Mount Rosser Rehabilitation Project

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OBJECTIVE

Alcan's overall aim is to rehabilitate its former bauxite residue landfill site at Mount Rosser; ultimately, rendering the site safe and transforming it into an aesthetically attractive area.

PROPOSED PROJECT

The rehabilitation of Mount Rosser requires the de-watering of the ponded water on the Mount Rosser landfill site as the first step in the work programme. The work entails building access tracks and ditches to control the rainwater entering the Mount Rosser landfill site, building a small water treatment plant, treating and then pumping away the ponded water into an adjacent soakaway. Alcan has applied to NEPA for permits in order to undertake the construction work and a public presentation is part of the necessary procedure.

When the water has been pumped away, the exposed bauxite residue will be re-graded so that rainwater no longer collects, and the area then re-vegetated. This project will very significantly reduce the current hazards associated with the landfill and transform it into a safe, aesthetically attractive area that can be returned to the Government.

BACKGROUND

In March 2001, Alcan Inc. ("Alcan") sold all of its Jamaican mining and manufacturing operations to Glencore Alumina Jamaica Limited, which are now operated by the West Indies Alumina Company (Windalco), a joint venture of Glencore and Jamaica Bauxite Mining Limited. As a part of the sale, Alcan retained ownership of a number of bauxite residue landfill sites and waste tips that were formerly used to serve its Ewarton and Kirkvine bauxite mines and alumina refineries. At the time of the sale an agreement was entered into with the Government of Jamaica, which among other things, provided for Alcan to remediate these sites.

Figure 1: Mount Rosser looking north

In 2002, Alcan appointed a UK based company, RPS Group Plc (RPS), one of the largest European environmental consultancy firms, to provide the necessary independent specialist environmental and engineering advice. In 2006, Alcan appointed Environmental Solutions Limited (ESL) to provide additional advice relating to this project.

The Jamaica Bauxite Institute (JBI) was appointed by the Government of Jamaica to act on its behalf in agreeing the closure process and criteria and it has co-ordinated many meetings and extensive consultations with the following regulators and stakeholders to facilitate this, including:

- Water Resources Authority (WRA)
- National Water Commission (NWC)
- National Environmental and Planning Agency (NEPA)
- Commission of Mines
- Commission of Land
- Ministry of Health, Environmental Health Unit

As part of this programme, Terms of References were submitted on 23rd April 2005 and subsequently approved by JBI and the regulators. Comprehensive site investigations were conducted and a detailed strategy has been completed in order to meet the various requirements and the stipulations laid down by the above regulators. In December 2005 applications were submitted to NEPA for the following:

1. Permit to construct the rainwater diversion ditches
2. Permit to install a small, temporary water treatment system
3. Licence to discharge treated Mount Rosser water

Subsequent discussions resulted in additional site investigations and data submissions being undertaken. As part of the communications and feedback process, a public presentation to communities affected by the work is planned and this document sets out to provide the information for that purpose.

Mount Rosser Bauxite Residue Landfill Site

The site is located to the north of the Ewarton plant and is adjacent to the main highway linking Spanish Town to Ocho Rios. The Mount Rosser bauxite residue landfill was initially constructed in 1959 to act as a tailings pond to take the bauxite residue from the Ewarton plant situated about 5km away. The bauxite residue was pumped as slurry comprising about 20% solids to the site over a period of about 32 years up until 1991. When the site was replaced, by the Charlemont Mud stacking and drying facility in 1986, Mount Rosser was used as a back-up storage facility; after 1991 no more bauxite residue was sent to the site. Due to natural settlement, the residues formed a depression that has subsequently filled with rainwater and liquor bleed from the bauxite residue and exhibits poor water quality. The present document sets out the procedure for the de-watering, re-grading and vegetation of the site.

In its present state the site contains bauxite residue covered by approximately 1.5 million cubic metres (m^3) of ponded water with an average depth of about 6m with an alkaline pH and an elevated sodium level. The ponded area gets continuously recharged with stormwater runoff from the surrounding hillsides, a catchment area of approximately 100ha.

The bauxite residues in Mount Rosser comprise the material that remains after the alumina has been extracted from the locally mined bauxite. Bauxite is primarily composed of aluminium hydroxides with a high proportion of iron oxides and lesser amounts of titanium oxide, calcium oxide, magnesium oxide and then traces of other oxides. The bauxite residue that remains after the extraction of the aluminium hydroxide comprises the same elements but in a higher proportion as most of the aluminium hydroxide has been removed. Caustic soda (sodium hydroxide) is used in the extraction process and despite strenuous efforts by the plant to recover all the caustic soda at the end of the process; some always remains in the bauxite residue.

