



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

December 14, 2018

Via e-mail: air.permits@pima.gov and
Certified Mail: 7017 3380 0000 0803 5861

Return Receipt Requested

Mr. Dustin Fitzpatrick
Air Compliance Manager
Pima County Department of Environmental Quality
33 N Stone Ave, Suite 700
Tucson, Arizona 85701

Re: Notice of Violation # PC 1810-033
Freeport-McMoRan Sierrita Inc., Title V Air Quality Permit # 6067

Dear Mr. Fitzpatrick:

Freeport-McMoRan Sierrita Inc. (FMSI) is in receipt of the Pima County Department of Environmental Quality (PDEQ) Notice of Violation, dated November 13, 2018, relating to fugitive dust events at FMSI's tailings dam between September 18 and November 6, 2018. As directed by that notice, FMSI is providing requested compliance documentation, including a 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 dam 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 dam, 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 tailings dam personnel have four 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. As described in the Tailings Dam Dust Control Management Plan, FMSI tailings dam 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 deposition, $MgCl_2$ application and water application occurred, along with any notes the supervisor has about the weekly activities that occurred on the tailings dam related to dust control.

In the excess emissions reports submitted to PDEQ on October 9 and 10, 2018, FMSI reported to PDEQ a total of 3.5 inches of rain fell on the tailings dam; however, upon review of calibrated weather stations surrounding the tailings dam rainfall was actually as high as 6.4 inches. This rain event was categorized as a 6-hour, 500-year rainfall event according to information provided by NOAA. In addition, on October 2, 2018, the tailings dam received an additional 1.5 inches of rain. Due to the large amount of rain, $MgCl_2$ that had been applied to the tailings dam before the event lost its binding properties and was unable to bind to the

tailings material. In the prior month leading up to the events on October 6 and 7, 2018, a total of 78,750 gallons of $MgCl_2$ was applied on top of the tailings dam.

After the large rain event on September 20, 2018, efforts were made to begin applying $MgCl_2$ to all areas of the tailings dam, most importantly the areas on the surface that are susceptible to high wind events (hot spots) identified during the daily inspections. However, due to some extremely moist surface areas of the tailings dam, one All-track vehicle became stuck on the impoundment and others could not travel certain areas inside the tailings dam due to the probability of getting more equipment stuck in the impoundment. To control fugitive dust from the berms and side slopes of phase 1, 2 and 3 of the North dam, 4,400 gallons of gorilla snot was applied on October 9 and 10, 2018. Starting on October 8, 2018, additional support from the Mine Operations department was used to help ensure all available dust control efforts were being used, including All-track vehicles for $MgCl_2$ application. On October 10, 2018, tailings dam staff switched deposition from phase 1 and 2 of the South dam to phase 2 of the North dam to help mitigate dust observed in a hot spot.

Beginning on October 11, 2018, the tailings dam supervisor adjusted the deposition schedule to cover a larger area of the impoundment in less time by moving deposition every one and a half shifts versus every two and a half shifts. Additionally, the daily operating schedule was increased to 12-hour shifts and employees from the Mine Operations department were called in to assist with dust control efforts.

FMSI employs a very comprehensive dust control management program; however, due to the tailings dam being damaged by the 6-hour, 500-year storm event and high sustained winds during subsequent dust events, dust control measures were overwhelmed and resulted in excess opacity. The corrective actions taken to return to compliance during each dust event 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 dam:

