



Freeport-McMoRan Sierrita Inc.
6200 W. Duval Mine Rd.
PO Box 527
Green Valley, Arizona 85622-0527

February 24, 2020

**Via e-mail: air.permits@pima.gov and
Certified Mail: 7017 3380 0000 0803 5106**

Return Receipt Requested

Ms. Jacqueline Ronstadt
Air Compliance Manager
Pima County Department of Environmental Quality
33 N Stone Ave, Suite 700
Tucson, Arizona 85701

**Re: Notice of Violation # PC 2001-039 Response Letter
Freeport-McMoRan Sierrita Inc., Title V Air Quality Permit # 6067**

Dear Ms. Ronstadt:

Freeport-McMoRan Sierrita Inc. (FMSI) is in receipt of the Pima County Department of Environmental Quality (PDEQ) Notice of Violation, dated January 24, 2020, relating to fugitive dust events at FMSI's tailings impoundment on January 9, 2020. As directed by that notice, FMSI is providing the requested thorough explanation of actions leading up to the event and a description of corrective actions and measures taken to prevent future violations of this type.

Actions leading up to the fugitive dust events

FMSI employs several measures to control fugitive dust from the tailings impoundment as identified in Attachment "B" Condition XIX.B.1.b (viii) and (ix) of the FMSI Air Quality Operating Permit No. 6067. These methods are largely designed to stabilize the surface area, with wetting and the use of chemical dust suppressants being the principal means of control. Although these measures have largely proven effective, given the size of the tailings impoundment, weather conditions, and the nature of high-wind events that can overwhelm currently available control measures, the control of windblown dust presents unique challenges.

FMSI has five all-track vehicles that are used to apply Magnesium Chloride ($MgCl_2$) as a dust control agent. The number of all-track vehicles necessary to provide the dust suppressant depends upon weather conditions and tailings surface conditions. As described in the Tailings Dam Dust Control Management Plan, FMSI tailings personnel are required to perform daily inspections which help identify signs of fatigue and areas susceptible to high wind events. The results of this inspection are used to determine the need for additional dust control measures. In addition, a weekly activities report is completed every week to detail the areas where fresh tailings deposition, $MgCl_2$ application and water application occurred, along with any notes the supervisor has about the weekly activities that occurred on the tailings impoundment related to dust control.

On December 26, 2019, FMSI observed that water flow had been lost from the #76 barge, one of three barges on the tailings impoundment pond. The barges on the impoundment pond are utilized to pump water from the tailings impoundment to the process area to be reused. Upon further investigation, it was determined that the pipe had broken off of the barge and the barge was not able to pump any water from the tailings pond to the process area at that time. Managing the pond size on the impoundment is critical to ensure our dam stability safety

factors set forth by the Engineer of Record are met, as well as comply with FMSI's Aquifer Protection Permit (APP) #P-101679. If the pond has a greater volume of water, the impoundment will experience a greater amount of pressure which can influence our impoundment stability safety factors. In addition to the Engineer of Record factors of safety, FMSI's APP, number #P-101679 Table 4.2.1 guidelines, states that FMSI must maintain no less than 2,000 feet of beach distance from the pond to the crest of the impoundment. This requirement helps to safeguard the stability of the impoundment. FMSI ensures that all three barges are able to operate to manage the pond size effectively. In order to pull a new 16" pipe out to barge #76, FMSI has to manually walk a rope around the pond from the west end to the east end. After the rope is in place, one end of the rope is attached to a dozer and the other end to the 16" pipe. The dozer then must pull the pipe into the pond towards the barge using the rope, once the pipe is near the barge, the Tailings department employees can attach the pipe to the barge. At this time, FMSI was depositing on the south dam while the north dam was resting enough to be able to walk on the surface near the water's edge in order to manually walk the rope around the pond from the west to the east side. The rope was scheduled to be manually walked around the pond on January 13, 2020, because FMSI determined this would provide adequate time for the surface to dry out enough to allow FMSI personnel to safely walk near the pond. FMSI had scheduled to start the "final fill" of fresh tailings deposition on the north dam during the week of January 13, 2020 after the 16" pipe had been placed at the #76 barge. According to the National Weather Service there were no forecasted high wind events in the vicinity of the tailings impoundment through the week of January 13, 2020.