The presence of small quantities of sodium hydroxide in the bauxite residue causes the alkaline nature of the ponded water in Mount Rosser. In August 2006, the pH level for the water in Mount Rosser was 10.2. [Note that pH is a scale used to measure whether solutions are acid (such as vinegar pH 3 to 4) or alkaline (such as washing soda, pH 10 to 11)].

PROJECT STEPS

The first step is to significantly reduce rainwater from the surrounding hills flowing into the ponded area above the bauxite residue landfill. It is proposed that this be achieved by building ditches along the sides of the lake to collect the water running down the hillside and diverting this rain water into a safe area, thereby stopping the water level rising. Access tracks will need to be built on the west and east sides of the lake shore in order to construct these ditches.

The next step is to treat the water by partial neutralisation; this will have the effect of eliminating the chance of the water causing any skin irritation or other problems attributable to a high pH value. Either the whole ponded area will be partially neutralised, as is currently done at one of Alcan's plants in Quebec, or a small area in the northern part of the lake will be dammed and the partial neutralisation undertaken in this area in a stepwise manner. This area that may be dammed off is called the North Finger and is shown on the attached plan. The partially neutralised water will then be discharged into an adjacent soakaway and the partial neutralisation of the water continued until all the water has been removed. When all the water has been removed, the area will be re-graded to allow for a free draining area.

In the final step, the bauxite residue area will be worked in a way to allow it to partially dry out and the area is then treated with gypsum, organic material and fertiliser are added, and then seeded. This process, which is the result of extensive research and trials over the past 10 years, has been found to give safe, effective and sustainable re-vegetation of bauxite residue areas in Kirkvine.

ALTERNATIVE APPROACHES CONSIDERED

A number of alternatives were considered to the proposed plan, the main ones were:

1. Convert to a drinking water reservoir
2. Leave water in situ.

It is recognised that there is a shortage of potable water reservoirs in the area and consideration was given to converting the existing ponded area to a reservoir for drinking water. The idea was reviewed but rejected primarily because of concerns over being able to guarantee the long-term integrity of the liner that would be required for separating the water from the alkaline bauxite residue underneath.

It is accepted that the Mount Rosser water has now taken on an attractive appearance and no action would still leave an aesthetically attractive area, however, the alkaline nature of the lake and the very soft nature of the mud under the water means that it would be unsuitable for swimming. The dam on the southern side of the landfill was constructed specifically to retain semi-solid material and not water and, whilst regular inspections by experts from SNC Lavalin show no current concerns, it is not considered appropriate in the long term.

The proposed de-watering option was therefore felt to be the safest option, as it would permanently remove the threat of drowning, any possible injury from the bauxite residue.

SITE INVESTIGATIONS

Ground Investigations

The main aspects of the ground investigation involved the determination of:

1. The engineering properties of the bauxite residue and their in situ state;

Figure 2: Investigation of the bauxite residue surface using probes

2. The volume and the composition of the ponded water.

A geotechnical investigation was undertaken at the site to provide the following:

1. The geotechnical nature and properties of the bauxite residue,
2. The nature of the geological strata in vicinity to Mount Rosser and information pertaining to potential soakaways.

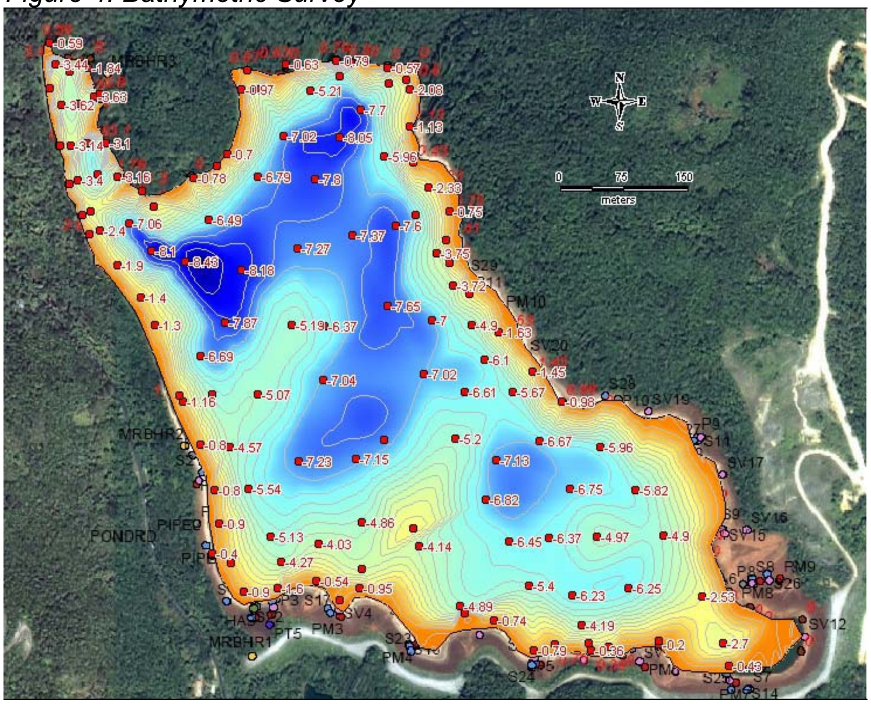
The results of the investigations of the bauxite residue indicate that, although the upper few metres is very soft, it becomes stiffer with depth.

