APPENDIX R

Overview of Acid Rock Drainage Operational and Post-Closure Water Management Strategies at Resolution Copper Mining for the Protection of Groundwater and Surface Water

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Internal memo

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CC	
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Overview of Acid Rock Drainage Operational and Post-Closure Water Management Strategies at Resolution Copper Mining for the Protection of Groundwater and Surface Water

Resolution will implement best practice, proactive acid rock drainage (ARD) management strategies. The goal of these strategies will be to minimize ARD risks during operation and ensure that ARD is avoided after closure. All potentially impacted water will be contained on site during operation and will be put to beneficial use, thereby reducing the need to import makeup water. The ultimate goal of the management strategies is to avoid the creation of any post-closure ARD-related water management liabilities. No potentially acid generating (PAG) development rock, ore and concentrate will be present on site at closure. All PAG rock within the block cave will be deeply buried and ultimately flooded, permanently isolating it from oxygen and controlling ARD in perpetuity. Similarly the PAG portion of the tailings will be encapsulated within a much larger mass of benign tailings, effectively controlling oxygen ingress and ARD generation in perpetuity.

Development Rock ARD Management

The block cave mining method will avoid the production of large volumes of waste rock, and less than 20 million tons of development rock will be created during excavation of the underground workings. To the extent practicable non-acid generating, geochemically benign development rock will be segregated from PAG rock and will be used as clean fill, cover material or put to some other beneficial use. During operation PAG development rock will be stored on the intermediate and development rock stockpiles, permitted facilities under ADEQ's Aquifer Protection Permitting (APP) program. Any water which contacts the PAG development rock will be captured and used within the process water circuit. Before closure all PAG development rock will be processed through the concentrator to recover the contained copper and eliminate the need for post-closure management.

Ore and Concentrate ARD Management

Ore brought from underground will be delivered directly to a roofed and fully contained ore stockpile before being processed within the concentrator. The stockpile will be isolated from precipitation and so will not pose any ARD risk. All ore will be processed before closure.

Concentrate will be piped from the concentrator to the loadout facility where it will be transported offsite. Concentrate containment tanks with secondary containment will be constructed at the loadout area and along the MARRCO Corridor. These basins will be able to safely accommodate the entire pipeline volume should it ever need to be drained during an upset condition. All concentrate will be shipped offsite before closure.

Stormwater which falls on the East Plant site (mine surface infrastructure), the West Plant site (concentrator) and the loadout facility will be captured and contained on site in lined contact water basins. Any water which could inadvertently contact ore or concentrate will thus be captured and put to beneficial use.

Block Cave ARD and Post-Closure Water Management

The overarching strategy for management of potential block cave ARD during the operational period will be the capture and reuse of all water which contacts the caved, mineralized rock mass. At closure the strategy will focus on the exclusion of oxygen from the residual caved mineralized rock mass, controlling the risk of ARD in perpetuity.

Operation - During operation the underground workings beneath the block cave will be continuously dewatered and their zone of groundwater capture will include the entire caved rock, fractured rock and continuous subsidence zones. All water contacting the block cave will thus be captured and put to beneficial use within the process water circuit.

Most of the ore and other mineralized host rock is potentially acid generating. Oxidation of ore and other mineralized rock is likely to occur as it moves towards the draw points more than 5000 feet below surface. The oxidation front is only anticipated to extend tens to hundreds of feet into the caved rock overlying the production level. At any given time, less than five percent of the rock within the caved zone is anticipated to be both net acid generating and to be in contact with oxygen. Approximately 1000 gpm of water is predicted to report to the production level workings, most of which must travel through the overlying caved ore. On average, this water is anticipated to be weakly to moderately acidic with elevated sulfate and some elevated metals concentrations. Excess mine water will be pumped to the surface where it will be mixed with the much greater flow of alkaline scavenger tailings slurry exiting the concentrator (at a water:water ratio of >10:1). The excess mine water will be neutralized during the mixing process, raising the pH and causing the precipitation of sulfate and dissolved metals. Neutralization solids (predominately gypsum) will be co-disposed within the much larger mass of

scavenger tailings (at a solids:solids ratio of >1000:1). Additional lime will be added at the mill if needed to ensure the tailings slurry maintains a neutral to alkaline pH.

Closure - At closure both the underground ventilation and pumping systems will be turned off. Oxidation and potential ARD generation from the mineralized caved rock above the draw points will end almost immediately. The dewatered rock mass within and surrounding the block cave will also begin to slowly resaturate. Reflooding to near pre-mining groundwater levels is anticipated to take approximately 1000 years and radial flow towards the underground workings and the caved rock zone will persist for centuries, maintaining a hydraulic sink.

ARD risks posed by the residual mineralized rock at the bottom of the block cave will be controlled in perpetuity by its burial beneath 2000 to 5000 feet of geochemically benign rock and by its eventual saturation by reflooding waters. The quality of water which reports to the production level will be closely monitored as closure approaches as it will be indicative of early reflood water quality. Water quality accumulating in the workings may be monitored after closure by sample collection at the bottom of the shafts.
Reflood waters in the upper 2000 to 5000 feet of the caved zone (within the geochemically benign Apache Leap Tuff and Whitetail Conglomerate) are predicted to be of good quality and will not require any special monitoring.

Figure 1 is a conceptual model of the post closure hydrogeologic and geochemical behavior of the block cave which highlights these ARD predictions and controls in more detail.

Figure 1 – Schematic Diagram of Block Cave Behavior at Closure

1 – At closure the caved rock zone will be approximately two kilometers in diameter and a depression approximately 600 to 1000 feet deep will be present at the surface. Approximately 6000 vertical feet of highly fractured and rubblized rock will be present within the caved rock zone. This caved rock will be several orders of magnitude more permeable than the surrounding undisturbed bedrock. Three significant rock types will be present in the caved zone and the immediately adjacent fractured rock zone:

Mineralized rock which hosts the ore body but which has copper concentrations below cutoff grades will be present at the bottom of the caved rock zone immediately above the inactive draw points at the production level. This mineralized rock may vary from roughly 600 to 3000 feet thick. Rock in this zone is pyrite-bearing and has elevated metals concentrations due to naturally occurring copper mineralization. It is typically potentially acid generating and could produce ARD if exposed to oxygen. However, only the lowermost tens to a few hundred feet are anticipated to be exposed to oxygen during operation. Undisturbed bedrock beneath the Whitetail Conglomerate is an aquitard with low permeability and is also constrained by numerous faults which act as groundwater flow barriers.

Whitetail Conglomerate which overlies the mineralized rock will vary in thickness from about 1000 to 4000 feet within the caved rock zone. The conglomerate was deposited after the formation of the ore body and is geochemically benign. It contains minimal sulfide minerals and abundant neutralization potential (typically >10% calcium carbonate). Undisturbed Whitetail bedrock is an aquitard with very low permeability and effectively isolates the upper Apache Leap aquifer from the underlying deep bedrock. Within the caved rock zone the conglomerate will have higher secondary permeability but will likely still inhibit vertical flow compared to the units above and below it.
Apache Leap Tuff which overlies the Whitetail Conglomerate will vary from roughly 1000 to almost 2000 feet within the caved rock zone. It is also geochemically benign with minimal sulfide minerals and minor neutralization potential.

2 – The mineralized rock mass is isolated from direct oxygen migration from the surface by between 2000 and 6000 feet of overlying benign rock. Its primary oxygen exposure pathway during operation is via the underlying draw points and forced air ventilation system at the production level. At closure all ventilation will be discontinued to the underground workings. The production level and the overlying mineralized rock will rapidly become anoxic. Oxidation reactions and ARD generation (if any) within the caved, mineralized rock mass will become negligible. Once access to the shafts is no longer needed, all shaft collars and subcollars will be permanently sealed preventing any subsequent oxygen ingress.

3 – Water will enter the immediate area of the caved rock zone via direct precipitation (3a), lateral inflow from the Apache Leap aquifer (3b) and lateral, yet limited, inflow from the deep bedrock (3c) [arrows sized based on relative flow contributions]. The immediate area of the block cave will become a groundwater recharge zone compared to the surrounding undisturbed landscape because there will be no runoff from the surface depression and because the Apache Leap Tuff will be highly fractured and very permeable. Surface water diversion strategies to minimize runoff into the depression are being explored and will be refined through NEPA. The impermeable Whitetail Conglomerate will not contribute significant seepage to the block cave as it refloods. However, water which enters the caved rock zone via precipitation or lateral inflow from the Apache Leap will need to flow downward through thousands of feet of conglomerate before reaching the base of the caved zone (3d). Based on short and long term laboratory leaching tests, the conglomerate will release significant alkalinity to the infiltrating water and deliver it to the mineralized rock zone and the recovering water table.

4a – Within several years of closure, the underground workings and the mineralized rock immediately above the inactive draw points will be reflooded. Any residual oxidation that may persist after the ventilation system is turned off will effectively end as the flooding front advances upward. The mineralized rock near the draw points which is most likely to have been oxidized and potentially acidified during operation will be the first material in the caved rock zone to be reflooded. Early reflood water quality will largely be controlled by the interaction of good quality, alkaline water from above with the partially oxidized mineralized rock. The first flush of water which accumulates in the underground workings will release any

residual sulfide oxidation products into solution. The first water which accumulates at the production level is thus likely to have the poorest quality within the caved zone. Subsequent reflood waters which accumulate above this in the mineralized rock zone will have progressively better water quality as saturation progresses upward.

4b – As flooding continues over decades to centuries the saturated zone will eventually reach the bottom of the caved Whitetail Conglomerate. Radial groundwater flow towards the block cave will likely still persist at this time. Water quality within the conglomerate is predicted to be good because 1) the cave will largely fill from the top down, so water within the conglomerate will not contact the underlying mineralized rock, 2) more saline waters that may be in contact with the mineralized rock will be more dense and so stratified conditions are likely to be established within the caved zone 3) the high calcium carbonate content of the conglomerate will create a geochemical barrier to the vertical migration of any lower pH water from depth and 4) the undisturbed Whitetail Conglomerate around the margins of the block cave will act as a low permeability aquitard limiting upward migration around the cave.

4c – After roughly 1000 years water levels will recover to near their pre-mining levels. A shallow pit lake may or may not form in the block cave depression depending on the depth of subsidence experienced at the surface. Flow-through conditions are likely to be established in the shallow Apache Leap aquifer system. This upper active groundwater flow system will remain isolated from the pore water in the deep caved mineralized rock by the Whitetail conglomerate.

Tailings ARD and Post-Closure Water Management

The overarching management strategy to proactively control acid rock drainage risks at the tailings impoundment will be the segregation and special handling of PAG cleaner and non-acid forming scavenger tailings. Runoff and seepage water which contacts the tailings during the operational period will also be captured and returned to beneficial use in the process circuit. Active water management will continue after closure until rehabilitation and drain down of the impoundment is largely completed, infiltration is minimized such that evaporation exceeds toe seepage, and it can be demonstrated that runoff water and residual seepage does not pose any environmental risks.

Pyrite and other gangue sulfide minerals will preferentially report to the cleaner tailings during the concentrating process. Scavenger tailings, which will make up about 85% of the tailings mass, will pose a very low geochemical risk because they will contain almost no pyrite (generally less than 0.1% sulfide sulfur) and very low residual metals concentrations. This benign material will be used to construct the tailings embankment and to encapsulate the much smaller mass of chemically reactive cleaner tailings.

More than 90% of the sulfides and the great majority of metals contained within the tailings will thus be concentrated in about 15% of the tailings mass. This

relatively small volume of cleaner tailings will be preferentially placed within the interior of the tailings impoundment where it can be kept saturated and isolated from oxygen during operation. At closure the majority of cleaner tailings will be permanently protected from contact with oxygen by the surrounding scavenger tailings. Approximately ten percent of the impoundment footprint will have cleaner tailings present near the final tailings surface. This relatively small surface will be buried beneath a layer of scavenger tailings either mechanically or hydraulically placed and a robust cover that is designed to limit water and oxygen ingress.

Process water co-disposed with the tailings and stored within the tailings pore spaces will be maintained at a circum-neutral to alkaline pH. The proactive prevention of ARD within the tailings will ensure that tailings seepage and runoff waters will maintain a neutral pH and low dissolved metals concentrations in compliance with aquifer water quality standards at points of compliance throughout operations and closure..

Operation

Figure 2 is a conceptual model which illustrates the ARD management strategy during operation in more detail.

1 – A reclaim pond will be maintained in the central interior of the tailings impoundment throughout its operational life. The pond will be maintained at the design depth and surface area by the balancing of precipitation, evaporation and returned seepage water, with the ongoing discharge of tailings slurry into the impoundment and the pumping of reclaim water to the concentrator for reuse. In the first few years of operation the cleaner tailings will be stored behind a separate starter dam (1a) in the center of the ultimate full impoundment footprint. However by year 10 the much larger scavenger tailings impoundment will merge with and cover the cleaner starter dam facility. Cleaner tailings will then be discharged directly into the reclaim pond. This will ensure they are saturated from the moment of placement and effectively isolated from contact with oxygen throughout the operational period. If any short term beaches of cleaner tailings are unintentionally exposed on the margins of the pond, the risks of ARD formation are still very low because the cleaner tailings have been demonstrated by humidity cell testing to have a three month lag period before the onset of acidic conditions. Given that the tailings impoundment is being continuously filled, any cleaner tailings beaches will be continuously covered by new tailings with low permeability, within the lag period.

2 – Ongoing deposition of cleaner tailings within the central interior of the impoundment will encapsulate the geochemically reactive tailings within a much larger mass of scavenger tailings. The scavenger tailings will be discharged from the margins of the impoundment and very fine-grained, low permeability and inert slimes will preferentially flow to the decant pond area. These fine grained scavenger tailings will intermix with, cover and surround the cleaner tailings. The entire cleaner interior tailings mass will remain saturated through operation with the decant pond over the top.

3 – On the margins of the impoundment the embankment (above small starter dams composed of local borrow material) will be constructed with more coarse scavenger tailings sands. These sands will have a higher permeability and will remain unsaturated throughout operation and closure. However, they will pose minimal ARD or other geochemical risks because the scavenger tailings by design will have very low sulfide and metals contents.

4 – As the tailings consolidate seepage water will preferentially flow laterally towards the impoundment margins via the higher permeability scavenger tailings sands, underlying drainage blankets (if needed beneath embankments to maintain unsaturated conditions) and in the thin, shallow alluvial deposits located in the drainage lines at the bedrock/tailings contact (arrows sized based on relative flow contribution).

5 - Eleven seepage and runoff collection ponds will be constructed in drainages surrounding the tailings storage facility. These ponds will capture runoff from the tailings embankment and seepage from the impoundment interior (#4 on diagram). The seepage collection dams will be cored with low permeability materials and will be excavated through shallow alluvial deposits and weathered bedrock so that they can be keyed into competent and lower permeability bedrock. All six seepage collection dams between the tailings impoundment, Queen Creek and Potts Canyon are underlain by the low permeability Gila Conglomerate or Pinal Schist aquitards. The five collection dams above Roblas Canyon are underlain by both the Pinal Schist aquitard and some younger Precambrian rocks. If needed grout curtains will also be installed below the collection dams to minimize potential underflow via the bedrock flow pathway. Up to approximately 800 gpm of seepage and runoff may ultimately report to these collection systems on average during operations. This water will be returned to the process water circuit for beneficial reuse.