Although no high wind events had been forecasted, on January 9, 2020, the National Weather Center posted a high wind advisory for that day. During the week leading up to the January 9, 2020 event FMSI applied 67,250 gallons of $MgCl_2$ to the tailings impoundment and 371,000 gallons to areas in and around the tailings impoundment. On January 9, 2020 the Sierrita Tailings Impoundment experienced sustained winds in excess of 25 mph with gusts as high as 48 mph as evidenced by a 7 (28 - 33mph) on the Beaufort Scale. Furthermore, the 10M weather station, the closest to the north side of the impoundment, as well as the "cow" station measured sustained winds greater than 25 mph. The third station, Tailings_1, measured sustained winds periodically greater than 25 mph. The Tailings_1 weather station, however, is partially blocked by the new berm push on the south dam which was completed on January 7, 2020.¹ During this high wind event, dust was observed to be intermittently emanating from the north and north eastern direction from the north dam. In response, four water trucks were immediately dispatched to the area and three all-track vehicles were dispatched to areas that were accessible. Immediately thereafter, the decision was made to switch deposition from the south dam to the north dam to try to mitigate the majority of the dust because most the impacted area was not accessible by all-track vehicle or manual application due to the still soft ground. Deposition on the north dam was started shortly thereafter. A total of 20,250 gallons of $MgCl_2$ and 224,000 gallons of water were applied to areas in and around the tailings impoundment on the day of the event. The Tailings Supervisor also adjusted the daily operating schedule by concentrating supplemental efforts on dust control, stopped all earthwork projects and started a 24-hour coverage shift starting on January 10, 2020 to concentrate on dust control efforts. As of the week of February 17, 2020, the rope is in place on the impoundment and the repairs to the 16" pipe on the #76 barge are underway.

FMSI employs a very comprehensive dust control management program; however, due to the high sustained winds, dust control measures were overwhelmed and resulted in excess opacity. The corrective actions taken to return to compliance are detailed in the excess emission and permit deviation reports submitted to PDEQ.

Corrective actions and preventive measures

To ensure compliance and to minimize the potential for a similar dust event, FMSI has identified the following actions that have or will be taken to improve dust control practices at the tailings impoundment:

¹ FMSI relocates the weather station after the berm push.

Tailings Dust Control Management Team

In January 2019, FMSI formed a Tailings Dust Control Management Team that focuses exclusively on controlling dust in and around the tailings impoundment. This team consists of Tailings and Environmental department personnel. The team tracks Key Performance Indicators and on-going projects that are focused on improving dust control practices. In 2019, the team accomplished many of its objectives such as the creation of a dust crew to focus on dust mitigation; developed and implemented manual application of $MgCl_2$; visited other mine sites to review Best Management Practices for dust mitigation; subscribed to the Planet database to access daily aerial images of the impoundment; developed and implemented a wireless Trimble GPS system to help track all-track application of $MgCl_2$ on the impoundment; evaluated various types of equipment to improve $MgCl_2$ application by being able to access areas of the impoundment that are not accessible by all-track vehicle; conducted two alternative dust suppressant studies on the Esperanza and the Sierrita Tailings Impoundments; negotiated a contract to utilize a contractor to apply $MgCl_2$ to cover large stable areas of the impoundment at a faster rate; adjusted personnel schedules to 24-hour coverage at the impoundment when needed to mitigate dust and utilized resources from other departments to help cover the 24-hour shifts dedicated to dust mitigation. Following the January 9, 2020 event, the team has collaborated on tracking $MgCl_2$ application and deposition on the impoundment, identifying hot spots, inspecting the hot spots and developing a plan to mitigate any dust issues in those areas. During this time, the team also started to utilize a phone application called, Windy, to provide an additional source to identify upcoming high wind or storm events. The Windy app provides real-time wind data from nearby weather stations. Thus FMSI can access data directly. Since the event on January 9, 2020, this application has helped FMSI be successful in proactively developing and implementing plans to mitigate dust prior to 3 high wind events forecasted on the 10-day weather forecast. The team is committed to continuing to evaluate best management practices for tailings impoundment dust control.

Dust Response Team (DRT)

FMSI is in the process of implementing a Dust Response Team (DRT) that will focus on dust mitigation at Sierrita. The team will be comprised of personnel from various departments who are trained on the all-track and water truck equipment and are familiar with the tailings impoundment. The DRT members can be called out to help with dust mitigation before, during and after a high wind or storm event. This team will allow FMSI to implement 24-hour coverage at a faster rate to prepare for and respond during and after high wind or storm events.