Bathymetric survey and Ponded Water Analysis

Figure 3: Over-water investigation

During the over-water portion of the ground investigation carried out in 2004, RPS undertook a bathymetric survey, to determine the extent and volume of water to be partially neutralised. The bathymetric survey measured the profile of the bottom of the lake and provided a plan showing the depth of water at all points. The survey comprised measuring the water depth and recording the position by Global Positioning Satellite (GPS). This information was inputted into a Geographical Information System and a bauxite residue (water depth) profile was modelled.

Figure 4: Bathymetric Survey



Based on this information, the volume of water held within the site at the time of the survey (October 2004) was 1.59 million m³ owing to an exceptionally rainy season and Hurricane Ivan; currently a volume of 1.5 million m^3 appears to be a more reasonable volume for calculation purposes.

As part of the bathymetric survey, water sampling was also undertaken. Samples were extracted at staged depth increments at 7 locations on the ponded area. All the samples were analysed on-site for pH and then sent to independently accredited laboratories for further analysis. The pH of the water at the surface was measured in August 2006 to be 10.2. No significant change with depth was noted, indicating good natural mixing although at the deepest parts the pH of the water was slightly higher because of its exchange with the underlying bauxite residue. An analysis of the water is shown below:

Table 1: Mount Rosser Water Analysis

Determinant	**Concentration (mg/l) (measured by ICP)**
Aluminium	43
Arsenic	0.2
Calcium	1
Molybdenum	0.15
Sodium	990
Vanadium	0.4
Sulphate	590
Chloride	500
Total Organic Carbon	130
Total Dissolved Solids	2500
pH	10.2

Other Determinants (recorded below detection limits)
Zinc, Silver, Nickel, Manganese, Iron, Beryllium, Barium all below detection limit of 0.01mg/l
Cobalt, Tin, Selenium all below detection limit of 0.05mg/l
Mercury, Chromium, Copper all below detection limit of 0.02mg/l
Antimony below detection limit of 0.08mg/l
Cadmium below detection limit of 0.005mg/l

Without effective interception of storm-water flowing in from the surrounding hills, de-watering Mount Rosser will be impracticable. An independent study of the water balance has demonstrated an anticipated inflow of 1.9 million m³ per year. This would effectively refill the site in 10 months. This confirms the need for effective diversions of storm-water if Mount Rosser is to be de-watered. With the inflow of the stormwater controlled, surface evaporation and seepage should keep the level constant or even slowly reducing, as they are greater than precipitation (560,000m³ precipitation compared to 700,000m³ evaporation). The water on top of the bauxite residue will be removed, effectively reducing the driving force for any seepage of the water from the bauxite residue at the interface with the limestone particularly around the periphery of the beaches.

Hydrogeology Investigation

Mount Rosser site lies on a hydrogeological divide between the White River Basin to the north and the Linstead Basin to the south. The bedrock directly underlying the bauxite residue landfill is limestone of the Troy-Claremont formation and is known to be karstic and contain significant dissolution features. Volcanic rock (Volcaniclastics and Lavas) of the Devils Racecourse formation underlies the limestone along the southern part of the site and act as an aquiclude.

There are significant variations in the gradients between the two catchments. The White River basin varies from about 1% to 2% and flows northwards whereas the Linstead Basing gradient varies from about 10% to 4% and flows to the southeast. When the groundwater table is extrapolated back towards Mount Rosser from each basin, there is a difference in elevation of almost 85m, the White River basin showing higher levels at 335m. This would indicate that the water table is about 130m below the surface of Mount Rosser.

During the period of discharge of bauxite residues to Mount Rosser, impacts on the groundwater were more apparent to the north and it appeared that there was greater hydraulic connectivity to the White River Basin. Considering that the flow to the southern basin is restricted by a change in geology and rock type and that the groundwater has closer influence to the northern catchment, it is reasonable to assume that any water discharged from Mount Rosser, particularly along the northern boundary, would have its greatest influence on the White River Basin. In addition, as the gradient is low, it would appear that the basin has large storage potential hence higher dilution ability, however the rate at which and discharge is noted in down-gradient monitoring points may be slow.

