PROJECT DESCRIPTION/ANALYSIS
MORENCI WASTEWATER TREATMENT PLANT PROJECT

BACKGROUND QUESTIONS

The bullets below are background questions submitted to FMMI regarding the existing and proposed wastewater treatment plant(s) (WWTP). The purpose of the questions is to gather background information on the purpose and need for the project, coordination with other entities and agencies in the vicinity operating wastewater facilities, areas to be served by the new facility, future population growth and treatment capacity needs, and plans for effluent disposal should mining operations cease in the future.

- ***Describe existing WWT facilities – A general description of the existing WWTP, i.e. year built, original design capacity, current average daily flow, ability to consistently meet current APP permit requirements, design life, etc.***

The existing Morenci Wastewater Treatment Plant in Morenci, Arizona was constructed in the 1950's and has reached the end of its useful life. The Morenci Wastewater Treatment Plant treats residential, commercial and mine site domestic sewage from the townsite of Morenci, the Freeport-McMoRan Morenci Inc. (FMMI) mine site, and routine (daily) septic waste from the mine site. Effluent from the Town of Clifton WWTP is also pumped to the existing Morenci WWTP where it is mixed with the effluent from the Morenci WWTP and used as described below.

The existing wastewater treatment plant was designed with two combination clarifier/digesters (clarigesters) for primary treatment and two trickling filters for biological fixed film treatment. Sludge is removed from the digester portion of the clarigester(s) and sent to a sludge drying bed. Effluent from the trickling fitters is conveyed to a plant effluent pump station wet well. The effluent is currently pumped to a thickener, where it is reused as industrial process water at the FMMI plant site.

The original design capacity is unknown, but Aquifer Protection Permit records indicate the average daily flow of 449,000 gallons per day (gpd) from Morenci townsite, the FMMI mine site, and septic waste from the mine site. The design life for the existing WWTP is also unknown. However, given the date the facility was constructed, it is likely operating well outside its intended design life.

No information was provided regarding the compliance history for the existing facility. Information requested from ADEQ indicates that the APP permit for the existing WWTP does not contain effluent quality limits or monitoring requirements, most likely due to the fact that the facility is non-discharging. The required inspections and operational monitoring requirements are required to be documented in the facility log book. Therefore, there are no self-monitoring report forms (SMRFs) that apply to the facility, which would typically be used to determine whether a WWTP complies with the conditions of its permit. The most recent inspection report for the facility is attached as Exhibit A.

- ***Map showing area served by WWTP and relationship to Town of Clifton service and planning area.***

A map indicating the 'collection area' for the proposed WWTP was provided by FMMI with their 208 Consistency form. The collection area appears to include much of the area served by the Town of Clifton

sewer system. Effluent from the Clifton WWTP is pumped to the existing Morenci WWTP where it is mixed with the effluent from the Morenci WWTP and used in the mining process as described above.

A map showing the Town of Clifton service area is attached to this report as Exhibit B. The 'service area' appears to include the most densely populated areas inside the corporate limits of the Town, and a small area outside of the Town limits. Most areas inside the corporate limits of the Town are not connected to the sewer system. Most notably, the sections south and east of Ward Canyon owned by the State of Arizona and US Bureau of Land Management remain mostly undeveloped. If these areas are developed in the future, it is likely developers will be required to determine the feasibility of connecting to the Clifton WWTP. If feasible, development would likely be required to pay for any costs associated with connecting to the existing system and additional capacity requirements at the WWTP, build separate satellite wastewater treatment facilities, or develop the land with larger lot sizes that can accommodate on-site systems.

- ***Provide latest population estimates over 20-year period.***

No information was provided in response to this request. The latest population projections for the period 2017 – 2037 from the Office of Employment and Population Statistics for the Town of Clifton and the Morenci CDP are attached as Exhibit C. Note that the population in both communities is expected to peak in 2033. This is believed to reflect a projected reduction of mining related activity in Morenci and a corresponding reduction in the area work force.

- ***Provide wastewater flow estimates over the 20-year planning period, including flow from Clifton based on potential for new development of areas that may be served by the Clifton facility in the future (i.e. Tabletop Mesa, areas in Town that may be connected to collection system in the future, areas in the Clifton planning area that may be considered for annexation, etc.)***

No information was provided in response to this request. Wastewater flow estimates for the period 2017 – 2037 are attached as Exhibit D. Current wastewater flow to the existing WWTP is 449,000 gallons per day (gpd), and an additional 324,000 gpd of effluent is received from the Town of Clifton WWTP. This amounts to a total of 773,000 gpd of wastewater that will be treated at the new facility. The new WWTP is designed to treat an inflow of 1.2 million gallons per day, which is anticipated to exceed the capacity needed to meet demand from future population growth in the area over the next 20 years.

The current wastewater flows of 773,000 gpd amounts to 64.4% of the treatment capacity of the new plant. Inflows to the new plant would need to increase to 1,020,000 gpd before 85% of the approved capacity would be reached and the requirement to design additional capacity is triggered. The wastewater flow in peak population year 2033 is anticipated to be 792,645 gpd, or 227,355 gpd of additional capacity.

- ***Describe the type and capacity of the recommended WWT Plant.***

The proposed Morenci WWTP will be a state-of-the-art, extended aeriation process package wastewater treatment plant with a design capacity of 1.2 MGD. The WWTP will treat gravity-flow raw sewage (generated from the Morenci townsite and FMMI mine) as well as Class C effluent from the Town of Clifton WWTP. The new facility will continue to be operated under FMMI's Aquifer Protection Permit

(APP P-100193) issued by the Arizona Department of Environmental Quality (ADEQ), and will not discharge to the aquifer nor surface waters.

