16852	3125	70420	1116	120528	16963	229003
Laguna Uno	collected by Mosaic	9/17/2012	1.196	2.71	2.25	0.55	9.12	0.05	15.87	2.48	26910	6578	109075	598	189805	29661	362627
Laguna Uno	collected by Mosaic	9/24/2012	1.192	3.59	2.98	0.55	9.67	0.04	17.33	2.56	35522	6556	115266	477	206574	30515	394910
Laguna Uno	collected by Mosaic	10/8/2012	1.148	1.44	1.19	0.4	7.74	0.06	12.8	1.88	13661	4592	88855	689	146944	21582	276324
Laguna Uno	collected by Mosaic	10/15/2012	1.14	2.49	2.07	0.43	6.78	0.07	12.8	1.04	23598	4902	77292	798	145920	11856	264366
Laguna Uno	collected by Mosaic	10/22/2012	1.196	2.27	1.88	0.5	9.04	0.04	15.47	2.2	22485	5980	108118	478	185021	26312	348395
Laguna Uno	collected by Mosaic	10/29/2012	1.188	2.38	1.97	0.64	8.95	0.04	15.8	2.24	23404	7603	106326	475	187704	26611	352123
Laguna Uno	collected by Mosaic	11/5/2012	1.152	1.88	1.56	0.46	7.68	0.05	13.33	1.72	17971	5299	88474	576	153562	19814	285696
Laguna Uno	collected by Mosaic	11/12/2012	1.192	2.27	1.88	0.52	9.16	0.04	15.67	2.28	22410	6198	109187	477	186786	27178	352236
Laguna Uno	collected by Mosaic	11/19/2012	1.193	2.21	1.84	0.51	9.32	0.04	15.87	2.24	21951	6084	111188	477	189329	26723	355753
Laguna Uno	collected by Mosaic	12/3/2012	1.112	1.38	1.15	0.37	6.45	0.1	11	1.44	12788	4114	71724	1112	122320	16013	228071
Laguna Uno	uno 12-17-12	12/18/2012	1.168	1.82	1.51	0.44	8.6	0.06	14.6	1.8	17637	5139	100448	701	170528	21024	315477
Laguna Uno	collected by Mosaic	12/24/2012	1.136	1.82	1.51	0.59	6.69	0.08	12.2	1.64	17154	6702	75998	909	138592	18630	257986
Laguna Uno	collected by Mosaic	12/31/2012	1.136	1.71	1.42	0.54	6.91	0.07	12.33	1.6	16131	6134	78498	795	140069	18176	259803
Laguna Uno	collected by Mosaic	1/7/2013	1.1	1.6	1.33	0.47	5.55	0.07	10.2	1.28	14630	5170	61050	770	112200	14080	207900
Laguna Uno	collected by Mosaic	1/14/2013	1.128	1.3	1.08	0.33	6.95	0.07	11.6	1.44	12182	3722	78396	790	130848	16243	242182
Laguna Uno	collected by Mosaic	1/21/2013	1.128	1.58	1.31	0.42	6.71	0.08	11.87	1.2	14777	4738	75689	902	133894	13536	243535
Laguna Uno	collected by Mosaic	1/31/2013	1.172	2.18	1.81	0.44	8.31	0.05	14.33	1.92	21213	5157	97393	586	167948	22502	314799
Laguna Uno	collected by Mosaic	2/4/2013		1.99	1.65	0.44	7.92	0.04	14	1.32							
Laguna Uno	collected by Mosaic	2/11/2013	1.148	2.13	1.77	0.49	8.12	0.06	14.13	1.92	20320	5625	93218	689	162212	22042	304105
Laguna Uno	collected by Mosaic	2/18/2013	1.184	2.41	2	0.52	8.84	0.04	15.53	1.92	23680	6157	104666	474	183875	22733	341584
Laguna Uno	collected by Mosaic	2/26/2013	1.208	3.57	2.96	1.03	8.1	0.02	16.2	2.68	35757	12442	97848	242	195696	32374	374359
Laguna Uno	collected by Mosaic	3/5/2013	1.188	2.71	2.25	0.53	9.07	0.04	15.87	2.32	26730	6296	107752	475	188536	27562	357350
Laguna Uno	collected by Mosaic	3/11/2013	1.204	2.16	1.79	0.52	8.16	0.08	14.4	1.8	21552	6261	98246	963	173376	21672	322070

TABLE B-3

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Laguna Uno (continued)																	
Laguna Uno	collected by Mosaic	3/18/2013	1.216	4.95	4.11	1.35	8.61	0.01	18.27	3.64	49978	16416	104698	122	222163	44262	437638
Laguna Uno	collected by Mosaic	3/25/2013	1.18	2.54	2.11	0.56	9.07	0.05	15.87	2.24	24898	6608	107026	590	187266	26432	352820
Laguna Uno	collected by Mosaic	4/1/2013	1.2	4.92	4.09	0.62	8.01	0.04	15.87	2.72	49080	7440	96120	480	190440	32640	376200
Laguna Uno	collected by Mosaic	4/8/2013	1.2	5.14	4.27	1.6	6.65	0	16.13	3.6	51240	19200	79800	0	193560	43200	387000
Laguna Uno	collected by Mosaic	4/15/2013	1.208	0.47	0.39	0.64	10.45	0.04	16.27	2.8	4711	7731	126236	483	196542	33824	369527
Laguna Uno	collected by Mosaic	4/29/2013	1.364	2.77	2.3	0.66	8.44	0.04	14.93	2.8	31372	9002	115122	546	203645	38192	397879
Laguna Uno	laguno Uno 5-8-13	5/8/2013	1.204	3.46	2.87	0.84	8.66	0.03	16	3.24	34555	10114	104266	361	192640	39010	380946
Laguna Uno	collected by Mosaic	5/13/2013	1.208	3.43	2.85	0.8	8.66	0.03	15.87	3.24	34428	9664	104613	362	191710	39139	379916
Laguna Uno	collected by Mosaic	5/20/2013	1.216	3.32	2.75	0.83	8.48	0.03	15.6	3.24	33440	10093	103117	365	189696	39398	376109
Laguna Uno	collected by Mosaic	5/27/2013	1.22	3.59	2.98	0.92	8.78	0.02	16.13	3.8	36356	11224	107116	244	196786	46360	398086
Laguna Uno	collected by Mosaic	6/3/2013	1.212	4.42	3.67	0.97	7.87	0.01	15.33	4	44480	11756	95384	121	185800	48480	386022
Laguna Uno	collected by Mosaic	6/17/2013	1.204	4.09	3.4	0.91	8.16	0	15.6	3.68	40936	10956	98246	0	187824	44307	382270
Laguna Uno	Laguno Uno 6-12-13	6/25/2013	1.232	5.61	4.66	1.29	7.6	0	16	5	57411	15893	93632	0	197120	61600	425656
Laguna Uno	Laguno Uno 6-21-13	6/25/2013	1.208	2.88	2.39	0.69	8.93	0.03	15.87	2.8	28871	8335	107874	362	191710	33824	370977
Laguna Uno	Laguno uno 7-1-13	7/1/2013	1.204	3.32	2.75	0.7	8.74	0.03	15.73	3.08	33110	8428	105230	361	189389	37083	373601
Laguna Uno	Laguno Uno 7-8-13	7/8/2013	1.22	4.26	3.53	0.87	8.46	0.02	16.13	3.6	43066	10614	103212	244	196786	43920	397842
Laguna Uno	Laguno Uno 7-15-13	7/15/2013	1.184	2.02	1.68	0.58	8.63	0.03	14.67	2.52	19891	6867	102179	355	173693	29837	332822
Laguna Uno	Laguno Uno 7-29-13	7/30/2013	1.18	1.8	1.49	0.53	9.39	0.04	15.47	2.6	17582	6254	110802	472	182546	30680	348336
Laguna Uno	Laguna Uno 8-5-13	8/5/2013	1.196	2.49	2.07	0.58	9.39	0.04	16	2.76	24757	6937	112304	478	191360	33010	368846
Laguna Uno	Laguna Uno 8-19-13	8/19/2013	1.188	1.94	1.61	0.54	9.35	0.04	15.4	2.76	19127	6415	111078	475	182952	32789	352836
Laguna Uno	Laguna Uno 8-26-13	8/28/2013	1.192	1.94	1.61	0.53	9.5	0.05	15.67	2.68	19191	6318	113240	596	186786	31946	358077
Laguna Uno	Laguno Uno 9-2-13	9/4/2013	1.204	2.16	1.79	0.57	9.53	0.04	15.87	2.88	21552	6863	114741	482	191075	34675	369387
Laguna Uno	Laguna Uno 9-9-13	9/9/2013	1.188	1.85	1.54	0.53	9.29	0.06	15.33	2.6	18295	6296	110365	713	182120	30888	348678
Laguna Uno	Laguna Uno 9-16-13	9/16/2013	1.188	1.82	1.51	0.51	9.12	0.05	15.07	2.52	17939	6059	108346	594	179032	29938	341906
Laguna Uno	Laguna Uno 9-24-13	9/24/2013	1.164	1.33	1.1	0.44	8.25	0.05	13.47	2.08	12804	5122	96030	582	156791	24211	295540
Laguna Uno	600988, 3582932	12/20/2013	1.204		0.67	0.25	5.08	0.13	8.53	1.16							190431
Laguna Uno	602053, 3581367	12/20/2013	1.204		0.62	0.34	5.04	0.12	8.8	1							191634
Laguna Uno	601325, 3580946	12/20/2013	1.204		1.58	0.4	7.61	0.06	13.07	1.88							296118
Laguna Uno	601069, 3582890	2/13/2014	1.204		1.01	0.27	5.1	0.11	9.07	0.96							198857
Laguna Uno	602047, 3581364	2/5/2014	1.204		1.54	0.42	7	0.07	12.4	1.52							276257
Laguna Uno	601511, 3580968	2/5/2014	1.204		1.58	0.44	7.51	0.05	13.13	1.68							293591
Laguna Uno	601065, 3582892	4/14/2014	1.204		0.3903	0.2413	4.3061	0.1078	7.5333	0.48							157194
Laguna Uno	602046, 3581366	4/14/2014	1.204		1.6072	0.4867	7.7866	0.044	14.133	1.12							303073
Laguna Uno	601488, 3580997	4/14/2014	1.204		2.1812	0.536	8.7295	0.0396	16.067	1.36							348035
Lindsey Lake																	
Lindsey Lake	598807, 3582110	12/20/2013	1.167		1.45	0.6	8.15	0.04	14	2.28							309488
Lindsey Lake	598725, 3581100	12/20/2013	1.167		1.33	0.58	7.97	0.04	13.73	2.04							299802
Lindsey Lake	598848, 3581940	2/14/2014	1.167		2.34	0.57	8.34	0.05	15.07	2.24							333879
Lindsey Lake	598810, 3581075	2/13/2014	1.167		2.11	0.62	8.78	0.04	15.6	2.32							343915
Lindsey Lake	598851, 3581942	4/13/2014	1.167		1.9287	0.4973	7.5011	0.0264	13.867	1.28							292919
Lindsey Lake	598791, 3581083	4/13/2014	1.167		2.8012	0.6813	7.962	0.0418	15.667	1.64							336013

TABLE B-3

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K20	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Tamarisk Flats																	
Tamarisk Flats	Tamarisk	12/15/2011	1.208	2.49	2.07	0.57	9.28	0.04	16.2	2.24	25006	6886	112102	483	195696	27059	367232
Tamarisk Flat	597717, 3579481	12/20/2013	1.208		1.61	0.55	8.76	0.04	15.07	2.16							340535
Tamarisk Flat	598186, 3580274	12/20/2013	1.208		1.7	0.59	8.69	0.04	14.93	2.44							342951
Tamarisk Flat	597717, 3579480	2/5/2014	1.208		2.11	0.65	10.17	0.04	17.73	2.48							400814
Tamarisk Flat	598180, 3580276	2/5/2014	1.208		2.25	0.65	9.71	0.04	17.2	2.44							390063
Tamarisk Flat	597874, 3581453	2/5/2014	1.208		2.09	0.68	8.85	0.05	15.8	2.44							361313
Tamarisk Flat	597747, 3579492	4/13/2014	1.208		2.5027	0.8813	8.0215	0.0308	15.933	1.8							352369
Tamarisk Flat	598156, 3580337	4/13/2014	1.208		2.1583	0.772	8.306	0.0352	15.867	1.64							347640
Tamarisk Flat	597874, 3581445	4/13/2014	1.208		2.1123	0.7667	8.24	0.033	15.733	1.6							344103
Laguna Tres																	
Laguna Tres	Tres	12/15/2011	1.2	2.99	2.48	0.65	8.66	0.03	15.87	2.2	29760	7800	103920	360	190440	26400	358680
Laguna Tres	599315, 3578466	12/19/2013	1.2		1.58	0.54	8.8	0.05	15.27	1.88							337440
Laguna Tres	600476, 3577200	12/19/2013	1.2		1.56	0.46	8.57	0.04	14.67	1.88							326160
Laguna Tres	600095, 3576471	12/19/2013	1.2		2.09	0.69	8.79	0.02	15.87	2.2							355920
Laguna Tres	599766, 3578420	2/13/2014	1.2		1.77	0.57	9.01	0.04	15.6	2.2							350280
Laguna Tres	599969, 3578169	2/14/2014	1.2		2.11	0.56	8.91	0.04	15.8	2.12							354480
Laguna Tres	600378, 3577258	2/14/2014	1.2		2.11	0.63	8.38	0.03	15.2	2.08							341160
Laguna Tres	600018, 3576515	2/13/2014	1.2		2.36	0.69	9.05	0.02	16.33	2.48							371160
Laguna Tres	598898, 3577151	2/13/2014	1.2		2.98	0.79	9.25	0.03	17.8	2.08							395160
Laguna Tres	599658, 3578419	4/13/2014	1.2		2.4338	0.5867	12.436	0.033	21.467	2.28							470829
Laguna Tres	599975, 3578062	4/13/2014	1.2		2.1812	0.62	9.4845	0.033	16.667	2.44							377105
Laguna Tres	600594, 3577111	4/13/2014	1.2		1.9516	0.576	8.7587	0.0396	15.4	2.2							347112
Laguna Tres	600095, 3576481	4/13/2014	1.2		2.7323	0.8587	8.5312	0.0242	16.2	2.68							372316
Laguna Dos																	
Laguna Dos	dos	6/27/2011	1.196	2.57	2.13	0.51	9.09	0.03	15.8	2.24	25475	6100	108716	359	188968	26790	356408
Laguna Dos	602300, 3579364	12/19/2013	1.196		1.35	0.47	8.25	0.04	14	1.88							310840
Laguna Dos	601703, 3578973	12/19/2013	1.196		1.49	0.48	8.81	0.04	14.93	2							331890
Laguna Dos	602250, 3579287	2/14/2014	1.196		1.79	0.52	8.59	0.04	14.87	2.16							334521
Laguna Dos	601678, 3579017	2/14/2014	1.196		1.72	0.43	8.87	0.13	15.13	2.16							340142
Laguna Dos	602255, 3579283	4/13/2014	1.196		0.9873	0.356	5.9387	0.0946	10.667	0.8							225365
Laguna Dos	601698, 3578974	4/13/2014	1.196		1.5843	0.5013	8.9757	0.0418	15.867	1.28							337867
Laguna Cuatro																	
Laguna Cuatro	cuatro	6/27/2011	1.212	3.29	2.73	0.63	8.98	0.04	16.13	2.76	33088	7636	108838	485	195496	33451	378992
Laguna Cuatro	cuatro 12-7-11	12/7/2011	1.188	2.65	2.2	0.47	9.05	0.04	16	1.8	26136	5584	107514	475	190080	21384	351173
Laguna Cuatro	602117, 3577956	12/19/2013	1.2		0.69	0.4	5.91	0.1	10.33	1							221160
Laguna Cuatro	601214, 3578288	12/19/2013	1.2		1.95	0.48	8.79	0.04	15.4	1.88							342480
Laguna Cuatro	602078, 3578011	2/4/2014	1.2		0.78	0.44	5.7	0.13	10.33	0.92							219600
Laguna Cuatro	601211, 3578279	2/5/2014	1.2		1.91	0.48	8.44	0.03	14.67	2.08							331320
Laguna Cuatro	601380, 3577447	2/14/2014	1.2		1.74	0.46	8.79	0.04	15	2.08							337320
Laguna Cuatro	602058, 3578044	4/13/2014	1.2		0.4822	0.32	4.7074	0.209	8.4667	0.72							178863
Laguna Cuatro	601213, 3578276	4/13/2014	1.2		1.7909	0.512	9.5224	0.0352	16.267	2.16							363446
Laguna Cuatro	601375, 3577448	4/13/2014	1.2		1.9746	0.548	9.3223	0.0308	16.133	2.28							363468

