Cadia Dust Management Update – DPIE August 2021

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1. PURPOSE

To provide DPIE with an update on the activities associated with dust management at Cadia.

The update includes information on;

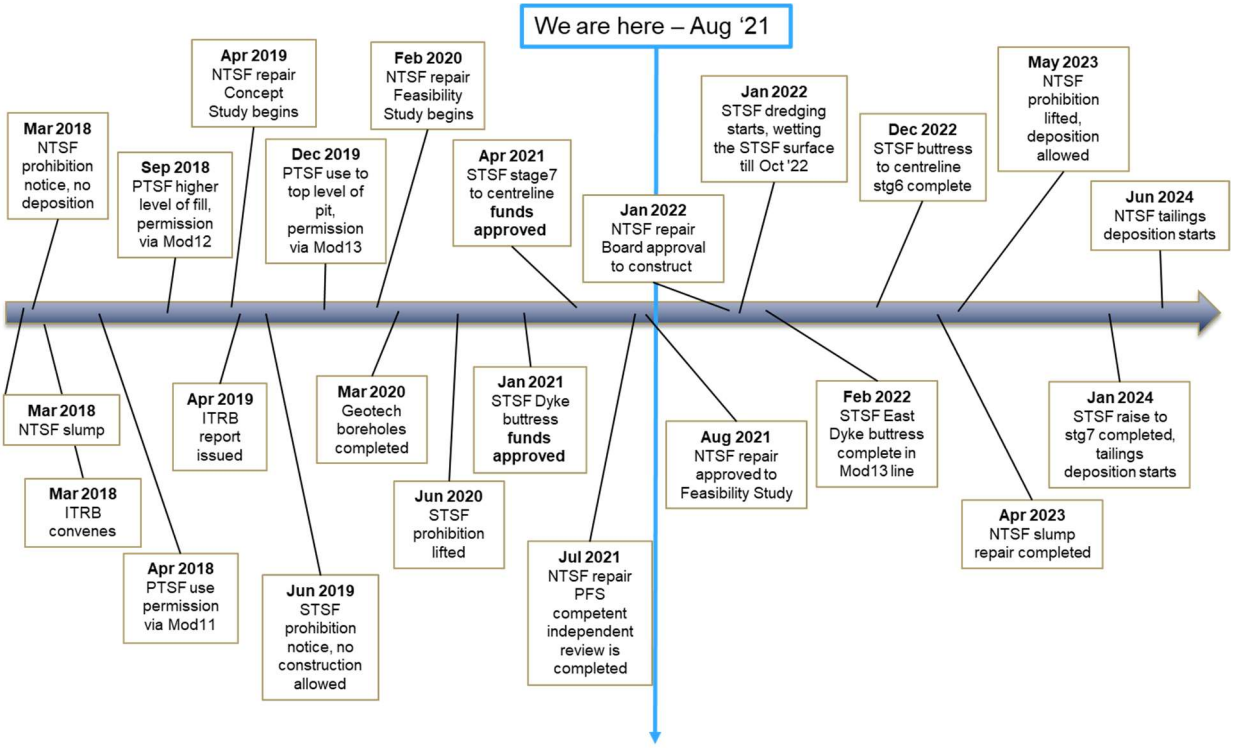
- Tailings Storage Facility Program of Works;
- Dust Management Programs; and
- Community Health and Environmental Monitoring Programs.

2. TAILINGS STORAGE FACILITY PROGRAM OF WORKS MARCH 2018 TO DATE

Error! Not a valid bookmark self-reference. provides an overview of events which have occurred since the slump of the Northern Tailings Storage Facility (NTSF). Following the slump occurring a prohibition notice was issued to Cadia to prevent further tailings deposition until the wall could be repaired. This resulted in a significantly reduced moisture content of the surface of the NTSF which was more susceptible to dust lift off. In addition to the prohibition notice on the NTSF a prohibition notice was also issued for the Southern Tailings Storage Facility (STSF) preventing construction works from June 2019 to June 2020. This Prohibition Notice also prevented ongoing tailings deposition in the STSF which resulted in the reduction of the moisture content in the tailings surface. The inactive tailings deposition also coincided with drought conditions further reducing the moisture content of the TSF surfaces.

Significant project work has been completed since the NTSF slump occurred to assist with future design plans for ongoing TSF construction. This included extensive drilling programs around each of the TSF's to further define foundation material to inform designs to meet and exceed ANCOLD Factor of Safety Guidelines.