Under normal conditions the discharge rate recorded at down-gradient monitoring points has been found to be slow, however, the recent tracer study using fluorescein dye has identified that during periods of extreme rainfall, as observed during October 2005, the flow rates are far greater than during normal conditions. It is feasible that this shift in discharge rate during different rainfall conditions may be due to the occasional establishment of underground fast-flowing streams in the karst limestone system.

DE-WATERING

It is planned to remove treated water via the soakaway located at the North Finger. The water will be partially neutralised by means of sulphuric acid dosing to lower the pH level, and then allowing natural dilution to lower sodium levels to a level at which it will not impact unduly on receptors downstream. Monitoring will run concurrently with any discharge to ensure adequate dilution and to ensure receptors are not impacted beyond the agreed limits.

Detail of De-watering Process

It is envisaged that the following steps will be required to de-water the ponded area:

1. Construction of Access Track along Western Shore
2. Expansion of the North Finger Soakaway
3. Reduction of Water Level to facilitate access and construction of interceptor drain
4. Construction of Access Tracks along Eastern Shore
5. Construction of Diversion Ditches
6. Acid Dosing and Discharge of Partially Neutralised Water
7. Monitoring and Determination of suitable discharge rate

An access track will be continued along the western side up to the North Finger at which point it will cross the water via an embankment and continue up to the existing soakaway.

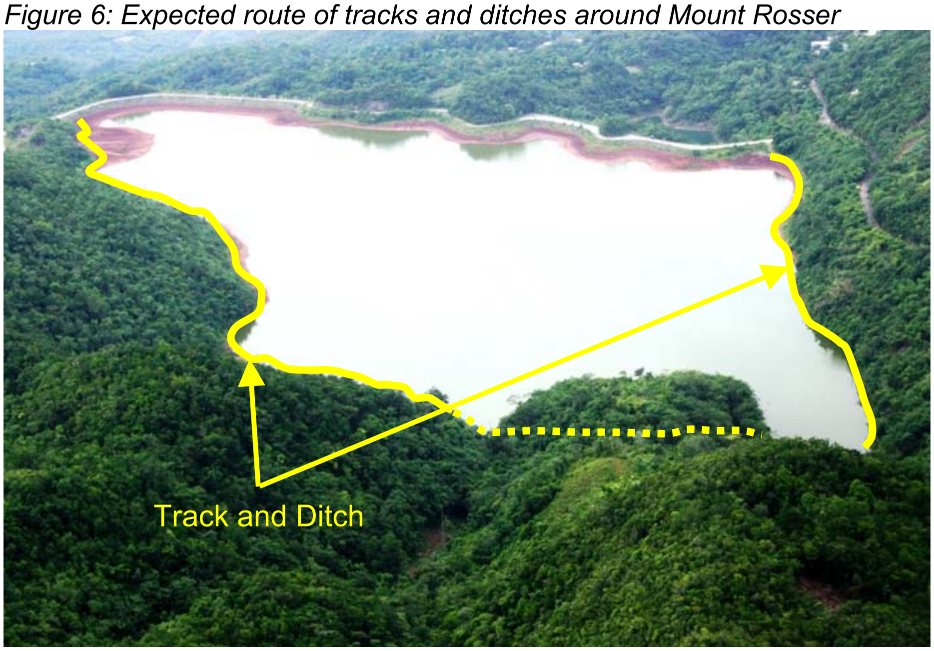
Figure 5: Illustration of the track and ditch

The expansion of the North Finger Soakaway will be required prior to de-watering of the ponded area to deal with the increased volumes of partially neutralised waters to be expelled. This work will be undertaken by means of hydraulic rock breakers and mechanical excavators.

In order to obtain the correct flow of water in the diversion ditches, the existing water level will need to be marginally reduced by approximately 1m. This will expose part of the underlying bauxite residue beach and enable a reduction in the moisture content of the saturated bauxite residue to be achieved. This will create access around the bauxite residue landfill perimeter to install the remainder of the access track. To facilitate this reduction in water level, water will be discharged from the ponded area via the existing soakaway at the North Finger. De-watering will be undertaken throughout the year to allow work to progress efficiently.

The access track will then be continued around the North Finger headland before continuing along the northern beach heading east. This work will rely on the water levels within the ponded area being lowered to expose sufficient areas of bauxite residue beach to enable placement of material won from the adjacent limestone quarry. Figure 6 illustrates the route of this access track.

Figure 6: Expected route of tracks and ditches around Mount Rosser



Ditches will be constructed on the slope side of the access track. Construction of the ditches was identified as crucial step towards removing the ponded water. In order to limit the volume of water requiring treatment, it is necessary to limit recharge of the ponded area. This can only be achieved by creating a cut-off between the ponded water and surrounding in-sloping lands using diversion ditches.