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Laguna Grande																	
Laguna Grande	Near LG7	4/2/2002	1.225	2.5	2.07	0.69	8.13	0.04	15.08	1.87	25358	8453	99593	490	184730	22908	341530
Laguna Grande	Near LG8	2/23/2001	1.225	2.54	2.11	0.58	8.44	0.04	15.55	1.94	25854	7107	103415	490	190534	23771	351171
Laguna Grande	Near LG9	2/23/2001	1.225	2.61	2.17	0.71	8.26	0.04	15.49	1.84	26591	8700	101218	490	189814	22547	349362
Laguna Grande	collected by IMC	5/26/2000	NA	3.04	2.53	0.12	37.02	0.07	59.2	0.88							
Laguna Grande	collected by Mosaic	6/30/2008	1.22	5.36	4.45	2.14	5.31	0.01	15.2	4.44	54290	26108	64782	122	185440	54168	384910
Laguna Grande	collected by Mosaic	7/7/2008	1.248	5.47	4.54	2.4	5.34	0.01	15.87	4.8	56659	29952	66643	125	198058	59904	411341
Laguna Grande	collected by Mosaic	7/14/2008	1.216	4.98	4.13	1.66	6.63	0.01	16.33	3.36	50221	20186	80621	122	198573	40858	390579
Laguna Grande	collected by Mosaic	7/21/2008	1.22	6.53	5.42	1.74	6.92	0.02	17.8	3.88	66124	21228	84424	244	217160	47336	436516
Laguna Grande	collected by Mosaic	7/28/2008	1.212	5.14	4.27	1.59	6.53	0.01	16.2	3.24	51752	19271	79144	121	196344	39269	385901
Laguna Grande	collected by Mosaic	8/4/2008	1.232	5.81	4.82	2.07	5.74	0.01	16.27	4.04	59382	25502	70717	123	200446	49773	405944
Laguna Grande	collected by Mosaic	8/11/2008	1.248	5.53	4.59	2.57	5.16	0	16.13	4.72	57283	32074	64397	0	201302	58906	413962
Laguna Grande	collected by Mosaic	8/19/2008	1.188	2.71	2.25	0.53	8.98	0.03	16.27	1.6	26730	6296	106682	356	193288	19008	352361
Laguna Grande	collected by Mosaic	9/1/2008	1.192	2.21	1.84	0.52	9.09	0.05	16	1.64	21933	6198	108353	596	190720	19549	347349
Laguna Grande	collected by Mosaic	9/9/2008	1.16	1.94	1.61	0.44	9.11	0.05	15.6	1.6	18676	5104	105676	580	180960	18560	329556
Laguna Grande	collected by Mosaic	9/15/2008	1.18	1.38	1.15	0.38	9.28	0.05	15.33	1.52	13570	4484	109504	590	180894	17936	326978
Laguna Grande	collected by Mosaic	9/29/2008	1.214	1.77	1.47	1.11	9.74	0.02	16.93	3.6	17846	13475	118244	243	205530	43704	399042
Laguna Grande	collected by Mosaic	9/22/2008	1.2	3.04	2.52	0.61	8.81	0.04	16.13	2.08	30240	7320	105720	480	193560	24960	362280
Laguna Grande	collected by Mosaic	1/4/2010	1.184	2.27	1.88	0.54	9.12	0.04	16	1.84	22259	6394	107981	474	189440	21786	348333
Laguna Grande	collected by Mosaic	1/4/2010	1.192	2.54	2.11	0.68	8.84	0.03	16	2.08	25151	8106	105373	358	190720	24794	354501
Laguna Grande	collected by Mosaic	1/11/2010	1.188	2.77	2.3	0.68	8.73	0.04	16.13	1.88	27324	8078	103712	475	191624	22334	353549
Laguna Grande	collected by Mosaic	1/18/2010	1.18	2.29	1.91	0.52	8.79	0.04	15.33	2	22538	6136	103722	472	180894	23600	337362
Laguna Grande	collected by Mosaic	1/25/2010	1.192	2.77	2.3	0.76	8.78	0.03	16.13	2.32	27416	9059	104658	358	192270	27654	361414
Laguna Grande	collected by Mosaic	2/1/2010	1.188	2.6	2.16	0.67	8.88	0.03	16.13	2	25661	7960	105494	356	191624	23760	354856
Laguna Grande	collected by Mosaic	2/8/2010	1.164	1.82	1.51	0.47	7.76	0.04	13.53	1.6	17576	5471	90326	466	157489	18624	289952
Laguna Grande	collected by Mosaic	2/15/2010	1.176	1.71	1.42	0.46	8.76	0.05	14.8	1.8	16699	5410	103018	588	174048	21168	320930
Laguna Grande	collected by Mosaic	2/15/2010	1.184	1.99	1.65	0.52	9.14	0.04	15.87	1.68	19536	6157	108218	474	187901	19891	342176
Laguna Grande	collected by Mosaic	2/22/2010	1.192	2.41	2	0.64	8.92	0.05	16.07	1.84	23840	7629	106326	596	191554	21933	351878
Laguna Grande	collected by Mosaic	2/22/2010	1.192	2.29	1.91	0.54	9.21	0.04	16.2	1.76	22767	6437	109783	477	193104	20979	353547
Laguna Grande	collected by Mosaic	3/1/2010	1.192	2.65	2.2	0.69	8.77	0.26	16	2.08	26224	8225	104538	3099	190720	24794	357600
Laguna Grande	collected by Mosaic	3/8/2010	1.204	2.6	2.16	0.76	8.66	0.04	16	2.08	26006	9150	104266	482	192640	25043	357588
Laguna Grande	collected by Mosaic	3/15/2010	1.188	2.6	2.16	0.78	8.5	0.04	15.67	2.24	25661	9266	100980	475	186160	26611	349153
Laguna Grande	collected by Mosaic	3/22/2010	1.188	2.99	2.48	0.88	9.26	0.05	17.33	2.4	29462	10454	110009	594	205880	28512	384912
Laguna Grande	collected by Mosaic	3/22/2010	1.192	2.77	2.3	0.81	8.59	0.04	16	2.28	27416	9655	102393	477	190720	27178	357838
Laguna Grande	collected by Mosaic	3/29/2010	1.2	2.93	2.43	0.7	8.54	0.04	15.6	2.44	29160	8400	102480	480	187200	29280	357000
Laguna Grande	collected by Mosaic	3/29/2010	1.204	3.18	2.64	1.02	7.68	0.04	15.33	2.56	31786	12281	92467	482	184573	30822	352411
Laguna Grande	collected by Mosaic	4/5/2010	1.204	3.26	2.71	1.1	8.15	0.04	16.13	2.84	32628	13244	98126	482	194205	34194	372879
Laguna Grande	collected by Mosaic	4/12/2010	1.212	3.71	3.08	1.31	7.62	0.04	16	3.2	37330	15877	92354	485	193920	38784	378750
Laguna Grande	collected by Mosaic	4/26/2010	1.212	3.87	3.21	1.36	7.22	0.04	15.53	3.36	38905	16483	87506	485	188224	40723	372326
Laguna Grande	collected by Mosaic	5/10/2010	1.22	4.98	4.13	1.62	6.46	0.01	15.6	3.84	50386	19764	78812	122	190320	46848	386252
Laguna Grande	collected by Mosaic	5/17/2010	1.192	2.77	2.3	0.77	8.47	0.06	15.73	2.24	27416	9178	100962	715	187502	26701	352474
Laguna Grande	collected by Mosaic	5/24/2010	1.232	5.31	4.41	1.65	6.81	0.01	16.4	3.92	54331	20328	83899	123	202048	48294	409024
Laguna Grande	collected by Mosaic	6/7/2010	1.236	5.86	4.87	2.19	5.36	0.01	15.53	4.8	60193	27068	66250	124	191951	59328	404914
Laguna Grande	collected by Mosaic	6/14/2010	1.244	6.03	5	2.39	5.22	0.01	15.73	5.2	62200	29732	64937	124	195681	64688	417362
Laguna Grande	collected by Mosaic	6/21/2010	1.232	5.72	4.75	1.59	7.37	0.01	17.6	3.68	58520	19589	90798	123	216832	45338	431200
Laguna Grande	collected by Mosaic	6/28/2010	1.232	5.81	4.82	2.01	5.78	0.01	15.8	4.52	59382	24763	71210	123	194656	55686	405821

TABLE B-3

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Laguna Grande (continued)																	
Laguna Grande	collected by Mosaic	7/12/2010	1.12	1.49	1.24	0.4	6.32	0.07	11.07	1.32	13888	4480	70784	784	123984	14784	228704
Laguna Grande	collected by Mosaic	7/19/2010	1.108	1.38	1.15	0.44	5.85	0.04	10.47	1.2	12742	4875	64818	443	116008	13296	212182
Laguna Grande	collected by Mosaic	7/26/2010	1.16	1.94	1.61	0.52	7.78	0.06	13.73	1.68	18676	6032	90248	696	159268	19488	294408
Laguna Grande	collected by Mosaic	8/2/2010	1.176	2.07	1.72	0.55	8.56	0.06	15.07	1.76	20227	6468	100666	706	177223	20698	325987
Laguna Grande	collected by Mosaic	8/9/2010	1.186	2.32	1.93	0.62	8.95	0.05	16	1.84	22890	7353	106147	593	189760	21822	348565
Laguna Grande	collected by Mosaic	8/16/2010	1.204	2.49	2.07	0.66	8.87	0.05	16	2	24923	7946	106795	602	192640	24080	356986
Laguna Grande	collected by Mosaic	8/20/2010	1.024	0.15	0.13	0.03	2.53	0.02	3.73	0.48	1331	307	25907	205	38195	4915	70861
Laguna Grande	collected by Mosaic	8/23/2010	1.2	2.49	2.07	0.67	8.74	0.05	15.87	1.96	24840	8040	104880	600	190440	23520	352320
Laguna Grande	collected by Mosaic	9/6/2010	1.2	2.71	2.25	0.75	8.84	0.06	16.27	2.16	27000	9000	106080	720	195240	25920	363960
Laguna Grande	collected by Mosaic	9/13/2010	1.204	3.32	2.75	0.71	8.62	0.03	15.87	2.72	33110	8548	103785	361	191075	32749	369628
Laguna Grande	collected by Mosaic	9/13/2010	1.208	2.93	2.43	0.82	8.57	0.05	16.13	2.28	29354	9906	103526	604	194850	27542	365782
Laguna Grande	collected by Mosaic	9/20/2010	1.204	3.04	2.52	0.8	8.58	0.05	16.13	2.32	30341	9632	103303	602	194205	27933	366016
Laguna Grande	collected by Mosaic	9/27/2010	1.196	2.82	2.34	0.76	8.46	0.06	15.67	2.32	27986	9090	101182	718	187413	27747	354136
Laguna Grande	collected by Mosaic	10/4/2010	1.196	2.88	2.39	0.78	8.58	0.05	16	2.28	28584	9329	102617	598	191360	27269	359757
Laguna Grande	collected by Mosaic	10/18/2010	1.208	3.15	2.62	0.85	8.27	0.05	15.87	2.36	31650	10268	99902	604	191710	28509	362642
Laguna Grande	collected by Mosaic	10/25/2010	1.208	3.32	2.75	0.89	8.17	0.05	15.87	2.48	33220	10751	98694	604	191710	29958	364937
Laguna Grande	collected by Mosaic	11/1/2010	1.216	3.51	2.92	1.01	8.03	0.05	15.87	2.84	35507	12282	97645	608	192979	34534	373555
Laguna Grande	collected by Mosaic	11/8/2010	1.216	3.37	2.8	1.01	7.81	0.07	15.53	2.68	34048	12282	94970	851	188845	32589	363584
Laguna Grande	collected by Mosaic	11/15/2010	1.212	3.26	2.71	1.09	8.29	0.02	16.33	2.8	32845	13211	100475	242	197920	33936	378629
Laguna Grande	collected by Mosaic	12/6/2010	1.208	3.93	3.26	1.14	7.79	0.03	16.2	2.84	39381	13771	94103	362	195696	34307	377621
Laguna Grande	collected by Mosaic	12/6/2010	1.204	3.98	3.31	1.14	7.61	0.03	16	2.8	39852	13726	91624	361	192640	33712	371916
Laguna Grande	collected by Mosaic	12/14/2010	1.208	9.54	7.92	1.09	4.94	0.03	15.93	2.76	95674	13167	59675	362	192434	33341	394654
Laguna Grande	collected by Mosaic	12/27/2010	1.198	3.65	3.03	1.17	7.86	0.02	16.2	2.84	36299	14017	94163	240	194076	34023	372818
Laguna Grande	collected by Mosaic	12/27/2010	1.204	3.65	3.03	1.18	7.74	0.01	16	2.88	36481	14207	93190	120	192640	34675	371314
Laguna Grande	collected by Mosaic	1/10/2011	1.208	3.76	3.12	1.14	7.88	0.03	16.13	2.92	37690	13771	95190	362	194850	35274	377138
Laguna Grande	collected by Mosaic	1/10/2011	1.21	3.59	2.98	1.15	7.83	0.01	16	2.88	36058	13915	94743	121	193600	34848	373285
Laguna Grande	collected by Mosaic	1/17/2011	1.2	3.43	2.85	1.07	7.99	0.02	16	2.72	34200	12840	95880	240	192000	32640	367800
Laguna Grande	collected by Mosaic	1/17/2011	1.208	3.51	2.92	1.07	7.95	0.02	16	2.72	35274	12926	96036	242	193280	32858	370614
Laguna Grande	collected by Mosaic	1/24/2011	1.22	3.48	2.89	1.07	8.08	0.11	16.13	2.8	35258	13054	98576	1342	196786	34160	379176
Laguna Grande	collected by Mosaic	2/14/2011	1.204	3.46	2.87	1.09	7.93	0.04	16	2.72	34555	13124	95477	482	192640	32749	369026
Laguna Grande	collected by Mosaic	2/21/2011	1.208	3.43	2.85	1.09	8.04	0.02	16.13	2.72	34428	13167	97123	242	194850	32858	372668
Laguna Grande	collected by Mosaic	2/28/2011	1.216	3.73	3.1	1.16	8.04	0.02	16.53	2.8	37696	14106	97766	243	201005	34048	384864
Laguna Grande	collected by Mosaic	3/7/2011	1.208	3.59	2.98	1.15	7.86	0.02	16.13	2.76	35998	13892	94949	242	194850	33341	373272
Laguna Grande	collected by Mosaic	4/4/2011	1.22	4.15	3.44	1.35	7.42	0.02	16	3.36	41968	16470	90524	244	195200	40992	385398
Laguna Grande	collected by Mosaic	4/11/2011	1.228	4.59	3.81	1.42	7.26	0.04	16.13	3.6	46787	17438	89153	491	198076	44208	396153
Laguna Grande	collected by Mosaic	4/18/2011	1.224	4.98	4.13	1.52	6.89	0.02	16	3.8	50551	18605	84334	245	195840	46512	396086
Laguna Grande	collected by Mosaic	4/25/2011	1.219	4.09	3.4	1.3	7.49	0.03	16	3.28	41446	15847	91303	366	195040	39983	383985
Laguna Grande	collected by Mosaic	5/2/2011	1.22	4.59	3.81	1.88	6.42	0.02	15.47	4.56	46482	22936	78324	244	188734	55632	392352
Laguna Grande	collected by Mosaic	5/16/2011	1.24	5.53	4.59	1.85	6.25	0.01	16	4.32	56916	22940	77500	124	198400	53568	409448
Laguna Grande	collected by Mosaic	5/23/2011	1.236	5.25	4.36	2.27	5.93	0	15.87	5.2	53890	28057	73295	0	196153	64272	415667
Laguna Grande	collected by Mosaic	5/30/2011	1.248	5.14	4.27	2.45	5.69	0	15.87	5.32	53290	30576	71011	0	198058	66394	419328
Laguna Grande	collected by Mosaic	6/27/2011	1.24	5.92	4.91	2.33	5.38	0.01	16.27	4.44	60884	28892	66712	124	201748	55056	413416
Laguna Grande	collected by Mosaic	7/11/2011	1.236	4.92	4.09	2.44	5.63	0	16.4	4.2	50552	30158	69587	0	202704	51912	404914
Laguna Grande	collected by Mosaic	7/18/2011	1.248	5.09	4.22	2.5	5.73	0	16.53	4.64	52666	31200	71510	0	206294	57907	419578
Laguna Grande	collected by Mosaic	7/25/2011	1.256	5.53	4.59	2.71	5.29	0	16.67	4.8	57650	34038	66442	0	209375	60288	427794

TABLE B-3

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Laguna Grande (continued)																	
Laguna Grande	collected by Mosaic	7/25/2011	1.144	3.1	2.57	1.59	3.99	0.01	11	2.88	29401	18190	45646	114	125840	32947	252138
Laguna Grande	collected by Mosaic	7/25/2011	1.232	5.25	4.36	1.75	6.06	0	15.67	3.68	53715	21560	74659	0	193054	45338	388326
Laguna Grande	collected by Mosaic	8/8/2011	1.256	5.67	4.71	2.8	5.07	0	16.53	5.04	59158	35168	63679	0	207617	63302	428924
Laguna Grande	collected by Mosaic	8/15/2011	1.232	4.59	3.81	2.09	6.46	0.02	16.8	3.68	46939	25749	79587	246	206976	45338	404835
Laguna Grande	collected by Mosaic	9/5/2011	1.236	4.81	3.99	2.08	6.06	0	16.13	3.92	49316	25709	74902	0	199367	48451	397745
Laguna Grande	collected by Mosaic	9/26/2011	1.22	5.61	4.66	1.24	7.22	0.02	17	2.68	56852	15128	88084	244	207400	32696	400404
Laguna Grande	collected by Mosaic	10/17/2011	1.24	5.2	4.32	2.36	5.08	0	15.47	4.28	53568	29264	62992	0	191828	53072	390724
Laguna Grande	collected by Mosaic	11/7/2011	1.232	4.81	3.99	2.44	5.47	0	15.87	4.48	49157	30061	67390	0	195518	55194	397320
Laguna Grande	collected by Mosaic	11/28/2011	1.22	4.53	3.76	2.38	5.38	0.01	15.47	4.32	45872	29036	65636	122	188734	52704	382104
Laguna Grande	collected by Mosaic	12/5/2011	1.144	3.1	2.57	1.59	3.99	0.01	11	2.88	29401	18190	45646	114	125840	32947	252138
Laguna Grande	collected by Mosaic	2/20/2012	1.216	4.42	3.67	1.2	7.46	0.02	16.13	2.96	44627	14592	90714	243	196141	35994	382310
Laguna Grande	collected by Mosaic	2/27/2012	1.168	2.32	1.93	0.45	8.32	0.05	14.33	2.12	22542	5256	97178	584	167374	24762	317696
Laguna Grande	collected by Mosaic	3/8/2012	1.216	5.17	4.29	1.41	6.82	0.01	16	3.4	52166	17146	82931	122	194560	41344	388269
Laguna Grande	collected by Mosaic	3/12/2012	1.22	4.81	3.99	1.47	7.08	0.01	16.13	3.64	48678	17934	86376	122	196786	44408	394304
Laguna Grande	collected by Mosaic	3/19/2012	1.224	5.61	4.66	1.55	6.77	0.01	16.33	3.84	57038	18972	82865	122	199879	47002	405878
Laguna Grande	collected by Mosaic	4/2/2012	1.228	5.97	4.96	1.76	6.6	0.01	16.8	4.08	60909	21613	81048	123	206304	50102	420099
Laguna Grande	collected by Mosaic	4/16/2012	1.228	5.25	4.36	2.11	5.94	0	16.07	4.32	53541	25911	72943	0	197340	53050	402784
Laguna Grande	collected by Mosaic	4/23/2012	1.228	2.99	2.48	2.19	7.07	0	16.27	4.44	30454	26893	86820	0	199796	54523	398486
Laguna Grande	collected by Mosaic	4/30/2012	1.2	5.59	4.64	0.59	7.89	0.04	16	2.84	55680	7080	94680	480	192000	34080	384000
Laguna Grande	collected by Mosaic	5/7/2012	1.232	5.25	4.36	1.75	6.06	0	15.67	3.68	53715	21560	74659	0	193054	45338	388326
Laguna Grande	collected by Mosaic	5/14/2012	1.208	4.29	3.56	1.24	7.1	0.02	15.93	2.52	43005	14979	85768	242	192434	30442	366870
Laguna Grande	collected by Mosaic	6/4/2012	1.232	6.3	5.23	1.43	6.75	0.01	16.87	3.32	64434	17618	83160	123	207838	40902	414075
Laguna Grande	collected by Mosaic	6/26/2012	1.236	5.94	4.93	1.83	6.36	0.03	16.6	4.08	60935	22619	78610	371	205176	50429	418139
Laguna Grande	collected by Mosaic	7/2/2012	1.234	6.14	5.1	1.67	6.54	0.02	16.67	3.92	62934	20608	80704	247	205708	48373	418573
Laguna Grande	collected by Mosaic	7/9/2012	1.232	5.39	4.48	1.58	7.04	0	16.93	3.52	55194	19466	86733	0	208578	43366	413336
Laguna Grande	collected by Mosaic	7/16/2012	1.216	4.59	3.81	1.11	7.63	0.03	16.8	2.24	46330	13498	92781	365	204288	27238	384499
Laguna Grande	collected by Mosaic	8/6/2012	1.236	6.36	5.28	1.85	6.06	0.01	16.67	3.88	65261	22866	74902	124	206041	47957	417150
Laguna Grande	collected by Mosaic	8/27/2012	1.124	1.19	0.99	0.43	6.7	0.04	11.4	1.48	11128	4833	75308	450	128136	16635	236490
Laguna Grande	collected by Mosaic	9/17/2012	1.212	3.65	3.03	1.04	8.29	0.02	16.67	2.56	36724	12605	100475	242	202040	31027	383113
Laguna Grande	collected by Mosaic	9/24/2012	1.24	4.98	4.13	2.95	4.79	0	16	5.04	51212	36580	59396	0	198400	62496	408084
Laguna Grande	collected by Mosaic	10/8/2012	1.196	1.66	1.38	0.55	9.46	0.04	16.13	1.76	16505	6578	113142	478	192915	21050	350667
Laguna Grande	collected by Mosaic	10/15/2012	1.18	1.69	1.4	0.54	8.29	0.05	14.67	1.28	16520	6372	97822	590	173106	15104	309514
Laguna Grande	collected by Mosaic	10/22/2012	1.204	2.82	2.34	0.81	9.76	0.05	17.87	2.24	28174	9752	117510	602	215155	26970	398163
Laguna Grande	collected by Mosaic	10/29/2012	1.2	2.82	2.34	0.82	8.61	0.05	16.13	2.24	28080	9840	103320	600	193560	26880	362280
Laguna Grande	collected by Mosaic	11/5/2012	1.196	2.88	2.39	0.86	8.62	0.03	16.2	2.4	28584	10286	103095	359	193752	28704	364780
Laguna Grande	collected by Mosaic	11/12/2012	1.208	3.37	2.8	0.98	8.28	0.04	16.2	2.64	33824	11838	100022	483	195696	31891	373755
Laguna Grande	collected by Mosaic	11/19/2012	1.208	3.32	2.75	0.99	8.18	0.04	16	2.72	33220	11959	98814	483	193280	32858	370614
Laguna Grande	collected by Mosaic	12/3/2012	1.208	3.48	2.89	1	8.13	0.02	16.13	2.64	34911	12080	98210	242	194850	31891	372185
Laguna Grande	Grande South	12/19/2012	1.192	3.79	3.14	1.2	7.69	0.02	16.07	2.88	37429	14304	91665	238	191554	34330	369520
Laguna Grande	Laguna Grande	12/24/2012	1.208	4.48	3.72	1.2	7.52	0.02	16.4	2.8	44938	14496	90842	242	198112	33824	382453
Laguna Grande	Laguna Grande	12/31/2012	1.204	3.87	3.21	1.07	7.5	0.03	15.67	2.6	38648	12883	90300	361	188667	31304	362163
Laguna Grande	Laguna Grande S	1/7/2013	1.192	5.47	4.54	1.03	7.01	0.02	16.07	2.52	54117	12278	83559	238	191554	30038	371785
Laguna Grande	Laguna Grande	1/14/2013	1.204	3.1	2.57	0.85	8.42	0.2	16	2.44	30943	10234	101377	2408	192640	29378	366979
Laguna Grande	Laguna Grande	1/21/2013	1.196	3.04	2.52	0.89	8.34	0.02	16.07	2.28	30139	10644	99746	239	192197	27269	360235
Laguna Grande	Laguna Grande	1/31/2013	1.196	3.46	2.87	0.89	8.29	0.09	16.2	2.4	34325	10644	99148	1076	193752	28704	367650