6 – A much smaller volume of seepage water will enter the bedrock beneath the tailings impoundment footprint. Deep seepage rates are anticipated to be very low because roughly 80% of the impoundment footprint is underlain by the very low permeability Gila Conglomerate and Pinal Schist aquitards. Because of the proactive ARD and seepage collection and management strategies employed at the tailings impoundment, any seepage to bedrock is predicted to have a neutral pH and low metals concentrations.

Closure

At closure tailings will no longer be discharged into the impoundment and it is anticipated that the tailings mass will begin to drain down and dry out immediately. This drain down will be accelerated by the dry climate of the area, the maintenance of upstream diversion channels and the discharge of good quality surface water runoff from the facility. After revegetation has been completed, any impoundment surfaces with exposed scavenger tailings are anticipated to produce runoff with acceptable quality for direct discharge to the environment. Similarly, once the cleaner tailings exposures are capped and vegetated, runoff should also be suitable for direct discharge. Seepage will continue to be collected at the toe of

the embankment and actively managed through the initial drain down period. However it is anticipated that toe seepage will dry up at many of the collection ponds as the phreatic surface within the tailings mass declines. Seepage is predicted to maintain a circum-neutral pH throughout the post-closure period because of the pro-active ARD management controls implemented during operation and because of the capping of the small area of exposed cleaner tailings at closure. Seepage water of suitable quality may be discharged directly to the surrounding environment. If seepage water quality will not allow direct discharge, then the water may either be returned to the interior of the tailings impoundment, polished for discharge or put to some beneficial use. The final method for management of post-closure seepage water will be refined as operational data is collected and as additional studies are completed through NEPA.

Figure 3 is a conceptual model which illustrates the post-closure ARD and water management strategy in more detail.

1 – The entire tailings surface will be revegetated at closure. This will enhance evapotranspiration rates and reduce net infiltration. The tailings embankment will be progressively reclaimed during operation; while the interior surface will be reclaimed as final surfaces are created towards the end of mine life. Scavenger tailings may be directly planted or may be revegetated after addition of soil amendments and/or placement of a thin cover layer to control wind and water erosion and to support revegetation. Approximately ten percent of the tailings surface will have exposed cleaner tailings and will be capped with a much thicker cover system before being revegetated. This cover may be constructed of scavenger tailings and/or imported growth media. The primary purposes of the cleaner tailings cover will be a) to preserve runoff water quality; b) to support a self-sustaining diverse vegetation community; c) to control wind and water erosion and d) to significantly reduce infiltration and/or oxygen ingress into the underlying cleaner tailings. Annual evaporation in the area is approximately three times annual precipitation so a store and release cover system will be used to restrict infiltration over the cleaner tailings. Final cover designs will be studied and optimized during NEPA and the operational period.

2 – Internal runoff water which flows towards the old decant pond area may be removed from the impoundment interior to further reduce infiltration. After capping and revegetation, this water is anticipated to be suitable for direct discharge to the environment. Final surface water runoff management designs will be studied and optimized during NEPA and the operational period.

3 – Runoff water from the exterior surface of the tailings embankment is anticipated to be suitable for direct discharge to the environment after closure. This water will be directed into the surrounding ephemeral drainages. Seepage water flows reporting to the eleven collection ponds are expected to decline rapidly after closure and many of the ponds are anticipated to dry up completely. Ponds which continue to receive toe seepage will be actively managed after closure. Seepage water of suitable quality may be discharged directly to the surrounding environment. If seepage water quality will not allow direct discharge, then the water may either be returned to the interior of the tailings impoundment, polished

for discharge or put to some beneficial use. The final method for management of post-closure seepage water will be refined as operational data is collected and as additional impact assessment studies are completed through NEPA.

4 – As draindown progresses the water table within the tailings interior will decline. Some mixed cleaner/scavenger tailings will be present in the vadose zone above the water table. However, much of this vadose zone tailings mass is anticipated to maintain pore water saturation above 85%, effectively controlling oxygen ingress in perpetuity. More shallow, unsaturated cleaner tailings will be protected from water and/or oxygen ingress by the overlying cover.

5 – Even after draindown is completed and a steady state condition has been reached the water table will remain mounded in the fine-grained cleaner tailings and scavenger tailings slimes in the center of the impoundment interior. Cleaner tailings below the water table will be isolated from oxygen in perpetuity. However, neutralizing potential within the saturated tailings mass below the water table will be available should any acidic seepage be generated in the overlying vadose zone.

6 – As draindown progresses and the height of the water table declines in the tailings mass, the small flux of water into the underlying bedrock will also decline. Deep seepage rates are anticipated to be very low because roughly 80% of the impoundment footprint is underlain by the very low permeability Gila Conglomerate and Pinal Schist aquitards. Because of the proactive ARD management strategies employed at the tailings impoundment, any seepage to bedrock is predicted to have a neutral pH and low metals concentrations. However, even if ARD were to form in the overlying cleaner tailings, any acid water entering the bedrock would be effectively neutralized by the abundant calcium carbonate in the Gila Conglomerate, which underlies the cleaner tailings footprint.

Figure 1

Schematic Diagram of Block Cave Behavior at Closure

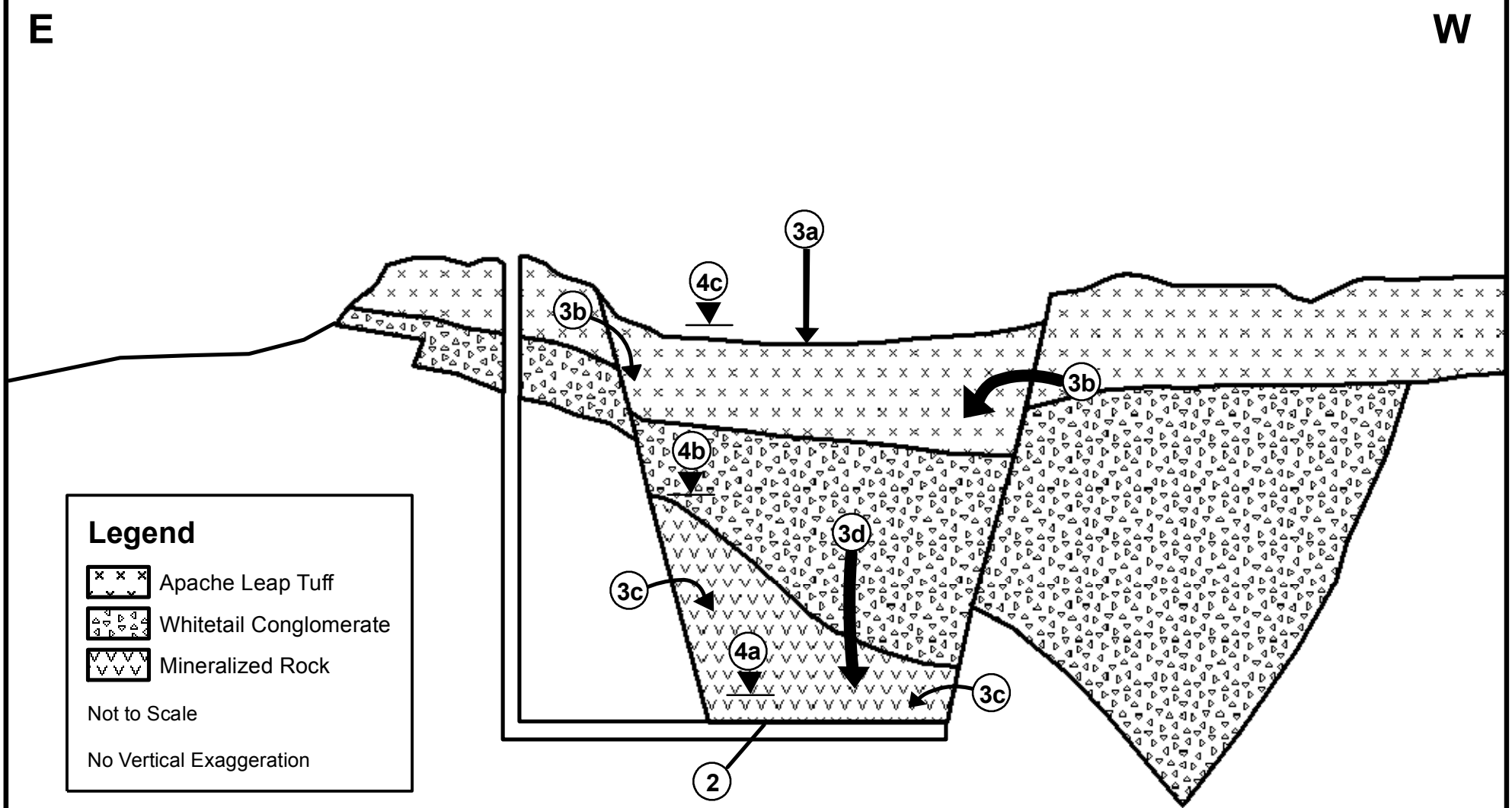


Figure 2 Schematic Diagram of Tailings Impoundment ARD and Water Management During Operations

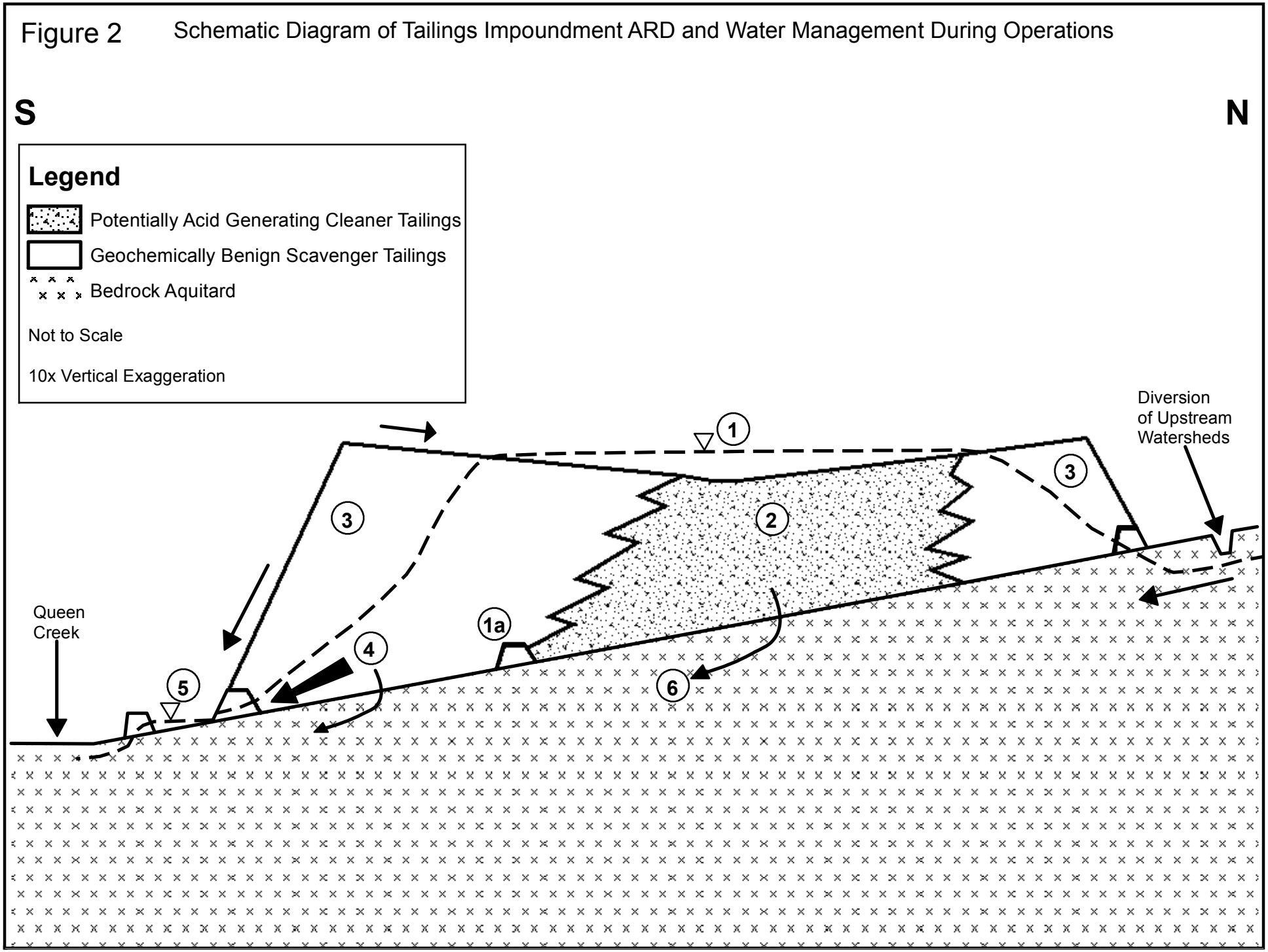
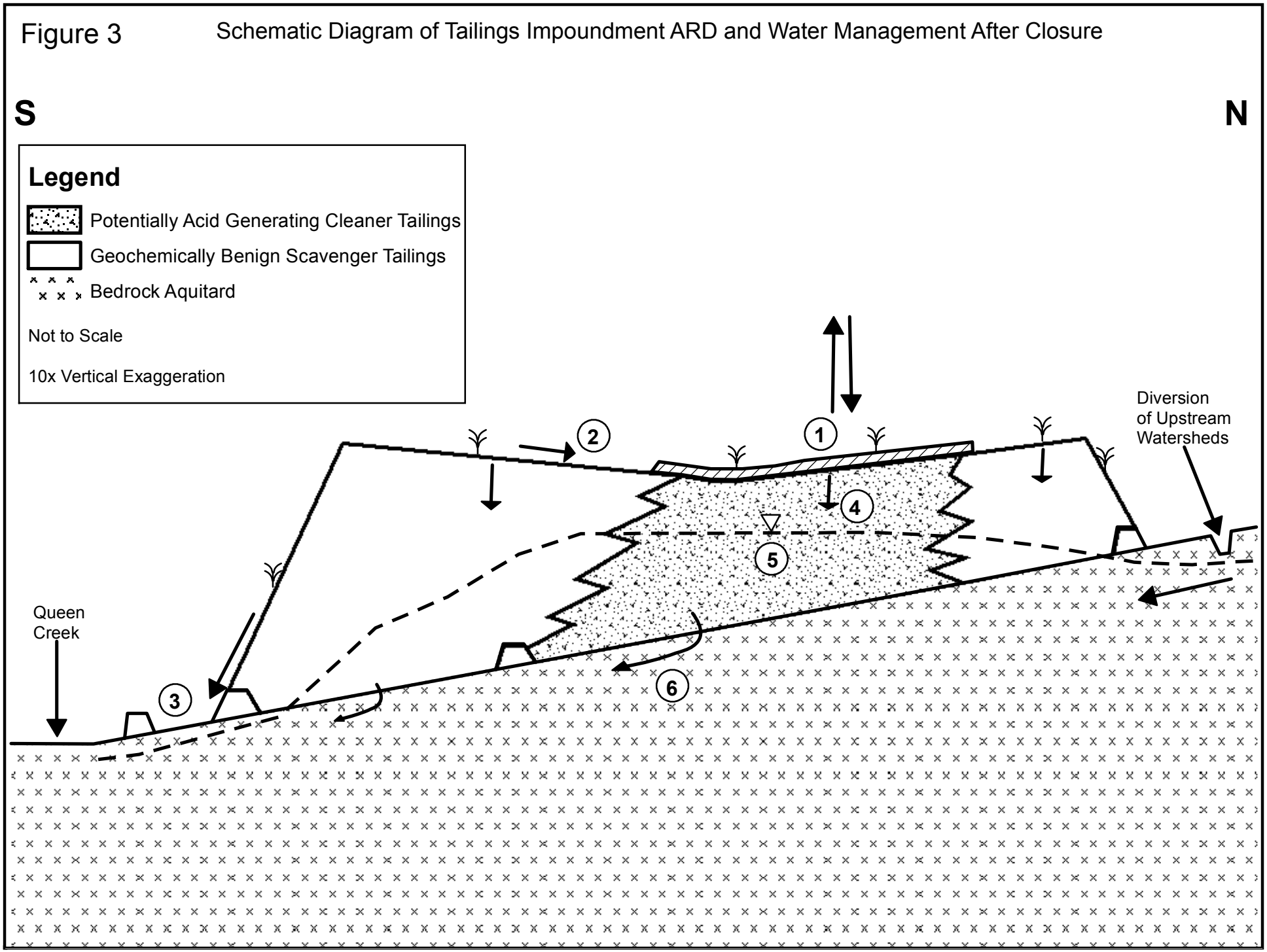


Figure 3 Schematic Diagram of Tailings Impoundment ARD and Water Management After Closure



APPENDIX S

Resolution Copper's Health, Safety,
and Environment (HSE) Performance Standards

Standards

HSE performance standards - HEALTH

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Contents page

B1 - Particulate and gas/vapour exposures

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It applies to dust, fibres, mist and fume (ie particulates), and gas and vapour exposures in the workplace, with emphasis on inhalation as the prime route of exposure. It covers particulate and gas/vapour hazard evaluation, control programme design and control programme evaluation (medical surveillance), to ensure that employees and contractors will not suffer adverse health effects from particulates or gas/vapours, either used or generated by the Business.