Wastewater will enter the headworks and flow into a fine and grit screen before entering an activated sludge tank. To handle periods of high flows, an equalization tank will be placed in line ahead of the activated sludge tank. The wastewater then moves to a clarifier where it will drop more solids. Biosolids flow into an aerobic digester and then are placed in concrete drying beds where excess liquids will be removed and returned to the headworks. Prior to sending the effluent to the reclaimed water system and/or tailings, the water is treated with chlorine tablets in a contact chamber. Exhibit E provides a flow diagram of the wastewater treatment process for the proposed Morenci WWTP.

The proposed WWTP has been designed to be a non-discharging facility and is to be constructed out of impervious materials, e.g. concrete, or in above ground steel tanks. All systems/areas will be inspected regularly. A retention basin, located on the eastern side of the WWTP, will be used to collect storm water and drop out sediment. Back-up power generation will allow the WWTP to pump all effluent in case of emergency loss of power. The generator is designed to operate for at least four hours. If any liquids are spilled from the wastewater treatment process, the liquids will be treated as a spill and clean-up immediately. The area around the WWTP will be bermed with an earthen berm to prevent spillage from leaving the site and to allow for easy clean-up.

The original APP application dated March 28, 1996 Section 8.6.32 page 8-240 describes discharge from the Plantsite WWTP as 7,680 gpd. Completion of a number of upgrades under a compliance schedule reduced the volume of discharge as described in the original application. The new WWTP will not be a discharging facility so there will be a net reduction in discharge.

- ***Describe method of effluent disposal and reuse sites.***

Although effluent from the Morenci WWTP will be sent either to the tailings impoundments (already covered under the existing area-wide APP) or the reclaimed water system for industrial re-use, FMMI will voluntarily manage the Morenci WWTP to meet the following performance goals and will therefore meet applicable Best Available Demonstrated Control Technology (BADCT) performance criteria.

Parameter	Performance Goal
5-Day Biochemical Oxygen Demand (BODs), mg/l	<30 mg/l (30 day average) <45 mg/l (7 day average) >85% removal efficiency
Total Suspended Solids (TSS), mg/l	<30 mg/l (30 day average) <45 mg/l (7 day average) >85% removal efficiency
pH	6.0 to 9.0
Fecal Coliform, CFU	No fecal coliform or E. coli detected (4 of 7 weekly samples) <23 CFU/100ml (single sample, fecal coliform) <15 CFU/100ml (single sample, E. coli)
Total Nitrogen, mg/l	<10 mg/l (5 month rolling geometric mean)

The effluent leaving the facility will have a Class B+ quality (whereas the current WWTP only treats to Class C). This will allow Morenci to use the water for parks and sports fields if the need ever arises. Furthermore, commingling class B+ effluent with existing tailings or reclaimed water will not cause an increase in pollutant discharge at these receiving facilities.

In addition, because the new Morenci WWTP is non-discharging, compliance with aquifer water quality standards will be monitored at A conceptual POC well (location is N 33"01'08", W 109"18'29").
The effluent will be discharged to either Tailings (N 33"01'02", W 109"20'45"), or the Reclaim Water System (N 33"02'07", W 109"21'20").

- ***Describe ownership of land proposed for plant site and reuse areas.***

The operational mining plan for FMMI has determined that the current location of the existing WWTP and Overflow Pond (Facility #99) needs to be decommissioned and replaced by a new Morenci WWTP (Facility #99A). The proposed site of the new WWTP location is approximately 2,900 feet to the southeast of the existing WWTP. The location was selected based on close proximity to existing infrastructure and remote location from nearest inhabited structure. The land at the proposed site for the new WWTP as well as all reuse areas is owned by FMMI. Exhibit F shows the location of the new Morenci WWTP in relation to the FMMI mine site.

- ***Describe alternatives and recommendation for the disposition of sludge generated.***

All biosolids and materials removed from the headworks' grit screening facilities will be transported to a solid waste landfill for disposal.

- ***Define construction priorities and time schedules for initiation and completion***

No construction schedule was provided, but the operational mining plan calls for the removal of the existing WWTP to occur prior to May 2017 to make way for placement of tailings on the site. The new WWTP must be constructed, tested, and fully operational before the existing plant can be removed.

Once the new Morenci WWTP is commissioned and fully-operational, the existing WWTP and Overflow Pond will be cleaned to remove sludges from all tanks and drying bed and disposed of properly. All electrical and mechanical components will be removed as well as the trickle filter seals. The rest of the facility will then be abandoned in place and buried by tailings. ADEQ will be notified prior to demolition and a subsequent APP amendment will submitted to remove the facility from Morenci's APP Permit.

- ***Identify entities who will construct, operate and maintain the facilities and otherwise carry out the plan.***

The proposed WWTP will be constructed, owned, operated and maintained by FMMI. The Morenci WWTP is expected to provide FMMI and the town of Morenci service for 50+ years depending on mining activities and component longevity. When the time comes for closure of the Morenci WWTP, FMMI will notify ADEQ that it intends to cease operations. A detailed plan for closure and post-closure will be submitted to ADEQ ninety days prior to closure of the Morenci WWTP.