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K2O	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Laguna Grande (continued)																	
Laguna Grande	Laguna Grande	2/4/2013	1.196	3.29	2.73	0.44	7.28	0.04	14	1.32	32651	5262	87069	478	167440	15787	308688
Laguna Grande	Laguna Grande	2/11/2013	1.2	3.37	2.8	0.94	8.44	0.01	16.4	2.56	33600	11280	101280	120	196800	30720	373800
Laguna Grande	Laguna Grande	2/18/2013	1.212	3.43	2.85	0.95	8.19	0.02	16.07	2.6	34542	11514	99263	242	194768	31512	371842
Laguna Grande	Laguna Grande	2/26/2013	1.18	2.35	1.95	0.45	8.82	0.14	15.2	2	23010	5310	104076	1652	179360	23600	337008
Laguna Grande	Laguna Grande	3/5/2013	1.208	4.15	3.44	1.06	7.61	0.02	15.87	2.8	41555	12805	91929	242	191710	33824	372064
Laguna Grande	Laguna Grande	3/11/2013	1.208	4.65	3.86	1.28	8.41	0.02	17.73	3.36	46629	15462	101593	242	214178	40589	418693
Laguna Grande	Laguna Grande	3/18/2013	1.192	2.6	2.16	0.6	9.26	0.04	16	2.68	25747	7152	110379	477	190720	31946	366421
Laguna Grande	Laguna Grande	3/25/2013	1.212	4.7	3.9	1.27	7.56	0.01	16.47	3.32	47268	15392	91627	121	199616	40238	394264
Laguna Grande	Grande	4/1/2013	1.236	1.44	1.19	1.46	9.02	0.01	16.53	3.68	14708	18046	111487	124	204311	45485	394160
Laguna Grande	Laguno Grande	4/8/2013	1.236	2.88	2.39	0.64	9.03	0.04	15.87	2.84	29540	7910	111611	494	196153	35102	380812
Laguna Grande	Laguno Grande	4/15/2013	1.228	5.59	4.64	1.53	6.86	0	16.53	3.68	56979	18788	84241	0	202988	45190	408187
Laguna Grande	Laguno Grande 4/29	5/1/2013	1.24	5.59	4.64	1.82	6.47	0.01	16.53	4	57536	22568	80228	124	204972	49600	415028
Laguna Grande	laguno Granda 5-8-13	5/8/2013	1.244	5.09	4.22	1.86	6.48	0.01	16.33	3.96	52497	23138	80611	124	203145	49262	408778
Laguna Grande	laguno grande	5/13/2013	1.236	5.03	4.18	2.62	5.37	0	15.87	5.2	51665	32383	66373	0	196153	64272	410846
Laguna Grande	Laguno Grande	5/20/2013	1.252	5.25	4.36	2.67	5.22	0	15.93	5.2	54587	33428	65354	0	199444	65104	417918
Laguna Grande	Laguno Grande	5/27/2013	1.232	5.81	4.82	1.73	6.51	0.01	16.67	3.76	59382	21314	80203	123	205374	46323	412720
Laguna Grande	Laguno Grande	6/17/2013	1.24	5.53	4.59	2.47	5.46	0	16.4	4.56	56916	30628	67704	0	203360	56544	415152
Laguna Grande	Lag Gran 6-21-13	6/25/2013	1.176	1.33	1.1	0.35	9.84	0.06	16.2	1.36	12936	4116	115718	706	190512	15994	339982
Laguna Grande	laguno grande 7-1-13	7/1/2013	1.172	1.6	1.33	0.45	8.42	0.05	14.4	1.48	15588	5274	98682	586	168768	17346	306244
Laguna Grande	Laguno G. 7-8-13	7/8/2013	1.22	6.25	5.19	1.34	6.76	0.02	16.8	3	63318	16348	82472	244	204960	36600	403942
Laguna Grande	Laguno Gran 7-15-13	7/15/2013	1.22	4.4	3.65	1.28	7.21	0.02	15.07	4.2	44530	15616	87962	244	183854	51240	383446
Laguna Grande	Laguno Grande 7-29-13	7/30/2013	1.196	2.77	2.3	0.8	9.07	0.04	17	1.88	27508	9568	108477	478	203320	22485	371836
Laguna Grande	Laguna Grande 8-5-13	8/5/2013	1.204	3.79	3.14	1.2	7.98	0.04	16.87	2.44	37806	14448	96079	482	203115	29378	381307
Laguna Grande	Laguna Grande 8-19-13	8/19/2013	1.232	5.12	4.25	1.76	6.81	0.01	16.8	3.64	52360	21683	83899	123	206976	44845	409886
Laguna Grande	Laguno Grande 8-26-13	8/28/2013	1.208	2.85	2.36	0.82	8.8	0.03	16	2.84	28509	9906	106304	362	193280	34307	372668
Laguna Grande	Laguno Grande 9-2-13	9/4/2013	1.228	4.81	3.99	2.25	5.84	0.01	16	4.32	48997	27630	71715	123	196480	53050	397995
Laguna Grande	Laguna Grande 9-9-13	9/9/2013	1.236	4.59	3.81	2.72	5.41	0.01	16	5.04	47092	33619	66868	124	197760	62294	407756
Laguna Grande	Laguno Grande9-16-13	9/16/2013	1.244	4.81	3.99	2.56	5.59	0.01	16.4	4.48	49636	31846	69540	124	204016	55731	410893
Laguna Grande	Laguna Grande 9-34-13	9/24/2013	1.22	3.46	2.87	1.14	8	0.03	16.4	2.52	35014	13908	97600	366	200080	30744	377712
Laguna Grande	596158, 3578743	12/19/2013	1.22		0.78	0.27	5.35	0.21	9.53	0.8							205826
Laguna Grande	594884, 3577937	12/19/2013	1.22		1.88	0.39	9.76	0.03	16.67	1.72							369977
Laguna Grande	596670, 3576970	2/4/2014	1.22		3.01	1.02	7.52	0.05	15.73	2.24							359284
Laguna Grande	596249, 3577520	2/13/2014	1.22		2.94	1.09	8.11	0.03	16.8	2.2							378725
Laguna Grande	596167, 3578684	2/14/2014	1.22		1.22	0.39	6.66	0.1	11.67	1.4							260502
Laguna Grande	594891, 3577903	2/14/2014	1.22		2.78	0.85	8.33	0.03	16.2	2.32							370706
Laguna Grande	596683, 3577000	4/13/2014	1.22		2.4108	1.224	6.4515	0.0484	14.667	1.52							319813
Laguna Grande	596205, 3577478	4/13/2014	1.22		4.1558	1.5627	6.1206	0.0176	16.2	2.16							367142
Laguna Grande	596154, 3578693	4/13/2014	1.22		0.9873	0.3867	5.8729	0.11	10.8	0.64							228387
Laguna Grande	LG Dischare	10/21/2019															365000
Laguna Seis																	
Laguna Seis	597982, 3579272	12/19/2013			1.31	0.55	7.87	0.06	13.8	1.64							
Laguna Seis	596982, 3578741	12/19/2013			2.16	0.61	9.64	0.04	16.87	2.44							
Laguna Seis	598007, 3579264	2/13/2014			1.93	0.55	8.17	0.04	14.67	1.84							
Laguna Seis	597005, 3578826	2/13/2014			2.09	0.6	9.1	0.04	16.2	2.08							
Laguna Seis	597998, 3579245	4/13/2014			1.8139	0.7093	8.1815	0.0506	15	1.92							

TABLE B-3

MOSAIC SURFACE WATER HYDROCHEMISTRY SUMMARY

Lake	Location	Date Collected	Percentage								mg/L						mmol
			Specific Gravity	K20	K	Mg	Na	Ca	Cl	SO4	K	Mg	Na	Ca	Cl	SO4	Total Ions
Pond 4																	
Pond 4	#4	3/26/2012	1.216	5.31	4.41	1.51	6.85	0.01	16.67	3.12	53626	18362	83296	122	202707	37939	396051
Pond 4	LG-Pond 4	10/21/2019															387000
Pond 4	Pond 4	10/28/2019															374000
Pond 2																	
Pond 2	#2 lake	2/28/2011	1.224	4.09	3.4	2.38	5.85	0	16.13	3.92	41616	29131	71604	0	197431	47981	387763
Pond 2	#2	4/4/2011	1.232	4.53	3.76	2.35	5.76	0.01	16	4.28	46323	28952	70963	123	197120	52730	396211
Pond 2	#2	5/23/2011	1.236	4.98	4.13	2.31	6.13	0	16.27	4.96	51047	28552	75767	0	201097	61306	417768
Pond 2	#2	6/20/2011	1.264	3.82	3.17	4.79	2.63	0	16.4	6.08	40069	60546	33243	0	207296	76851	418005
Pond 2	#2	6/27/2011	1.248	5.75	4.77	2.29	5.57	0.08	16.4	4.32	59530	28579	69514	998	204672	53914	417206
Pond 2	#2	8/8/2011	1.252	5.75	4.77	2.67	5.14	0.01	16.8	4.4	59720	33428	64353	125	210336	55088	423051
Pond 2	lake # 2	3/8/2012	1.224	4.87	4.04	1.87	6.23	0.02	16.07	3.6	49450	22889	76255	245	196697	44064	389599
Pond 2	#2	3/26/2012	1.22	5.25	4.36	2.18	5.84	0	16.27	4.12	53192	26596	71248	0	198494	50264	399794
Pond 2	#2	4/16/2012	1.228	5.25	4.36	2.61	5.12	0	15.87	4.88	53541	32051	62874	0	194884	59926	403275
Pond 2	#2	5/7/2012	1.22	4.98	4.13	2.89	3.68	0	14.07	5.12	50386	35258	44896	0	171654	62464	364658
Pond 2	#2	7/9/2012	1.256	4.23	3.51	4.13	3.52	0	16.2	6.04	44086	51873	44211	0	203472	75862	419504
Pond 2	#2	7/23/2012	1.244	5.25	4.36	3	4.8	0	16.47	4.92	54238	37320	59712	0	204887	61205	417362
Pond 2	#2	8/13/2012	1.252	4.2	3.49	4.14	3.64	0.01	16.4	6.04	43695	51833	45573	125	205328	75621	422174
Pond 2	#2	11/12/2012	1.212	4.48	3.72	1.76	6.75	0.01	16.33	3.48	45086	21331	81810	121	197920	42178	388446
Pond 2B																	
Pond 2B	#2B	4/4/2011	1.248	3.59	2.98	4.04	3.64	0	16.2	5.28	37190	50419	45427	0	202176	65894	401107
Pond 2B	Below 2B	9/16/2014	0.9938												3130		6120
Pond 2B	Below 2B	9/21/2014	1.012														28300
Pond 2B	South of 2B	9/22/2014	1.025												26400		47700
Pond 2B	South 2B	9/23/2014	1.017												22000		39500
Pond 2B	Below 2B	9/24/2014	1.020												25200	1780	46400
SWLGCD																	
SWLGCD	SWLG Cont. Dike	9/21/2014	1.003												8800		17000
SWLGCD	SWLG Cont. Dike	9/22/2014	1.004												8100		18300
SWLGCD	SWLG CD	9/24/2014	1.004												11200	3500	22000
Pond 3																	
Pond 3	Lake 3	10/4/2010	1.232	5.53	4.59	2.03	5.96	0.09	16.13	4.24	56549	25010	73427	1109	198722	52237	407053
	stewart	7/11/2011	1.204	3.32	2.75	0.72	8.99	0.03	15.8	3.6	33110	8669	108240	361	190232	43344	383956
	stewart	7/18/2011	1.265	2.21	1.84	0.57	8.67	0.11	15.07	2.2	23276	7211	109676	1392	190636	27830	360019
Tailings Ponds																	
Tailings Ponds	dike breach	8/17/2008	1.159	1.11	0.92	0.33	9.61	0.06	15.7	1.25	10663	3825	111380	695	181963	14488	323013
Tailings Ponds	new dam	8/18/2008	1.204	2.13	1.77	0.37	9.53	0.04	15.93	1.96	21311	4455	114741	482	191797	23598	356384
Tailings Ponds	dam breech	9/9/2008	1.116	2.77	2.3	1.78	2.94	0.06	9.8	2.72	25668	19865	32810	670	109368	30355	218736
Tailings Ponds	Tailings Pond	5/23/2011	1.22	2.43	2.02	0.72	9.28	0.03	15.47	3.76	24644	8784	113216	366	188734	45872	381616
Tailings Ponds	lake	2/21/2011	1.224	3.93	3.26	2.67	5.45	0.01	16	4.24	39902	32681	66708	122	195840	51898	387151

Notes:

calculated mg/L concentrations 2021

calculated mg/L concentrations from most recently measured SG reading

MOSAIC SPRING HYDROCHEMISTRY SUMMARYY

Spring	Location	Sample Name	Date Collected	Specific Gravity	Percentage								mg/L							mmol					
					K2O	K	Mg	Na	Ca	Cl	SO4	Total Ions	K	Mg	Na	Ca	Cl	SO4	Total Ions	K	Mg	Na	Ca	Cl	SO4
Salt Stack	base of salt stack	11	2013	1.212	1.94	1.61	0.42	8.20	0.10	13.67	2.48	26.47	19480	5098	99361	1187	165640	30058	320823						
Clay Settling Area East	N 3582654 E 601358.3 (northwest of tailings pond 1)	Sec. 19 S 6/21	6/21/2001	1.099	1.33	1.10	0.18	4.25	0.20	8.00	0.60	14.34	12089	1978	46708	2198	87920	6594	157487	309.18	81.41	2030.76	54.81	2480.11	68.69
Clay Settling Area East	N 3582841 E601252.3 (northwest of tailings pond 1)	Sec. 19 N 6/21	6/21/2001	1.093	0.89	0.73	0.21	4.14	0.15	7.33	0.80	13.37	7979	2295	45250	1640	80117	8744	146025	204.06	94.46	1967.40	40.89	2260.00	91.08
Laguna Uno		Uno 7/1/2013	7/1/2013	1.172	3.32	2.75	0.70	8.42	0.03	15.73	3.08	31.03	32230	8204	98682	352	184356	36098	363672						
Laguna Uno		Uno 7/8/2013	7/8/2013	1.172	4.26	3.53	0.87	6.76	0.02	16.13	3.60	32.61	41372	10196	79227	234	189044	42192	382189						
Laguna Uno		Uno 7/15/2013	7/15/2013	1.172	2.02	1.68	0.56	7.21	0.03	14.67	2.52	28.11	19690	6563	84501	352	171932	29534	329449						
Laguna Uno		Uno 7/30/2013	7/30/2013	1.172	1.80	1.49	0.53	9.07	0.04	15.47	2.60	30.70	17463	6212	106300	469	181308	30472	359804						
Laguna Uno		12	2013	1.172	1.94	1.61	0.47	8.49	0.05	14.27	2.32	27.19	18837	5454	99450	541	167205	27190	318678						
Lindsey Lake	N 3582208 E598388.3	Linsey Lake 6/21	6/21/2001	1.173	2.07	1.72	0.56	6.44	0.05	11.80	1.92	22.49	20176	6569	75541	587	138414	22522	263808	516.00	270.32	3284.40	14.63	3904.49	234.60
Lindsey Lake	Spring Lindsey	1	2013	1.18	1.71	1.42	0.65	8.60	0.03	14.67	2.48	27.85	16798	7654	101501	350	173067	29264	328634						
Lindsey Lake	Spring Lindsey	2	2013	1.172	1.66	1.38	0.50	8.21	0.04	13.87	2.12	26.12	16146	5805	96279	477	162517	24846	306071						
Lindsey Lake	Spring Lindsey	3	2013	1.168	1.41	1.17	0.65	7.81	0.06	13.47	2.20	25.35	13677	7553	91253	642	157291	25696	296112						
Lindsey Lake	Spring Lindsey	4	2013	1.152	1.66	1.38	0.44	7.92	0.05	13.20	2.20	25.18	15870	5046	91258	545	152064	25344	290127						
Lindsey Lake	Spring Lindsey	13	2013	1.156	1.99	1.65	0.43	7.60	0.05	12.93	2.20	24.867	19110	4948	87848	610	149509	25432	287457						
Tamarisk Flat	N. Tam Flat	14	2013	1.2	2.21	1.84	0.77	8.82	0.04	15.53	2.76	29.75	22042	9248	105783	449	186400	33120	357042						
Tamarisk Flat	Tamarisk at RR grade	15	2013	1.212	2.66	2.20	0.92	8.75	0.04	16.00	3.04	30.95	26715	11191	105999	467	193920	36845	375136						
Tamarisk Flat	Spring Tam E	8	2013	1.156	1.66	1.38	0.55	7.83	0.07	13.87	1.64	25.35	15925	6412	90558	865	160299	18958	293017						
Tamarisk Flat	Spring Tam W	10	2013	1.148	1.71	1.42	0.53	6.93	0.06	12.20	1.96	23.11	16342	6138	79550	732	140056	22501	265319						
Laguna Tres	Spring Tres	6	2013	1.124	1.11	0.92	0.39	5.83	0.11	10.13	1.40	18.79	10323	4421	65555	1236	113899	15736	211170						
Laguna Tres	Tres outlet	17	2013	1.2	2.32	1.93	0.67	8.97	0.04	15.80	2.44	29.85	23144	8032	107641	475	189600	29280	358172						
Surprise Spring	Surprise Spring		2/1/1978										11812	5250	91875	425	178697	5500	334892						
Surprise Spring	N 3578654 E 596124.4	Surprise Spring 6/21	6/21/2001	1.139	1.94	1.61	0.34	5.44	0.12	10.33	0.96	18.8	18338	3873	61962	1367	117659	10934	214132	469.00	159.37	2693.98	34.08	3319.00	113.90
Laguna Dos	Spring Dos	7	2013	1.084	0.61	0.51	0.49	4.51	0.28	7.87	1.04	13.93	5528	5261	48918	3005	85275	11274	150995						
Lagina Cuatro	Cuatro outlet	16	2013	1.196	1.80	1.49	0.52	9.69	0.04	16.20	2.28	30.22	17849	6267	115856	447	193752	27269	361441						
Laguna Grande North	Spring N. Grande	5	2013	1.076	0.53	0.44	0.25	4.27	0.29	7.40	1.12	13.77	4694	2726	45965	3077	79624	12051	148138						
Laguna Grande Inlet	Grande inlet	18	2013	1.202	2.88	2.39	0.85	9.58	0.03	17.40	2.80	33.05	28702	10169	115178	410	209148	33656	397263						
Laguna Grande East	N 32 deg 18.905 min, W103 deg 58.475 min	SP-ELG-3105	5/31/2000	1.165	1.71	1.42	0.61	6.40	0.15	12.64	0.76	21.98	16543	7107	74560	1748	147256	8854	256067	423.09	292.45	3241.74	43.58	4153.91	92.23
Laguna Grande East	N 32 deg 19.088min W 103 deg 58.308 min	SP-ELG-3105	5/31/2000	1.161	1.76	1.46	0.55	6.42	0.13	12.48	0.80	21.84	16951	6386	74536	1509	144893	9288	253562	433.52	262.78	3240.70	37.64	4087.24	96.75
Laguan Grande West	N 482541.9320 E 643962.133	PIT-2102	2/21/2001	1.0166	0.12	0.10	0.08	0.58	0.16	1.76	0.47	3.54	1017	813	5896	1627	17892	4778	32023	26.00	33.47	256.36	40.56	504.72	49.77
Spring	R29E,T23S,S10, SW, NE	SP-1202	2/12/2001	1.1025	0.36	0.30	0.37	4.54	0.16	8.07	0.76	14.2	3308	4079	50054	1764	88972	8379	156555	84.59	167.87	2176.24	43.99	2509.78	87.28
Spring	Spring isolated pond	9	2013	1.164	1.52	1.26	0.63	7.79	0.23	14.60	1.08	25.59	14699	7310	90714	2663	169944	12571	297901						
Mud Flat		Mud Flat	6/21/2001	1.8239	4.48	3.72	0.98	18.65	1.53	30.47	9.80	99.18	67849	17874	340157	27906	555742	178742	1188271	1735.27	735.56	14789.45	695.90	15676.79	1861.90
Mur Tails		Mur Tails	9/12/2001	1.244	4.18	3.47	0.66	8.28	0.01	15.43	3.28	31.12	43167	8210	103003	124	191949	40803	387257	1104.01	337.88	4478.40	3.10	5414.65	425.03
K-Mag Tails		K-Mag Tails	9/12/2001	1.226	3.59	2.18	0.43	9.08	0.02	15.33	2.53	29.59	26727	5272	111321	245	187946	31018	362528	683.55	216.95	4840.03	6.11	5301.72	323.10