Personnel and Scheduling

In addition to the creation of the dust crew, mentioned in the Tailings Dam Dust Control Team section above, FMSI has hired an additional supervisor for the dust crew. The additional supervisor has expanded the supervisor coverage to 7 days a week on the impoundment. This change in personnel scheduling will improve FMSI's response to address any hot spots that may develop over the weekend.

Aerial Drone Audit Pilot Program

In 2019, FMSI conducted a pilot program to fly a drone over the impoundment to take pictures of the impoundment condition. The areas of focus were areas that had not received deposition and could have become hotspots in a high wind or storm condition. The aerial photos were evaluated to determine if they provided a useful view of the entire impoundment and could be used in conjunction with the daily surface area inspection. During this evaluation, it was decided that the drone images were taken too close-up making it hard to determine where on the impoundment the images were taken from. After the January 9, 2020 event, FMSI took drone images of the impoundment from a distance which proved to be a

very useful tool to identify potential hot spots. FMSI is currently evaluating the use of drone images before and after a forecasted high wind or storm event to identify potential hot spots.

Agile Cross-functional Planning

FMSI has implemented “agile” cross-functional dust mitigation project planning methods to improve the identification of tasks or projects for dust mitigation that may have a high impact and are relatively easier to accomplish. FMSI has identified more opportunities to improve our dust mitigation through this method such as tailings inspection training, dust crew training, better $MgCl_2$ application and deposition planning, the Dust Response Team, weekly Dust Management Team inspections of the impoundment and an aerial $MgCl_2$ trial (see Trial Aerial $MgCl_2$ Application section below).

GPS Units on All-track Vehicles

In April of 2018, FMSI installed GPS units on the all-track vehicles. The GPS units gave FMSI the opportunity to better track the areas of $MgCl_2$ application. This software, used in conjunction with daily surface area inspection helped FMSI identify any areas of the impoundment that did not receive $MgCl_2$ application. In 2019, FMSI stopped using this software due to licensing issues, as well as time constraints in the transfer of information from the GPS unit to a computer utilizing a USB jump drive. To alleviate the time constraint obstacle, FMSI updated all of the GPS units to run on a wireless cellular connection on each all-track vehicle. At this time, FMSI is still working on resolving technical issues.

Dust Suppressant Study

In 2018, FMSI had identified that our reportable dust events frequently occur due to damage sustained during the monsoon season and started to explore other options for dust suppressants during that time of year. In July of 2018, FMSI conducted a dust suppressant study on the inactive Esperanza Tailings Impoundment. The purpose of the study was to experiment with various dust suppressant products during monsoon season to identify if any were able to stand up to the monsoon storms and not be washed away like $MgCl_2$. At the conclusion of this study, FMSI identified some promising products that have comparable infiltration rates to $MgCl_2$. FMSI is very cautious of the products applied to the surface of the impoundment to ensure that water will be able to infiltrate through the surface and not contribute to any stability concerns. In 2019, The Engineer of Record gave FMSI the approval to test two dilution ratios of the product that performed well on the inactive Esperanza Tailings Impoundment on the active Sierrita Tailings Impoundment. The study started in June 2019 and is still ongoing at this time.

Trial Aerial $MgCl_2$ Application

In 2019, FMSI evaluated local aerial $MgCl_2$ application companies. The evaluation included the effectiveness of aerial applications in the past, the possible airports the aircraft will depart from, if the airports will allow $MgCl_2$ to be stored in bladders on the airport property, the corrosivity factor of $MgCl_2$ on the aircraft, the availability of a pilot and aircraft and total cost of operation. During the initial evaluation, FMSI was not able to find any local companies that were willing to put $MgCl_2$ in their aircraft due to the corrosive nature of $MgCl_2$. It was also determined that due to factors such as unpredictable bad weather and aircraft availability it would be challenging for aerial $MgCl_2$ to have a high impact on dust mitigation. Following the January 9, 2020 event, FMSI was able to contract with a company that was willing to do a trial of $MgCl_2$ application so that the effectiveness of this application technique could be evaluated. The trial is scheduled to take place in late February.

FMSI is committed to continuous improvement of its dust control measures at the tailings impoundment. If there are additional concerns or questions regarding these responses, please contact Natalie Nunez, Senior Environmental Scientist, at (520) 393-2376.

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

David Rhoades, President and General Manager

 

(Signature) (date)