- ***Describe effluent disposal methods if mining production is reduced to the point effluent is no longer needed for mine process water. Describe impacts on existing wastewater facilities, infrastructure and services, the impact on communities and businesses affected (i.e. Town of Clifton). Describe if the effluent from the Town of Clifton will no longer be accepted, how the Town will be notified, the number of days notice that will be provided, etc. Describe types of permits needed, including AZPDES, APP and reuse (if applicable). Describe restrictions on AZPDES permits, if needed, for discharge and sludge disposal (if applicable).***

No information was provided in response to these questions. However, FMMI estimates there are 70 years of minable resources remaining at the Morenci mine at the current rate of extraction. Even if mining were to cease entirely, it is anticipated that effluent will continue to be utilized in leaching operations for many decades after mining operations cease. As an example, active mining ended in Bisbee in the mid-1970s, and 40 years later, leaching operations continue to extract minerals from tailings. This should provide ample time for discussion and coordination in the future to resolve these issues.

- ***Describe who will assume responsibility for WWTP operations should mining cease entirely. Define who (municipal or private utility) will serve which areas, and when service will be available in the designated areas.***

No information was provided in response to these questions. However, Morenci Water and Electric, a subsidiary of FMMI, already provides utility services to the Clifton – Morenci area, and it may be possible for them to assume wastewater operations in the future.

SECTION 208 WATER QUALITY MANAGEMENT PLAN (WQMP) CONSISTENCY ANALYSIS

Under the SEAGO 208 WQMP, proposals seeking Consistency Reviews are to be examined against the Wastewater Treatment Options Table and other strategies in the Plan. A Consistency Review typically occurs during ADEQ's administrative review process of wastewater permit applications and for "certificates of sanitary facilities" for proposed subdivisions. While the Wastewater Treatment Options Table was designed primarily with the development of future subdivisions in mind, it also applies to new or expanding wastewater treatment facilities.

Wastewater Treatment Options Table:

"Option 1 – Connect to an existing wastewater treatment plant (WWTP) with adequate capacity

If economically feasible, and an existing WWTP has adequate capacity, connecting to a sewer line is usually the best choice within a service area, a planning area, or a high priority area for sewer lines.

Depending on the proximity and characteristics of a proposed development, connecting to existing wastewater facilities frequently provides economies of scale, treatment efficiencies, resource conservation, and is more cost-effective than other alternatives. Even outside of a service or planning area it may be more cost-effective and resource efficient to connect to an existing wastewater plant than construct new facilities or systems. These opportunities should be evaluated before constructing new wastewater treatment plants or using on-site wastewater treatment (septic systems)……"

The Town of Clifton WWTP is also operating well beyond its useful life and the Town is actively seeking funding to replace the facility. Discussions between the Town and FMMI have occurred and it was determined that it is not feasible at this time for Clifton to utilize the new Morenci WWTP for treatment of its sewage. Because of site limitations at the Clifton WWTP and the existing use of Clifton's effluent in the Morenci mining operations, it also appears infeasible for the wastewater from Morenci to be treated at the Clifton WWTP.

Staff Recommendation: The Morenci proposal appears **CONSISTENT** with this Option, but it is recommended that coordination and discussions between FMMI, the Town of Clifton, and SEAGO continue since it appears the new Morenci WWTP will have sufficient capacity to meet the wastewater treatment needs for both communities for the useful life of the facility. It is also recommended that coordination and discussion include Morenci Water and Electric to explore the potential of operating a single wastewater collection and treatment system for both communities as a public utility.

"Option 2 – Modify existing wastewater treatment plant or collection system

Expanding or modifying existing wastewater facilities to take on a new development may also improve treatment efficiency, energy efficiency, resource conservation, or offer economies of scale. As developments are proposed, DMAs and WMUs should look for opportunities to merge WWTPs, expand treatment plants, or create collection systems to take advantage of economies of scale. This is more consistent with this Plan than developing new, smaller treatment plants that are less efficient at removing pollutants……"

While FMMI is not a Designated Management Agency (DMA) or a Wastewater Management Utility (WMU), expanding the existing Morenci WWTP is not feasible due to the need to use the site for the deposition of tailings in accordance with FMMI's operational mining plan. It is also impractical to modify the existing WWTP to provide additional treatment capacity or extend the useful life of a facility already operating well beyond its design life.

Staff Recommendation: CONSISTENT with the same recommendations as Option 1.

"Option 3 – Build new wastewater treatment facilities

Construction of new wastewater treatment facilities is sometimes the best alternative due to physical site conditions and engineering considerations in a given development scenario and/or capacity limitations at existing facilities. New construction also can be the best alternative when the facility is designed to use more effective technologies than existing facilities. In addition, new facilities can be designed and constructed to accommodate future expansion if further growth is anticipated.

New centralized wastewater treatment facilities and collection systems should be designed to take advantage of new technologies and potential economies of scale whenever practicable. For example, new facilities and collections systems can be designed to accept wastewater from older and less efficient facilities or systems located inside or adjacent to an existing or proposed service area……"

The proposed Morenci WWTP is will utilize improved treatment technology over the existing facility, and will produce Class B+ effluent, whereas the existing facility is capable of producing only Class C effluent.

Effluent from the aging, less efficient Town of Clifton WWTP will be processed at the new Morenci facility, resulting in a uniform effluent quality that can be used in mining operations or Morenci's reclaimed water system for irrigation of parks and recreational facilities.

Staff Recommendation: CONSISTENT with the same recommendations as Options 1 and 2.

"Option 4 – Build on-site wastewater systems (up to 24,000 gpd)"

Staff Recommendation: This Option is **NOT APPLICABLE** to the FMMI proposal under consideration.