Notes:
calculated mg/L concentrations 2021
calculated mg/L concentrations from most recently measured SG reading

MOSAIC STABLE ISOTOPES (DEUTERIUM AND OXYGEN) DATA

Borehole	Screen Interval [ft bgs]	Sample Name	Date Collected	Deuterium [‰]	Oxygen 18 [‰]
Monitoring Well Samples					
LG-1	29.0 to 39.0	LG1-2939-2205-010	5/22/2000	-39 -38	-4.2
	29.0 to 39.0	LG1-2939-0806-010	6/8/2000	-39	-4.1 -4.2
LG-2	22.7 to 32.0	LG2-042-0606-010	6/6/2000	-35	-3.8
LG-3	12.0 to 17.0	LG3-1217-2505-010	5/25/2000	-42	-3.0
LG-4	48.0 to 62.0	LG4-4862-0806-010	6/8/2000	-30	-0.4
LG-5	38.0 to 49.0	LG5-3849-2905-010	5/29/2000	-27	1.8
	38.0 to 49.0	LG5-3849-2905-010-B	5/29/2000	-29	1.7
LG-5A	36.0 to 40.0	LG5A-3640-0906-010	6/9/2000	-33 -31	1.7
LG-6	10 to 20	NS1A-1902-D/O	2/19/2001	-31	-1.5
LG-7A	18.5 to 27.5	NS2A-1702-D/O	2/17/2001	-36	-3.9
LG-7B	7.5 to 12.5	NS2B-1702-D/O	2/17/2001	-43	-4.9
LG-8A	65.0 to 75.0	NS3A-1002-D/O	2/10/2001	-32	0.2
LG-8B	30.6 to 35.6	NS3B-1102-D/O	2/11/2001	-31	-0.2
LG-8C	6.5 to 11.5	NS3C-1502-D/O	2/15/2001	-29	-0.5
LG-9A	10.0 to 30.0	NS4A-2302	2/23/2001	-39	-5.3
LG-11	31.0 to 51.0	LG11-0724-D/O	7/24/2001	-42	-6.4
LG-12	26.0 to 36.0	LG12-0715-D/O	7/15/2001	-23	-0.3, -0.4
LG-13	19.5 to 29.5	LG13-1603	3/16/2001	-32	1.5
LG-14	40.0 to 66.0	LG14-1203	3/12/2001	-41	0.5, 0.5
LG-16A	6.0 to 11.0	LG16A-2203	3/22/2001	-33	-1.2

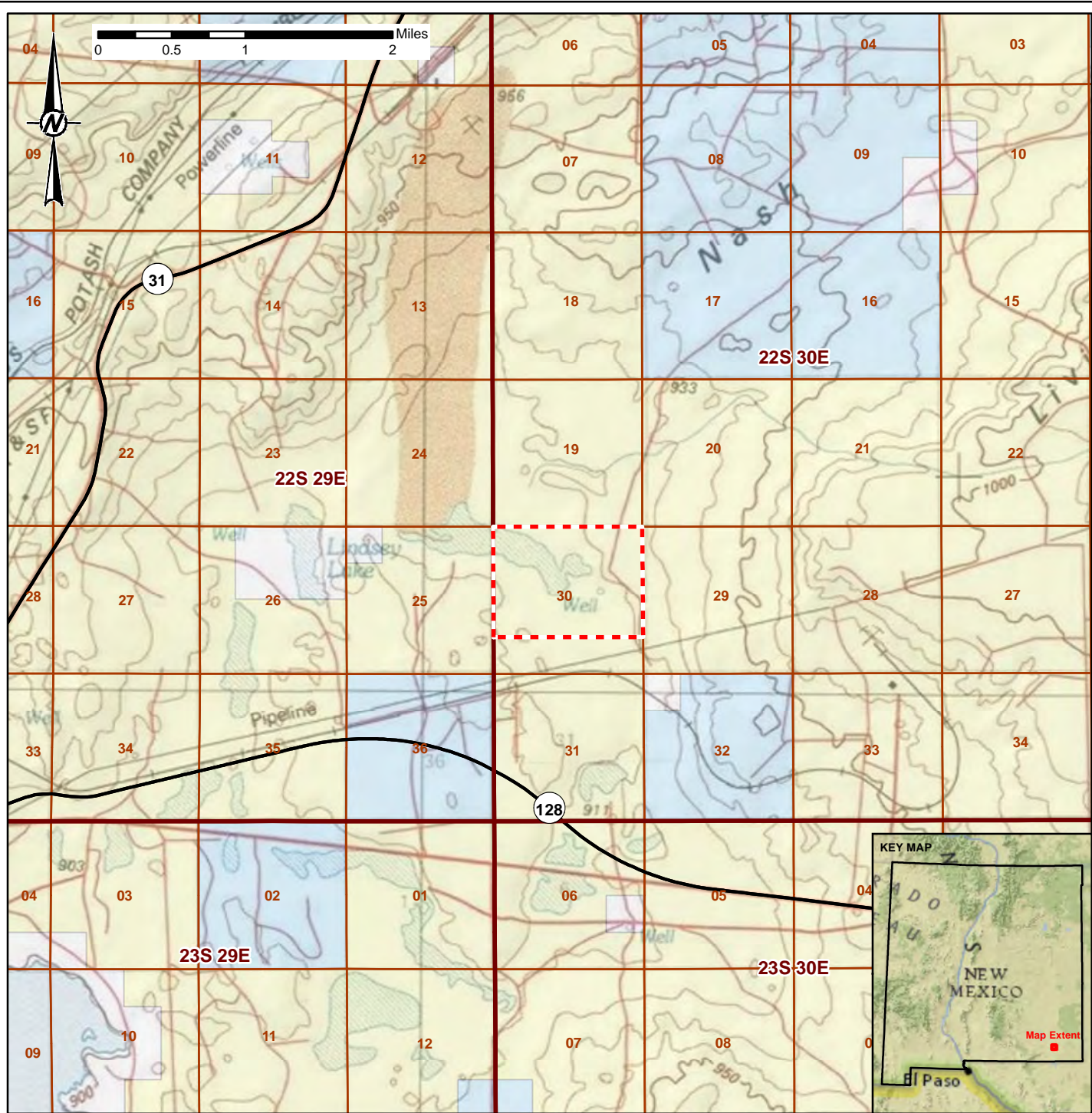
MOSAIC STABLE ISOTOPES (DEUTERIUM AND OXYGEN) DATA

Borehole	Screen Interval [ft bgs]	Sample Name	Date Collected	Deuterium [‰]	Oxygen 18 [‰]
Monitoring Well Samples (continued)					
LG-16B	25.0 to 35.0	LG16B-2403	3/24/2001	-23	3.1
LG-17	20.0 to 24.0	LG17-1903	3/19/2001	-43	1.4
LG-19	21.0 to 26.0	LG19-1903	3/19/2001	"-18, -18	1.9, 2.1
LG-20	0 to 4.0	LG20-1203	3/12/2001	-41	-1.5
LG-21	14.0 to 24.0	LG21-2603	3/26/2001	-30	1.4, 1.1
LG-22	36.11 to 56.11	LG22-3103	3/31/2001	-23	0.5
LG-23	47.5 to 75.0	LG23-0712	7/12/2001	-31, -31, -31	1.1, 1.2
LG-25	11.0 to 26.0	LG25-0807	8/7/2001	-36, -36	-4.3, -4.1
Spring Samples					
SPRING 1	N 32 deg 18.905 min, W103 deg 58.475 min	SP-EL6-3105-010-1	5/31/2000	-35	-1.2
SPRING 2	N 32 deg 19.088min W 103 deg 58.308 min	SP-EL6-3105-010-2	5/31/2000	-37	0.7
SPRING	R29E, T23S, S10, SW, NE	SP-1202-D/O	2/12/2001	-31	"-3.4 and -3.3"
Pit	N 482541.9320 E 643962.133	PIT-2102-D/O	2/21/2001	-41	-5.8
Lake Samples					
Salt Lake Near LG-7	Surface	LGNS2-2202-D/O	2/21/2001	-37	-2.3
Salt Lake Near LG-8	Surface	LGNS3-2302-D/O	2/23/2001	"-46 and -44"	-2.3
Salt Lake Near LG-9A	Surface	LGNS4A-2302-D/O	2/23/2001	"-38 and -37"	-2.2
Tailings Samples					
K-Mag Tails	Surface	K-Mag Tails	9/11/2001	-48, -50, -50	-5.9
MUR Tails	Surface	MUR TAILS	9/11/2001	-48, -49	-5.7, -5.6

MOSAIC TRITIUM SUMMARY

Borehole	Screen Interval [ft bgs]	Sample Name	Date Collected	Tritium [TU]
Monitoring Wells				
LG-5	38.0 to 49.0	LG5-3849-2905-010	5/29/2000	6.8
LG-5A	36.0 to 40.0	LG5A-3640-0906-010	6/9/2000	6.34
LG-6A	10.0 to 20.0	NS1A-1902-T	2/19/2001	7.2
LG-7A	18.5 to 27.5	NS2A-1702-T	2/17/2001	4.45
LG-8A	65.0 to 75.0	NS3A-1002-T	2/10/2001	6.03
LG-9A	10.0 to 30.0	NS4A-23-02-T	2/23/2001	3.56
LG11	31.0 to 51.0	LG11-0724-T	7/25/2001	1.61
LG12	26.0 to 36.0	LG12-0715-T	7/25/2001	4.31
LG-14	40.0 to 66.0	LG14-1203-T	3/12/2001	10.9
LG-20	1 to 4	LG20-1203-T	3/12/2001	5.9
LG-23	47.5 to 75	LG23-0712-T	7/12/2001	6.75
Springs				
SPRING	R29E, T23S, S10, SW, NE	spring-1202-T	2/12/2001	4.86

FIGURES



LEGEND

- PROPOSED PROJECT AREA
- TOWNSHIP & RANGE
- SECTION
- ROADS

SURFACE OWNERSHIP

- BLM
- STATE
- PRIVATE

REFERENCES

1. ROADS: U.S. CENSUS BUREAU, GEOGRAPHY DIVISION, TIGER LINE SHAPEFILES, 2019.
2. SURFACE OWNERSHIP: U.S. DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT, NEW MEXICO STATEWIDE SPATIAL DATA, SURFACE OWNERSHIP LAYER.
3. PLSS: U.S. DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT, BLM NATIONAL PUBLIC LAND SURVEY SYSTEM - NATIONAL GEOSPATIAL DATA ASSET, 5/19/2020.
4. TOPOGRAPHIC BACKGROUND: ESRI BASEMAP SERVICES. USGS 1:24,000 TOPOGRAPHIC QUADRANGLES SHOWN: TOWER HILL SOUTH, LIVINGSTON RIDGE, REMUDA BASIN, & LOS MEDANOS.

CLIENT

MOSAIC POTASH CARLSBAD INC.

PROJECT

LAGUNA UNO EA

TITLE

SITE LOCATION MAP

CONSULTANT



PROJECT NO.

19132769

YYYY-MM-DD

2021-02-11

DESIGNED

RHG

PREPARED

RHG

REVIEWED

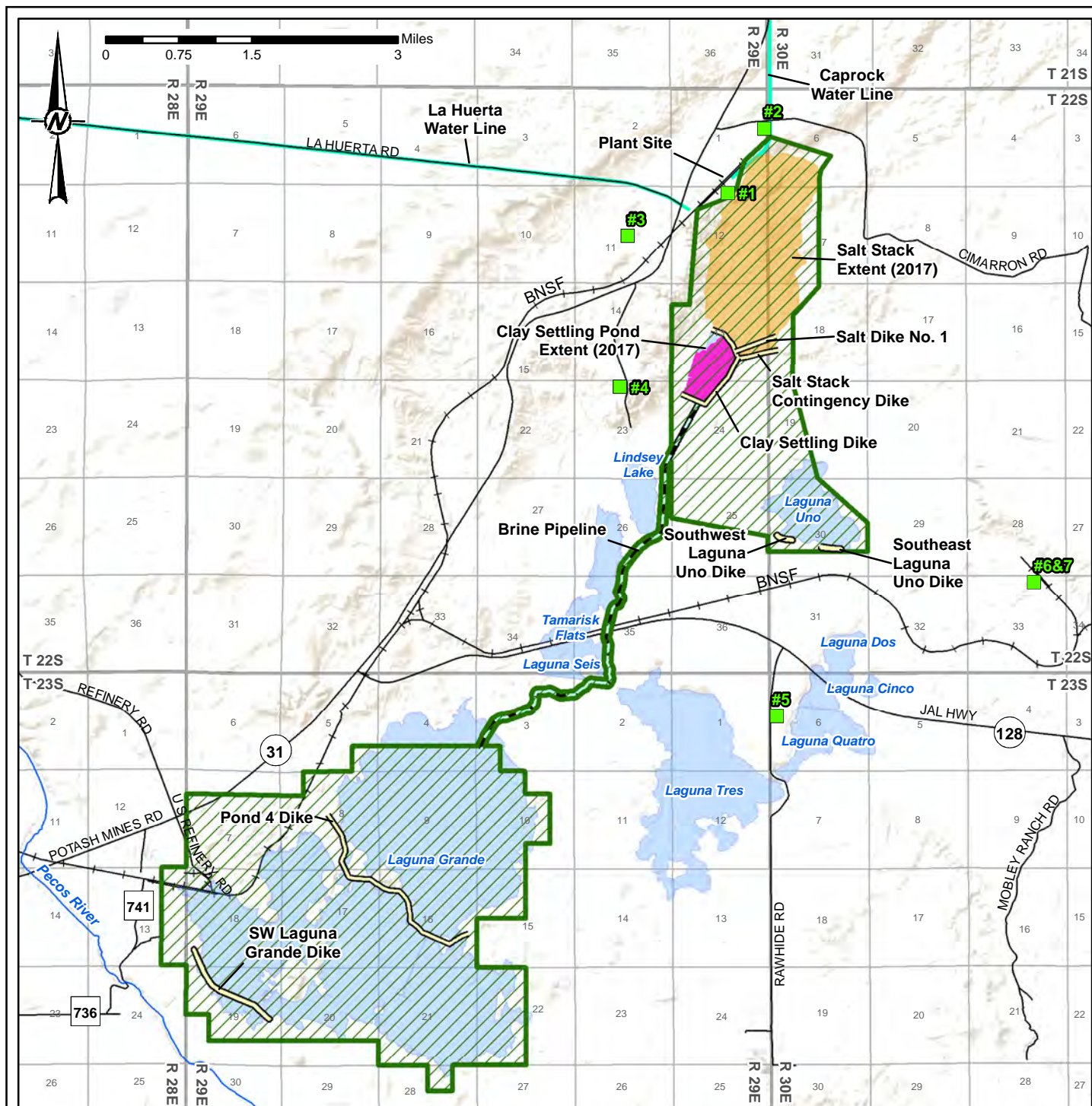
MWB

APPROVED

EC

FIGURE

1-1



LEGEND

- MINE SHAFT
- DIKE
- BRINE PIPELINE
- RAILROAD
- ROADWAY
- WATER LINE
- SALT STACK EXTENT (2017)
- CLAY SETTLING POND EXTENT (2017)
- TAILINGS MANAGEMENT AREA
- SECTION BOUNDARY
- TOWNSHIP/RANGE BOUNDARY

REFERENCES

1. BASEMAP: SOURCES: ESRI, USGS, NOAA

CLIENT

MOSAIC POTASH CARLSBAD INC.

PROJECT

LAGUNA UNO EA

TITLE

MINE FACILITIES

CONSULTANT



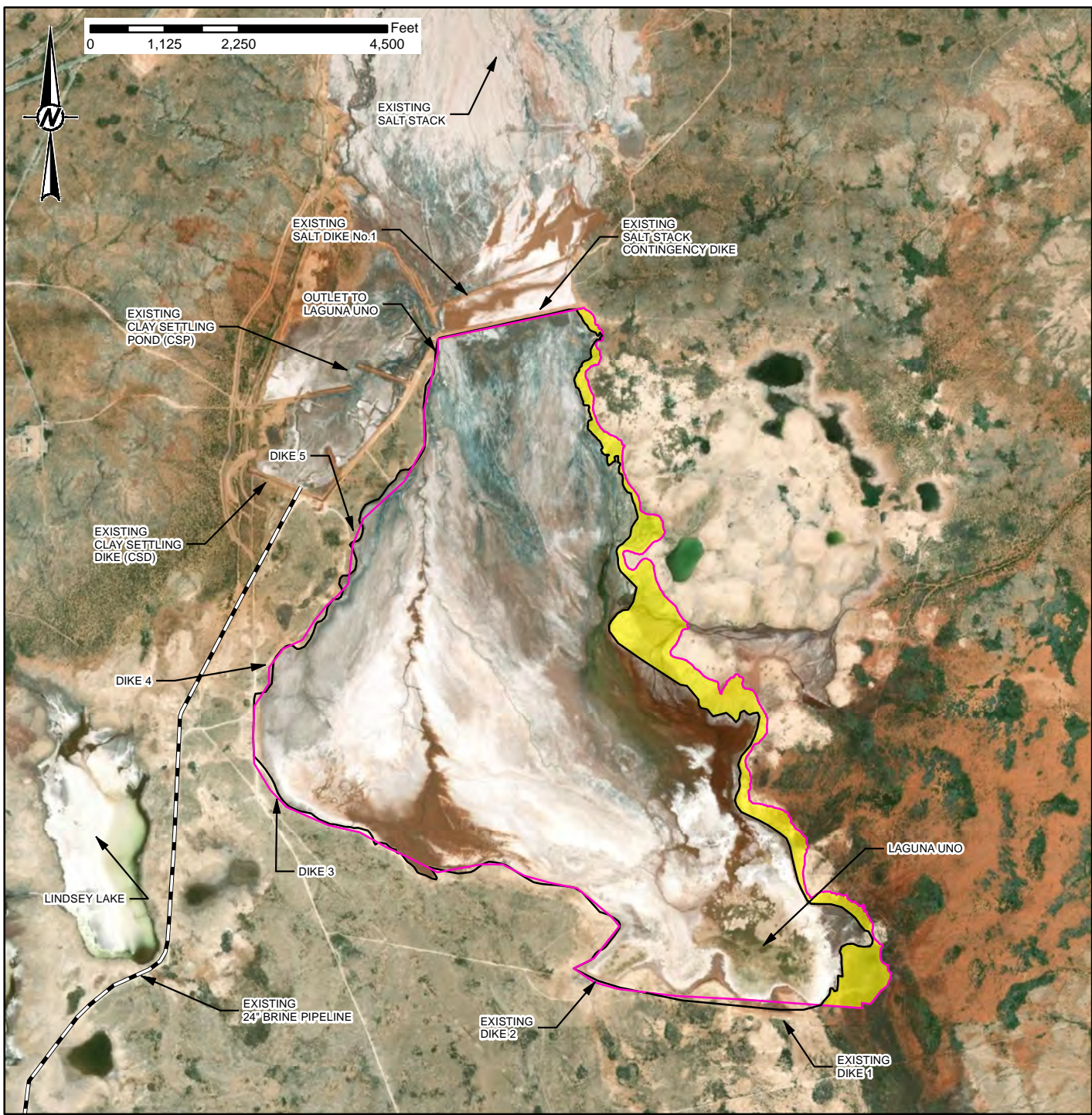
YYYY-MM-DD	2021-02-11
DESIGNED	KJC
PREPARED	KJC
REVIEWED	MWB
APPROVED	EC

PROJECT NO.