Review and update FMSI's Tailing Dam Dust Control Management Plan

FMSI is in the process of updating its "Tailings Dam Dust Control Management Plan," (TDDCMP) to incorporate changes to address the deficiencies identified in the NOV PC1810-033. For example, FMSI will implement a contingency plan for forecasted high wind or storm events and will also develop a plan for after heavy rainfall events. In the days prior to a forecasted high wind event, FMSI will identify areas of concern using any or all of the following methods; surface area inspection, GPS tracking review and aerial observations. If appropriate, the operating shift for $MgCl_2$ application can be switched to a 24/7 operation where $MgCl_2$ is applied both manually and mechanically. Manual application of $MgCl_2$ consists of application through the use of hoses attached to an All-track vehicle. Mechanical application of $MgCl_2$ consists of application through the use of the sprays on the All-track vehicles. Applying $MgCl_2$ both manually and mechanically should allow FMSI to effectively cover any windblown tailings material collected on the interior of the active berm and in canyons, in addition to the rest of the tailings impoundment surface. This method should also allow FMSI to treat the area closest to the water's edge without getting equipment stuck in the tailings material.

After a heavy rainfall event, FMSI will inspect the tailings impoundment to determine what level of degradation has occurred. If the inspection of the tailings dam surface identifies any areas of degradation, $MgCl_2$ will be applied either manually or mechanically. If a large portion of the tailings impoundment is degraded after a heavy rainfall event, the $MgCl_2$ application will be switched to a 24/7 operation using additional resources from other departments at FMSI.

As part of FMSI's commitment to dust control at the tailings dam, FMSI is in the process of investigating new technologies and innovative control methods. FMSI's environmental group

is conducting a dust suppressant study on the inactive Esperanza Tailings Impoundment. FMSI has also installed GPS units on All-track vehicles to better track dust suppression applications. FMSI is continually trying to utilize the best available work practices and dust control technology to manage the tailings impoundment. The FMSI Environmental and Tailings Dam teams are working together to ensure the upcoming revision of the TDDCMP will include the most effective means to control dust. FMSI will submit a revised plan to PDEQ by March 31, 2019.

Personnel Scheduling

As discussed above, FMSI revised its schedule for tailings personnel to allow the facility to stabilize the surface of the impoundment. FMSI will continue this scheduling flexibility according to weather forecasts and surface conditions on the tailings dam. FMSI management approved 24/7 shifts and weekend shifts for assistance in applying the dust suppressant to the tailings dam surface if needed. The availability of these employees will help ensure commensurate measures are taken to address high wind events before and after they occur.

Tailings Dust Control Management Team

FMSI has recently 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. As a part of this process, the team has visited the Morenci Mine and the Asarco Mine to gain a better understanding of dust control management practices utilized at other mine sites. Some of these practices, such as the manual hose application of $MgCl_2$ have already been implemented at FMSI. The team will continue to evaluate best management practices for tailings dam dust control.

Aerial Drone Audit Pilot Program

FMSI is conducting a pilot program to fly a drone over the impoundment to take pictures of the condition of the impoundment. The areas of focus will be in areas that have not received deposition and could become hotspots in a high wind or storm condition. The aerial photos will be evaluated to determine if they provide a useful view of the entire dam and can be used in conjunction with the daily surface area inspection.

Tailings Dust Control Team

FMSI is planning to increase headcount to create a dust control team within the tailings operation department. The dust control team positions will focus on dust control efforts in areas on and around the tailings impoundment. This team will inspect the dam, apply $MgCl_2$ both manually and mechanically, operate water trucks, track the weather patterns and prepare for upcoming storm or wind events.

GPS Units on All-track Vehicles

In April of 2018, FMSI installed GPS units on the All-track vehicles. The GPS units give FMSI the opportunity to better track the areas of All-track application. This software, if used in conjunction with daily surface area inspection and aerial photos will help FMSI identify any areas of the impoundment that did not receive $MgCl_2$ application.

Dust Suppressant Study

FMSI has identified that our reportable events frequently occur due to damage sustained during the monsoon season and are exploring other options for dust suppressants during that time of year. In July of 2018, FMSI started a dust suppressant study on the inactive Esperanza Tailings Impoundment. The purpose of this study is to experiment with various dust suppressant products during monsoon season to identify if any were able to stand up to the monsoon storms. The study is ongoing and we have identified some promising products

that will be presented to the Tailings Stewardship Team for approval for experimental application on the active tailings impoundment.

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)