"Option 5 – Build a satellite plant or communal facility"

Staff Recommendation: This Option is **NOT APPLICABLE** to the FMMI proposal under consideration.

208 Plan Goals and Strategies:

As with the Wastewater Treatment Options Table, some of the Goals, Strategies and Tactics outlined in the strategic plan are not applicable to the FMMI proposal.

"GOAL 1:

Provide region-wide wastewater treatment that meets all regulatory requirements, is economically sustainable, and utilizes recognized best management practices."

This Goal is intended to foster 20-year planning in the development of wastewater treatment facilities and on-site wastewater treatment (septic) systems, encourage public wastewater entities (e.g. municipalities, sanitary districts, Wastewater Improvement Districts) to become Designated Management Agencies (DMAs), formalize private wastewater providers (e.g., private utilities) as Wastewater Management Utilities (WMUs), identify sensitive areas undesirable for placement of conventional onsite wastewater treatment systems, and provide centralized wastewater treatment guidelines for new development.

While FMMI chose not to provide information relating to 20-year population growth or future wastewater flow projections, it appears the new Morenci WWTP will have sufficient capacity to meet those needs for the 20-year planning horizon (see Exhibits C and D). In addition, the new facility is anticipated to have a useful operational life well beyond the next 20 years, is capable of meeting all regulatory requirements, is economically sustainable, and will meet or exceed BADCT performance criteria.

Theoretically, FMMI appears to be acting as a private utility in providing wastewater services to the businesses and company housing at the Morenci townsite. However, this is a unique circumstance where a mining company has literally built a company-owned town around its mining operation, and in the interests of managing water quality issues, also operates a wastewater treatment facility. In reality, the Morenci WWTP is privately-owned and is not a public service corporation subject to regulation by the Arizona Corporation Commission. It does not charge Morenci businesses and residences for wastewater services, nor will the Town of Clifton incur any costs for the treatment of its Class C effluent at the new WWTP.

In addition, the establishment of WMUs is not required under State statutes or administrative rules and ordinances have not been adopted to require their establishment at the local level. Consequently, the Morenci wastewater treatment plant is not a WMU subject to the service area and 20-year planning requirements.

Staff Recommendation: The FMMI proposal appears **CONSISTENT** with the overarching intent of this Goal, but it is recommended that coordination and discussion between FMMI, the Town of Clifton, Morenci Water and Electric and SEAGO continue in order to explore the potential of operating a single wastewater collection and treatment system for both communities as a public utility and/or WMU.

"GOAL 2

Minimize and/or prevent pollution discharges to surface and ground waters."

This Goal was intended to address discharges of pollutants from concentrations of failing or substandard on-site septic systems, stormwater runoff from developments, and stormwater runoff from agricultural sites. Stormwater collected from the mine site is controlled and managed under FMMI's areawide Aquifer Protection Permit No. P-100193.

Staff Recommendation: This Goal is **NOT APPLICABLE** to the FMMI proposal under consideration.

"GOAL 3

Foster regional coordination and public involvement, and provide a continuing planning process to support plan implementation."

This Goal encourages coordination and cooperation among programs, agencies, and other partners, re-engagement of the ERC, use of the Consistency Review Process to provide a more efficient and consistent regional approach to evaluating proposals, and discussions between adjacent communities that may benefit from joint planning of facilities or cross-boundary service agreements.

Staff Recommendation: The Morenci proposal appears generally **CONSISTENT** with this Goal, but it is recommended that coordination and discussions between FMMI, the Town of Clifton, Morenci Water and Electric and SEAGO continue as discussed above.

"GOAL 4

Seek to make all water quality projects in the SEAGO region cost effective."

This Goal involves reducing the costs of developing, operating, and maintaining water quality projects and systems, and increasing the amount of funding available for water quality improvement projects.

Staff Recommendation: With the exception of the potential cost reductions to the Town of Clifton that may be realized through continued coordination and discussions between FMMI, the Town, Morenci Water and Electric and SEAGO as recommended above, this Goal is **NOT APPLICABLE** to the FMMI proposal under consideration.

"GOAL 5

Encourage practices that support water sustainability, waste reduction, and energy production (e.g. graywater use, rainwater harvesting, recharge basins, conservation measures and biomass energy production).”

FMMI will continue to use the effluent from the Clifton and Morenci WWTPs into the foreseeable future in their mineral extraction processes after it has already been used for domestic use, thus reducing the amount of groundwater needed for mining processes.

Staff Recommendation: The Morenci proposal appears **CONSISTENT** with this Goal.

EXHIBIT A

100193

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street ▪ Phoenix, Arizona 85007
(602) 771-2300 ▪ www.azdeq.gov

Janice K. Brewer
Governor

Benjamin H. Grumbles
Director

May 14, 2010

Insp #	160304	WW Sys #	36-102
ADEQ #	N/A	Place #	2512
Inv #	100193	Case #	N/A

Freeport McMoRan Southeast Arizona
Attention: Hunter White, Senior Vice President
4521 U.S. Highway 191
Morenci, AZ 85540

Subject: Compliance Inspection of Freeport McMoRan Morenci Aquifer Protection Permit

Dear Mr. White:

Enclosed is a copy of an Inspection Report prepared by Robert Wallin of our staff concerning the referenced facility. An inspection was performed on May 13, 2010, in accordance with Arizona Revised Statutes (A.R.S.) §49-241 *et seq*. and with the Arizona Administrative Code (A.A.C.) R18-9-101 *et seq*.

No deficiencies were found in the operation or maintenance of this system at the time of inspection. This system was also found to be in compliance with respect to monitoring and reporting requirements. No further action will result from this inspection.