19132769

FIGURE

2-1



LEGEND

- 24" BRINE PIPELINE
- INUNDATION EXTENT 2019
- INUNDATION EXTENT 2065
- AREA OF CHANGE

REFERENCES

- COORDINATE SYSTEM: NAD83 STATE PLANE NEW MEXICO EAST, US FEET.
- AERIAL IMAGERY PROVIDED BY ESRI BASEMAP SERVICES. VIVID, MAXAR. IMAGERY FLOWN ON 5/8/2019.

CLIENT

MOSAIC POTASH CARLSBAD INC.

PROJECT

LAGUNA UNO EA

TITLE

LAGUNA UNO
SECONDARY CLAY SETTLING FACILITY

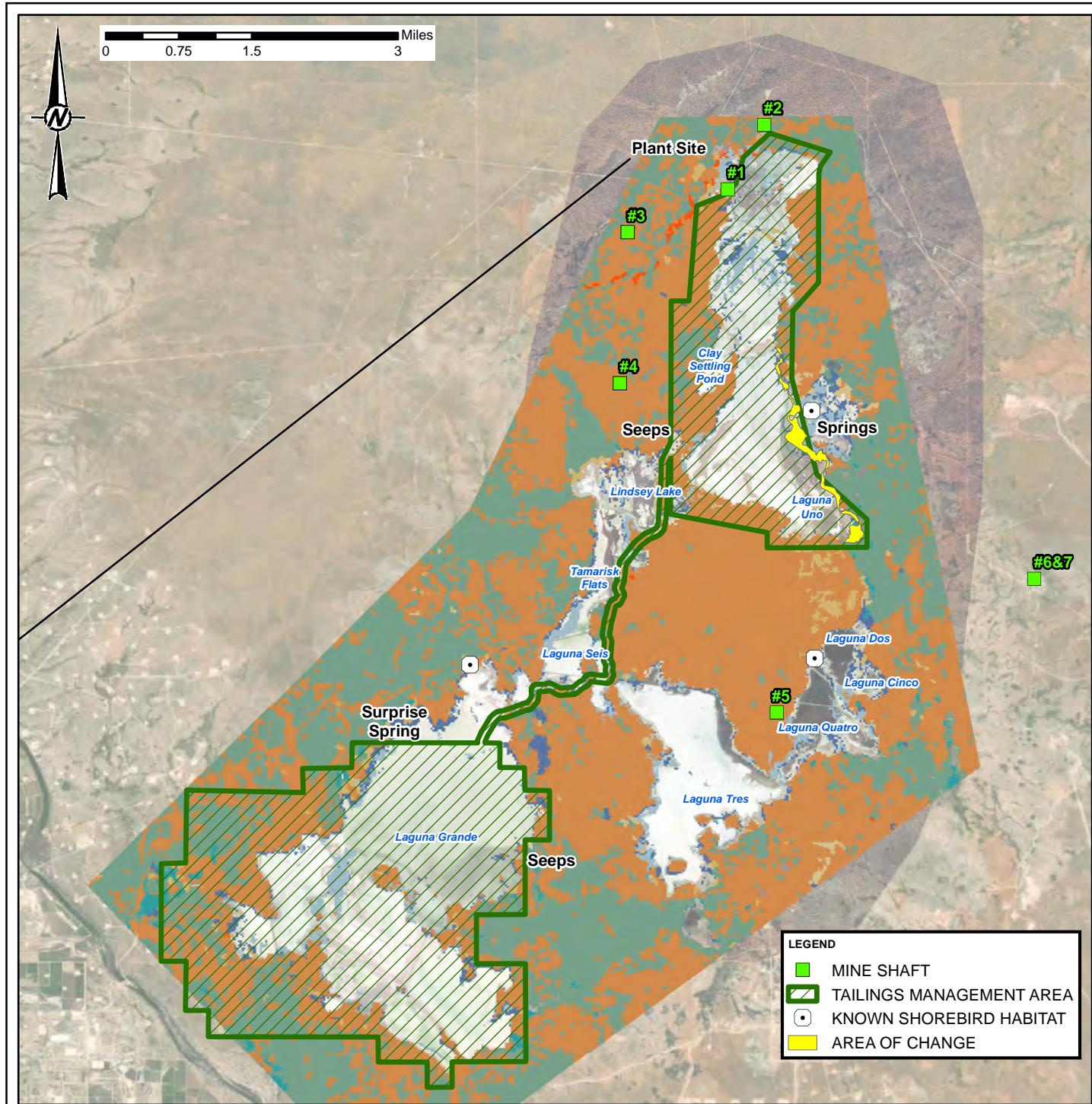
CONSULTANT



YYYY-MM-DD	2021-02-11
DESIGNED	RHG
PREPARED	RHG
REVIEWED	MWB
APPROVED	EC

PROJECT NO.
19132769

FIGURE
2-2



LEGEND	
■	MINE SHAFT
	TAILINGS MANAGEMENT AREA
	KNOWN SHOREBIRD HABITAT
	AREA OF CHANGE

LEGEND

ECOLOGICAL SYSTEM

- APACHERIAN-CHIHUAHUA MESQUITE UPLAND SCRUB
- APACHERIAN-CHIHUAHUA SEMI-DESERT GRASSLAND AND STEPPE
- CHIHUAHUA CREOSOTE BUSH, MIXED DESERT AND THORN SCRUB
- CHIHUAHUA MIXED SALT DESERT SCRUB
- NORTH AMERICAN WARM DESERT LOWER MONTANE RIPARIAN WOODLAND AND SHRUBLAND
- NORTH AMERICAN WARM DESERT RIPARIAN WOODLAND AND SHRUBLAND
- WESTERN GREAT PLAINS SALINE DEPRESSION WETLAND
- WESTERN GREAT PLAINS SHORTGRASS PRAIRIE

REFERENCES

1. AERIAL IMAGERY (SITE AREA NORTHEAST OF LAGUNA GRANDE): PHOTOSAT INFORMATION LTD, MARCH 2017.
2. AERIAL IMAGERY (ELSEWHERE): ESRI, DIGITAL GLOBE, VIVID USA. IMAGERY CAPTURED NOVEMBER 2016.
3. VEGETATION/LAND COVER DATASET: GAP VERSION 2.2, U.S. GEOLOGICAL SURVEY GAP ANALYSIS PROGRAM, 2011.

CLIENT

MOSAIC POTASH CARLSBAD INC.

PROJECT

LAGUNA UNO EA

TITLE

VEGETATION COMMUNITIES

CONSULTANT



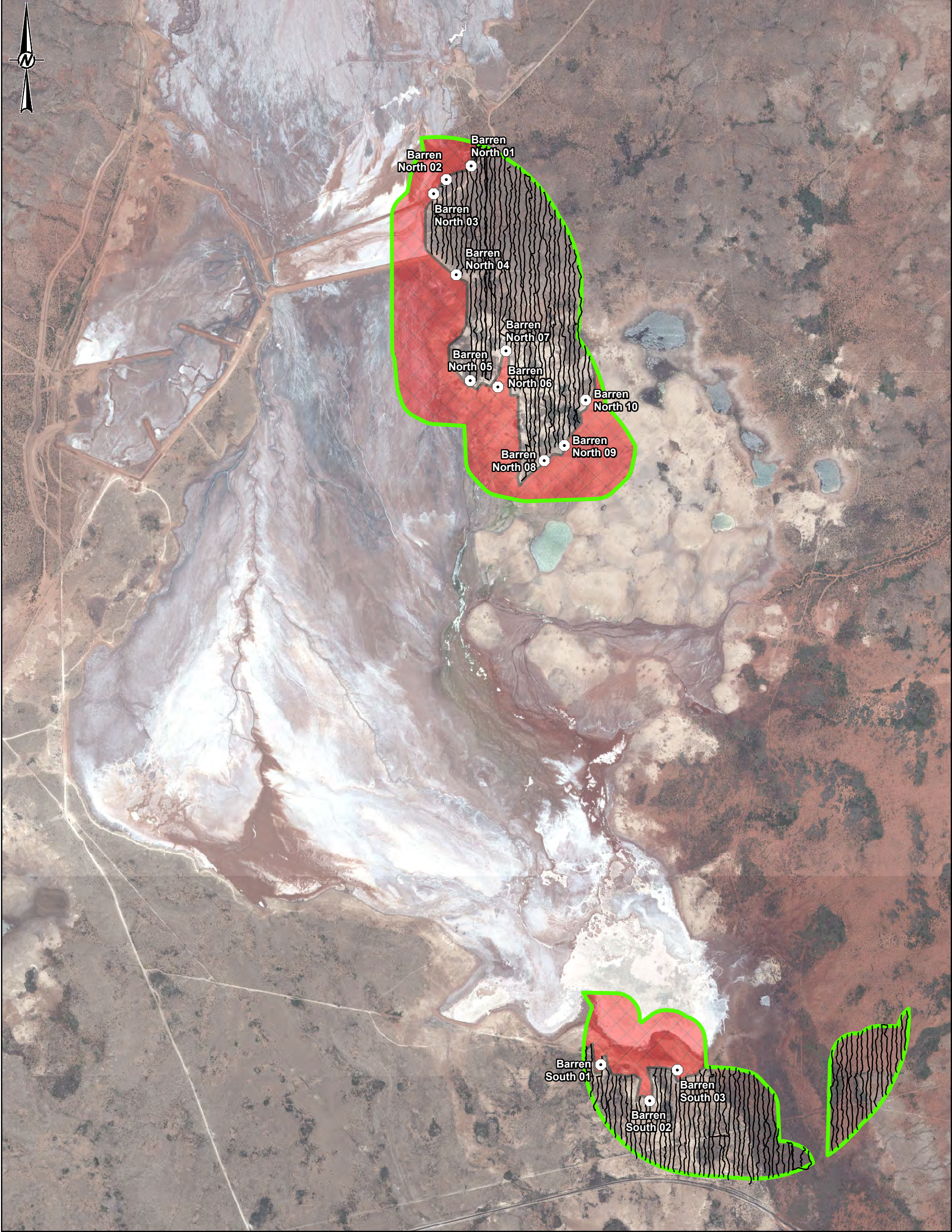
YYYY-MM-DD	2021-02-11
DESIGNED	KJC
PREPARED	KJC
REVIEWED	EMC
APPROVED	TS

PROJECT NO.

19132769

FIGURE

3-1



- LEGEND**
- UNSUITABLE HABITAT PHOTO LOCATIONS
 - SURVEY TRACKS
 - UNSUITABLE HABITAT
 - SSPS SURVEY AREA

- REFERENCES**
1. SURVEY CONDUCTED BY GOLDER ASSOCIATES, MAY 2020.
 2. AERIAL IMAGERY: PHOTOSAT, MAY 2019.
 3. SSPS SURVEY AREA BOUNDARIES PROVIDED BY THE BLM.

CLIENT
MOSAIC POTASH CARLSBAD INC.

PROJECT
LAGUNA UNO EA

TITLE
SCHEER'S PINCUSHION CACTUS SURVEY AREA

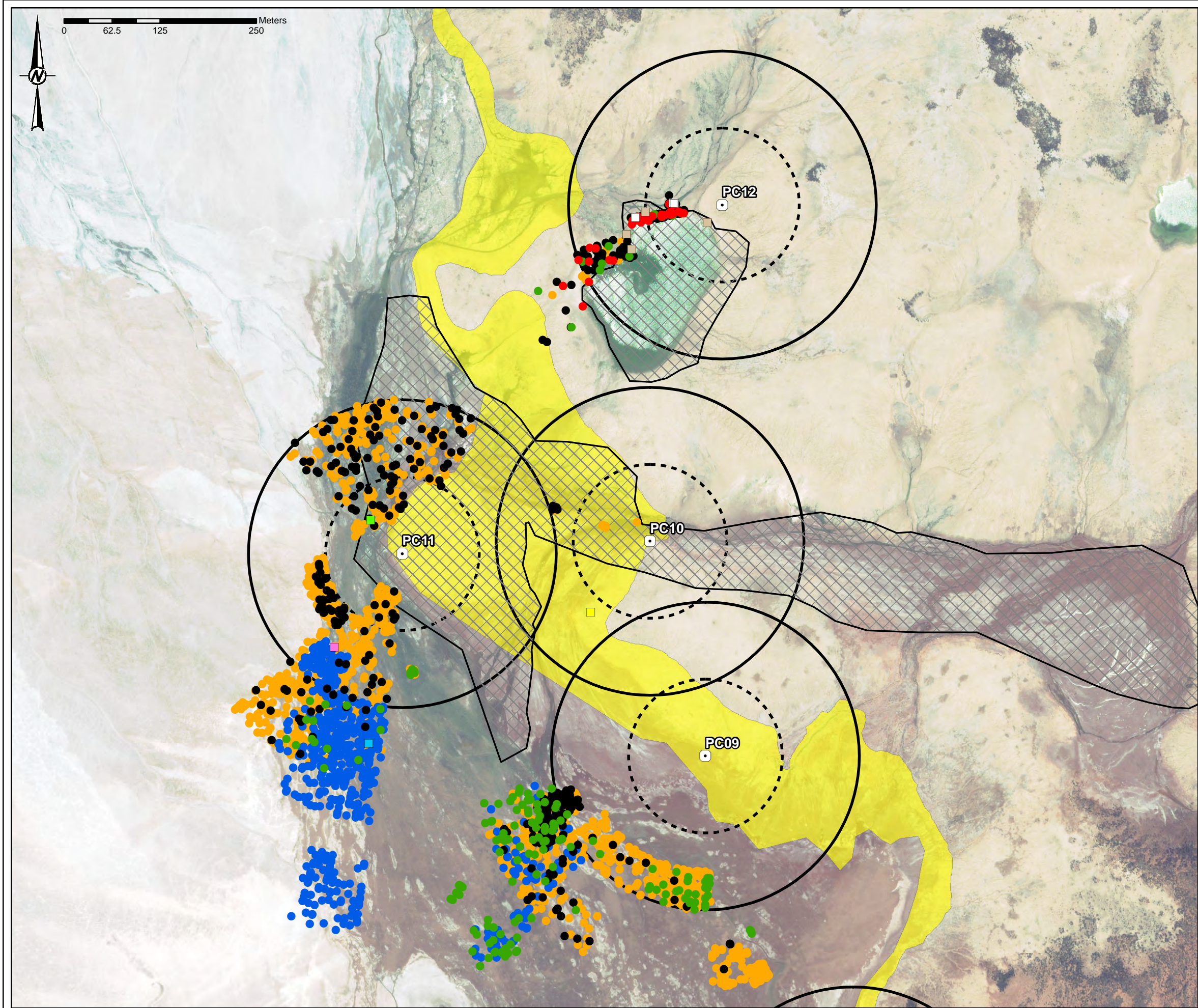
CONSULTANT	YYYY-MM-DD	2021-02-11
	DESIGNED	CD
	PREPARED	KJC
	REVIEWED	MWB
	APPROVED	MWB

PROJECT NO.
19132769

FIGURE
3-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

R:\TH\Map\Map_0202102_EA\Map\Map_0202102_EA\Figure3_11\17_MosaicBreakdownEA.mxd PRINTED ON: 2021-02-11 AT 2:11:28 PM



LEGEND

- SHOREBIRD SURVEY LOCATION
- 2004 HIGH QUALITY SHOREBIRD HABITAT
- 100m SURVEY RADIUS
- 200m SURVEY RADIUS
- AREA OF CHANGE

SHOREBIRD OBSERVATION BY SPECIES

- STILT SANDPIPER
- DUNLIN
- GREATER YELLOWLEGS
- PECTORAL SANDPIPER
- SEMIPALMATED SANDPIPER
- SANDERLING
- BAIRD'S SANDPIPER
- SNOWY PLOVER
- WESTERN SANDPIPER
- UNIDENTIFIED CALIDRIS SANDPIPER
- LEAST SANDPIPER

REFERENCES

- SHOREBIRD SURVEY CONDUCTED BY GOLDER ASSOCIATES, FALL 2018.
- AERIAL IMAGERY: PHOTOSAT INFORMATION LTD, MARCH 11, 2017.

CLIENT

MOSAIC POTASH CARLSBAD INC.