Figure 1: Timeline of Events March 2018 to Date



**Activities and timeframes post-Aug 2021 are indicative only and are subject to market and operating conditions, regulatory approvals and potential delays due to COVID-19 impacts.*

3. TAILINGS STORAGE FACILITY DUST MANAGEMENT PROGRAM

Cadia has invested ~$29M over the past three years to minimise and prevent dust lift-off in spite of numerous significant challenges presented by the scale and complexity of this issue and compounded by the severe drought conditions experienced in 2017 to early 2020.

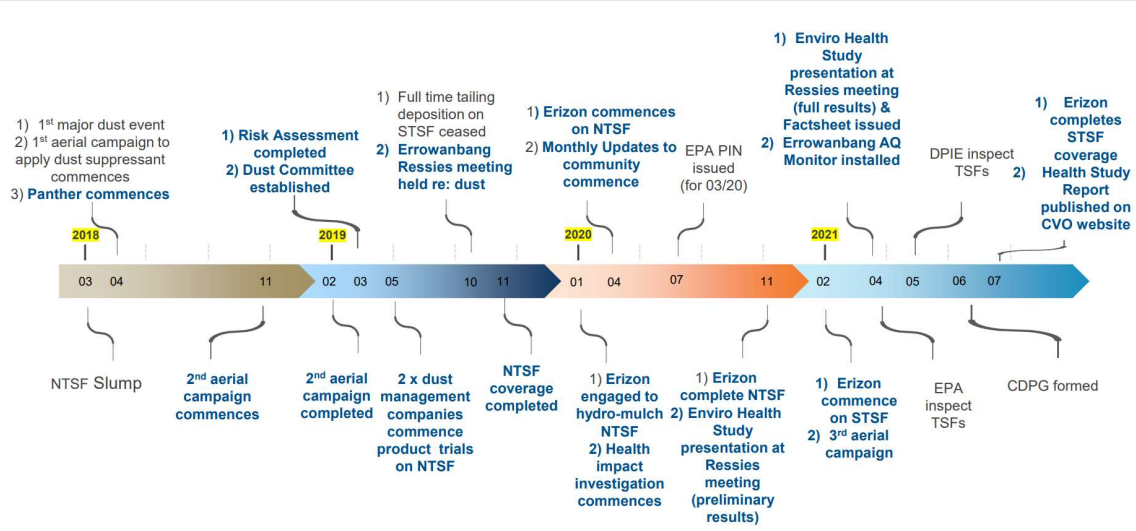
Cadia has invested significantly into a wide range of methods and alternatives to minimise and prevent dust lift off from the TSFs. The issue presents numerous technical challenges which have required novel solutions to overcome, however many of these challenges persist with ongoing dust suppression activities. These challenges include:

- Large affected area of ~800 ha.
- Unconsolidated surface that becomes wet and boggy after rainfall, requiring specialised equipment. Some areas remain inaccessible to any form of equipment.
- Inert growth medium for vegetative covers.
- Wildlife accessing the treatment areas and causing damage to the covers.
- COVID-19 which has impacted on contractor personnel availability and travel for product trials.

Figure 2 provides a timeline of dust management methods and community health studies. This section will focus on information relating to dust management programs.

Further details of works conducted regarding community health studies is referenced in Section 4.

Figure 2:Timeline of dust suppression and community health studies.



Cadia has worked to determine the most effective form of dust control for the TSF's since 2018. This included the following methods:

- Ground application of various polymer dust suppressant products;
- Aerial application of various polymer dust suppressant products;
- Ground application of hydromulch dust suppressant product, containing grass seed and fertiliser; and
- Management of riling erosion on the TSF surface.

These activities have required the development of novel solutions. Key innovations made throughout this time:

- A specialised low ground pressure trailer (Figure 3 to mount their hydro-mulch application tank and nozzles (like a water cannon) to allow the application of the hydro-mulch product across the interior surface of the NTSF (except the decant area that is under water);
- A grid-based monitoring system to identify dust lift-off patches and assess product performance, drone and ground camera footage and visual inspections;
- Use of a modified 'paddock roller' to ensure a consistent coverage.

3.1 Ground Application of Polymer Products

Investigations into ongoing dust management options for the TSF's were in progress prior to the NTSF wall slump. This included trailing various polymer products to the surface with ground-based equipment (Panther) to target potential dust prone areas where tailings deposition was not occurring.

The Panther is continuing to apply polymer product as required as a part of the maintenance program to assist in repairing previously applied hydromulch cover on the NTSF as an immediate response action.

3.2 Aerial Application of Polymer Products

Following the slump and resulting non-active tailings deposition in the NTSF a review of the ground-based application of the polymer was conducted, and a decision made to cover the entire surface of the NTSF with a polymer using aerial application methods. This first aerial application on the NTSF occurred in April 2018.