Please call Robert Wallin at (520) 628-6743 or (888) 271-9302, if you have any further questions regarding this or any other matters pertaining to your system.

Sincerely,

Larry A. Bogdanski
Acting Regional Compliance Manager
Southern Regional Office

ARIZONA DEPARTMENT ENVIRONMENTAL QUALITY
MAY 21 2010
WATER QUALITY COMPLIANCE SECTION

LAB:rww

cc: Brent Fletcher, Manager, Environmental Services Department, Freeport McMoRan Morenci, Inc.
Greenlee County Health Department
Cindy Campbell, Manager, WQCS, WQD, ADEQ

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Compliance Programs Unit - Southern Regional Office
400 W. Congress, Suite 433, Tucson, AZ 85701

INSPECTION REPORT - WASTEWATER

Facility: Freeport McMoRan Morenci, Inc. **(APP Inspection)** System No.: 36-102

Inventory No.: 100193 GWPP No.: N/A AZPDES No.: N/A

APP No.: P-100193 Reuse No.: N/A Unified Permit No.: N/A

Insp. No.: 160304 Case No.: N/A ADEQ No.: N/A

Place No.: 2512 Inspection Date: 5/13/10 Report Date: 5/14/10

Inspected By: Bob Wallin

Accompanied By: Wesley Word, Freddy Rodriguez, Manny Rodriguez County: Greenlee

Population: 2500 Service Connections: 1000 Plant Grade: 2T/1C

	YES	NO	N/A
1. This system meets the requirements of the following permits.			
A. Ground Water Protection Permit			X
B. Aquifer Protection Permit	X		
C. Reuse Permit			X
D. General Permit			X
E. AZPDES Permit			X
F. Unified Permit			X
2. The effluent quality of this system meets Arizona Department of Environmental Quality and U.S. EPA standards	X		
3. The method of effluent disposal is in accordance with Arizona Department of Environmental Quality and U.S. EPA requirements	X		
4. The operator of the system holds the required level of certification as required by Arizona Department of Environmental Quality rules (Manny Rodriguez 2T/1C)	X		
5. This facility met the Arizona Department of Environmental Quality standards for physical facilities, at the time of the inspection	X		

SYSTEM DESCRIPTION

This Aquifer Protection Permit (APP) for Freeport McMoRan Morenci consists of 120 potentially discharging facilities. These facilities fall into the following classifications: tailing impoundments, non-stormwater impoundments, process solution impoundments outside the capture zone of the hydrologic sink, process solution impoundments within the capture zone of the hydrologic sink, leach stockpiles outside the capture zone of the hydrologic sink, leach stockpiles within the capture zone of the hydrologic sink, a wastewater treatment facility, vehicle wash facilities within the capture zone of the hydrologic sink, vehicle wash facilities

outside of the capture zone of the hydrologic sink, miscellaneous facilities outside of the capture zone of the hydrologic sink, and facilities to be closed under the compliance schedule.

The Arizona Pollutant Discharge Elimination Permit (AZPDES) regulates the discharge of stormwater overflow from the Gold Gulch Spillway (Facility #43) and the Lower Chase Creek Spillway (Facility #41). Gold Gulch is a tributary to Eagle Creek and Chase Creek is a tributary to the San Francisco River. Pumps on the upstream side of both the spillways pump waters for reuse. The intent is to never activate the spillways, even during a storm event. This facility is also covered under the Stormwater Multi-Sector General Permit for Industrial Activities (Sector G). Stormwater BMPs include sediment basins that collect neutral pH waters draining non-stockpile areas. This permit also includes the Morenci WWTP which serves the town and the mine. Effluent from the Morenci WWTP is used for makeup water at the Metcalf SX Plant.

The following individual facilities were visited during this inspection:
#1 – Southwest 1 Tailing Dam Impoundment
#6 - West Tailing Dam Complex
#7 - East Tailing Dam Complex
#11 - Tailing Stormwater Retention Dam 2A
#12 - Tailing Stormwater Retention Dam 2B
#14 - Tailing Stormwater Retention Dam 3A
#15 - Tailing Stormwater Retention Dam 3B
#16 - Tailing Stormwater Retention Dam 3C
#17 - Tailing Stormwater Retention Dam 3D
#18 - Tailing Stormwater Retention Dam 4
#20 - Tailing Stormwater Retention Dam 4B
#22 - Tailing Stormwater Retention Dam 5A
#23 - Tailing Stormwater Retention Dam 5B
#24 - Tailing Stormwater Retention Dam 5C
#25 - 5D (Big Miller) SW Retention Dam & Impoundment (all other SW retention ponds are pumped to here)
#26 - Tailing Stormwater Retention Dam 5E
#27 - Tailing Stormwater Retention Dam 5F
#28 - Tailing Stormwater Retention Dam 5G
#29 - Tailing Stormwater Retention Dam 6
#31 - Tailing Stormwater Retention Dam 7A
#32 - Tailing Stormwater Retention Dam 7B
#33 - Tailing Stormwater Retention Dam 8
#34 - Tailing Stormwater Retention Dam 9
#35 - Tailing Stormwater Retention Dam 9A
#36 - Tailing Stormwater Retention Dam 10
#37 - Tailing Stormwater Retention Dam 10A
#39 - Industrial Drain Overflow Pond (Reed Lake)
#40 - Bat Canyon Safety Dam 1 Stormwater & Overflow Impoundment
#41 - Lower Chase Creek Dam
#42 - Rocky Gulch Dam PLS Impoundment
#43 - Gold Gulch Dam
#44 - Columbine Reservoir (This facility has been dismantled and reclaimed)
#45 - Horseshoe Overflow Pond
#46 - Stargo Overflow Pond
#48 - Central SX Plant PLS Pond
#49 - Central SX Plant Raffinate Pond
#50 - Modoc SX Plant PLS Pond
#51 - Modoc SX Plant Raffinate Pond
#52 - Dam BC1 (Bat Canyon)
#53 - Dam BC2
#54 - Dam BC3
#55 - Dam BC4
#56 - Dam BC5
#57 - Horseshoe Sump
#58 - Stargo Sump (Stargo Raffinate & PLS tanks not regulated)