2 Programme design

2.1 Deleted.

2.2 Designated areas will be created where:

a) it is likely that the 95 per cent upper confidence limit of an SEG's mean exposure concentration for agents resulting in chronic effects, such as total inhalable dust, respirable dust,

respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials, exceeds the relevant OEL; or

b) agents with an acute effect, such as particulate hazards, or gases (eg CO, SO2, NH3, HF, etc), or vapours exceed 50 per cent of the relevant OEL.

2.3 Designated areas must:

a) be identified and mapped, signposted or otherwise clearly communicated to employees working in the area. Signposting, where necessary, must use appropriate wording or symbols on signs to identify the hazard;

b) have a documented respiratory protection programme based on suitable risk assessment and standards, which is applied to employees, contractors and visitors;

c) have regular monitoring of SEGs working in the area; and

d) have a formal review of the practicality of engineering controls at least every two years, or less where it is a critical control for a significant risk.

2.4 Particulate and gas/vapour monitoring must be appropriate to the exposure conditions and toxicants, and based on the use of equipment approved by local regulatory authorities, as per documented methods.

2.5 There must be a special consideration given to the sampling of hot/volatile/ pressurised toxic process streams where they occur.

2.6 For known human carcinogens, mutagenic and reproductive toxicants, exposure data must be statistically valid on an annual basis. Time-weighted average (TWA) measurements over several shifts, and consistent with the work-day period, must be used. If three or more years of statistically significant data are less than 25 per cent of the OEL, or below the detection limit, then monitoring periodicity can go out to once every three years, provided the process or work organisation (including maintenance) remains unchanged.

2.7 For progressive chronic conditions with a known cause (requiring long-term exposure for an effect to manifest) and suspected carcinogens, mutagenic and reproductive toxicants, exposure data must be statistically valid on an annual basis. TWA measurements over several shifts, and consistent with the work-day period, must be used. If three or more years statistically significant data are less than 50 per cent of the OEL, then monitoring periodicity can go out to once every three years, provided the process or work organisation (including maintenance) remains unchanged.

2.8 Where risk assessment indicates the possible presence of levels of gas or vapour sufficient to cause health effects in less than one shift (eg confined space entry), continuous monitoring is required as long as the potential for harm exists.

3 Medical surveillance

3.1 Employees and Category 1 contractors must be covered by a medical surveillance programme when:

a) their SEG TWA mean exposure to respirable crystalline silica, total inhalable dust, respirable dust, lead or asbestos is greater than 50 per cent of the relevant OEL; or

b) the medical adviser considers that it is advisable; or

c) there is a legal requirement for medical monitoring.

3.2 Where risk assessment indicates a risk of a respiratory condition, assessment programmes must include chest x-rays and/or lung function tests. The test or tests chosen must enable the earliest detection of adverse effects from the exposure of concern. Where indicated, they must meet the following standards:

a) high quality chest x-rays will be taken every five years, unless local legislation requires these to be more frequent;

b) all chest x-rays for pneumoconiosis surveillance will be read to ILO standards by an ILO B reader, wherever possible, and if not, by a competent radiologist using verifiable quality criteria;

c) any progression of more than one step on the ILO extended scheme to a reading above 1/0 will be reviewed by a physician;

d) any reading suggesting active lung disease will be reviewed by a physician; and

e) all spirometry will be performed by trained staff following the American Thoracic Society guidelines or equivalent and be offered at a frequency determined by the likely rate of detectable change in lung function.

3.3 All lead monitoring programmes must meet the following standards:

a) all testing will be of venous blood according to local standards;

b) only laboratories using an active quality assurance or quality control scheme will be used for testing;

c) females of reproductive capacity with a whole-blood lead above 20µg/dL will be removed from exposure until the physician declares the worker fit for duty, and exposure to lead should cease when pregnancy is notified to the Company; and

d) all other workers with a whole-blood lead above 40µg/dL will be removed from exposure until the level has fallen below 30 µg/dL, and until the physician declares the worker fit for duty.

3.4 All monitoring programmes for other substances must be documented.

4 Exposure controls

4.1 Deleted.

4.2 Deleted.

4.3 Deleted.

4.4 Controls must be of an adequate standard such that surfaces are adequately cleaned to avoid:

a) dust generation due to material dislodgment (eg wind blown), where practicable; and

b) fume generation from accumulated dust during welding/heating or cutting operations.

4.5 Where risk assessment indicates the need to reduce exposures to toxic substances for employees or their families, good personal hygiene must be enforced. The programme must include:

a) no smoking, eating or drinking in designated hazard areas. Cigarette smoking must also be prohibited in all indoor areas and wherever people are likely to be exposed to second-hand smoke;

b) washing of hands and face prior to drinking, eating or smoking;

c) showering at work post shift or after exposure to ‘dirty’ conditions; and

d) laundering of contaminated clothing by the operation.

4.6 Abrasive blast cleaning must be conducted so as to protect worker health and minimise dust emissions. Substitutes must be used whenever practicable for abrasives containing crystalline silica. However, if such abrasives are used, workers must be aware of the hazards and exposure monitoring conducted. The hazardous properties of alternative materials must be considered before use.

4.7 Fixed station monitors and alarms must be installed where appropriate to warn against accidental or periodic releases of toxic gases/vapours (eg HCN, CO, Cl2, SO2). Such monitors must only be installed after training all affected personnel on the capabilities and limitations of the monitors.

4.8 All fixed station monitors/alarms must be identified, listed and included in a periodic schedule of preventive maintenance and testing, including calibration of detectors. Periodic drills with regard to response to sounding of the alarm must be conducted. Periodicity should be based on level of risk.

4.9 Where required, training in the recognition of signs and symptoms of hazardous particulate and gas/vapour exposure,

emergency procedures and preventative measures must be provided.

5 Respiratory protection devices

5.1 Respiratory protection devices (RPDs) must be selected with regard to:

a) the potential particulate size distribution, gas/vapour types, substance toxicity and likely concentrations;

b) compatibility with the work tasks and other PPE; and

c) comfort (as it affects wear-time) and allowance for adequate communication.

Only operation-approved RPDs will be used. The operation must ensure that suitable facilities are available for cleaning and sanitary storage of RPDs, where applicable.

5.2 Half-mask and full-face air-purifying respirators must not be used where:

a) the atmosphere is oxygen deficient (< 19.5 per cent);

b) the atmosphere is immediately dangerous to life or health (eg. in areas where CO concentrations are > 1,500 ppm, HF > 30 ppm or NH4 > 300 ppm);

c) gases and vapours are more than ten times their OEL or greater than 1000 ppm for half-mask respirators, or more than 100 times their OEL for full-face respirators; or

d) particulates are more than five times their OEL for half-mask respirators, or more than 50 times their OEL for full-face respirators.

5.3 For atmospheres that are oxygen deficient, or contain unknown hazards, or have concentrations of gases and vapours that are unknown, or could potentially exceed immediately dangerous to life or health (IDLH) values, an air-supplied type respirator must be worn.

5.4 For effective use of negative pressure RPDs (including disposable RPDs), fit testing must be qualitative and documented as a minimum, although quantitative fit testing is preferred. Fit testing must be performed by a competent person when RPDs are first issued and must be repeated periodically according to legal requirements or at a minimum every two years. There must be a policy requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks, or the use of a positive pressure RPD will be required. A pulmonary function test and medical evaluation may be required to determine whether or not an individual is medically fit to wear a respirator.

5.5 For air-supplied RPDs, breathing air must be effectively filtered and/or isolated from plant and instrument air, and isolated from

sources of potential contaminants. The quality of the breathing air must be checked for conformance with national standards.

5.6 The respiratory protection programme must include:

a) periodic inspection of RPDs, including before each use;

b) periodic evaluation of cleaning, sanitising, maintenance and storage practices by competent persons;

c) performance of positive and negative fit checks before each use by RPD wearers to ensure that the respirator is functioning properly; and

d) training at first issue of a RPD and regular refresher training there after provided according to regulatory requirements or at least once every two years.

6 Asbestos and non-asbestos fibrous silicates

6.1 This section applies to asbestos and bio-persistent non-asbestos fibrous silicates that may display asbestos-like toxicity, related to fibre diameter and length. Local regulations must be followed at a minimum. In any case the following requirements must be met:

a) a management programme compliant with all relevant requirements of the HSEQ management system or the Health A standards, and other sections of this standard, must be in place and actively pursued;

b) no new products containing these materials should be purchased;

c) installed materials of this type must be identified and assessed annually for current safety. Where ‘safe in place’, it should not be removed, unless there is an opportunity for removal during renovation or construction of buildings or equipment;

d) work areas must be separated by ropes or barriers and signposted to restrict entry; and

e) contaminated material must be placed in appropriate marked plastic disposal bags or covered containers promptly for disposal to an approved landfill.

6.2 All workers exposed to these materials must be on a register. “Exposed” means working on or near such material that has been disturbed, abraded or cut. The register must contain details of their annual medical examination and the results of occupational hygiene monitoring.

6.3 Contractor bid specifications must be reviewed and an individual identified who is responsible for overseeing contractor performance. Asbestos contractors must be competent, registered and have adequate equipment, procedures and monitoring.

6.4 Where required, the asbestos/bio-persistent non-asbestos fibrous silicates management programme must cover work

practices, training, monitoring, medical surveillance, waste handling and disposal, and the above noted detail.

6.5 Maintenance operations must be made aware of potential cristobalite exposure hazards when disturbing non-asbestos fibrous silicates that have undergone high temperature conditions.

6.6 The potential for occurrence of naturally occurring asbestiform materials in exploration or mining production activities must be assessed, the risk of exposure determined and appropriate control measures implemented where required.

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B2 - Hearing conservation

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It applies only to noise exposures in the workplace. It covers noise hazard evaluation, control programme design and control programme evaluation (audiometric surveillance), to ensure that employees and contractors will not suffer adverse health effects from noise generated by the business.

2 Programme design

2.1 Deleted.

2.2 Designated areas will be created where:

a) it is likely that the 95 per cent upper confidence limit (UCL) of an eight hour L_{eq} mean exceeds 85 dB(A); or

b) impulse noise exceeds 140 dB(C).

2.3 Designated areas must:

a) be identified and mapped, signposted or otherwise clearly communicated to employees working in the area. Signposting,

where necessary, must use appropriate wording or symbols on signs to identify the hazard;

b) have a documented hearing conservation programme based on suitable risk assessment and standards, which is applied to employees, contractors and visitors;

c) have regular monitoring of SEGs working in the area; and

d) have a formal review of the practicality of engineering controls at least every two years, or less where it is a critical control for a significant risk.

2.4 Monitoring must be based on the use of a dosimeter or sound level meter (SLM), with 3 dB exchange rate, and A-weighting and impulse noise measurement capability, calibrated as per the manufacturer's methods.

2.5 Employees and Category 1 contractors whose eight-hour L_{eq} exceeds 85 dB(A), or impulse noise exposure exceeds 140 dB(C), must be offered and encouraged to undergo annual audiometry. The results should be discussed with the worker.

3 Audiometry programme

3.1 Where an audiometry programme is indicated, it must meet the following standards:

a) all testing must be by pure tone audiometry in an audiometry booth or quiet room, with measured noise levels less than 40 dB(A);

b) the initial audiogram must be taken prior (minimum of 24 hours) to exposure to significant noise. Further audiograms must be taken periodically; annually where exposures are over 85 dB(A) L_{eq} or where continued deterioration to hearing is occurring;

c) testing must be performed by trained and competent personnel;

d) audiometers must be calibrated according to the manufacturer's guidelines. As a minimum these will be a weekly biological calibration using a member of staff unexposed to noise, or a bio-acoustic simulator, and an annual quantitative check. All results must be documented; and

e) audiograms must be read by trained persons who will identify any increasing hearing loss and then determine if this is noise induced. Any employee with a significant downward shift in one or both ears (measured as an average non age-adjusted loss from baseline of 10 dB at 2, 3 and 4 kHz) must be retested following removal from noise for a minimum of 24 hours, usually after a days-off period. If the downward shift persists the employee must be reviewed by a physician and improved hearing protection considered.

4 Exposure controls

4.1 Deleted.

4.2 Deleted.

4.3 Deleted.

4.4 Where required, training in the recognition of signs and symptoms of hazardous noise exposure and preventative measures must be provided. Training will begin after hire and continue with regular refresher training provided according to regulatory requirements or at least once every three years.

4.5 Hearing protection devices (HPDs) must be selected with regard to the potential type and loudness of noise likely, comfort, and compatibility with the work tasks and other PPE. No employee should be exposed to more than 82 dB(A) at the ear while wearing a HPD, as determined over an eight hour equivalent shift. Only operation-approved HPDs will be used.

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B3 - Manual handling and vibration

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It focuses on musculo-skeletal damage that can result from manual handling and from vibration. This standard covers musculo-skeletal hazard evaluation, control programme design and control programme evaluation, to ensure that employees and contractors will not suffer adverse health effects from poor task and equipment design, or from inappropriate behavioural practices.

2 Programme design

2.1 Deleted in part and moved to clauses 2.5, 2.6 and 2.7

2.2 The workplace must be assessed by a competent person for compliance with good design, layout and practice, to avoid or minimise adverse health consequences due to manual handling and vibration issues.