The second aerial application of polymer product occurred in February 2019 following the breakdown of the first product.

Prior to the application of the hydromulch product on the STSF a third aerial campaign was conducted in February 2021. This campaign was conducted to provide a cover on the STSF whilst works were progressing to cover the STSF surface with hydromulch.

A fourth aerial campaign is being conducted in August and September 2021 to apply a polymer product to areas that are not accessible by ground-based equipment with the hydromulch product.

Aerial campaigns will continue until deposition recommences on both dams as required in the Spring prior to onset of summer conditions.

3.3 Hydromulch Application

Due to the learnings from the application of the polymer product and its ability to maintain its competency in being effective in the management of dust, a decision was made to engage two dust management companies to trial various dust suppression products.

The trials were conducted to determine a product that had the ability to control dust over a longer time frame.

Hydromulch consists of a mixture of organic fibres, water, polymers, condition, a specially formulated grass seed mix and fertilizer. The objective of hydromulching is to form a layer across the surface of the dam and promote a grass coverage to suppress dust. It is applied using purposely engineered trailer rigs that have the ability to traverse the TSF surface.

Hydromulch application of accessible areas with ground-based equipment was competed on the NTSF in November 2020. The STSF was completed in July 2021.

Maintenance of the hydromulch surface will continue on an ongoing basis until deposition recommences in both TSF's. Cadia will have a condition in the EPL5590 that requires this to be conducted.

Figure 3 provides an image of the application of the hydromulch with the specifically engineered Tractor and low-ground-pressure spray trailer.

Figure 4 shows hydromulch and polymer application as at November 2020.

Figure 5 provides an image demonstrating the progression of application of hydromulch on the STSF which was completed in July 2021.

Figure 6 provides an aerial view of hydromulch application on the STSF.

3.4 Management of Riling Erosion on the Surface of the TSF's

Erosion rills have formed across the surface of the TSF's following rain events. There have been attempts to fill or remediate these areas, however this has resulted in more widespread damage to dust suppression cover by diverting rainfall runoff to other areas. The current, and more effective approach is to manage these erosion rills as controlled water drainage pathways by using hay bales to lower the water velocity and reduce the risk of the channels increasing in size or propagating elsewhere.

4. COMMUNITY HEALTH STUDIES AND ENVIRONMENTAL MONITORING

4.1 Community Health Studies

Between 2020 and 2021 Cadia completed a comprehensive Study into the potential environmental health impacts of the tailings dust (including mine ventilation emissions). A "tailings dust environmental health assessment and monitoring study review" was completed which peer reviewed a number of specialist studies and consolidated the findings into a health assessment.

Supporting technical studies included in this assessment were:

- Geochemical characterisation of the tailings by Earth Systems Consulting;
- Assessment of drinking and stock water chemistry from farms surrounding Cadia by Earth Systems Consulting;
- An Air Quality Monitoring Plan for the TSFs by Todoroski Air Sciences;
- Ventilation shaft air dispersion modelling by Todoroski Air Sciences;
- Health, Safety and Environmental Hazard Classification of the tailings by Callander and Johnson Consultancy Services.

Additionally, Cadia engaged Mr. Paul Harrison, from Serinus Health, Safety and Environment, to peer review the program of work and reports (a specialist consultant in occupational health and safety and environmental management with more than 30 years of experience and expertise).

The Study work program encompassed:

1. Laboratory testing of geochemical and mineralogical composition of tailings and tailings dust;
2. Monitoring of ambient air concentrations of respirable crystalline silica (RCS) from vent emissions and assessment of the potential exposure risk to the community from RCS based on ambient air monitoring;

3. Monitoring of ambient air concentrations of PM10 and PM2.5 particulate matter and assessment of the exposure risk to the community from PM10 and PM2.5 based on ambient air monitoring;
4. Testing and reporting on drinking water and water from farm dams used for livestock watering;
5. Undertaking a Materials Hazard Assessment for Cadia's tailings, including ore processing reagents, dust suppression products and potential breakdown by-products.