#59 - 5X Sump (unlined)
#60 - Dam BC6
#61 - Dam BC7
#62 - 27MM Sump
#63 - Dam BC8
#64 - Dam BC9
#65 - 29MM Sump
#66 - 23/25 MM Pond (maintained as separate PLS ponds)
#67 - Three Former Ponds at 13/23/25 MM Pond (maintained as separate ponds, 13 usually dry)
#68 - Metcalf SX Plant PLS Pond
#69 - Metcalf SX Plant Raffinate Pond
#76 - In-Pit Sumps (Dispatch Sump)
#99 - Plantsite WWTP and Overflow Pond
#102 - Metcalf Mine Shop Vehicle Wash
#103 - Metcalf Truck Wash
#120 - Tailing Stormwater Retention Dam 7C

INSPECTOR COMMENTS

On October 30, 2008, at approximately 1:30pm, ADEQ SRO Compliance Programs Unit was notified by FMI, of a pipeline release of rich electrolyte solution to Lower Chase Creek, a tributary of the San Francisco River. Rich electrolyte solution is primarily composed of sulfuric acid and copper. The pH of the solution is between 0 and 1. An inspection was conducted by ADEQ Water Quality and Hazardous Waste inspectors on October 31, 2008.

The release was estimated at 168,000 gallons and ultimately migrated 10,680 feet down Lower Chase Creek. The amount released was back calculated based on volumes missing from a storage tank that was connected to the pipeline. The cause of the release was an accidental cross connection between a process solution pipe and the Chase Creek diversion pipe. Four dirt berms were built in the creek bed to intercept the release which ultimately flowed to within 120 feet of the San Francisco River.

FMI initially removed approximately 93,000 gallons of electrolyte using vacuum trucks on October 31, 2008. Recovered electrolyte was returned to the leach operations. In addition, 84,481 tons of soil was excavated and removed to the mine to be placed on leach piles. A paste pH method was used to guide the removal of electrolyte-impacted soil. Initial removal of approximately 63,000 tons of wet soil was completed on November 4, 2008. Final removal of impacted soils and reclamation of the site was completed on November 10, 2008. A final Spill Response Report was submitted to ADEQ on December 15, 2008.

SUMMARY

The results of this sanitary survey indicate that your wastewater system does not appear to have any operation or maintenance deficiencies at this time according to Arizona Department of Environmental Quality rules and regulations. This system was also found to be in compliance with respect to monitoring and reporting requirements.