2.3 The quantitative evaluation of vibration produced by specific equipment must include the following measurement parameters: direction of movement, frequency, intensity, and variation with time and duration, as per documented methods.

2.4 Employees and contractors must be informed of the results of assessments and instructed in appropriate manual handling techniques, where the risk assessment indicates a need.

2.5 Workplace vibration sources that could contribute to the exceedance of OELs (hence potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.

2.6 Manual handling tasks assessed as having potential to cause an LTI (ie with potential for impact on worker musculo-skeletal fitness) must be identified and adequately characterised.

2.7 Workplace manual / materials handling tasks risk rated as “significant” must be assessed and recorded to include biomechanical factors (eg posture, bending, twisting, repetitive motions, working overhead, exerting force away from the body).

3 Exposure controls

3.1 Design criteria that address ergonomic requirements, and the minimisation of vibration where appropriate, must be available for the purchase or fabrication of all new fixed and mobile workplace equipment, and furniture. This also applies to retrofits to existing equipment.

3.2 The operation must ensure that its management of change mechanisms eliminate or minimise ergonomic risks when designing workplaces, processes, facilities, machines and operational procedures.

3.3 Control measures must be in place to minimise exposures and protect employees and contractors from adverse exposure. Where possible, machines or equipment, or alternative systems of work, must be employed to conduct heavy, awkward or repetitive tasks.

3.4 Deleted.

3.5 Where risk assessment indicates the need, businesses must have within the periodic medical assessment a programme that includes:

a) encouragement of workers to recognise and report the early symptoms of musculo-skeletal disorders;

b) encouragement of workers to recognise unsafe manual handling and vibration conditions;

c) the identification of modifiable risk factors that may impact fitness for work;

d) education and support to address any identified fitness for work risk factors; and

e) education and support to assist workers regain their fitness for work.

3.6 Machines, working equipment and tasks risk rated as "significant" must be evaluated for possible modification or replacement where necessary.

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B4 - Hazardous substances

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It applies to dangerous goods and hazardous substances, both process and non-process. It covers hazard identification and evaluation, control programme design and evaluation, to ensure that employees, contractors and third parties will not suffer adverse health or safety effects from hazardous substances that are transferred, used or generated by the business, and to ensure the minimisation of risks and environmental impacts due to spill or other releases of hazardous substances. Local definitions of dangerous goods and hazardous substances in regulations should be adhered to by businesses.

This standard is an extension of Elements 7.1 through 7.4 of the HSEQ management system.

2 Programme design

2.1 A hazardous materials register or inventory system must be available and be used to control the purchase and introduction of new materials to operations, including those brought in by contractors. The register must be updated regularly.

2.2 The properties of materials brought to site, site products, intermediates, by-products and wastes must be adequately understood and documented with regard to their ability to impact on health, safety and environment. Material Safety Data Sheets (MSDS) must be obtained where possible and when required by law prior to using hazardous materials at site.

2.3 MSDS, or equivalent hazard communication document, for products and any process or waste materials sent off site must be sent to customers. These documents must be maintained and identified on the site register.

2.4 MSDS must be used to:

a) provide adequate information regarding health, safety and environmental effects, precautions and safe handling practices to all on site who transport, handle or use hazardous materials/substances;

b) conduct a risk assessment to determine the need for workplace monitoring, medical surveillance and controls;

c) prepare workplace labels as necessary; and

d) provide emergency response and first aid information.

2.5 A coordinator must be assigned the accountability for the hazardous substances management programme, which will include maintenance of the hazardous materials register and MSDS system.

2.6 Safe working procedures and training in the safe use, transport, storage and disposal of hazardous substances (including explosive dusts), as well as the use of appropriate storage facilities and personal protective equipment, must be provided.

2.7 Deleted

2.8 MSDS for site products and process or waste materials must comply with local regulatory requirements and with requirements of the country or location to which the product is shipped. Mandatory use of GHS (Globally Harmonised System) compliant MSDS will be required for those countries that have adopted GHS. MSDS must be revised, as necessary, at least every 5 years.

2.9 Material Safety Data Sheets (MSDS), or a computer database containing MSDS, must be readily available to employees, contractors and other affected parties (eg local community, emergency services), and be in the language(s) commonly used at the operation.

3 Material Safety Data Sheets - Deleted

3.1 Deleted and moved to clause 2.8.

3.2 Deleted and moved to clause 2.9.

4 Controls

4.1 Deleted

4.2 There must be written procedures for the use, storage and disposal of identified high priority hazardous substances (those with a risk classification of Critical). These must be audited every 12 months.

4.3 Storage facilities must be secure and protected from damage. They must also be designed for easy access for fire fighting. Where applicable, the storage facility must protect chemical containers from physical damage due to temperature extremes, moisture, corrosive mists or vapours, and vehicles.

4.4 Hazardous substances must be adequately stored and segregated based on:

a) quantity of materials stored;

b) physical state of the chemicals (solid, liquid or gas);

c) degree of incompatibility; and

d) known behaviour of the materials.

4.5 All containers must be adequately and clearly labelled to indicate identity, precautionary requirements and date for expiry, where relevant. Pipes or other distribution systems used for hazardous substances must be clearly identified. Directional flow must be indicated where practical.

4.6 Prior to disposal, empty containers/equipment must be properly decontaminated, where applicable.

4.7 There must be a programme to assess safer alternatives to current hazardous chemicals/ substances (based on risk assessment for health, safety or environmental hazards), and to limit worker access to hazardous substances. This programme must also consider product and process re-formulation/re-design activities where technically feasible.

4.8 Appropriate PPE must be selected with regard to the potential hazards, permeability, penetration, resistance to damage and compatibility with the work tasks.

4.9 Emergency showers and eye-wash stations must be available where required by law, or where their need is indicated by risk assessment, and must be appropriately located, maintained regularly and signposted. Workers must be trained as to their location and use.

4.10 Supply chain optimisation practices must be used to minimise the inventory of hazardous substances to necessary quantities for justifiable use.

5 Asbestos and non-asbestos fibrous silicates - moved

5.1 Deleted and moved to standard-clause B1-6.1.

5.2 Deleted and moved to standard-clause B1-6.2.

5.3 Deleted and moved to standard-clause B1-6.3.

5.4 Deleted and moved to standard-clause B1-6.4.

5.5 Deleted and moved to standard-clause B1-6.5.

5.6 Deleted and moved to standard-clause B1-6.6.

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B5 - Radiation

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It applies to workplace radiation issues and includes both ionising and non-ionising radiation. It covers radiation hazard evaluation, programme design, exposure controls and employee education and training, to ensure that employees, contractors and third parties will not suffer adverse health effects from radiation sources.

2 Programme design - all types of radiation

2.1 The risks associated with ionising (from naturally occurring radioactive mineral (NORM), radon, and man-made sources), ultra violet (UV) and electromagnetic field (EMF) radiation exposure must be assessed by a competent person.

2.2 There must be an inventory of all relevant types of radiation sources that have a potential for adverse health effect, and should include radiation source type, type of radiation (eg radioisotope, radon, EMF, laser, etc.), strength and unit/material location.

2.3 Where risk assessment indicates the need, a documented radiation management programme must be developed such that:

a) all types of radiation sources are adequately characterised and described;

b) such exposures can be eliminated or reduced to as low as reasonably practicable (ALARP);

c) it provides a clearly defined chain of responsibility, with duties and responsibility documented; and

d) education is provided for employees and contractors regarding radiation safety, including the radiation management programme elements.

3 Programme design - ionising radiation

3.1 The ionising radiation management programme must meet all applicable regulatory requirements, and at a minimum include the following elements (as applicable):

a) surveyed radiation areas and quantification of exposure sources/levels;

b) exposure and medical monitoring programmes based on established investigation levels;

c) transport of radioactive materials in compliance with international radiation transport regulations, when no local regulations are in place;

d) waste monitoring and disposal programmes;

e) feedstock and equipment checks for naturally-occurring ionising radiation;

f) clearance and control procedures for all contaminated materials and equipment leaving or arriving at site (including scrap);

g) leak (wipe) tests on sealed radioactive containment equipment;

h)mine ventilation with specific reference to radiation protection (for underground mines);

i) water management and air emission control;

j) lock-out procedures for vessels and equipment containing radioactive sources and radon decay product measurement prior to entry;

k) emergency procedures;

l) environmental impact risk assessment (air, water, waste, foods, etc);

m) product/waste life cycle control; and

n) dose assessment for employees and critical exposure groups, according to documented methods and by a competent person.

3.2 Areas with ionising radiation with annual doses greater than 5 milli Sieverts (mSv) must be designated as restricted access or controlled areas. These areas must be identified and mapped, signposted or otherwise clearly communicated to employees working in the area.

3.3 All underground operations must have conducted a baseline radon survey using passive area monitoring techniques. All underground operations with an identified radon issue must conduct similar surveys once every two years. Areas with levels greater than the International Commission on Radiological Protection (ICRP) action levels must be designated as restricted access or controlled areas.

3.4 These underground designated restricted areas will require the development of engineering controls. Signposting, where necessary, must use appropriate wording or symbols on signs to identify the hazard.

3.5 Each person whose potential exposure exceeds 5 mSv per annum or who is a designated radiation worker must undergo periodic personal radiation monitoring and medical surveillance designed to show continued fitness for radiation work.

4 Exposure controls

4.1 Deleted

4.2 All sources of ionising radiation must be managed in use and when they are either disposed of or securely stored in accordance with local regulations. Each operation where individual worker's exposures could exceed 5 mSv per annum must have a trained radiation protection adviser or ready access to a trained protection consultant.

4.3 There must be documented procedures for the inspection, assessment and maintenance of the controls, and emergency procedures to deal with incidents involving ionising radiation sources (including fire and explosions). All controls must be reassessed annually to ensure their continued effectiveness and that operating practices are in accordance with written procedures.

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B6 - Thermal stress

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It addresses both workplace heat stress and cold stress. It covers high temperature conditions generated by the industrial process or the mining environment, temperatures exacerbated by hot weather, and extreme cold weather conditions, that can pose a risk to health and safety of employees and contractors.

2 Programme design

2.1 Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.

2.2 Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.

2.3 For defined extreme thermal conditions and job activities, medical examinations must include information about the

operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.

2.4 Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.

2.5 Workplace thermal stress levels (temperature, air movement, humidity, etc), activities (work level, etc) and conditions (clothing, health, etc) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.

3 Measurement techniques

3.1 Detailed heat stress assessment of identified tasks or jobs must be tiered to:

a) commence with the use of a simple heat stress index as a screening tool; then, if necessary;

b) use rational heat stress indices in an iterative manner to determine the ‘best’ control methods for alleviating potential heat stress; then

c) undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss must be worn.

3.2 Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the ‘best’ control methods for alleviating potential cold stress.

4 Exposure controls & treatment

4.1 Deleted.

4.2 When a risk of thermal stress is identified, the following exposure controls must be implemented:

a) an acclimatisation period for new workers and those returning from extended leave or sickness;

b) training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;

c) protective observation (buddy system or supervision); and

d) a requirement for self-paced working.

4.3 The following exposure controls must be considered by a competent person:

a) work/rest regimes and job rotation based on measurements conducted;

b) suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;

c) selection of appropriate clothing or other PPE for extreme temperature conditions;

d) the use of engineering controls; and

e) undertake hot/cold tasks during a cooler/warmer time of the day.

4.4 Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

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B7 - Fitness for work

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It applies where a risk assessment has identified that fatigue or other causes of impaired fitness for work could produce a potential for serious injury, illness or death, significant equipment/plant damage, or significant environmental impact. It covers programme design, management of shift systems, and personal fitness. 'Personal fitness' includes the person's physical, mental and emotional state.

2 Programme design

2.1 Safety critical jobs are those where fatigue or other causes of reduced fitness for work could lead to serious injury, illness or death to employees, significant equipment/plant damage, or significant environmental impact. These jobs must be identified and an assessment of the risks from these conditions made.

2.2 For safety critical jobs, a programme to manage these risks is required, and must consider both employees and contractors, to the extent possible by local or regional employment laws. The programme, in addition to the requirements in HSEQ

management system Element 13.7 or Occupational health standard A5, must include:

a) mechanisms for managing fatigue, stress and lack of fitness;

b) an alcohol and other (including prescription, pharmaceutical or illicit) drugs policy that includes testing (where legally possible) and applies to employees and contractors;

c) access to an Employee Assistance Programme providing confidential access to resources and counsellors; and

d) training and awareness programmes.

3 Management of shifts and work hours

3.1 Sleep deprivation during shift work or from excessive working hours is a known cause of fatigue. Fatigued employees are at increased risk of accidents. Shift system design must consider:

a) the effect on worker fatigue;

b) the effects of activities carried out during rostered and over time hours;

c) the impact on sleep cycles of activities such as the time for commuting to and from site; and

d) the monitoring and control of working hours.

4 Personal fitness

4.1 All workers commencing work in safety critical jobs must have a pre-placement medical examination, followed up by periodic medical examinations, based on risk assessment and detailed position descriptions.

4.2 The medical criteria for fitness must be documented and based on an evaluation of the physical and medical requirements for the jobs.

4.3 All workers in safety critical jobs must report to their supervisor/manager any condition that might impair their ability to safely perform the functions of their position. A mechanism must be in place for such reports to be referred to the medical adviser for consideration as to the worker's fitness for their type of work.

4.4 The periodic medical assessment programme of employees and Category 1 contractors in safety critical jobs must include:

a) the identification of modifiable risk factors that may impact fitness for work;

b) education and support to maintain health or address identified risk factors; and

c) education and support to assist workers regain their fitness for work.

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B8 - Legionnaires disease

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It applies to Legionnaires disease in the workplace. It covers Legionella hazard evaluation, control programme design and control programme evaluation, to ensure that employees, contractors and third parties will not suffer adverse health effects.

2 Programme design

2.1 All equipment with the potential for generating Legionella (such as cooling towers and associated equipment, air-handling systems, hot water services and showers) must be identified and the risks of contamination and aerosol generation assessed.

2.2 Where there is an assessed risk that Legionella could grow in the system and cause harm, a programme must be in place such that:

a) all such equipment is identified on a register. The register must contain details of the regular maintenance, cleaning and checking programmes;

b) control measures are in place to minimise aerosol emissions;

c) there must be a documented water treatment programme, including procedures for inspection, assessment and maintenance of the controls; and

d) new or retrofitted equipment is designed and constructed to minimise the risk of Legionella growth.

3 Monitoring

3.1 Where available, the Legionella plate count test should be used if more effective methods are not available.

4 Controls

4.1 Good maintenance procedures must be followed to minimise the risk of significant contamination of equipment with other bacteria and microbial organisms.

4.2 Adequate procedures must be available for disinfecting systems if significant concentrations of Legionella bacteria are present. Once disinfected, systems must be retested to confirm effectiveness of treatment.

4.3 Deleted

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B9 - Travel and remote site health

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. It covers the general travel health issues associated with temporary site visits, health issues associated with working in remote areas or at operations that supply food and water, and altitude sickness. It covers travel health programme design and management, to ensure that employees, contractors and third parties will not suffer adverse health effects.