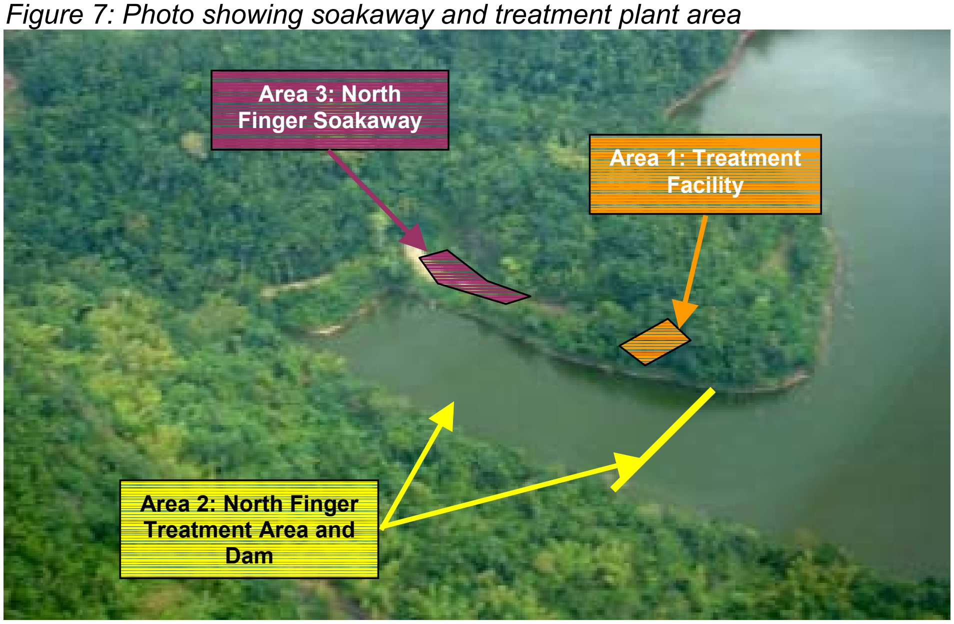
To avoid any risk of impacting the elevated highway, it is proposed to position the ditches at beach level. This approach would comprise the construction of an access track at beach level and placing an open ditch on the interface with the slope.

Field trials have indicated that any proposed trench cannot function effectively while unlined and as such a concrete lined channel will be laid along the slope side of the new access track. This approach has been adopted given the availability of local material and ease of ongoing maintenance. The catchment was modelled to enable suitable sizing of the concrete channel to deal with envisaged flows for a one in 20 year event.

Once the trenches are in, the surface water level must be kept below them to avoid saturation and early degradation. To achieve this an overflow at the North Finger soak-away will be constructed at the required level. Any overflow from the ponded area would be directly diluted by the freshwater diversions along the western side and North Finger bund.

It is planned that acid dosing and discharge of the partially neutralised water will be undertaken at the North Finger. If for any reason this is found to be problematic, then the procedure utilised in Alcan's alumina plant in Jonquiere, Quebec will be employed. In this process, mass dosing of the bauxite residue lake is undertaken annually by the addition of the necessary quantity of sulphuric acid to the lake water. This process has been carried out for over 10 years in order to control the pH of one of the major bauxite residue landfills in the region.

Figure 7: Photo showing soakaway and treatment plant area



The acid dosing facility and procedure will comply with Alcan's *EHS FIRST* directives, which are amongst the highest accepted for health, safety, and environment. The discharge rate will be determined by analyses at the monitoring locations. It is estimated that the de-watering could be complete within 1-2 years, assuming no excessively heavy years of rain.

Throughout the de-watering process, partial neutralisation and dilution levels will be managed to ensure that the discharge does not threaten the threshold limits of 100ppm sodium and a pH of between 6.5 and 8.5 at the key receptors. It should be noted that the WHO standard for drinking water, adopted by most countries in the world, allows for levels of sodium up to 200ppm in potable water. Initial discharge rates will be kept to a low level in order to build up an accurate model correlating discharge rates with rises at the different monitoring points,

To further minimise risk, discharge will only be slowly increased to planned levels over a one month period to verify any impacts.

A risk assessment together with a detailed monitoring and emergency response management plan, including responsibilities and site and technical contacts, has been submitted as part of the NEPA application.

MONITORING

A proposed monitoring programme was established after extensive discussion with the key regulators and approved by all the regulators prior to the commencement of the project.

The effects of the work being carried out will be monitored to assess the direct impact of elements such as the discharge of the ponded water and also data will be collected to provide information that illustrates the trends of water quality improvements over time. Results collected during the monitoring may dictate whether the programme should be altered at any given time.