EXHIBIT B

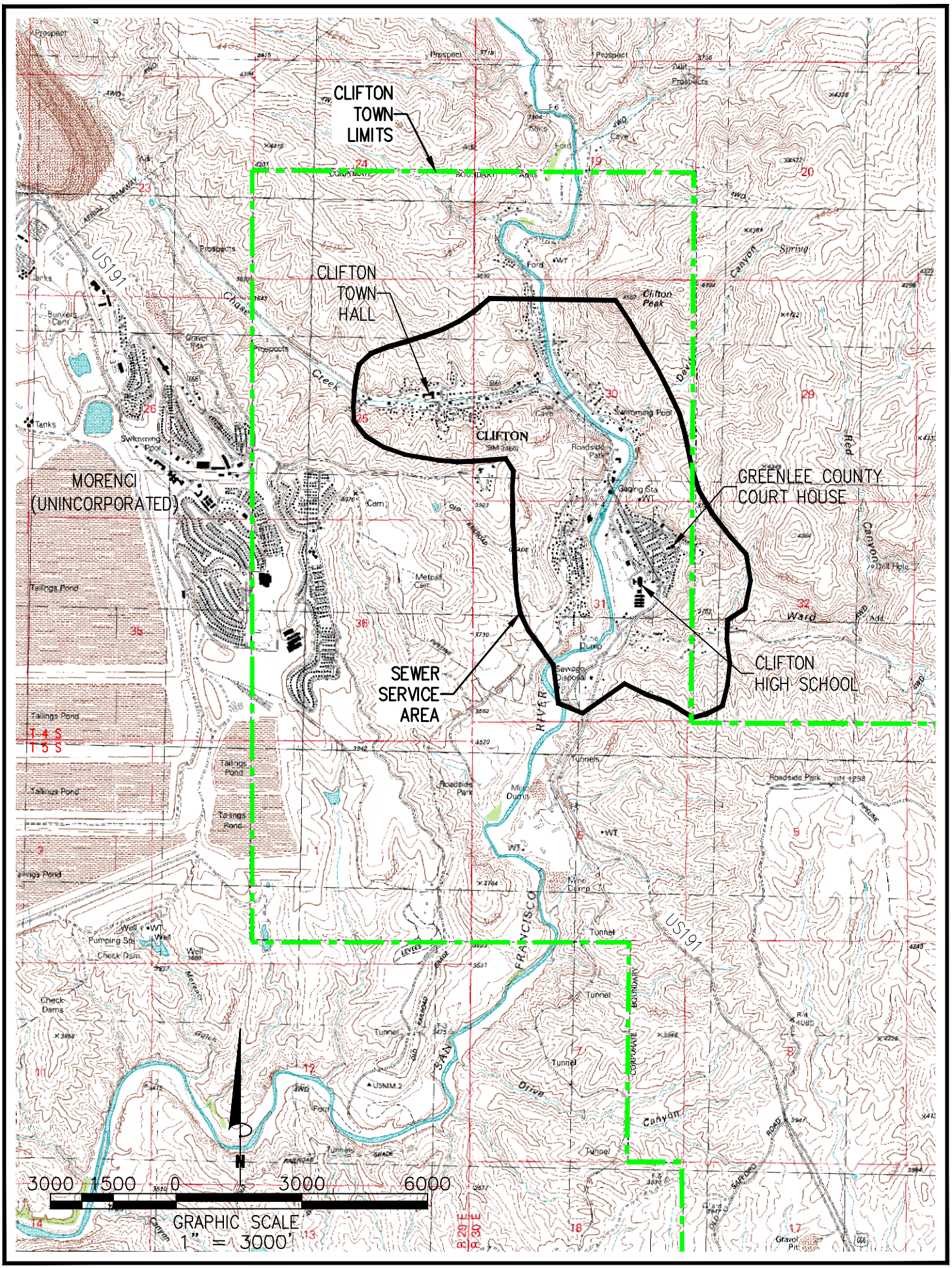

CLIFTON TOWN LIMITS
CLIFTON TOWN HALL
CLIFTON
MORENCI (UNINCORPORATED)
GREENLEE COUNTY COURT HOUSE
CLIFTON HIGH SCHOOL
SEWER SERVICE AREA
US191
SAN FRANCISCO RIVER
T 4 S
T 5 S
R 29 E
R 30 E
3000 1500 0 3000 6000
GRAPHIC SCALE
1" = 3000'

EXHIBIT C

CLIFTON AND MORENCI POPULATION PROJECTIONS

2017 - 2037

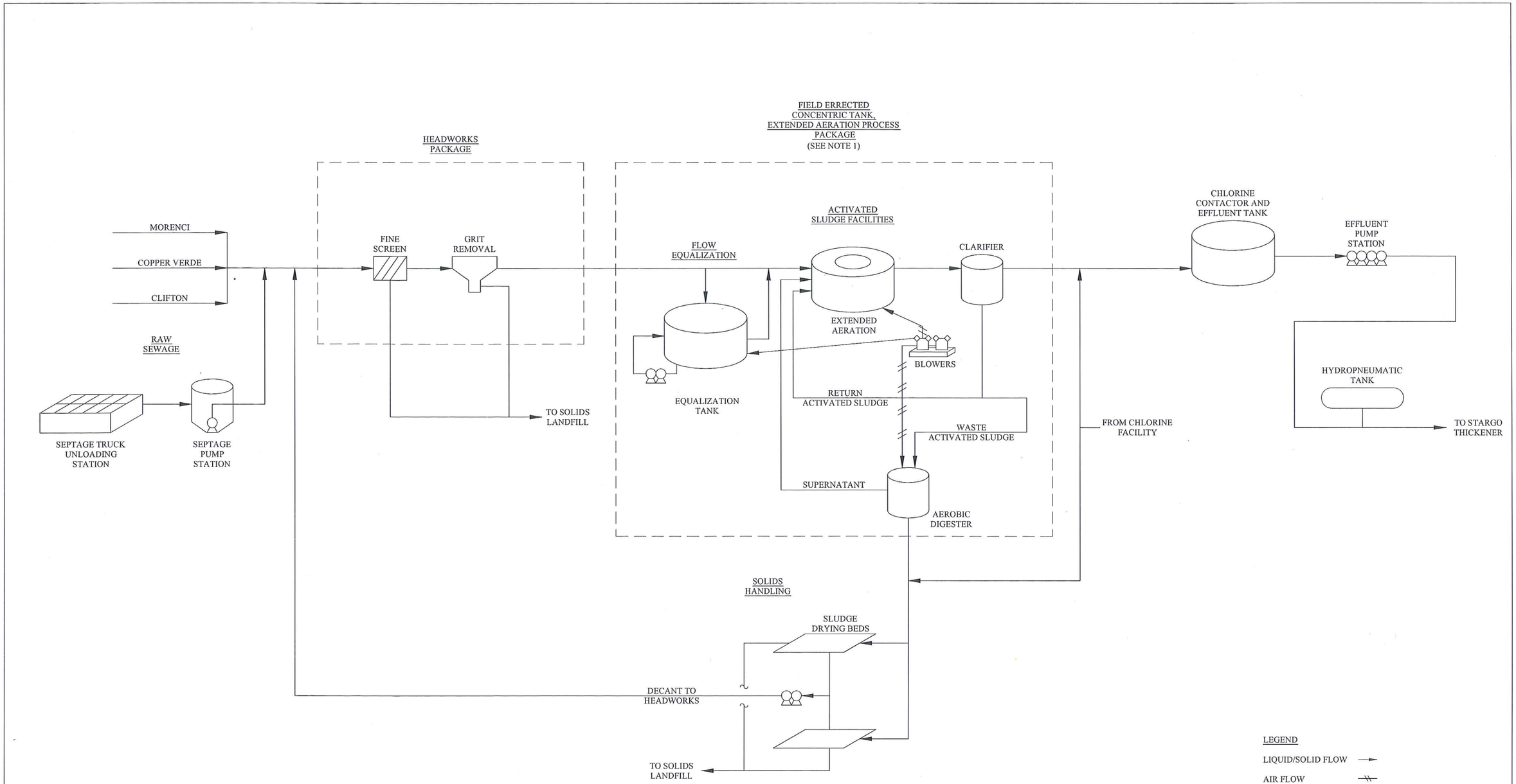
	CLIFTON		MORENCI		GREENLEE COUNTY
CENSUS 2010	3,311		1,489		8,437
2017	4,577		1,765		10,625
2018	4,588		1,769		10,651
2019	4,596		1,773		10,673
2020	4,605		1,776		10,694
2021	4,613		1,781		10,714
2022	4,620		1,784		10,733
2023	4,628		1,787		10,752
2024	4,634		1,790		10,770
2025	4,641		1,793		10,787
2026	4,647		1,796		10,803
2027	4,653		1,799		10,817
2028	4,658		1,801		10,830
2029	4,663		1,803		10,841
2030	4,666		1,804		10,850
2031	4,668		1,806		10,857
2032	4,670		1,807		10,862
2033	4,672		1,807		10,864
2034	4,671		1,806		10,863
2035	4,669		1,806		10,859
2036	4,667		1,805		10,852
2037	4,663		1,803		10,843