PROJECT

LAGUNA UNO EA

TITLE

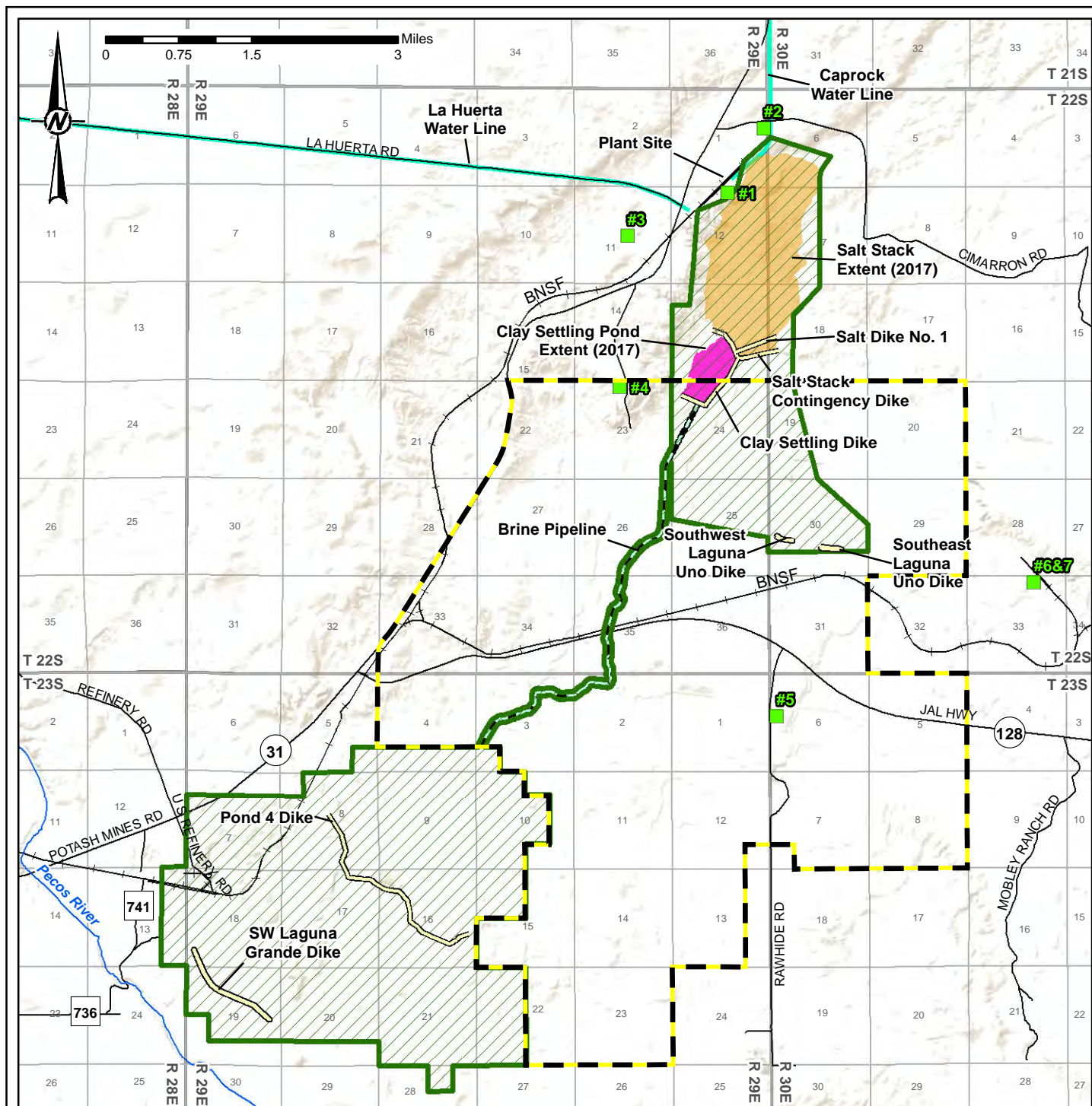
SHOREBIRD OBSERVATIONS AT LAGUNA UNO, FALL 2018

CONSULTANT	YYYY-MM-DD	2021-02-11
	DESIGNED	KJC
	PREPARED	RHG
	REVIEWED	MWB
	APPROVED	EC

PROJECT NO.
19132769

FIGURE
3-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- MINE SHAFT
- DIKE
- BRINE PIPELINE
- RAILROAD
- ROADWAY
- WATER LINE
- SALT STACK EXTENT (2017)
- CLAY SETTLING POND EXTENT (2017)
- TAILINGS MANAGEMENT AREA
- SECTION BOUNDARY
- TOWNSHIP/RANGE BOUNDARY
- ACEC - SALT PLAYA

REFERENCES

1. BASEMAP: SOURCES: ESRI, USGS, NOAA

CLIENT

MOSAIC POTASH CARLSBAD INC.

PROJECT

LAGUNA UNO EA

TITLE

**SALT PLAYA PROPOSED AREA OF
CRITICAL ENVIRONMENTAL CONCERN**

CONSULTANT



YYYY-MM-DD	2021-02-11
DESIGNED	KJC
PREPARED	KJC
REVIEWED	MWB
APPROVED	EC

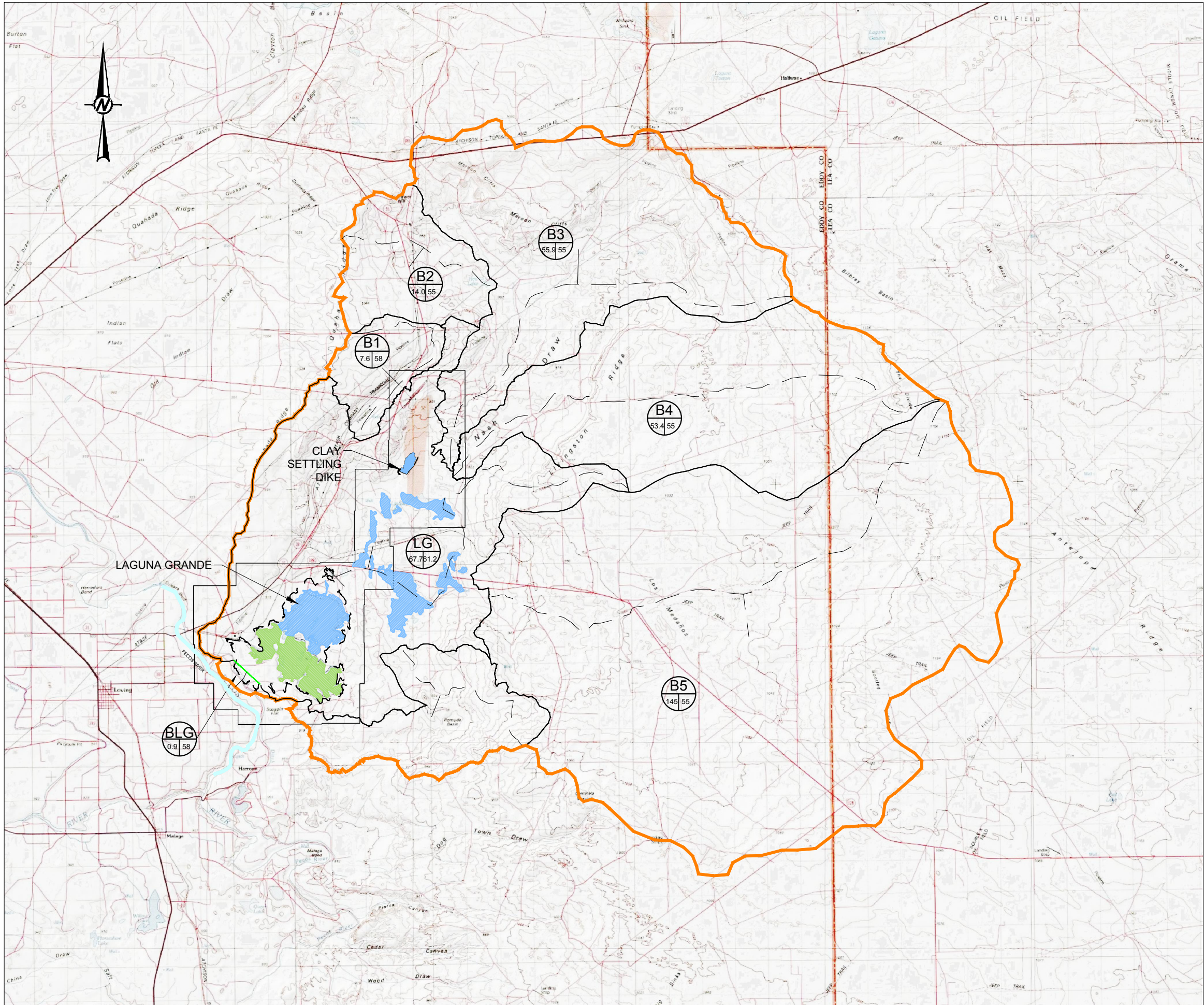
PROJECT NO.

19132769





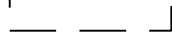




FIGURE

3-4

Path: U:\Denver\golder\gs\carlsbad\141407242\PRODUCTION\141407242\LAGUNA GRANDE FIGURES\1 File Name: 1407242D002.dwg



LEGEND

-  PLAYA LAKES WITHIN CLOSED BASINS WITHIN THE STUDY AREA
-  LAGUNA GRANDE SALT HARVESTING AREA
-  SUBCATCHMENT DELINEATION
-  WATERSHED DELINEATION
-  LIMIT OF LAGUNA GRANDE CLOSED BASIN
-  DRAINAGE FLOW PATH FOR LAG TIME
-  SUBBASIN IDENTIFIER
-  SOIL CONSERVATION SERVICE CURVE NUMBER
-  SUBCATCHMENT AREA, SQ. MILES

REFERENCES

- EXISTING GROUND TOPOGRAPHY PROVIDED BY USGS 1:100,000 MAPS ARTESIA NM, CARLSBAD NM, HOBBS NM, AND JAL NM.


0 1.5 3
SCALE FEET

CLIENT
MOSAIC POTASH CARLSBAD INC.
CARLSBAD, NEW MEXICO



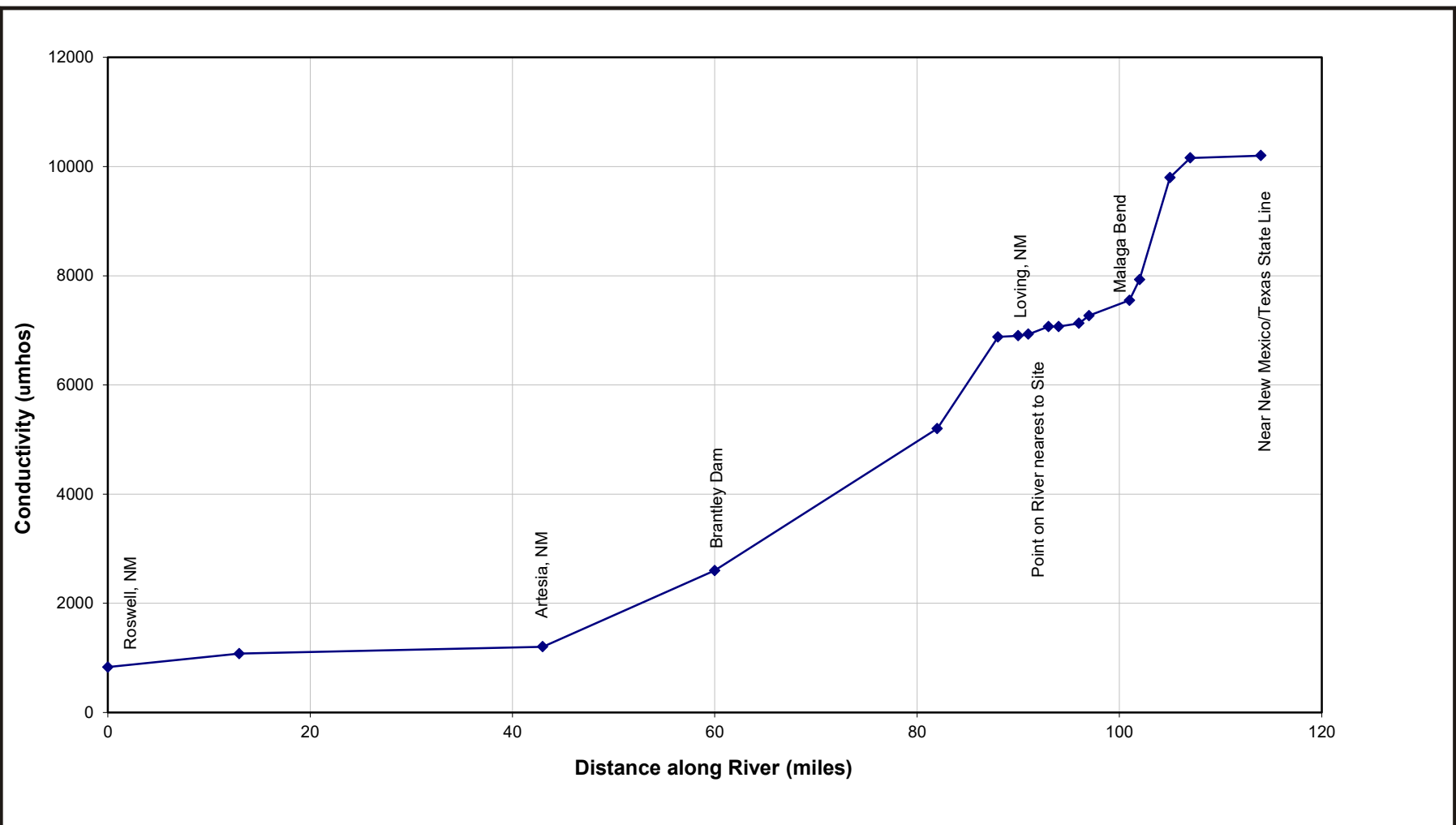
PROJECT
LAGUNA UNO EA

TITLE
NASH DRAW DELINEATION

	CONSULTANT	YYYY-MM-DD	2015-7-25
	PREPARED	JWR	
	DESIGN	SWR	
	REVIEW	SWR	
	APPROVED	JMJ	

PROJECT No. 1913769 CONTROL Rev. A FIGURE 3-5.1

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



GOLDER

Denver, Colorado

TITLE

Electrical Conductivity in the Pecos River (September 1998)

CLIENT/PROJECT

Mosaic Potash Carlsbad Inc.

DRAWN

DPH

DATE

Mar-02

JOB NO.

003-2214

CHECKED

LK

SCALE

NA

DWG. NO.

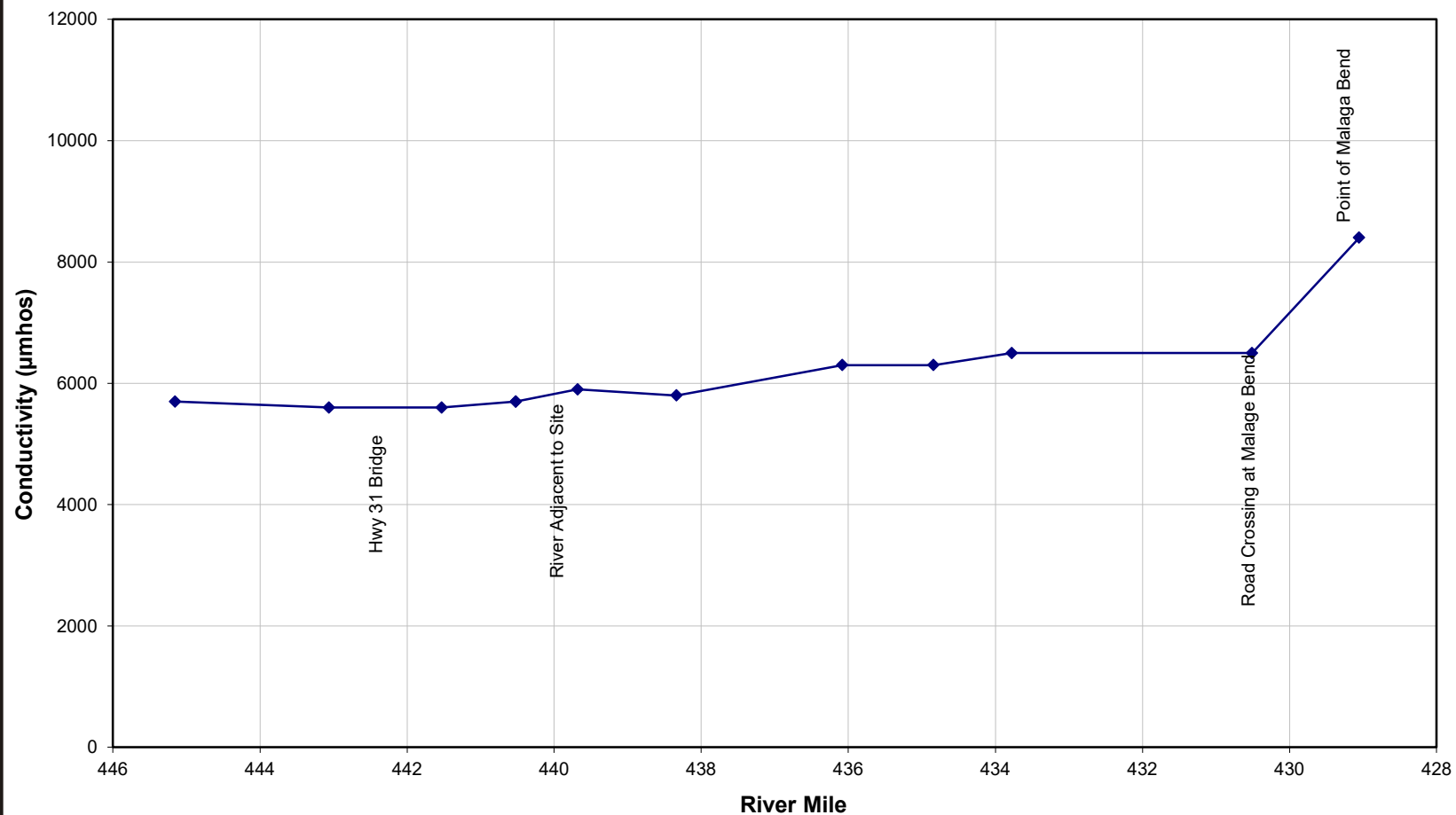
REVIEWED

TS

FILE NO.

FIGURE NO.

3.5-2



GOLDER

Denver, Colorado

TITLE

Electrical Conductivity in the Pecos River In the Vicinity of the Site (IMC 2001)

CLIENT/PROJECT

Mosaic Potash Carlsbad Inc.

DRAWN

DPH

DATE

JOB NO.

003-2214

CHECKED

LK

SCALE

NA

DWG. NO.

REVIEWED

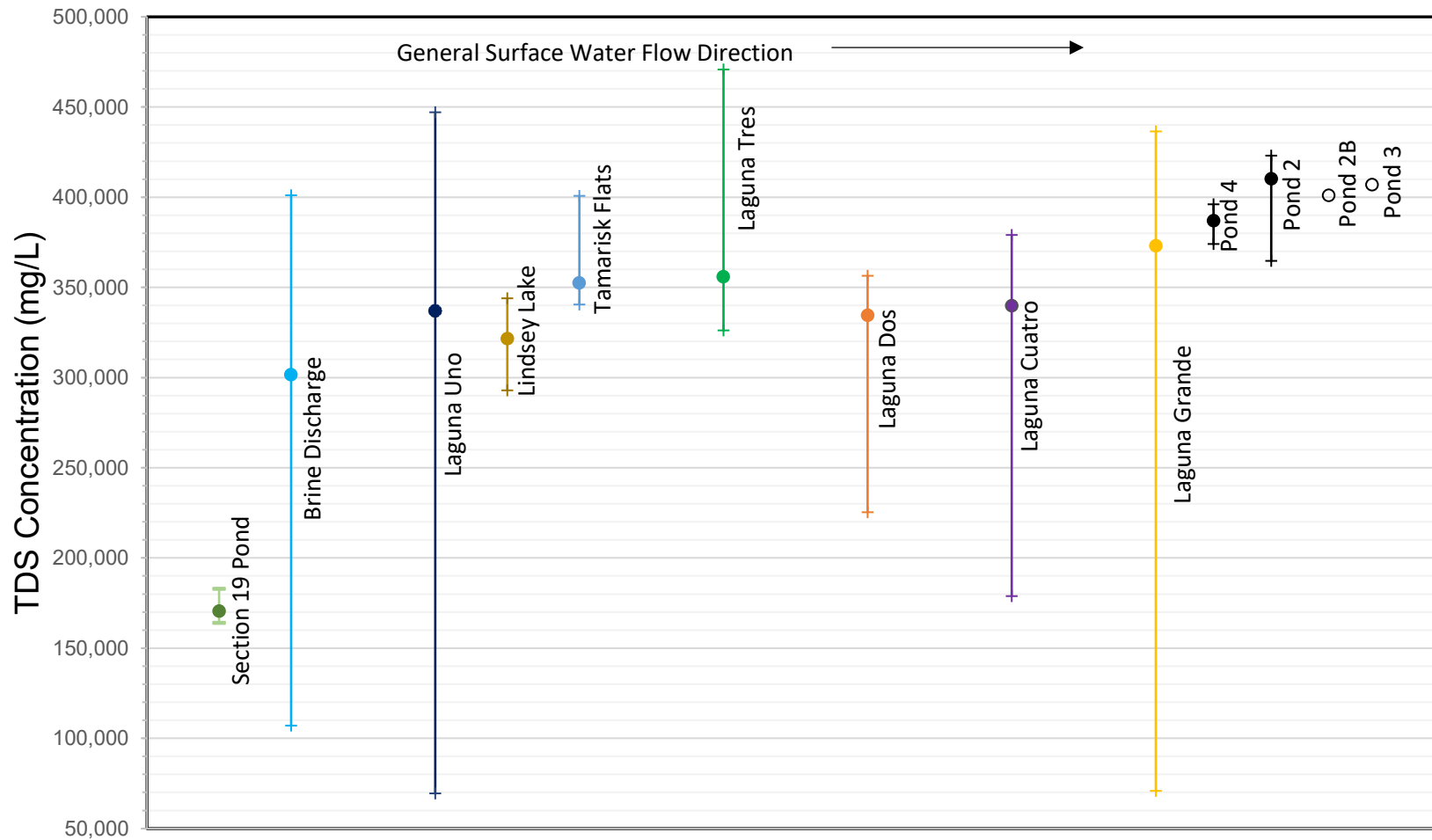
TS

FILE NO.