Pre-discharge Monitoring

To provide background data on the concentrations of sodium and pH levels the following locations have been monitored weekly for the last 6 months. The samples collected have been analysed using the field test equipment and also by laboratory analysis, in order to provide validation results, against which the results obtained from the in-situ monitors can be gauged:

The locations for the monitors are:

Table 2: In-situ Monitoring Locations

pH, Conductivity, Salinity (Sonde)	**Na+ (Ion Selective Electrode)**
Sterling Castle Well	Jericho Well
Rio Hoe	Walker's Wood Well
	Mount Rosser Ponded Water
	Weatherly Spring

In addition, prior to discharge of the ponded water from Mount Rosser, water samples will be collected on two occasions for more extensive analyses from the following locations:

- Mount Rosser Ponded Water
- Weatherly Spring
- Rio Hoe
- Sterling Castle Well
- Jericho Well
- Walker's Wood Well
- Rio Cobre

These samples will be analysed for the following determinants:

Table 3: Chemical Testing Proposed Pre-discharge

Chemical Testing Proposed		
Aluminium	Molybdenum	pH
Arsenic	Nickel	Dissolved Oxygen (DO)
Boron	Boron	Sulphate
Cadmium	Sodium	Ammonia
Chromium	Zinc	Vanadium
Copper	Suspended Solids	Mercury
Electrical Conductivity	Chemical Oxygen Demand (COD)	Biological Oxygen Demand (BOD)

Jericho Well and Walker's Wood wells are water abstraction boreholes that have been targeted based upon the requirements of the Water Resources Authority (WRA). It has been determined that monitoring at these locations will take the following form:

Walker's Wood

Due to the current working practices employed at this location it will not be practicable to install a monitor into the water holding tank, as it is only utilised occasionally and the purpose of the monitoring project is to gather data on a constant basis. It has therefore been accepted that a monitoring point will be installed in the abstraction pipe prior to chlorination.

The WRA/NWC have accepted this procedure.

Jericho Well

A water holding tank is used to store water prior to sending the water for treatment and it is used constantly. It is proposed that a permanent monitoring probe will be installed in the storage tank.

As a result of consultation with the regulators, a number of tracer studies were undertaken to establish whether connectivity exists between the North Finger Soakaway at Mount Rosser and the above receptors and to provide information on potential dilution rates. The results of the study confirmed that connectivity exists between Mount Rosser and Walker's Wood Well and that extremely high rates of dilution occur.

Monitoring During Discharge

It will be necessary to assess whether the discharge at Mount Rosser is causing an unacceptable impact on the selected groundwater monitoring locations and as such a monitoring programme will be scheduled during the discharge period.

Water samples will be collected from the following locations:

- Mount Rosser Ponded Water
- Weatherly Spring
- Rio Hoe
- Sterling Castle Well
- Jericho Well
- Walker's Wood Well
- Rio Cobre

Regular monitoring visits will be undertaken at the following locations, at which time in-situ results for pH, sodium and conductivity will be recorded using hand-held equipment:

Table 4: Monitoring Schedule during Discharge

Monitoring Schedule during Discharge	
Mount Rosser Ponded Area (3 Times/week)	Jericho Well (3 Times/week)
Weatherly Spring (3 Times/week)	Walker's Wood Well (3 Times/week)
Rio Hoe (3 Times/week)	Rio Cobre (1 Time/week)
Sterling Castle Well (3 Times/week)	

The data being collected from the loggers will be downloaded weekly unless changes in measured concentrations are detected during the daily visits (when the data will be downloaded at that time). This data will be used to ensure that the discharge is not threatening the threshold limits of 100ppm Na and a pH of between 6.5 and 8.5. The daily monitoring visits will be used to drive any alterations in discharge rates and quality at Mount Rosser.

In addition these samples will be analysed for the following determinants on an as required basis during the discharge:

Table 5: Chemical Testing During Discharge

Chemical Testing Proposed		
Aluminium	Molybdenum	pH
Arsenic	Nickel	Dissolved Oxygen (DO)
Boron	Boron	Sulphate
Cadmium	Sodium	Ammonia
Chromium	Zinc	Vanadium
Copper	Suspended Solids	Mercury
Electrical Conductivity	Chemical Oxygen Demand (COD)	Biological Oxygen Demand (BOD)

The frequency of the monitoring visits to these locations will be reviewed after one month of continuous monitoring and thereafter on a regular basis.

Post Discharge Monitoring

In order to record any changes in water quality/improvements it is intended that we shall continue to collect monitoring data from the loggers installed at Weatherly Spring, Rio Hoe, Sterling Castle and Walker's Wood Well for a period of three months post discharge.