2 Programme design

2.1 There must be in place a programme to prevent both chronic and acute illnesses through proper sanitation, food hygiene and control of disease vectors at remote operations. Vector control must be conducted in a manner that prevents the transmission of disease and ensures that control measures are applied in a safe and healthy manner.

2.2 There must be in place a programme to minimise as far as possible the impact of travel related ill-health and safety risks, and ensure that all international travellers (eg visitors, secondees & contractors) are adequately informed before travel. The programme must include information on jet lag,

deep vein thrombosis (DVT), food safety, relevant community health hazards (including infectious diseases), local security and safety threats and emergency procedures.

2.3 Deleted.

3 Management

3.1 Deleted.

3.2 The need for immunisations and behavioural precautions (eg sunscreen, insect repellent, appropriate clothing, food preparation, etc) must be documented and communicated to relevant staff. A medical travel kit must be made available for travellers to remote/high risk areas. In addition, a process must be established to manage travel-related health concerns that arise following departure from the site, including the development of malaria type symptoms.

3.3 An in-house occupational health service, a service provider or a general practice must provide relevant pre-travel advice and preparation, as well as a medical review on return to home if there are health concerns. Professional responsibility for the provision of these pre- and post-travel medical services must be defined. Where a service provider or a general practice is used, standards for the level of service provided must be established.

3.4 Consultants, bulletins and the Rio Tinto Intranet must be used to provide up-to-date warnings on health risks for remote area workers and visitors. A nominated person will post warnings received from the operations to the Intranet.

3.5 Deleted.

3.6 Where food and water is provided by the business, there must be a system to ensure that:

a) food is purchased from reputable sources, stored at appropriate temperatures and prepared in a hygienic manner and location. It must be inspected for temperature and signs of spoilage on receipt;

b) potable water sources are located away from potential sources of contamination, and the water be treated to kill disease-producing organisms and periodically checked for potability;

c) waste is treated in a way that will prevent water and air pollution and is not accessible to insects or rodents; and

d) documented procedures are available for the above requirements and relevant employees are trained in these procedures.

4 Altitude

4.1 Prior to a visit, a physician must have reviewed all travellers to altitudes above 3000m within the previous 12 months, specifically for travel to high altitudes, and the following must be included in the review:

a) previous history of travel to similar altitudes;

b) lung function to establish the absence of significant restrictions;

c) heart function to establish normal exercise tolerance and absence of significant ischaemic or valvular disease. An electrocardiogram (ECG) should be performed;

d) blood pressure to ensure the absence of significant uncontrolled hypertension. Particular care is required for those with labile or poorly controlled disease;

e) cerebral function to establish the absence of conditions such as epilepsy that may be adversely affected by low oxygen concentrations;

f) any other concern of the traveller about the trip; and

g) the use of medications to reduce the effects of altitude.

4.2 Whenever possible two or three days must be allowed to begin acclimatisation to altitude before work commences.

4.3 Whenever possible, visitors must move to lower levels at night. Practical experience suggests that moving to 3500m or below significantly improves the duration of sleep. Irritability and severe breathlessness or anxiety may be indicators of maladjustment to altitude, and must be treated by moving the sufferer to lower altitude.

4.4 In the first week of a trip considerable caution must be exercised to avoid excessive physical exercise. Thereafter, exercise can increase very slowly.

4.5 Deleted and moved to clause 4.3.

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Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
4	December 2008	Ian Firth; Adrian van Tonder	Manoel Arruda	Incorporation of suggested changes from operations and alignment with HSEQ management system.

B10 - Occupational exposure limits

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management. To protect all who work at our operations from occupational illness, workplace hazardous exposures must be controlled to below occupational exposure limit (OEL) and/or biological test limit values. The lists of substances (or agents) are derived from an assessment of business unit exposures, but do not necessarily include all hazardous exposures found within the Rio Tinto Group.

2 Definitions

2.1 Deleted.

2.2 Deleted.

2.3 Deleted.

3 Programme design

3.1 Each business or operation must establish or adopt an OEL for each hazardous agent for which significant worker exposure is possible. Where, in the absence of a legal or Rio Tinto OEL, a

business/operation standard is developed, this OEL must be documented.

3.2 OEL and biological test limit values must be reviewed annually for relevance and efficacy. Rio Tinto OELs and biological test limit values are documented in Work Cycle WC2080. These mandatory standard limits are reviewed regularly by Rio Tinto HSE.

3.3 Where workers have a working day longer than eight hours or unusual shift rotations are in effect, the TWA OEL may need to be reduced by a suitable factor to ensure adequate worker protection. Such factors require specialist consideration.

3.4 For some agents, the existence of an adverse carcinogenic health effect is known or suspected, but there is no internationally accepted assessment of the appropriate OEL or no agreed practical method to quantify workplace levels. In these cases, exposures to agents meeting these criteria must be as low as reasonably achievable or practicable.

4 Rio Tinto OEL values

Deleted (Rio Tinto OELs are now documented in Work Cycle WC2080. These mandatory standard limits are reviewed regularly by Rio Tinto HSE).

5 Rio Tinto biological test limit values

Deleted (Rio Tinto biological test limit values are documented in Work Cycle WC2080. These mandatory standard limits are reviewed regularly by Rio Tinto HSE).

Revision history

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4	December 2008	Ian Firth; Adrian van Tonder	Manoel Arruda	Incorporation of suggested changes from operations and alignment with HSEQ management system.

B11 - HIV/AIDS

1 Scope

This standard applies to all operations, including projects, in which the community prevalence of HIV is at one per cent or greater (as defined by UNAIDS), or in lower prevalence areas where the presence of HIV/AIDS poses a significant business risk, for example due to the threat to employee health, company reputation or business sustainability. It covers risk assessment, programme design and evaluation to ensure the effective management of the significant risks that HIV poses to workers, their dependents and the communities in which we operate.

Rio Tinto has committed to not discriminating at pre-employment or during employment on the grounds of HIV status; all operations must manage their HIV/AIDS programmes in compliance with this commitment.

2 Programme design

2.1 All operations must assess the risks posed by HIV. For all high or critical risks (as defined in the HSEQ MS – Element 3), a mitigation programme incorporating sustainable development principles, must be implemented covering the life of the operation from exploration, project development and commissioning, to operation and closure.

2.2 The HIV/AIDS risks of all labour contracts must be assessed. For all high and critical risks, control strategies must be implemented.

2.3 The risks posed by HIV/AIDS to the business' workforce and communities must be assessed in the development of the multi-year communities plan. This assessment must include consideration of and seek synergies with the business' workplace HIV strategy, goals and objectives.

2.4 Discrimination towards employees on the basis of actual or perceived HIV status is forbidden.

2.5 All information on the HIV status and condition of employees and community members, including that relating to counselling, care and treatment and receipt of benefits, must be maintained in medical confidence.

2.6 HIV/AIDS screening is not a requirement for recruitment or a condition of employment.

3 Programme elements

3.1 Where the HIV prevalence rate is at or above one per cent (as defined by the UNAIDS), operations must ensure that employees and one nominated partner have affordable access to an integrated HIV/AIDS programme that includes antiretroviral therapies (ART). At separation of the employee from employment, transition to alternative, affordable source of ART, such as via government or NGO, must be sought.

3.2 Operations must ensure that employees and their nominated partner have access to medical provider(s) that comply with HIV/AIDS drug protocols consistent with the current WHO Guidelines or (equivalent recognised scheme) applicable to the host country.

3.3 The programmes must address the following components:

i) prevention, awareness and education;

ii) voluntary counselling and testing (VCT);

iii) wellness, counselling and treatment; and

iv) monitoring and evaluation.

3.4 Partnerships must be actively sought with specialist external organisations to assist the business to deliver HIV education, awareness raising and treatment to employees, their dependents and where indicated by the multi-year community plan, to the broader community.

Revision history

Version no.	Effective date	Prepared by	Authorised by	
1 (Strategy)	2004	Liz Wall	Elaine Dorward-King	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Rob McDonald	Elaine Dorward-King	Strategy revisions approved by ExCo and published as an HSE performance standard.

Rio Tinto HSEC

Rio Tinto

Standards

HSE Performance Standards - SAFETY

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Contents page

C1 – Isolation

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

1.1 This standard applies to all sources of hazardous energy and hazardous substances.

1.2 **Hazardous energy:** For example electrical, pneumatic, hydraulic, stored (springs, batteries), potential (by virtue of position), gravitational, heat (hot water, steam), radiation.

1.3 **Hazardous substances:** For example, gases, vapours, liquids, dusts with the potential to cause injury or illness, eg toxic, corrosive or flammable.

1.4 **Isolation officer:** Whenever a piece of plant or equipment is to be isolated, there must be a person designated to carry out the Isolation procedure. That person is referred to as the Isolation officer. No person may be designated as the Isolation officer for a piece of equipment unless s/he has been trained, tested and certified as competent to carry out the Isolation procedure for that piece of plant or equipment. Tests for voltage, for example, require competency in electrical work as outlined in the electrical standard.

1.5 **Isolation procedure:** All designated systems, plant and equipment must have written procedures for isolation. (see Rio Tinto Standard A1.3.1). This procedure will set out how the system, plant or equipment is to be made safe and kept safe. It will include, for example: decontamination; venting of stored energy; securing of rotors or fan blades; chocking of vehicles; and disconnecting, blocking or bleeding of equipment, cables, pipes and vessels. It will show any connections to Distributed control systems. It will also show the isolation points for lockout and test procedures.

2 Isolation officer's responsibility

2.1 Before any work is begun on or in a system, plant or equipment, the Isolation officer must first ensure that it is made safe in accordance with the Isolation procedure.

2.2 The Isolation officer's lock and identification tag must be the first to be applied and the last to be removed.

2.3 a) The Isolation officer's lock must be a master series lock since it will remain on the plant or equipment when handing over to subsequent shifts. Keys to the Isolation officer's lock must only be held by other designated Isolation officers; and

b) where isolation involves only one person on jobs to be completed within a single shift and where it is not appropriate for a master series lock to be utilised, the person must be an Isolation officer and s/he must apply his/her personal lock and identification tag.

2.4 After locking and tagging, the Isolation officer must clear the area of personnel before a trial step to ensure that the plant or equipment has been isolated.

2.5 In the case of electrical isolation, a test for voltage must be carried out, after the switching device, to ensure the absence of voltage.

2.6 Where there is a need for work to extend over multiple shifts or where there are large numbers of people involved in the work (such as large maintenance projects) then a project isolation procedure can be implemented. This procedure must, however, have the requirements that personal locks must be used for each person working on the project, an Isolation officer's control lock is in place and this control lock cannot be unlocked without all personal locks being removed.

2.7 Where it is necessary to work on live equipment for the purposes of commissioning, testing, sampling and adjustments, such work shall be carried out in accordance with a written procedure. The written procedure shall require:

a) an isolation officer to confirm effectiveness of controls associated with the live work area; and

b) the work area is controlled to prevent unauthorised access.

3 Everyone's responsibility

3.1 Everyone, including the Isolation officer, who has to perform work on the plant, equipment or system, must first apply a personal lock and identification tag in accordance with the Isolation procedure.

3.2 Personal locks must be such that they can only be unlocked by their owner.

3.3 Personal locks may never be removed other than by the person to whom they belong, other than in the presence of and under the supervision of the department or area manager or his/her appointed nominee, and in accordance with a written procedure.

4 Revision history

Version no.	**Effective date**	**Prepared by**	**Authorised by**	
1	Jan 2001	CEO Safety Adviser	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.

C2 - Electrical safety

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

1.1 This standard applies to all electrical work above 110 volts DC or 50 volts AC.

2 Competency standards and safe work procedures

2.1 There shall be demonstrated job and equipment-specific electrical competency standards and safe work procedures for all electrical work, ie construction, decommissioning and demolition of electrical equipment.

2.2 The competency standards shall specify the frequency for re-certification, which shall be no less than every two years and address job and equipment-specific safe work procedures.

2.3 All electrical work must be conducted by competent personnel in accordance with governing regulation, code, design criteria and safe work procedures.

2.4 There shall be an arc flash protection program in place to determine incident energies and define the appropriate PPE and associated procedures to mitigate the hazard.

3 Electrical equipment

3.1 Electrical safety devices such as earth leakage and overload protection shall be installed on all final distribution circuits and the settings established by qualified personnel.

3.2 Electrical equipment, grounding continuity and electrical safety devices shall be inspected and/or tested on a suitable schedule and the findings recorded.

3.3 There must be a system for removing electrical equipment unfit or unsafe for purpose.

3.4 There must be a system for maintaining an up-to-date set of single line diagrams, with supporting documentation showing: system fault calculations; equipment details; electrical protection discrimination curves; and cable ratings.

4 Isolation and access

4.1 Equipment shall be isolated in accordance with the site Isolation procedure (see Rio Tinto standard C1 Isolation). All energised electrical work will require a safe work procedure and, with the exception of voltage testing and where no tools are used, will require an Energised Electrical Work Permit.

4.2 Electrical panels, enclosures, control centres, substations and equipment shall be appropriately guarded, labelled, and made inaccessible (except for emergency shut off mechanisms) to unauthorised personnel. Areas containing such equipment are 'controlled areas'.

4.3 Where it is necessary for untrained personnel (eg visitors) to enter controlled areas there shall be a system for communicating the hazards and for escorting them with appropriately trained personnel. Contractors must have a permit to work in controlled areas.

4.4 Access to an electrical cabinet or other enclosure with exposed energised terminals in excess of 1,000 volts is prohibited.

4.5 Employees and contractors exposed to electrical hazards shall receive electrical hazard training at the commencement of their employment and thereafter on an annual basis. The training shall address the equipment and conditions specific to the work area of the personnel and be documented.

4.6 There must be an assessment of overhead and underground power lines and a system in place to mitigate the hazards associated with working in close proximity to prevent contact by personnel or equipment.

5 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	Jan 2001	CEO Safety Adviser	ExCo	
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2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.

C3 - Vehicles and driving

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

1.1 This standard applies to all vehicles, including mobile mining equipment, owned and operated by Rio Tinto or its contractors, which are used on Rio Tinto operations or off-site for Rio Tinto business purposes.

1.2 Tyre and rim safety requirements applies to tyres and rims of size 60 cm (24 inches) and greater. It is supported by the tyre and rim safety work cycle.

2 Risk analysis

2.1 A comprehensive risk analysis shall be conducted to clearly identify the conditional and behavioural factors that impact vehicles and driving safety. The risk analysis must cover all aspects of vehicles and driving and will have up-to-date action plans in place to manage identified issues.

3 Vehicles

3.1 All vehicles used for work purposes must be subject to a risk assessment. The assessment must:

a) involve operators and maintainers who will use the equipment; and

b) address all aspects of safe operation including handling, driver vision, brake failure, tyre blow out and access/egress for operators and maintainers.

3.2 All vehicles driven for work purposes must be subject to an appropriate pre-operation safety check based on a risk assessment.

3.3 All vehicles used for work purposes must be fitted with:

a) fixed seats and safety belts for driver and all passengers, unless a risk assessment specifies otherwise; and

b) a speedometer or like means of informing operators of vehicle speeds for vehicles capable of exceeding the lowest applicable speed limit.

3.4 All light vehicles used for work purposes must comply with all aspects of the Rio Tinto Light vehicle guidance note unless the risk assessment specifies otherwise.