FIGURE NO.

3.5-3

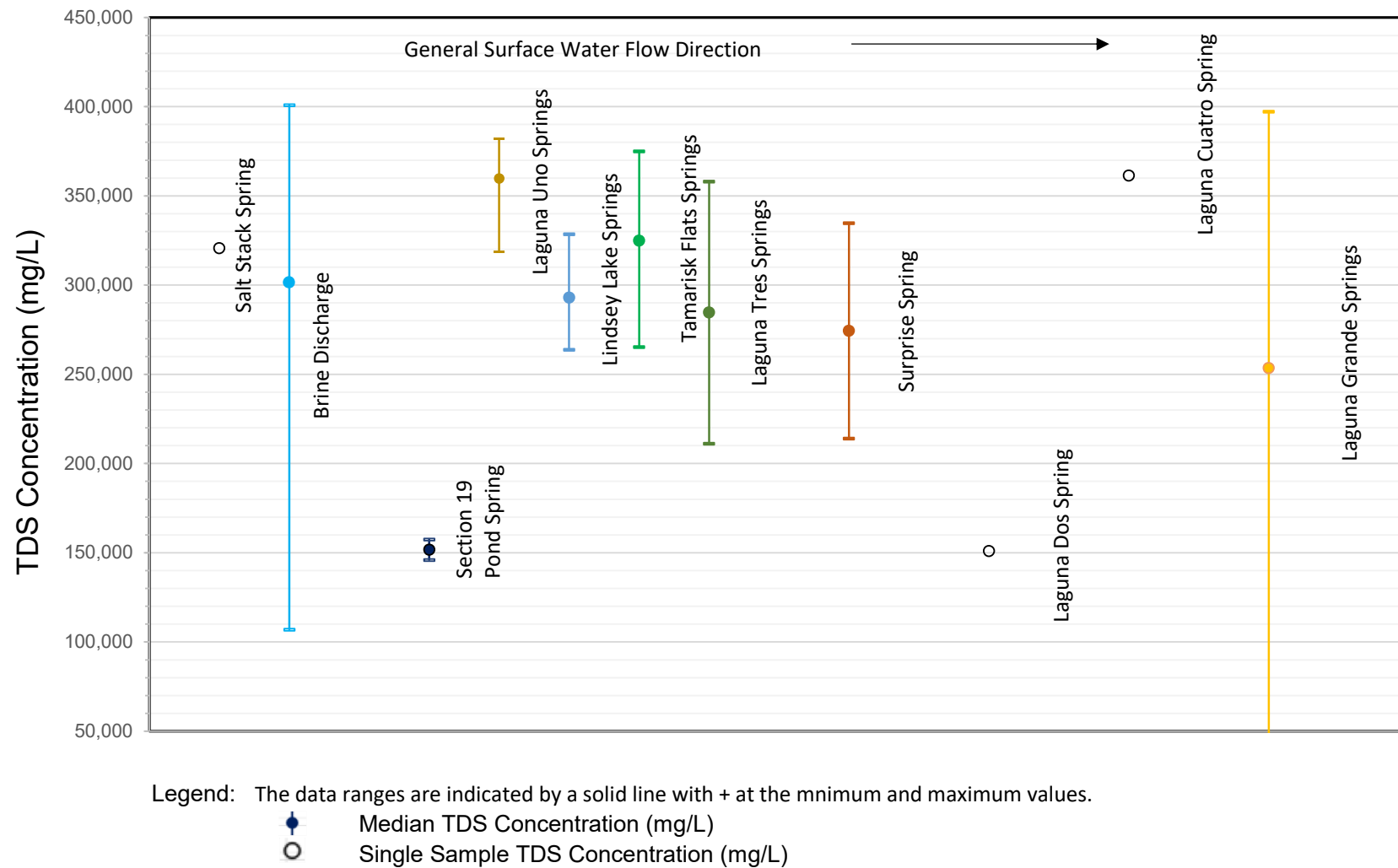
Figure 3.5-4:
TDS Concentrations in Surface Water



Legend: The data ranges are indicated by a solid line with + at the minimum and maximum values.

- Median TDS Concentration (mg/L)
- Single Sample TDS Concentration (mg/L)

Figure 3.5-5:
TDS Concentrations in Spring Discharge Water



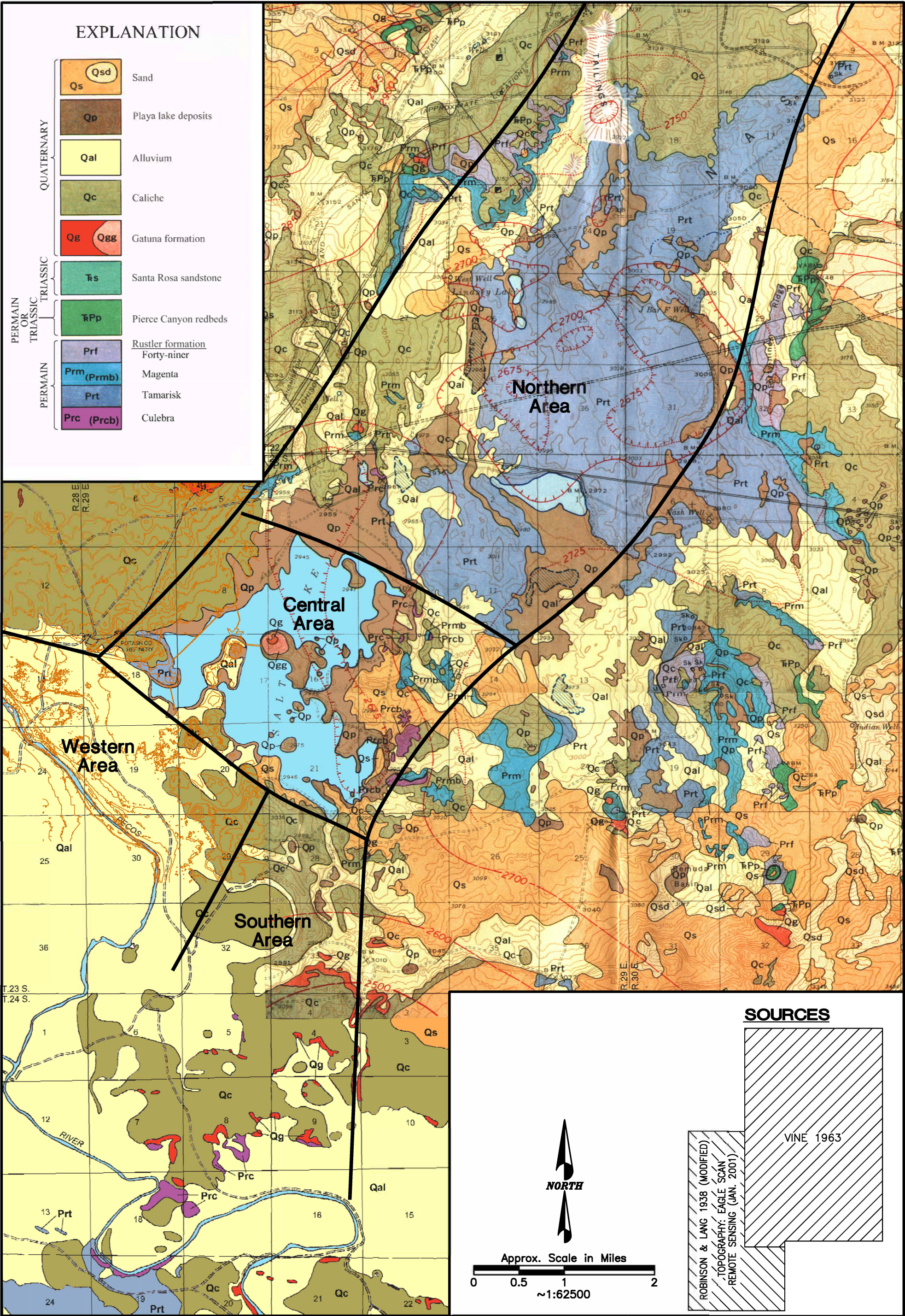



Figure 3.5-7: Rustler Formation Descriptions

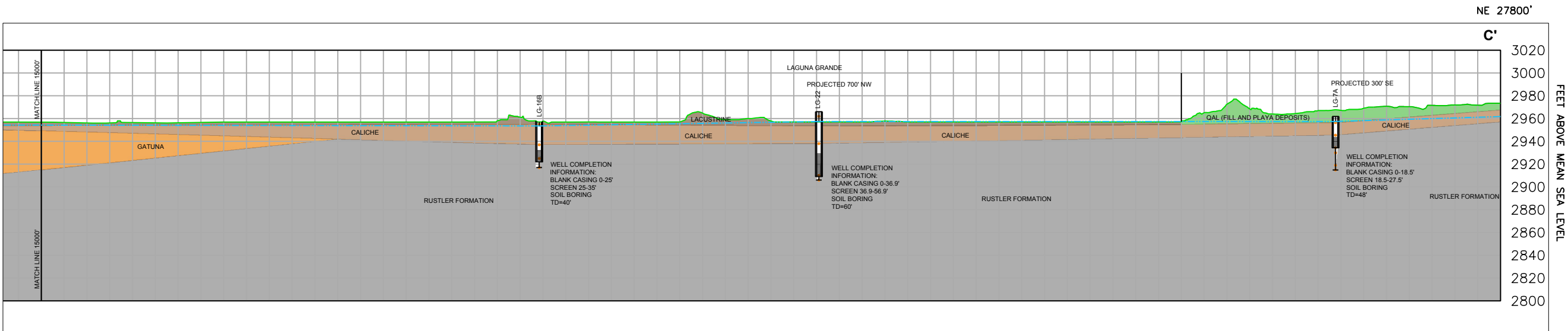
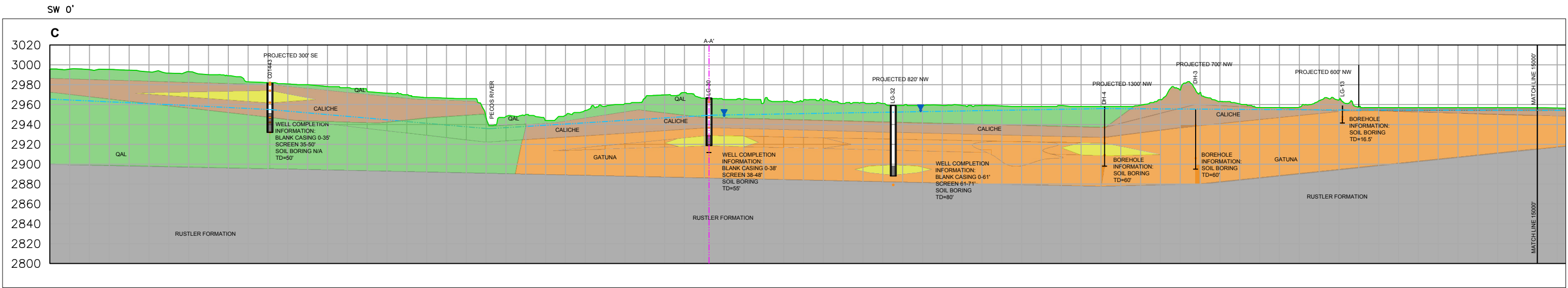
			Description ⁽¹⁾
Aeolian Sands		Quaternary-Recent	Aeolian sands are thickest along the Pecos River and form a low berm over the Gatuna between the river and Laguna Grande.
Playa Lake Deposits			Playa lake deposits are fine-grained sediments (sands, silts, and clays) with low permeability and are often intermixed with salt deposits.
Alluvium			Sand and silt, locally conglomeratic, deposited on slopes and in depressions on the east side of the Pecos River. On the west side of the Pecos River and west of Nash Draw, gravel, sand, and silt has been deposited by the Pecos River and its tributaries (a.k.a., Pecos Valley alluvial fill).
Caliche			Caliche is consistently found at the top of the Gatuna as a replacement of Gatuna sediments. Thickness varies in Nash Draw is typically between five and six feet. Caliche thickness may be significantly greater locally, particularly over relict sink hole deposits.
Conglomerate	Gatuna Formation	Quaternary-Pleistocene?	Cobbles, up to six inches, are matrix supported, well-rounded clasts of chert, quartzite and the underlying Permian units. Conglomerate appears to be concentrated near the top of the Gatuna, but not sufficiently continuous to be mapped aerially across the site.
Mixture of Sands, Silts, and Clays			Unconsolidated sands, silts and clays are present in several boreholes beneath the caliche and conglomerate units (where present).
Sandstone, Siltstone, and Claystone			Reddish-orange friable sandstone, siltstone, but locally includes gypsum, gray shale, and claystone.
Dewey Lake Red Beds	Dewey Lake Formation	Permian	The Dewey Lake Formation consists of thin-bedded, fine-grained, red sandstone, probably from a fluvial (river) source indicative of the end of basin deposition.
Forty-Niner Member	Rustler Formation		Massive gypsum or anhydrite with silt interbeds. In the Nash Draw area the Fortyniner is nearly everywhere removed by surface erosion or solution.
Magenta Dolomite			Consists of variegated greenish- to reddish-gray platy dolomite. Where present in the Nash Draw area, it is everywhere higher than the water table.
Tamarisk Gypsum			Underlies much of the floor of Nash Draw, but doesn't appear to be present in the area between Laguna Grande and the Pecos River.
Culebra Dolomite			Underlies the Gatuna Formation under much of Nash Draw adjacent to Laguna Grande. Fine-grained dolomite mud interbedded with primary breccia zones.
Los Medanos (Lower Rustler) Member			Silty sandstone overlain by interbedded silt and gypsum.

Notes:

(1) - Unit descriptions based in part from: (Vail, 2012) Geologic Relationships Between the Laguna Grande Evaporation Pond and the Pecos River, Eddy County, New Mexico and Potential for Groundwater Impacts. For Mosaic Potash Carlsbad Inc. January; (Vail, 2014) Geology and Hydrology of the Rustler Formation (Permian) in Nash Draw, Eddy County, NM. April; and (Vine, 1963) Surface Geology of the Nash Draw Quadrangle Eddy County New Mexico.

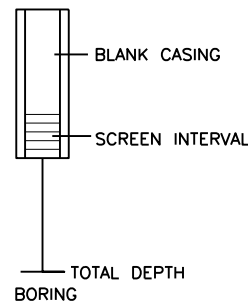
LEGEND		CLIENT	PROJECT	
●	MOSAIC MONITORING WELL/PIEZOMETER (EXISTING)	MOSAIC POTASH CARLSBAD INC.	LAGUNA UNO EA	
●	MOSAIC MONITORING WELL (PLUGGED AND ABANDONED)			
●	MONITORING/PUMPING WELL (OTHERS - EXISTING)			
●	MONITORING/PUMPING WELL (OTHERS - PLUGGED AND ABANDONED)			
●	MONITORING/PUMPING WELL (OTHERS - INACTIVE)			
●	MONITORING/PUMPING WELL (OTHERS - UNKNOWN STATUS)			
▲	SOIL BORING (MOSAIC)			
▲	SOIL BORING (OTHERS)			
—	NEW HYDROGEOLOGIC CROSS-SECTION ALIGNMENT			
CONSULTANT		YYYY-MM-DD	TITLE	
 GOLDER		2021-02-25	WELLS, PIEZOMETERS, AND SOIL BORINGS	
		DESIGNED		KJC
		PREPARED		KJC
		REVIEWED		TS
		APPROVED	MWB	
		PROJECT NO.	FIGURE	
		1913769	3.5-8	

C:\Plan Production Data Files\Albuquerque_CAD_Support\CAD\2013 Projects\130-1512 Mosaic Hydro\PRODUCTION\TEMPORARY (in Progress)\NEW Cross Sections_KRK.dwg | Layout: G-G' | Modified: 08/13/2019 1:37 PM | Plotted: 08/13/2019



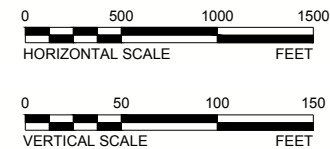
LEGEND





QAL	RECENT ALLUVIUM, AEOLIAN SANDS, LACUSTRINE SILTS AND CLAYS
LACUSTRINE	UNDIFFERENTIATED LACUSTRINE, LAKE BOTTOM SALT
CALICHE	CALICHE
GATUNA	UNCONSOLIDATED SILT AND CLAY WITH MINOR SAND (GATUNA FORMATION) ALSO INCLUDES LOCALIZED SANDSTONE, SILTSTONE AND MUDSTONE
CONGLOMERATE	CONGLOMERATE
RUSTLER FORMATION	LOWER RUSTLER FORMATION
TD	TOTAL DEPTH (FEET BGS)
BGS	BELOW GROUND SURFACE
MEASURED WATER LEVEL (APRIL 2019) AND PROJECTED POTENTIOMETRIC SURFACE	