The graphical presentation of these results will be provided and will be used to illustrate the trends in groundwater quality improvements expected post discharge.

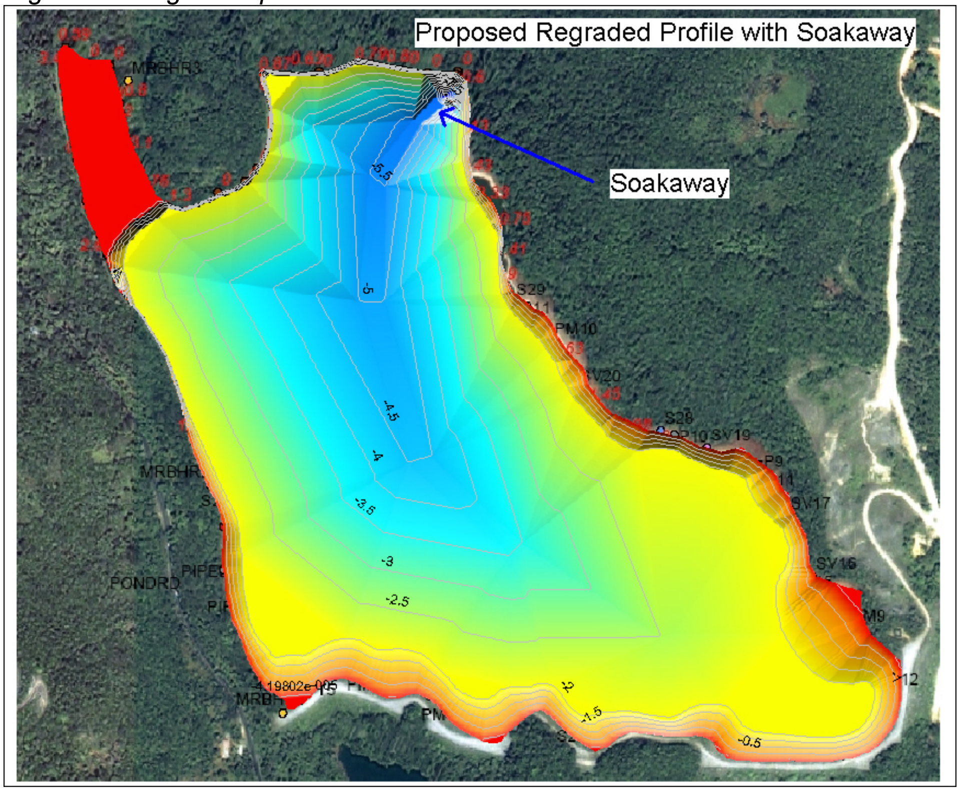
It is planned that a modified monitoring programme will continue for a further period of one year from ceasing the discharge stage, to demonstrate that impacts over time are negligible or cease.

RE-GRADING AND REHABILITATION

Objective

It is the intention to create an aesthetically attractive, free draining area so when the site has been permanently de-watered; the surface will be re-graded in order to provide a gentle slope such that rainwater will not collect in any depressions.

Figure 8: Re-graded profile



Re-grading

It is envisaged that, in the final re-graded profile, the bauxite residue beach profile will be shaped to fall towards a new soakaway located at the north eastern extent of the bauxite residue landfill or at another location if conditions dictate otherwise. Re-grading of the surface will predominately be a 'cut to fill' operation.

Bauxite Residue Management

As the water level subsides, the underlying beach will become exposed to the daylight and the drying out process begins. Temporary access tracks will enable trenches and ditches to be cut into the bauxite residue to expel the water. It is not possible at this stage to predict the timescale of the bauxite residue drying process but once the moisture content of the bauxite residue has reduced, it is envisaged that dried bauxite residue will be stripped in layers and stockpiled for re-use. Stripping layers enables underlying bauxite residue to be exposed to the drying elements and the process will be repeated until the formation level is achieved.

Water Management

Untreated water accumulating during the re-grading works will be sent to evaporation slopes and ponds or sent to the soakaway providing it meets the agreed disposal standard. The waters may also be suitable as a means to control dust on bauxite residue surfaces but not on newly vegetated areas.

Water collected from the diversion ditches along the western side will be sent to the North Finger. It is envisaged that once the North Finger is no longer used to partially neutralise the leachate it could use as a small water reservoir for irrigation use on the site. Other clean waters collected in the diversion ditches will be directed where possible to the proposed new soakaway.

Settlement Considerations

Re-grading works will need to consider the effect of consolidation of the bauxite residue and areas to be filled will need to take into account future settlements otherwise troughs or low points will emerge. It is likely that the bauxite residue may need to be filled above the finished re-graded profile in some areas, to account for future settlement.