3.5 Deleted.

4 Training and licensing

4.1 No person may drive a vehicle unless they are trained, competent, tested and licensed to operate that vehicle. The training must address hazards assessed for

(a) that vehicle and

(b) the tasks for which it is to be used.

4.2 All persons required to drive/operate vehicles at the operation must have a site license to operate those vehicles. A state or civil driving license is an approved alternative except where

(a) there is a need for a specific set of Company rules/procedures (for example, in a pit area where a pit license or permit is required) or

(b) the state or civil licence does not apply to the class of vehicle being driven.

4.3 The manager shall have a system in place to ensure that the renewal of licenses will be based on an assessment of competency to drive and or operate the equipment. The frequency of assessment will be either annual, or derived from a risk assessment for each vehicle type.

4.4 A system shall be in place that limits the number of people that drive in an open pit. In addition, because of the constant change in conditions, no person shall be licensed to drive in an open pit unless they are required to do so more than once in a two week period.

5 Traffic rules

5.1 The driver and all passengers must wear their seat belts, where fitted, at all times.

5.2 Speed limits and traffic rules must be reviewed regularly and rigorously enforced.

5.3 There must be rules to ensure that:

a) in mining operations no vehicle approaches within 50 metres of any heavy mobile machinery without first making positive contact with the operator of that equipment;

b) the interaction between heavy and light vehicles is controlled;

c) if an operations rule permit overtaking in the pit area, then no vehicle will overtake a haul truck or water truck before making positive contact with the driver; and

d) no vehicle tows equipment unless it is engineered to do so.

6 Tyre and rim safety

6.1 Operations must establish a Tyre management plan that is approved by the senior manager at the operation and reviewed every 12 months.

6.2 There must be demonstrated job competencies and safe work procedures for all tyre maintenance, servicing activities and tyre fire emergency response. The competencies must specify the frequency for re-certification, which must be no less than every three years.

6.3 No person must approach a vehicle within 24 hours of a lightning strike, contact with high voltage electricity or a tyre fire. An exclusion zone of 300 metres (1000 feet) of a tyre fire must be established and only be accessed by emergency service personnel that are shielded while fighting the fire.

6.4 Restricted work zones (RWZ) and exclusions zones must be established for the tyre installation, removal and handling processes.

6.5 All tyre and rim handling equipment must have fall back prevention in place prior to anyone entering the RWZ.

6.6 Tyres with split rims must be deflated to zero and other tyres to a nominal pressure no greater than 5psi prior to removal of any retaining devices. In a dual assembly both tyres must be deflated.

6.7 Tyre inflation is subject to the following requirements:

a) remote inflation must be used for all tyre inflation;

b) where the risk of ejection of components exists barricading must be in place;

c) a tyre must not be left unattended during inflation; and

d) tyres that have run at less than 80 per cent cold inflation pressure must not be re-inflated. Both tyres in a dual assembly must be dismounted and inspected.

6.8 No welding, cutting or application of heat sources to a rim or wheel must be done while the rim or wheel is fitted with a tyre - whether inflated or deflated.

6.9 A periodic testing and/or inspection regime must be in place for tyres, rims/wheels and assemblies.

6.10 All tyres, rims/wheels must be made unserviceable when deemed unfit for service or before being sent off site for disposal.

6.11 A tracking system must be in place to track the lifecycle of tyres, rims/wheels.

7 Revision history

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1	Jan 2001	CEO Safety Adviser	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	• Incorporation of suggested changes from operations and alignment with HSEQ management system. • Tyre and rim safety requirements added.

C4 - Working at heights

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

1.1 This standard applies to any task where the risk assessment highlights a danger of falling. In any case, fall prevention or protection shall be used for elevated work above 1.8 metres.

1.2 **Fall prevention**. Wherever practical, a safe working area must be provided by means of work platforms or scaffolds. Fall prevention standards are set out below.

1.3 **Fall protection.** In all other cases, Fall protection must be used. This includes situations in which work is being carried out from an elevating work platform or manlift. Fall protection standards are set out below.

1.4 **Ladders.** A person may climb or descend a ladder without fall protection provided that they are able to use both hands and legs to do so; face the ladder and use one step at a time. Ladders shall be tied off or supported below.

1.5 **Barricades.** Where overhead work is being conducted, barricades must be erected around the work area to protect others below from falling objects.

2 Fall prevention

2.1 Work platforms and scaffolds must have complete floors, guardrails and toe-boards and safe access and egress must be provided.

2.2 A person must be designated to control the work platform, scissor lift or man-lift ("the basket"), who is trained and competent to do so and qualified as required under local regulations.

2.3 The designated person must be in the 'basket' unless it can be demonstrated that it is not possible.

2.4 Every person in the 'basket' must be secured at all times with proper fall protection equipment and there must be systems in place to prevent tools and equipment from falling.

2.5 There shall be a system for ensuring the design, construction, certification, maintenance and inspection of elevating work platforms and man-lifts.

3 Fall protection

3.1 A person has fall protection if s/he is secured with an approved full body harness, shock absorbing lanyard (where the potential to fall is greater than 4 metres) or short restraining lanyards (where the potential to fall is less than 4 metres), double or triple action snap hooks (or karabiner type rings) and secure anchorage points.

3.2 Anchorage points must, where practical, be above the head of the worker, and must ensure that in the event of a fall the worker will neither swing nor touch the ground.

3.3 There must be a system for ensuring that anchorage points are tested and approved by a competent person to ensure that they are secure and can take the required load.

3.4 There must be a system for ensuring that fall protection equipment is:

a) tested and certified for use;

b) inspected by the user before use; and

c) destroyed following a fall or where inspection has shown evidence of excessive wear or mechanical malfunction.

3.5 There must be a system for preparing and testing emergency rescue procedures for fall victims.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	Jan 2001	CEO Safety Adviser	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.

C5 - Confined spaces

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

1.1 **Confined space** is an enclosed or partially enclosed space that:

a) has been identified as such in a risk assessment;

b) is not intended or designed primarily as place of work;

c) may have restricted entry and exit; and

d) may:

(i) have an atmosphere which contains potentially harmful levels of contaminant or explosive atmospheres;

(ii) not have a safe level of oxygen eg following a nitrogen purge; or

(iii) cause entrapment or engulfment.

1.2 Confined spaces may include, but are not limited to:

a) storage tanks, process vessels, boilers, pressure vessels, tank-like compartments that have only a manhole for entry, ceiling and floor spaces;

b) open-topped spaces such as pits, or grease traps, or excavations more than 1.5 metres deep;

c) pipes, pumps, sewers, shafts, ducts, drains, tunnels, cellars, basements and similar structures; and

d) abandoned workings and exploration audits.

1.3 **Contaminant** is any dust, fume, mist, vapour, gas, or other substance in liquid or solid form, the presence of which may be harmful to health and safety.

1.4 **Entry to confined space** occurs when a person's whole body, upper body or head is within the confined space. However, this is not intended to prevent a person from inserting their hand or arm while holding a test instrument or probe into a confined space as part of the evaluation procedure provided that this procedure is duly authorised.

2. Identification

2.1 Confined spaces must be identified and permanent signage erected at the entry points denoting that a permit is required prior to entry. Where signage is impractical, for example with adits other means of highlighting the dangers need to be used.

3 Permit system

3.1 Entry to a confined space must only be allowed after a written approval, in the form of a permit, has been issued by a competent person, whom is authorised to issue such permits.

3.2 The permitting process must include the following elements:

a) a risk assessment, including the need for a competent person to assess such things as oxygen levels, contaminants, temperature extremes, and concentrations of flammable substances;

b) isolation procedures for contaminants and other energy sources;

c) the requirement for breathing apparatus;

d) the sign-in and sign-out of all persons entering the confined space;

e) display of the permit;

f) communication process and/or equipment between standby person and personnel within confined space;

g) safety specification of equipment to be taken into the confined space;

h) barricading;

i) rescue plan and equipment;

j) standby person; and

k) a completion procedure.

4 Other requirements

4.1 All persons required to work in a confined space, or to act as a standby person, must be trained, competent and tested.

4.2 Specific safe work procedures must be developed for work activities that are more hazardous when carried out in a confined space than elsewhere. These activities would include hot work (cutting and welding), chemical cleaning, steam cleaning, and abrasive blasting.

4.3 The standby person will have no other duties and is to be positioned outside the confined space entry point at all times while personnel are within the space.

4.4 Where the risk assessment has identified the need for ventilation, then this must be covered by a documented procedure.

5 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	Jan 2001	CEO Safety Adviser	ExCo	
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2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.

C6 - Cranes and lifting equipment

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and - where applicable - for post closure management.

1.1 This standard applies to all cranes, including vehicle-mounted cranes, equipment used as cranes, hoists and lifting equipment such as elevated work platforms (EWP) and rigging equipment. The standard does not apply to hoisting operations in underground mines.

2 Planning

2.1 Each operation must develop a register of critical lifts and a documented plan for each critical lift to address the associated hazards. Critical lifts include all multiple crane lifts; lifts over operating facilities where this may endanger personnel; lifts over power lines; lifts involving personnel cages; and lifts at maximum rated loads. The lift plan must include:

- **lift data**: equipment weight, rigging weight, total weight, height of lift, radius of lift and equipment surface area, centre of gravity;

- **equipment data:** manufacturer, model, size, boom length, jib length, load block, material size;

- **rigging data:** sling diameter, length, sling configuration, capacity, hook type, shackle size and capacity;

- **lift computation:** boom length, radius of lift, equipment capacity, size of outrigger footplates, and wind speed;

- **proximity to power lines and process areas:** Mobile cranes working in proximity to energised power lines must operate under a proximity permit, which must define exclusion zones and spotter duties; and

- **local hazards and their controls:** including the route for the crane, ground stability, proximity of people or equipment and agreed communication method.

2.2 Crane drivers and rigging crews involved in critical lifts must have input into the lifting plan and be consulted prior to finalisation of the plan.

2.3 Lifts not subject to detailed lift plans must be subject to a risk assessment.

2.4 Where practicable or where the weight of a lift is uncertain, cranes should be fitted with a load cell with the weight of the load displayed in the visual range of the operator.

2.5 Where practicable, cranes should be equipped with an anti two-block device or limit switch that includes audible and visual alarms.

3 Operation

3.1 There must be a documented process that ensures all critical components are inspected and in place prior to a crane being commissioned and put into service.

3.2 Operators must undertake a pre-operational safety check for each shift the crane or lifting equipment is used and this should be kept with the equipment. The detail required in the pre-operational safety check must be based on a risk assessment for the equipment.

3.3 Cranes and lifting equipment must not be operated with an inoperable or defective safety device.

3.4 There must be documented procedures that require:

- all rigging connections to be checked and correct prior to commencing a lift;
- checks that the load being lifted is within the rated capacity of the crane and lifting attachments and is also within the limits set out in the lift plan; and
- checks of all safety devices or overload limiters to ensure they are not overridden or cut out.

3.5 All lifting hooks (except for grab and chain shortening hooks) will be fitted with a safety latch to prevent the load from accidentally detaching, unless otherwise specified in a risk assessment.

3.6 Loads must not swing over people or occupied buildings and no person shall be under a suspended load or in a position where they could be struck by a falling load. Where there is a risk of a load falling and striking a person, barricading or similar controls to prevent access must be in place.

3.7 The operator shall not leave the crane controls while a load is suspended.

3.8 Overhead travelling cranes must be fitted with audible travel alarms or an equivalent warning device.

3.9 Tag lines must be attached to loads that require steadying or guidance while suspended. The load must be well secured and properly balanced in the sling or lifting device.

3.10 There must be a documented and approved method for communication between the crane driver and those assisting with the lift.

3.11 A procedure must be in place to prevent the use of lifting or rigging equipment in lifting operations if such equipment has been used for towing.

3.12 Mobile cranes must have a rating capacity chart available in the crane cabin.

3.13 Operator control stations for vehicle-mounted cranes must be located in an area protected from swinging loads and from the crane jib.

3.14 Slew pins must be secured in place in mobile cranes while travelling.

3.15 Slewing to test the integrity of outriggers on mobile cranes must be conducted prior to commencing lifts.

4 Maintenance and inspection

4.1 A register of cranes and lifting equipment must be established.

4.2 Any crane or lifting equipment brought to site must have a current test certificate and a pre-use safety inspection to ensure the equipment is fit for purpose. As a minimum, this inspection must satisfy regulatory and manufacturer requirements for frequency of inspection and physical condition of the machine.

4.3 There must be a system for the inspection, maintenance and approval of cranes and lifting equipment, including a process that verifies the equipment is able to function to its design specifications and the integrity of:

- mechanical and electrical components;
- controls for each piece of lifting or rigging equipment;
- crane cables and all lifting attachments;
- structural components for example: boom, hoist, brakes, wheels, hooks, baskets, out-riggers, hook-blocks and rails; and

- integrity of load limiting devices, safety devices, limit switches and control systems required for individual equipment eg independent fail-safe braking systems, a device to stop the crane such as a "dead-persons" switch, and emergency shut-off switch.

4.4 Inspections and repairs to cranes, cables and lifting equipment must comply with the manufacturer's specifications and regulatory requirements as a minimum.

4.5 Records of maintenance inspections and cable tests must be kept.

5 Training

5.1 Personnel must be trained, competent and authorised to:

- operate cranes and lifting equipment;
- set-up or rig loads;
- provide signals for controlling lifts; and
- inspect, maintain or test cranes and lifting equipment.

5.2 There must be a system for establishing minimum operating time, frequency of operation and testing to ensure competency for each class of crane and elevated work platform.

6 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	Jan 2001	CEO Safety Adviser	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.

C7 - Aviation safety

1 Scope

This standard applies to all Rio Tinto business units and managed operations, including new acquisitions. It covers exploration, through all development phases and construction, operation to closure and, where applicable, post closure management.

This standard covers aviation activities throughout Rio Tinto, including the use of aircraft by Rio Tinto employees, contractors and visitors, and applies to both charter operations and commercial airline travel.

2 Specialist aviation services

2.1 Businesses must seek advice on all aviation activities from the Rio Tinto HSEC principal adviser, Aviation Safety, or from an approved aviation safety consultant.

2.2 Aviation safety consultants must be approved by Rio Tinto HSEC.

2.3 Each Rio Tinto business that incorporates the use of aviation services within its operations must have a nominated responsible manager – Aviation [NRM – Aviation] for the implementation of this standard and associated work cycle and work practice. The responsibilities of the NRM – Aviation are in section 6 of the work cycle WCSC701 – Aviation Safety. For this role, the NRM – Aviation should complete the Rio Tinto approved training course defined by HSEC.

2.4 Businesses can seek advice from the Rio Tinto HSEC principal adviser, Aviation Safety, when appointing the NRM – Aviation.

3 Aviation safety auditing

3.1 The NRM – Aviation of any business that uses charter operations must ensure the audits required under this standard are undertaken, registered on the Rio Tinto Aviation Safety database, and findings are closed.

3.2 All aircraft charter companies must be audited by an approved aviation safety consultant prior to using their services. The audits must be conducted against the requirements of this standard, associated work cycle, local civil aviation rules and regulations and aircraft operator standards and manuals as a minimum.