EXHIBIT D WASTEWATER FLOWS 2017 - 2037			
	CLIFTON	MORENCI	TOTAL
2017	324,775 GPD	450,517 GPD	775,292 GPD
2018	325,527 GPD	451,619 GPD	777,146 GPD
2019	326,111 GPD	452,691 GPD	778,802 GPD
2020	326,736 GPD	453,461 GPD	780,197 GPD
2021	327,280 GPD	454,521 GPD	781,800 GPD
2022	327,815 GPD	455,344 GPD	783,159 GPD
2023	328,350 GPD	456,113 GPD	784,463 GPD
2024	328,838 GPD	456,934 GPD	785,772 GPD
2025	329,298 GPD	457,815 GPD	787,113 GPD
2026	329,731 GPD	458,411 GPD	788,141 GPD
2027	330,143 GPD	459,117 GPD	789,259 GPD
2028	330,507 GPD	459,693 GPD	790,201 GPD
2029	330,832 GPD	460,154 GPD	790,986 GPD
2030	331,066 GPD	460,552 GPD	791,618 GPD
2031	331,225 GPD	460,884 GPD	792,109 GPD
2032	331,364 GPD	461,151 GPD	792,514 GPD
2033	331,470 GPD	461,175 GPD	792,645 GPD
2034	331,403 GPD	461,131 GPD	792,534 GPD
2035	331,253 GPD	461,024 GPD	792,277 GPD
2036	331,125 GPD	460,724 GPD	791,849 GPD
2037	330,887 GPD	460,302 GPD	791,189 GPD

CURRENT YEAR 2016		
CLIFTON	NEW PLANT CAPACITY	1,200,000 GPD
324,000 GPD	CURRENT FLOWS	773,000 GPD
70.95 GPCPD	PERCENT OF NEW CAPACITY	64%
	85% TRIGGER LEVEL	1,020,000 GPD
MORENCI	ADDITIONAL CAPACITY	247,000 GPD
449,000 GPD		
255.26 GPCPD		
TOTAL		
773,000 GPD		

FUTURE PEAK YEAR 2033		
CLIFTON	NEW PLANT CAPACITY	1,200,000 GPD
331,470 GPD	FUTURE FLOWS	792,645 GPD
	PERCENT OF NEW CAPACITY	66%
	85% TRIGGER LEVEL	1,020,000 GPD
MORENCI	ADDITIONAL CAPACITY	227,355 GPD
461,175 GPD		
TOTAL		
792,645 GPD		

EXHIBIT E



LEGEND

LIQUID/SOLID FLOW

AIR FLOW

PUMP

AIR BLOWER

NOTE

1. FIELD ERRECTED CONCENTRIC TANK, EXTENDED AERATION PROCESS PACKAGE IS SHOWN AS MULTIPLE COMPONETS FOR CLARITY. ALL PROCESSES SHOWN WITHIN PACKAGE OCCUR IN A SINGLE TANK.

FIGURE 2-2

REFERENCES		REFERENCES		REVISIONS				REVISIONS			
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

NOTICE

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TOLERANCES (UNLESS OTHERWISE SPECIFIED)

FRACTIONS	DECIMALS	ANGLES
±	±	±

SCALE:	AS NOTED	SHEET SIZE:	ANSI D
DRAWN BY:	RKB	DATE:	APRIL 2016
CHEK. BY:	JAS	DATE:	APRIL 2016
ENG. BY:	EC	DATE:	APRIL 2016
APPR. BY:		DATE:	

FREEPORT-McMoRan COPPER & GOLD

MORENCI OPERATIONS

DIVISION:

AREA:

JOB NO.

TITLE: GENERAL PROCESS FLOW DIAGRAM

DWG. NO. 126-I-014

CAD NO. 126I014

REVISION:

SHT. OF

EXHIBIT F


Morenci Wastewater Treatment Plant
Locations of existing and proposed Morenci WWTPs in relation to Morenci and Clifton
Legend
Clifton
Existing Morenci WWTP
Morenci
Proposed Morenci WWTP
Coronado Trail
Morenci
Clifton
191
Coronado Blvd
Existing Morenci WWTP
Proposed Morenci WWTP
Google earth
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N
1 mi