Fencing and Signs

During the de-watering process and re-grading it will be necessary to keep unauthorised persons out of the construction area. As part of the first major civil works contract, the existing fencing will be repaired and improved. In addition to fences signs will also be used to inform the public on access restrictions and possible hazards.

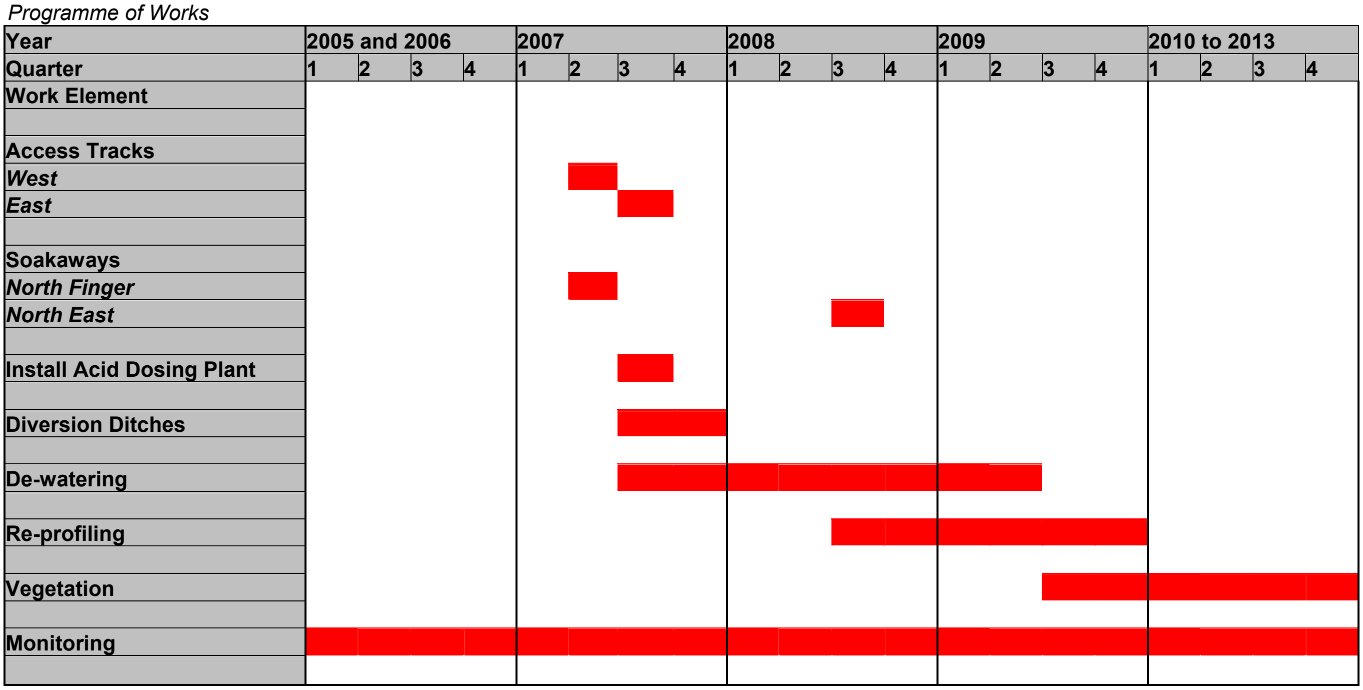
Final Rehabilitation

In order to provide the final rehabilitated site, it is intended that the bauxite residue will be treated with gypsum as a way of reducing its cation exchange capacity and thereby improving its ability to sustain growth. The proposed process of converting the bauxite residue into a growing medium capable of sustaining vegetation has a major environmental benefit in that it returns the surface of the bauxite residue, over a period of time, to a soil type matrix capable of sustaining diverse vegetation and does not require the importation of scarce topsoil that can be more effectively used elsewhere.

Figure 9: Illustration of rehabilitated area

TIMESCALE

Programme of Works



WEATHERLY SPRING

The Weatherly Spring is located southeast of Mount Rosser and is known to have a high alkaline level and high sodium content. This alkalinity is believed to be due to seepage of high sodium containing water from the beach surrounding Mount Rosser. It is anticipated that as the volume of water in the Mount Rosser site recedes (hence a reduction in hydraulic gradient) the water quality of Weatherly Spring will improve.

The positive environmental effects of the project work at Mount Rosser is expected to have a major impact on the water quality at Weatherly Spring.

If the pH and/or sodium content increase to unacceptably high levels, it is proposed, when necessary, to capture waters from the Weatherly Spring and pump the waters back up to the Mount Rosser site via the existing pipeline.

Programme of works

The programme of works at Weatherly Spring has commenced with the improvement of the site security, ongoing monitoring and the removal of silt and sediment that has accumulated.