3.3 Where an audit is impractical, an approved aviation safety consultant or the Rio Tinto HSEC principal adviser, Aviation Safety, after considering the specific flight details, may provide advice based on a 'desktop assessment', with subsequent approval by the NRM – Aviation. For an audit to be considered impractical, all of the following must apply.

a) The charter is a one-off event.

b) The logistics of conducting the audit are unreasonable.

c) Approved charter companies were not available within the region.

3.4 Audits conducted against the standard must have an expiration date, after which a new audit must be conducted. Audits must be undertaken at intervals agreed to by the aviation safety consultant and nominated responsible manager – Aviation, and will be specific to the company being audited. Audits will generally be annual but this can be varied on advice of the aviation safety consultant.

3.5 Audits conducted by an approved aviation safety consultant but performed for other companies may be acceptable as an audit against this standard. To meet this requirement, audits must:

a) have been carried out in the last three months;

b) have been carried out by an approved aviation safety consultant;

c) cover the planned Rio Tinto flying activity and, as a minimum, be conducted to Rio Tinto standards; and

d) have an agreement in place to allow the sharing of the report between all parties involved.

4 Aviation incident investigation

4.1 Aviation incidents must be reported, investigated and final reports submitted in accordance with Rio Tinto requirements.

4.2 Investigation teams for aviation incidents with an actual or potential risk of high or critical must include an approved aviation safety consultant. Safety consultants used for such investigations must be independent of audits conducted on the aviation company. Investigation of all aviation incidents must reference the requirements of the standard.

5 Flight operations

5.1 The use of single-engine, fixed-wing aircraft must be authorised by an approved aviation safety consultant or the Rio Tinto HSEC principal adviser, Aviation Safety.

5.2 Flight operations must be managed in accordance with the Rio Tinto Aviation work cycle WCSC701 – Aviation Safety.

5.3 Preference must be given to the use of turbine-powered, multi-engine, fixed-wing aircraft.

6 Commercial airlines

6.1 Only commercial airlines included in the Rio Tinto Approved Airlines lists may be used for scheduled airline travel.

6.2 The number of executive directors and senior officers travelling together on the same aircraft must be controlled to protect the viability of Rio Tinto and its product groups. The NRM – Aviation must consider appropriate restrictions when executive travel is being planned, in line with the requirements of the Rio Tinto travel policy.

7 Other requirements

7.1 Deviations from requirements of this standard must be based on an assessment of the associated risks and advice from an approved aviation safety consultant or the Rio Tinto HSEC principal adviser, Aviation Safety.

7.2 A written contract or letter of agreement must be in place for all charter flights. Should a situation occur where this is not possible, the responsible manager must seek advice on the associated risks from an approved aviation safety consultant. In such cases the NRM – Aviation must be accountable for approving such charter operations.

7.3 Where applicable, commercial and logistical activities such as tendering, airfield construction, airfield security, aircraft refuelling systems, heliports and passenger handling, must, at a minimum, meet local regulatory requirements and be managed in accordance with established aviation manuals or with guidance from an approved aviation safety consultant or the Rio Tinto HSEC principal adviser, Aviation Safety.

8 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1			ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Paul Dewar; Adrian van Tonder	Robert Davies	• Update to section 5 following an aviation incident in Peru. • Incorporation of suggested changes from operations and alignment with HSEQ management system.
3.0	01 August 2011	Geoff Want	Suresh Rajapakse	• Complete review.

Rio Tinto

Underground safety

D1

Underground performance safety standard

An integrated set of performance safety standards for the management of underground mine safety

Group function: Rio Tinto Health, Safety , Environment and Communities

Effective date: January 2013

Document number: STS11

Authorised by: Rio Tinto ExCo - Kevin McLeish

Discipline: Safety

Status: Final

Version no: 3.0

Prepared by: Larry J. Jaudon; Scott Philpott

Contents

D1.1 Ground control

1.0 Scope

1.1 This standard applies to all underground mines at existing operations and new acquisitions as well as at all shafts and adits including those developed for exploration or mine construction purposes.

1.2 All prevailing government regulations must be complied with.

1.3 Each operation must establish a Ground Control Management Plan that consists of three elements: design, implementation and verification.

2.0 Design

2.1 Only suitably qualified and experienced (in-house or external) geotechnical engineers must be used to develop the design rationale, calculations, support systems and specification of materials.

2.2 All underground excavations, drives and stopes must be designed to specified and documented minimum stability criteria for all relevant rock types. The design must ensure that all personnel work in a secure environment.

2.3 The design must take into account local and regional hydrology and hydrogeology to ensure that the potential for major water ingress is understood and prevented.

2.4 The materials used for all support types must be specified.

2.5 Where pillars are required for reasons of safety they must be mathematically derived and clearly marked on all mine plans and sections.

3.0 Implementation

3.1 Protocols must be developed to ensure that no personnel work beneath ground that has been inadequately secured.

3.2 Protocols must be developed and documented for all aspects of ground control activity. These protocols must specify:

a) the persons authorised to install support in accordance with approved

design and the training they require;
b) the persons authorised to install additional, unplanned support and the training they require;
c) the tools and equipment used to install ground support to cater for all sizes of excavation encountered in the mine;

d) the tools and equipment used for scaling to cater for all sizes of excavation encountered in the mine and, which will allow the removal of loose material without exposing the person performing the work to injury;
e) the persons authorised to scale and the training they require; and
f) planned job observations of scaling and support practices at a frequency defined by supervisors and senior management.

3.3 All underground employees and contractors must be trained in awareness and communication of rockfall hazards. Supervisors will undergo specific training in rockfall hazard identification and mitigation.

3.4 Supervisors will be trained in how to develop standard work practices and carry out planned job observations for key aspects of the mining cycle.

3.5 Up-to-date mine plans must be maintained in locations that are easily accessible to the workforce. Any potential ground control hazards must be clearly identified on these plans.

3.6 Any change to the Ground Control Management Plan must be fully documented and must be authorised by the mine manager.

3.7 Protocols must be defined for information flow between shifts and between technical and operations management.

4.0Verification

4.1 Procedures must be in place that define:
a) the frequency and responsibility for inspecting, monitoring, evaluating and reporting on ground conditions in:
- active work places, i.e. development ends and stopes, etc;
- shafts, declines, access ramps, airways, escape ways, etc; and
- other key sections of the mine i.e. workshops, stores, shaft stations, etc.

b) the frequency and method of testing rock bolts, cables and other support elements together with the necessary record keeping.

4.2 In addition to these routine inspections, all underground workings must be reviewed on a periodic basis to:

a) evaluate conformance to the Ground Control Management Plan and local regulatory requirements;
b) re-evaluate possible failure modes and up-date risk management studies;
c) arrange for peer review of standard work procedures; and

d) arrange periodic external review of the Ground Control Management Plan.

4.3 Programmes to measure over-break in development drives and stopes, as compared with design, must be in-place and the necessary records maintained.

4.4 Survey accuracy of underground development must be checked against the mine's standards and recorded.

5.0Revision history

Version no.	Effective date	Prepared by	Approved by	
1	Jan 2001	CEO Safety Advisor	ExCo	
Version no.	**Revision date**	**Revised by**	**Approved by**	**Reason for change**
2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.
3	1st August 2012	Larry Jaudon; Scott Philpott	Kevin McLeish	Formatted to align with the D1 standard review following the outcomes of the Underground Standards working group

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D1.2 Emergency procedures

1.0 Scope

1.1 This standard applies to all underground mines at existing operations and new acquisitions as well as at all shafts and adits including those developed for exploration or mine construction purposes.

1.2 All prevailing government regulations must be complied with.

1.3 An Underground Emergency Response Plan that incorporates the elements in sections 2 through 8 must be established.

1.4 The Underground Emergency Response Plan must be incorporated as a section in the Emergency Response Plan within the Business Resilience and Recovery Programme.

2.0 Underground risk assessment

2.1 A risk assessment must be undertaken to identify the possible types of emergency situations that might occur within the mine. This risk assessment must be approved by the mine manager.

2.2 Written procedures must be developed in response to potential emergencies that have been identified and the workforce trained accordingly.

2.3 Where reversible ventilation fans are installed, procedures and responsibility must be established for operating the fans in reverse.

2.4 The risk assessment must be reviewed annually and the procedures updated as necessary.

3.0 Warning system

3.1 The minimum acceptable time for an emergency warning to reach all personnel in the mine must be determined; including those personnel engaged in non-routine work such as ventilation engineers in return airways, diamond drillers and geologists in remote locations, etc.

3.2 Each underground operation must have an effective system, together with at least one back up system, to warn all personnel underground, within the determined minimum time period, that an emergency exists.

4.0 Emergency egress

4.1 Each operation must establish and maintain evacuation routes/secondary egress as close as practicable to existing and planned working areas.

4.2 A maximum period of time from the moment the emergency warning is activated to the time the last personnel evacuate the mine or are able to reach the safety of an underground refuge chamber must be set. In setting this period the non-availability of man-hoisting and vehicular access must be considered.

4.3 Clear and highly visible signs must be used to demarcate all evacuation routes.

4.4 All persons who work underground must be instructed in the escape and evacuation plans. Procedures must be in place to advise all persons who work underground when a change in the emergency egress takes place.

4.5 Test evacuations must take place such that, as far as reasonably practical, all personnel participate once a year. This test must include, where relevant, the use of safety refuge stations.

5.0 Co-ordination with other emergency services

5.1 The Emergency Response Plan must incorporate the involvement of the in-house mine rescue teams, third party mine rescue teams (where available) and the use of local emergency services, as appropriate.

6.0 Personnel tagging system

6.1 Each operation must have an effective system to identify who is underground.

7.0 Single entry/self-contained refuges

7.1 Safe Working Practice (SWP) for single entry systems (these are working areas with one way in and the same way out) must be established. The SWP must state the maximum distance allowed before an alternate secondary means of egress or a refuge chamber is required. The SWP must also

quantify the maximum number of personnel allowed in a single entry system and any particular PPE or other precautions that are necessary.

7.2 Each operation must establish the need, location and capacity for self-contained refuge chambers.

8.0 Emergency training

8.1 All persons who work underground (including all contractors) must be trained in what to do in the event of an emergency. Visitors must receive instruction in the use of safety equipment and emergency procedures and must remain with the operations representative at all times while underground.

9.0 Revision History

Version no.	Effective date	Prepared by	Approved by	
1	Jan 2001	CEO Safety Advisor	ExCo	
Version no.	**Revision date**	**Revised by**	**Approved by**	**Reason for change**
2	December 2008	Paul Dewar; Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.
3	1st August 2012	Larry Jaudon; Scott Philpott	Kevin McLeish	Formatted to align with the D1 standard review following the outcomes of the Underground Standards working group.

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D1.3 Fire precautions

1.0 Scope

1.1 This standard applies to all Rio Tinto managed, underground mining operations and projects, including;

- Existing sites and new acquisitions
- Exploration, through all development phases and construction
- Operation through to closure
- Post-closure management (where applicable)

2.0 Design

2.1 Each operation must identify and assess potential fire risks.

2.2 The operation will nominate a manager who must establish and implement a Fire Control Plan. The Fire Control Plan must:

a) Be designed by a **competent person** or group
b) Establish a Fire Risk Register that is reviewed annually
c) Apply fire prevention and mitigation control to the design, placement, and operation of **infrastructure/plant**, fuel, combustibles and explosive materials storage areas
d) Establish a system for the installation, inspection, and maintenance of fire detection, warning, and suppression systems
e) Provide for real-time carbon monoxide monitoring in major ventilation circuits of the mine
f) Establish fire response capabilities available at all times when people are underground
g) Identify and designate “No Smoking” areas
h) Identify prohibited items and establish a system to prevent these items entering underground areas
i) Include the requirement for self-contained self rescuers (SCSR) with a minimum 30-minute oxygen supply
j) Provide for caches of additional SCSR, determined by a **risk assessment**
k) Be reviewed annually by a **competent person** or group

2.3 A **competent person** or group must design the following systems:

- Fixed and portable fire detection
- Warning
- Suppression
- Alarms
- Equipment

2.4 Where likelihood for spontaneous combustion of **in situ** materials exists, a Spontaneous Combustion Management Plan must be implemented.

3.0 Implementation

3.1 Where the risk of fire from **hot work** exists, hot work procedures and permit systems must be implemented.

3.2 Petrol (gasoline) powered equipment must not be permitted underground.

Mobile equipment

3.3 Where mobile equipment is used underground, the following controls must be implemented:

a) Mobile equipment is fitted with a hand held extinguisher mounted on the unit in an accessible location, the size and type of which is determined by a risk assessment
b) Mobile equipment containing more than 100 litres (26 gallons) of flammable hydraulic fluid is fitted with an automatic fire suppression system with suitable manual activation
c) Fire suppression systems must be able to be activated from inside and outside of the operator's cabin
d) Pre-shift inspections are carried out for mobile equipment to check for leaks and associated accumulations of hydrocarbons
e) Engine components that are a potential ignition source are shielded from exposure to fuel sources, where practicable

Flammable and combustible materials

3.4 Flammable storage, fuel dispensing, workshops, sub-stations and explosive storage should, where practicable, be placed in exhaust airway locations.

3.5 Where there is a risk of fire from flammable and combustible materials, the following controls must be implemented:

a) Storage of flammable and combustible materials is minimised
b) Flammable and combustible materials are isolated from ignition sources
c) Fire resistant hydraulic fluids are used, where practicable
d) Pipelines delivering hydrocarbons are periodically inspected and identified leaks are repaired
e) Pipelines delivering hydrocarbons are run empty at the end of filling

cycles

Electric cables

3.6 All new electrical installations must use fire retardant, low-toxicity cables, where practicable.

Heating, ventilation and air-conditioning systems

3.7 Heating, ventilation and air-conditioning (HVAC) and intake air heater systems must:

a) Have emergency shutdown capabilities
b) Be provided with a fire suppression system

4.0 Key terms

The following key terms are found throughout this standard as **bold text**.

Competent person	Someone who has demonstrable knowledge, experience and skills in all of the areas/disciplines that are covered by the Terms of Reference. Demonstration of this may be through appropriate tertiary qualification, accreditation, membership of professional association, work within the industry or by recognition by peers within the industry as being qualified to participate in the assessment.
Hot Work	Heat and spark producing operations such as welding, flame cutting and grinding.
Infrastructure/Plant	Buildings, structures, fixed equipment, electrical substations, hydrocarbon dispensing facilities, mine ventilation systems and heating, ventilation and air-conditioning (HVAC) systems.
In situ	In the natural or original position. Applied to a rock, soil, or stress etc., occurring in the original, unaltered state.
Risk assessment	The method of evaluating the consequence and likelihood of identified hazards or opportunities, and comparing against a defined risk acceptance threshold. The health, safety, environment and quality (HSEQ) risk framework contains three levels of assessment for consideration during risk evaluation.