NOTES

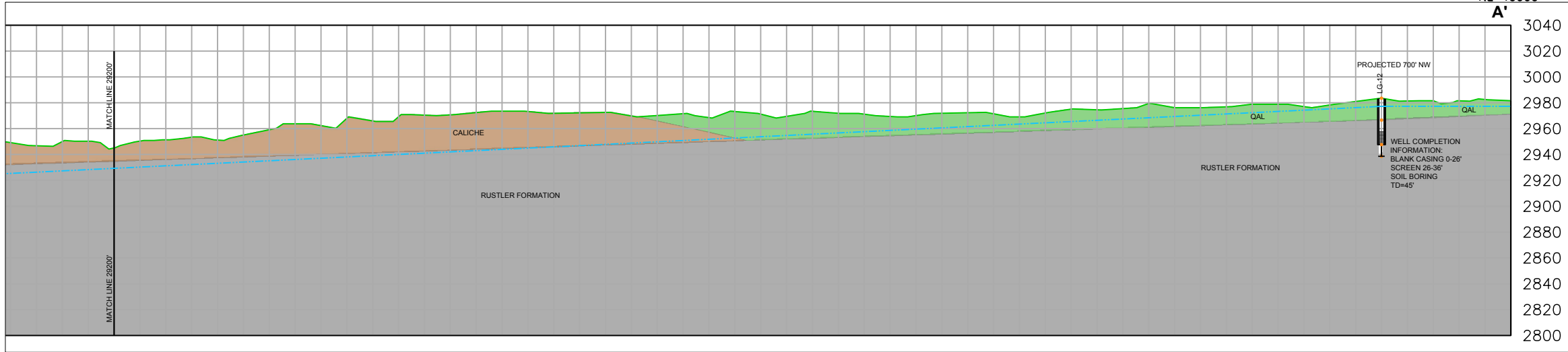
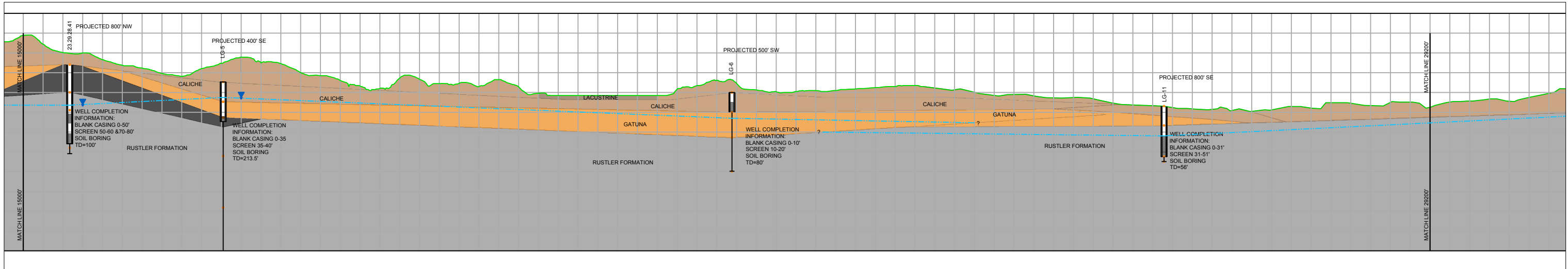
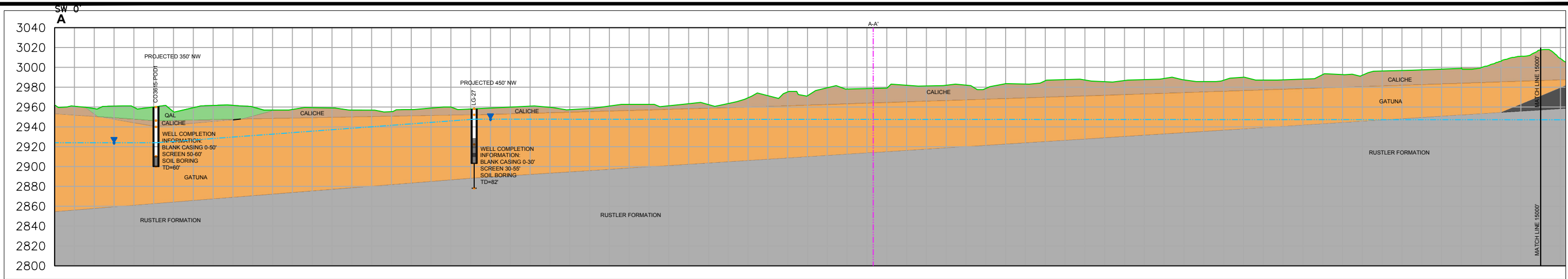
1. SURFACE TOPOGRAPHY BASED ON 2009 LIDAR SURVEY AND USGS TOPOGRAPHY OUTSIDE LIDAR SURVEY LIMITS



	8/16/19	FINAL	TS	SB	EC	TS
	8/12/19	CLIENT COMMENTS	TS	SB	EC	TS
	7/17/19	DRAFT FOR REVIEW	TS	SB	EC	TS
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
PROJECT			LAGUNA UNO EA			
TITLE						
HYDROGEOLOGIC CROSS SECTION C-C'						
		PROJECT No.		1913769	FILE No. NEW Cross Sections_KRK	
		DESIGN	TS	8/16/19	SCALE AS SHOWN	
		CADD	SB	8/16/19	DRAWING	
		CHECK	EC	8/16/19	FIGURE 3.5-11	
		REVIEW	TS	8/16/19		

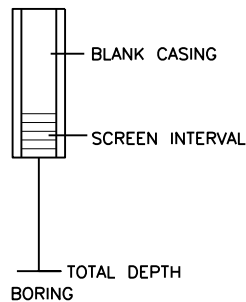


C:\Plan Production Data Files\Albuquerque_CAD_Support\CAD\2013 Projects\130-1512 Mosaic Hydro\PRODUCTION\TEMPORARY (in Progress)\NEW Cross Sections_KRK.dwg | Layout: H-H | Modified: 08/13/2019 1:37 PM | Plotted: 08/13/2019



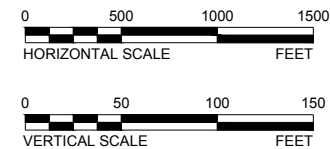
LEGEND

QAL	RECENT ALLUVIUM, AEOLIAN SANDS, LACUSTRINE SILTS AND CLAYS
LACUSTRINE	UNDIFFERENTIATED LACUSTRINE, LAKE BOTTOM/SALT
CALICHE	CALICHE
GATUNA	UNCONSOLIDATED SILT AND CLAY WITH MINOR SAND (GATUNA FORMATION) ALSO INCLUDES LOCALIZED SANDSTONE, SILTSTONE AND MUDSTONE
CONGLOMERATE	CONGLOMERATE
RUSTLER FORMATION	RUSTLER FORMATION- CULEBRA MEMBER
RUSTLER FORMATION	LOWER RUSTLER FORMATION
TD	TOTAL DEPTH (FEET BGS)
BGS	BELOW GROUND SURFACE
	MEASURED WATER LEVEL (APRIL 2019) AND PROJECTED POTENTIOMETRIC SURFACE






NOTES

1. SURFACE TOPOGRAPHY BASED ON 2009 LIDAR SURVEY AND USGS TOPOGRAPHY OUTSIDE LIDAR SURVEY LIMITS




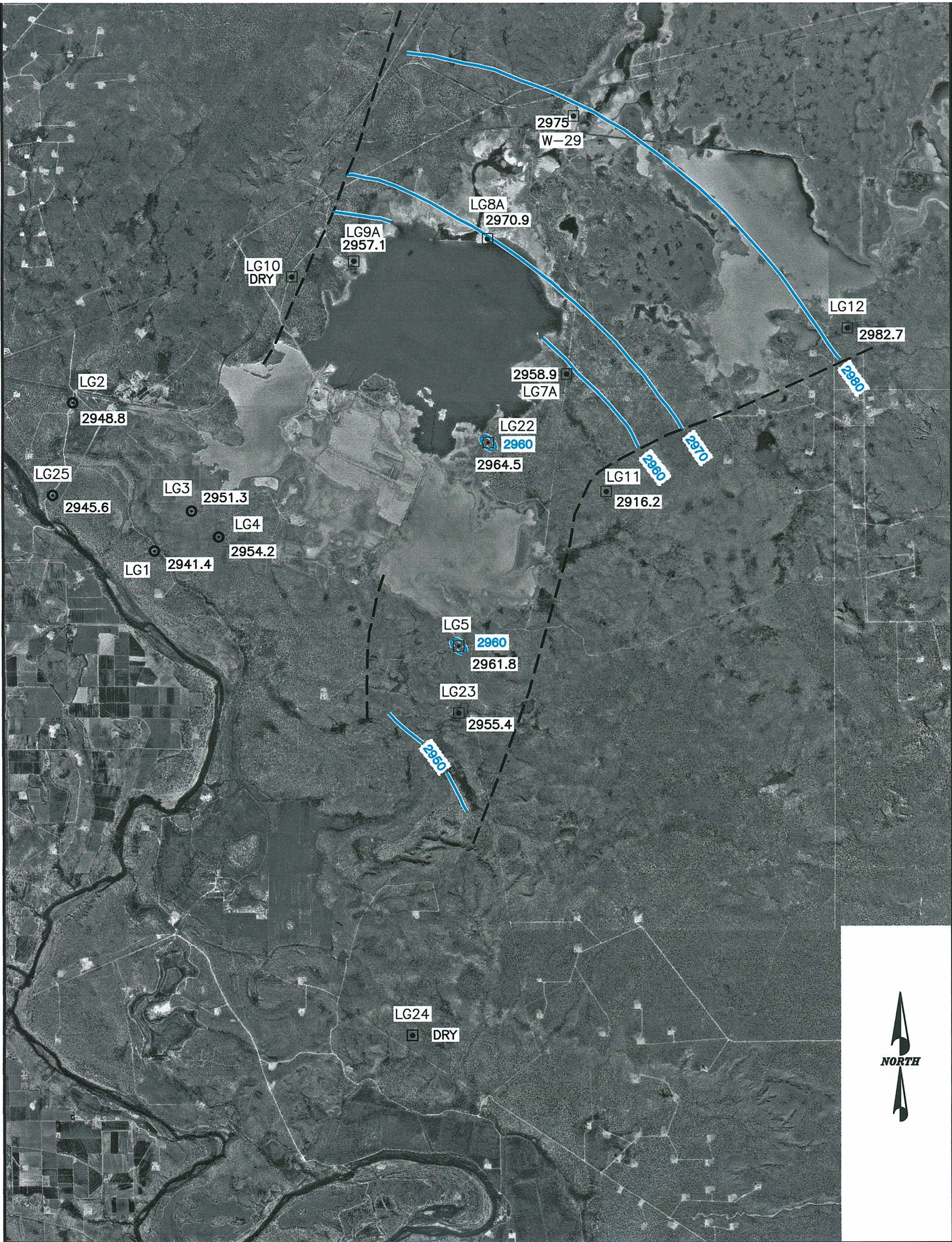
FEET ABOVE MEAN SEA LEVEL

	8/16/19	FINAL	TS	SB	EC	TS
	8/12/19	CLIENT COMMENTS	TS	SB	EC	TS
	7/17/19	DRAFT FOR REVIEW	TS	SB	EC	TS
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

PROJECT	LAGUNA UNO EA					
---------	---------------	--	--	--	--	--

TITLE						
HYDROGEOLOGIC CROSS SECTION D-D'						

 GOLDER	PROJECT No.		1913769	FILE No. NEW Cross Sections_KRK		
	DESIGN	TS	8/16/19	SCALE AS SHOWN		
	CADD	SB	8/16/19	DRAWING		
	CHECK	EC	8/16/19	FIGURE 3.5-12		
	REVIEW	TS	8/16/19			



LEGEND

- 2955.4 ELEVATION OF FRESH WATER LEVELS AS OF 7/25/01 (FOR LG WELLS)
- CULEBRA WELLS
- QUATERNARY WELLS
- POTENTIOMETRIC CONTOUR
- FLOW SYSTEM BOUNDARY

CLIENT/PROJECT
MOSAIC POTASH CARLSBAD INC.

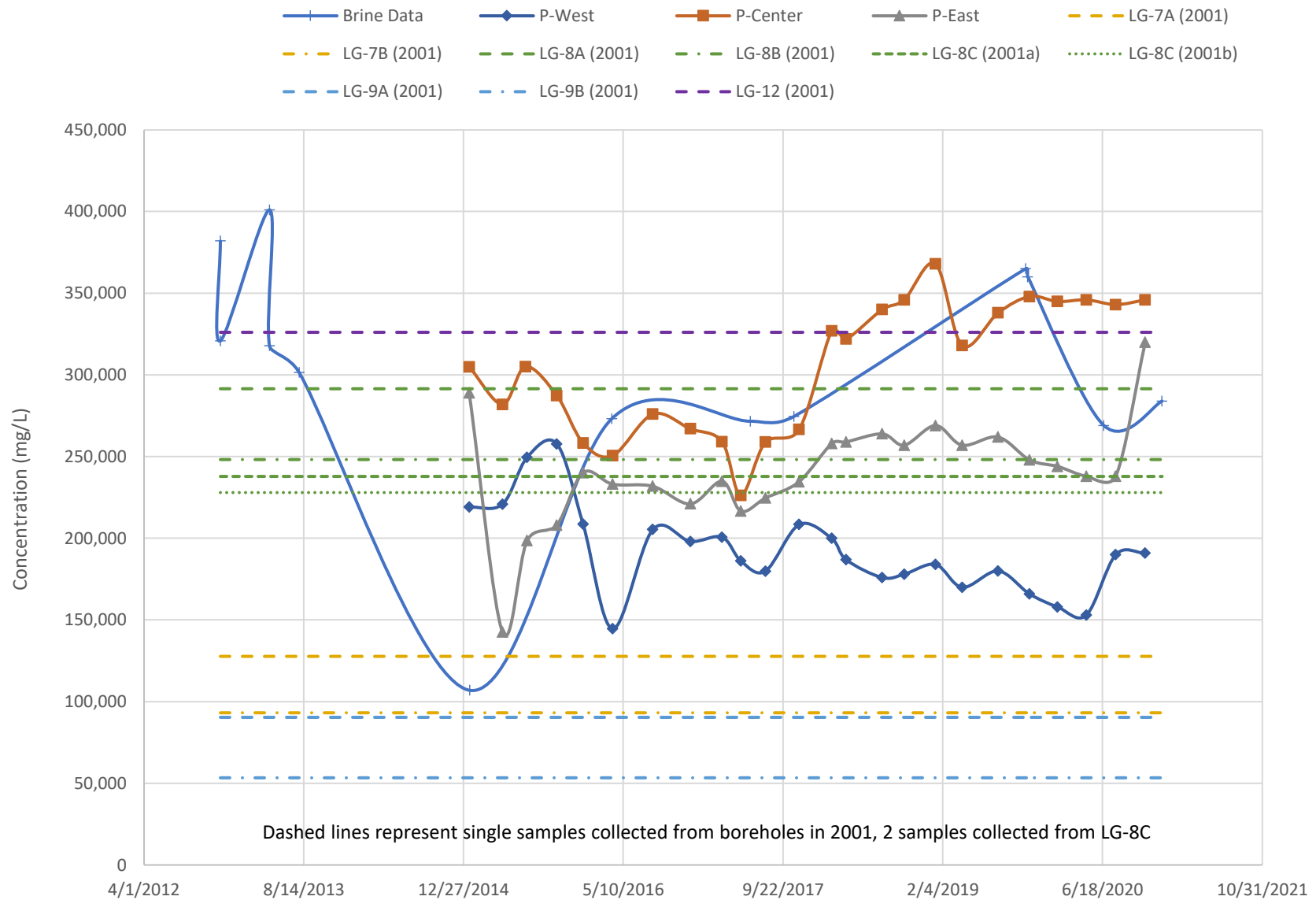


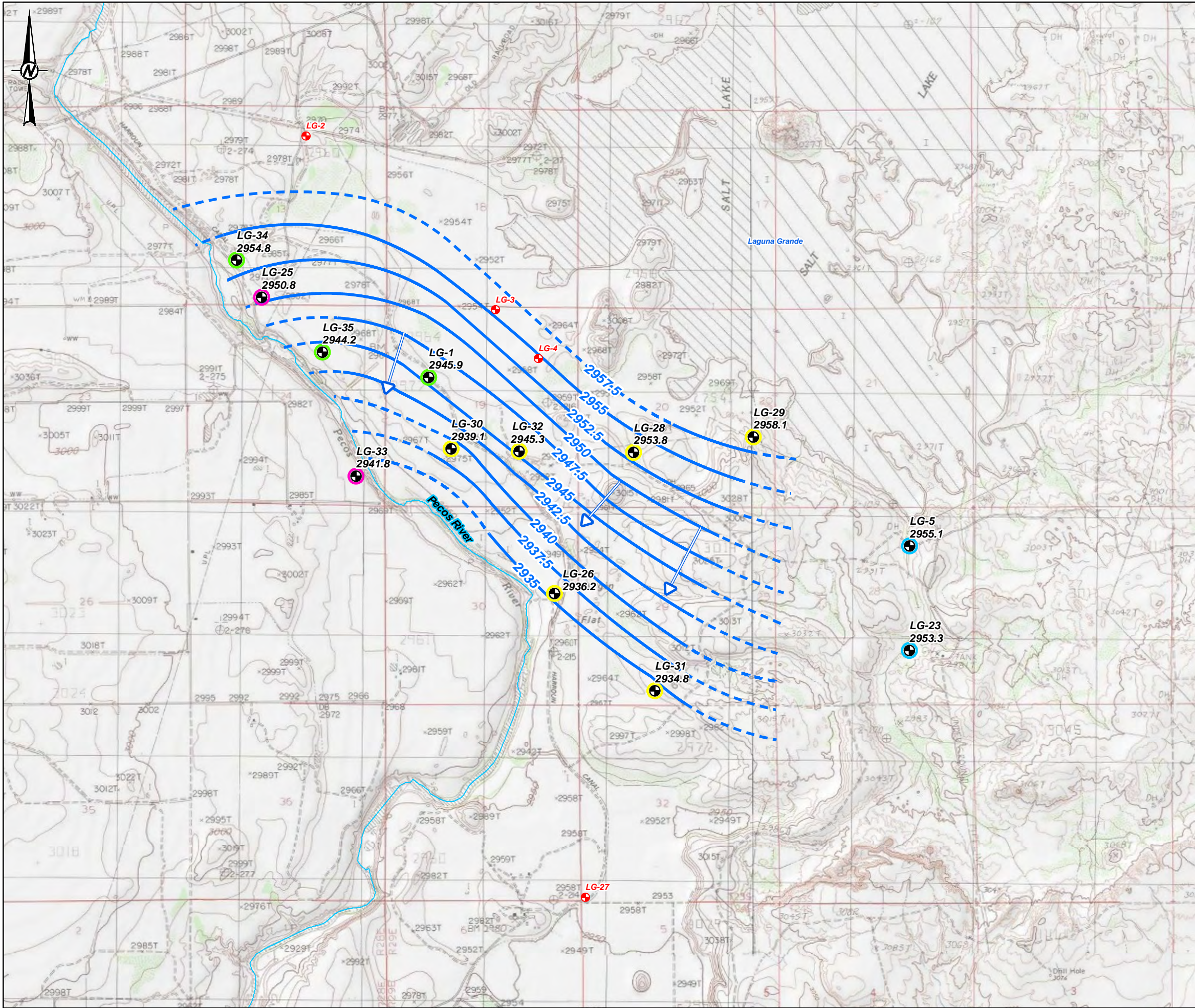
Denver, Colorado

TITLE
**ADJUSTED
POTENTIOMETRIC SURFACE
OF THE CULEBRA DOLOMITE**

DRAWN sfd	CHECKED TS	REVIEWED MWB	DATE MAY 2002	SCALE AS SHOWN	FILE NO. 2214B190.dwg	JOB NO. 003-2214	DWG NO./REV.NO. B190	FIGURE 3.5-13
--------------	---------------	-----------------	------------------	-------------------	--------------------------	---------------------	-------------------------	------------------

Figure 3.5-14:
TDS Concentrations in Groundwater





LEGEND

EQUIVALENT FRESHWATER HEAD ELEVATION CONTOUR (DASHED WHERE INFERRED)

GROUNDWATER FLOW DIRECTION

MONITORING WELLS WITH JANUARY 2021 EQUIVALENT FRESHWATER HEAD ELEVATION (WHERE APPLICABLE)

PRESENT

CURRENTLY INACCESSIBLE

MONITORING WELLS BY GEOLOGIC UNIT (SEE NOTE 2)

ALLUVIUM

CALICHE

CULEBRA

GATUNA

0 0.25 0.5 1 Miles

NOTE

1. EQUIVALENT FRESHWATER HEAD ELEVATIONS REPORTED IN FEET ABOVE MEAN SEA LEVEL.

2. WELLS LG-5 AND 23 WERE SCREENED IN THE CULEBRA AQUIFER AND WERE NOT USED IN CONTOURING.

3. WELL LG-33 IS LOCATED ON THE WEST SIDE OF THE PECOS RIVER, AND WAS NOT USED IN CONTOURING.

REFERENCES

1. BASEMAP: USGS 1:24,000 SCALE TOPOGRAPHIC QUADRANGLES: "MALAGA, NM", "PIERCE CANYON, NM", "LOVING, NM", AND "REMUDA BASIN, NM".

2. GROUNDWATER ELEVATION CONTOURS DEVELOPED BY GOLDER ASSOCIATES BASED ON JANUARY 2021 WELL DATA PROVIDED BY MOSAIC.

CLIENT

MOSAIC POTASH CARLSBAD INC.

PROJECT

LAGUNA UNA EA

TITLE

JANUARY 2021 EQUIVALENT FRESHWATER HEAD ELEVATIONS AND FLOW DIRECTIONS LAGUNA GRANDE AREA

CONSULTANT	YYYY-MM-DD	2021-02-16
	DESIGNED	KJC
	PREPARED	RHG
	REVIEWED	ML
	APPROVED	TS

PROJECT NO.
1913769

FIGURE
3.5-15