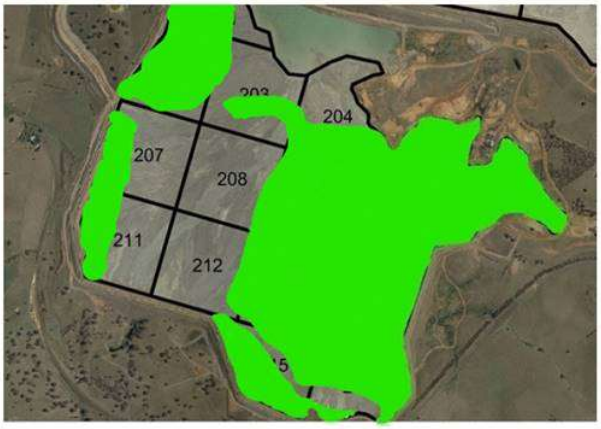
At the completion of the Study, Serinus concluded: "*Based on the data and information available from the Tailings Dust Environmental Health Assessment and Air Quality Monitoring Study, and the ambient dust levels measured by the Study, there is no current evidence to suggest that dust from the Cadia tailings storage facilities or emissions from the mine ventilation system pose a health risk to the community.*"

Figure 3: Hydromulch Application

Figure 4: Hydromulch (brown) and Polymer (aqua) Application November 2020

Figure 5:Progression of Hydromulch Application on the STSF June – July 2021

Hyrdomulch on STSF as at 1 July 2021



Hyrdomulch on STSF as at 1 June 2021

Hyrdomulch on STSF as at 30 July 2021

Figure 6: Hydromulch Coverage on STSF – Aerial View Looking South East

4.2 Operational Monitoring

Cadia has a monitoring system in place to detect and respond to dust lift-off events. Four real-time dust monitors are established on the NTSF perimeter (Figure 7 and Figure 8). These instruments are set up to receive automatic notifications if the PM10 level reaches a threshold. This notifies Surface Operations Team and the Cadia Operations Control Room.

Following receipt of an alert, a physical dam inspection is conducted to identify the cause of the dust and mobilise equipment in response, if required.

Drones are also used to provide supporting imagery.

Visual monitoring of the TSF surface is also conducted three times per shift and any issues identified and reported to the Tailings Supervisor. Increased inspections are conducted during high wind events.

In the even that dust lift off is identified, the area is inspected, mapped and prioritised for re treatment.

Figure 7:Envizo Real Time Performance Monitoring

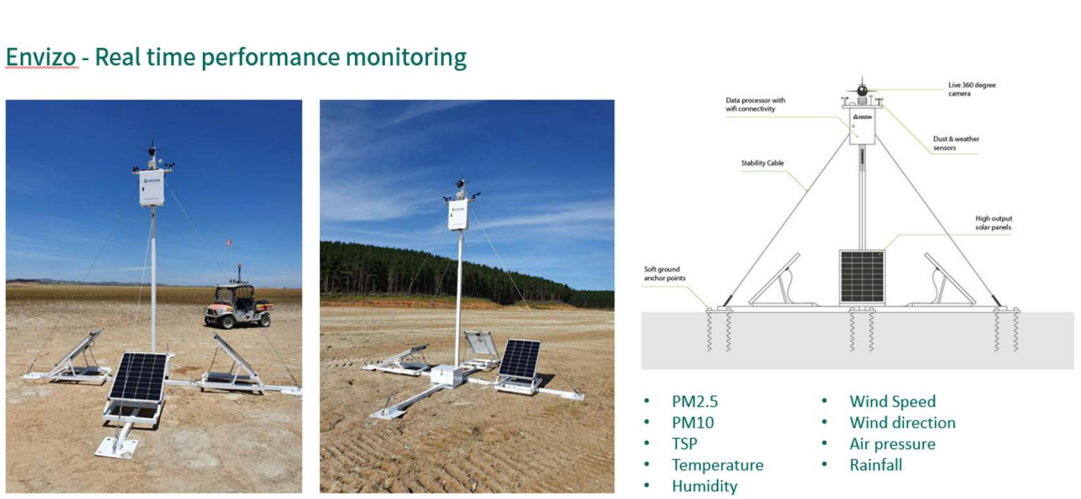


Figure 8:Monitor Locations

A site-specific weather forecast system has been developed at Cadia to identify conditions that could lead to a variety of safety and environmental hazards. Cadia has worked with WeatherZone to incorporate real-time weather data from its weather stations to provide more accurate and site-specific forecast conditions.

In July 2020 approximately 30 local households in the area were contacted with an offer to receive a 7 Day Weather Forecast that includes a 'Dust Forecast'. 17 households currently receive the weekly forecast.

Cadia has made offers to all local landholders to visit the site to view the dust management activities however no community members responded to these offers.

5. COMMUNITY ENGAGEMENT

Cadia provides the following engagement with respect to dust management.

- Monthly updates on dust management projects and responses to complaints;
- Quarterly updates on dust management projects in the Cadia Community Consultative Committee (CCC);
- Information on dust management projects in Cadia District Newsletter;

All of the above documents are also available on the Cadia Valley Operations Website.

In addition to the above the following stakeholder engagement activities are being conducted;

- Ongoing meetings with the Cadia District Protection Group; and
- Development of a stakeholder engagement plan for future TSF construction works.