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5.0 Revision history

First issue	Effective date	Prepared by	Approved by	
1st August 2012	1st January 2013	Sally Rayner, Larry Jaudon	Rio Tinto ExCo	
Revision no.	**Revision date**	**Revised by**	**Approved by**	**Reason for change**

D1.4 Hoisting and shaft sinking

1.0 Scope

1.1 This standard applies to all Rio Tinto managed, underground mining operations and projects, including;

- Existing sites and new acquisitions
- Exploration, through all development phases and construction
- Operation through to closure
- Post-closure management (where applicable)

2.0 Design

2.1 Each operation must identify and assess potential hoisting and **shaft sinking** risks.

2.2 Where there is a **hoisting system**, the operation must nominate a manager who will develop a Hoisting Plan. The Hoisting Plan must:

a) Be designed by a **competent person** or group
b) Establish **hoist** control methods
c) Establish maximum **hoist** speeds and deceleration rates
d) Provide for soft stopping and emergency stopping
e) Provide overwind and underwind prevention
f) Specify maximum allowable load
g) Establish the frequency and method for testing of all safety devices and control systems
h) Establish a plan for the inspection, maintenance, and modification of the **hoisting system**
i) Be reviewed by an independent **competent person** or group every two years, or more frequently as determined by a **risk assessment** or event

2.3 Where **shaft sinking** is conducted, the operation must nominate a manager to develop a Shaft Sinking Management Plan. The Shaft Sinking Management Plan must:

a) Be designed by a **competent person** or group
b) Provide specifications for the **shaft**, **winches**, **work-stage** and other **shaft sinking** equipment

c) Establish controls specific to **shaft sinking** hazards
d) Be reviewed by an independent **competent person** or group before construction is commenced
e) Establish a system of periodic structural inspection of the **work-stage**
f) Be reviewed by an independent **competent person** or group every two years or more frequently as determined by a **risk assessment** or event

2.4 A **competent person** must design **shaft infrastructure**. An independent **competent person** or group must then review this design prior to construction or installation.

2.5 Any modifications to shaft infrastructure, work stages, or hoisting equipment must be subject to engineering review by a **competent person** or group.

3.0 Implementation

Hoists

3.1 **Hoisting systems** must be provided with the following safety devices:

a) **Hoists** used for transporting personnel shall have at least two sets of mechanical brakes to stop and hold the drum, one of which must apply directly to the drum
b) Primary and secondary protection against over travel and over speed
c) An interlock system, for all **hoists** fitted with a clutch, to ensure the free drum is braked and the driven drum is limited to creep speed
d) A device to stop the **hoist** in the event that the conveyance does not move in relation to the amount of rope paid out.
e) Indicators to show the location and speed of conveyances in the **shaft**
f) An emergency off switch
g) Ammeter to indicate the winder motor current

3.2 All conveyances used for transporting personnel must have a:

a) Secondary emergency egress should the primary conveyance becomes inoperable
b) System to prevent the conveyance from falling in the event of a rope failure except in **shaft sinking** and **major shaft rehabilitation** or **refurnishing** applications

3.3 Any rope used as part of the hoisting system must have established:

a) Rope manufacturing quality assurance and quality control criteria for all rope procurements

b) Rope inspection and maintenance criteria for all ropes either in storage or in service
c) The method and frequency of rope end cuts and rope end cut testing
d) Discard criteria that addresses strength loss, corrosion, deformation and physical impairment

3.4 Operations must maintain records of **hoist** rope data including, date of installation, serial number, maximum admissible legal life, end cut test results, manufacturing date, and safety factors.

3.5 Conveyances and rope connecting **attachments** must be:

a) Designed or selected by a **competent person**
b) Provided with up to date engineering drawings
c) Provided with manufacturing quality assurance and control established for procurement
d) Maintained on a register that includes their serial number and rated load

3.6 Conveyances used for transporting people must have two independent means of communication with the hoist operator.

3.7 Persons who operate, inspect, maintain, or test any part of the hoisting system must be trained, **competent** and authorised to do so.

Maintenance of hoists and shaft infrastructure

3.8 Operations must implement a Maintenance and Inspection Plan for:

a) Mechanical and electrical components of the hoists and **shaft infrastructure**
b) Hoist rope **attachments** and conveyances
c) Structural integrity of **hoists** and **shaft infrastructure**
d) Safety devices and control systems
e) **Non-destructive testing (NDT)** of critical **hoist** components, ropes, **attachments**, conveyances and infrastructure

3.9 Communication protocols between management and those carrying out maintenance and inspections must be established to ensure the timely notification of adverse findings

Shaft sinking

3.10 **Shaft sinking** safety devices must include:

a) Stage rope load indicators that are visible to the **hoist** operator
b) Engineered fall protection devices for conveyances and **work-stage**
c) Bucket movement controls above and below work stage
d) Fully enclosed bucket wells with signalling devices

3.11 Persons must be tied off while travelling in a conveyance, unless the conveyance is fully enclosed.

4.0Key terms

The following key terms are found throughout this standard as **bold text**.

Attachment	Any device or equipment that connects a conveyance to the **hoist** rope.
Competent person	Someone who has demonstrable knowledge, experience and skills in all of the areas/disciplines that are covered by the Terms of Reference. Demonstration of this may be through appropriate tertiary qualification, accreditation, membership of professional association, work within the industry or by recognition by peers within the industry as being qualified to participate in the assessment.
Hoist	An electrically driven rope winder used for hoisting and lowering a conveyance in a vertical shaft or incline. Synonymous with winder.
Hoisting equipment	Hoisting arrangements and shaft furnishings used for the transport of men and materials within a vertical excavation. Includes: **hoist**, ropes, **head-frame**, conveyances, guides, sheaves, etc.
Hoisting system	A system that includes, for example; **hoists**, **head-frames**, ropes, conveyance and other equipment, used for the safe raising or lowering people, equipment or materials.
Head-frame	The frame at the top of a shaft, which supports the rope sheave and/or dumping gear.
Major shaft rehabilitation	Large-scale process of restoring a sub-standard or neglected product to its original or prime condition.
Major refurnishing projects	Comprehensive provision for and installation of: new equipment, infrastructure or utilities to enhance fundamental service requirements.
Non-destructive testing (NDT)	Analysis techniques used in industry to evaluate the properties of a material, component or system, without causing damage.

Risk assessment	The method of evaluating the consequence and likelihood of identified hazards or opportunities, and comparing against a defined risk acceptance threshold. The health, safety, environment and quality (HSEQ) risk framework contains three levels of assessment for consideration during risk evaluation.
Shaft	A vertical or inclined excavation in rock developed for the purpose of providing access to an ore body.
Shaft infrastructure	**Head-frames**, collars, sub-collars, and shaft furnishings including steel sets, guides, loading pockets, water rings, station landings, piping and electrical services, etc.
Shaft sinking	The method of excavating a vertical or near-vertical tunnel from the top down
Winch	A mechanical device that is used to wind up, wind out or adjust the tension of a wire rope. For **shaft sinking**, stage winches are used to support and adjust the position of the **work-stage**.
Work-stage	The suspended platform upon which shaft sinking operations are carried out, e.g. galloway, work deck.

5.0Revision history

First issue	Effective date	Prepared by	Approved by	
1st August 2012	1st January 2013	Steve Wood, Mike Egosque	Rio Tinto ExCo	
Revision no.	**Revision date**	**Revised by**	**Approved by**	**Reason for change**

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D1.5 Explosive and hazardous atmospheres

1.0 Scope

1.1 This standard applies to all Rio Tinto managed, underground mining operations and projects, including;

- Existing sites and new acquisitions
- Exploration, through all development phases and construction
- Operation through to closure
- Post-closure management (where applicable)

1.2 This standard is to be read in conjunction with the Rio Tinto Health Performance Standards; most particularly:

- B1 - Particulate and gas/vapours exposures
- B6 - Thermal stress
- B10 - Occupational exposure limits

2.0 Design

2.1 Each operation must identify the potential for a **hazardous atmosphere** that may be harmful to personnel in the underground environment.

2.2 The **risk assessment** for a **hazardous atmosphere** must consider the potential for harmful effects from:

a) Naturally occurring gases within the strata and ore body
b) Gases liberated or created due to operational activities
c) Pre–existing gas reservoirs in the vicinity of operations
d) Spontaneous combustion of ore or waste
e) Combustible dust forming an explosive mixture

2.3 Where there is a risk of **hazardous atmospheres**, the operation will nominate a manager who must develop a Ventilation Management Plan. The Ventilation Management Plan must:

a) Be designed by a **competent person** or group
b) Specify a **ventilation system** that provides a sufficient volume, velocity, and quality of air to prevent **hazardous atmospheres**
c) Provide for real-time carbon monoxide monitoring in major ventilation circuits of the mine
d) Establish a program of inspection and maintenance of the **ventilation system**
e) Establish a program of periodic monitoring and testing of the **ventilation system** carried out by a **competent person** or group
f) Incorporate a **Trigger Action Response Plan (TARP)** prescribing the pre-planned response to escalating levels of risk for explosive gases, thermal stresses, toxic and asphyxiating gases
g) Establish a system of monitoring for potentially harmful or explosive gases and dust that is designed by a **competent person** or group

3.0Implementation

Combustible dust

3.1 Where the potential for hazardous levels of combustible dust exist, the following controls must be implemented:

a) Limiting the amount of dust generated.
b) Suppression, collection and removal of dust at points of generation
c) Regular inspection for and removal of dust accumulation from infrastructure
d) **Inertisation** to treat coal dust

3.2 Where the potential for a combustible dust explosion exists, there must be the means to minimise propagation of an explosion.

Gases

3.3 Where there is a risk of accumulation of harmful levels of gases, the following controls must be implemented:

a) Predetermined limits with appropriate factors of safety
b) Provision of sufficient volume, velocity, and quality of air to reduce the gas to an acceptable level
c) Assessment and monitoring of gases prior to entry and while working in the location
d) Trigger Action Response Plan (TARP) prescribing the pre-planned response to escalating levels of risk
e) Controls to prevent unauthorised access to areas containing a hazardous atmosphere

3.4 Where there is a risk of a gas ignition or explosion, the following controls must be implemented:

a) Elimination or control of ignition sources
b) Use of intrinsically safe equipment

3.5 Where continuous monitoring is used, the system must alarm at predetermined concentrations and activate a notification system.

3.6 Where potential for **explosive** or **hazardous atmospheres** exist:

a) Underground personnel must be trained in the recognition of signs, indicators, and hazards of mine gases
b) Preventive measures and emergency procedures must be provided for

4.0Key terms

The following key terms are found throughout this standard as **bold text**.

Competent person	Someone who has demonstrable knowledge, experience and skills in all of the areas/disciplines that are covered by the Terms of Reference. Demonstration of this may be through appropriate tertiary qualification, accreditation, membership of professional association, work within the industry or by recognition by peers within the industry as being qualified to participate in the assessment.
Explosive atmosphere	Atmospheres, which may contain concentrations of gas or dust within explosive limits.
Hazardous atmosphere	Atmospheres, which may compromise the health and safety of workers; may include conditions that create thermal stress and hazardous concentrations of dust, toxic/asphyxiating gases, fumes etc. This concerns concentrations, which result in immediate risk.
Inertisation	The process of introducing inert gas or dust into an environment to prevent chemical **propagation** of a fire or explosion.
Factor of safety	It is the ratio or multiplier applied to a critical safety limit that manages the system while allowing for a margin of error.

Propagation	The spread of flame or explosion through extensive areas of the mine as a result of initiating medium such as coal or sulphide dust.
Risk assessment	The method of evaluating the consequence and likelihood of identified hazards or opportunities, and comparing against a defined risk acceptance threshold. The health, safety, environment and quality (HSEQ) risk framework contains three levels of assessment for consideration during risk evaluation.
Trigger Action Response Plan (TARP)	A proactive risk management system that defines ascending pre-planned responses to escalating levels of risk. A TARP recognises that normal operating conditions may adversely change and proactively establishes pre-set levels of deviation known as triggers. When a trigger is realised a corresponding set of actions is initiated in response to the escalation.
Ventilation system	A designed methodology and supporting infrastructure which: • Provides adequate quantities of fresh air to the underground workings • Dilutes and transports hazardous atmospheres into exhaust air-ways and out of the mine

5.0 Revision history

First issue	Effective date	Prepared by	Approved by	
1st August 2012	1st January 2013	John Coughlan, Russell Uhr	Rio Tinto ExCo	
Revision no.	**Revision date**	**Revised by**	**Approved by**	**Reason for change**

D1.6 Inflow or inundation of liquids

1.0 Scope

1.1 This standard applies to all Rio Tinto managed, underground mining operations and projects, including;

- Existing sites and new acquisitions
- Exploration, through all development phases and construction
- Operation through to closure
- Post-closure management (where applicable)

2.0 Design

2.1 Each operation must identify and characterise the geological, hydrogeological and geotechnical feature(s) to determine the potential for **uncontrolled inflow** and **inundation**.

2.2 Where the hazard of **uncontrolled inflow** and **inundation** exists, the operation will nominate a manager who must establish and implement an Inflow and Inundation Management Plan. The Inflow and Inundation Management Plan must:

a) Be based on a **risk assessment** of potential **uncontrolled inflow** and **inundation** carried out by a **competent person** or group
b) Implement controls specific to identified risks
c) Incorporate a **Mine Water Management System**
d) Be reviewed by an independent **competent person** or group every two years or more frequently as determined by a **risk assessment**, event or when there is a material change to the **mine plan**

2.3 The **risk assessment** for **inflow** and **inundation** must consider the following sources as a minimum:

a) From a major water bearing structure/feature
b) Along each high risk structure/feature as determined by a **competent**

person

c) From drill holes, flooded historical workings, and/or adjacent mines
d) Due to failure of a **water retaining pillar**
e) Due to failure of a **water retaining structure**
f) Due to **surface waters** entering the mine
g) From improper design or operation of a **Mine Water Management System**

3.0 Implementation

3.1 The design and location of mine entry points must consider the potential for **inflow** and **inundation**.

3.2 **Inflow** and **inundation** hazards specific to the work areas must be included on up-to-date **mine plans**. Potential inaccuracies in the location of the historical workings and/or workings from adjacent mines must be indicated on up-to-date **mine plans**.

3.3 Procedures must be established for managing an intersection with a drill hole or breakthrough to a historical working or adjacent mines.

3.4 The operation must retain relevant available information including:

a) Historical mine workings within the zone of influence of the operating mine
b) Adjacent mines within the zone of influence of the operating mine
c) Drill hole information with associated treatment records
d) Major water bearing structure(s)/feature(s)

3.5 When excavating in areas of limited knowledge, with high **inflow** risk potential, a program of **probe drilling** ahead of the excavation must be in place.

3.6 Where the risk of **uncontrolled inflow** from major structures and/or features, drill holes, flooded historical workings, and/or adjacent mines exists, the following controls must be implemented:

a) All drill holes which pose an i**nflow** risk must be plugged/grouted upon completion of service life
b) All drill holes which pose an **inflow** risk must be clearly identified on relevant **mine plans**
c) Major structures and/or features must be portrayed on relevant **mine plans** and clearly identified as inflow risks.

3.7 Where the risk of **uncontrolled inflow** due to failure of a **water retaining pillar** exists, the following controls must be implemented:

a) The Ground Control Management Plan (GCMP) must specifically address the design of **water retaining pillars** (i.e. **crown pillar**, **barrier pillar**), provisions for assessing on-going stability (monitoring/inspection) and a clear decision making process for

evaluating monitoring data
b) **Water retaining pillar**(s) must be designed by a **competent person**

3.8 Alterations to any **water retaining pillar**(s) require a **risk assessment** performed by a **competent person** or group.

3.9 Where the risk of **uncontrolled inflow** due to failure of a **water retaining structure** exists, the following controls must be implemented:

a) The location of mine entry points must consider the proximity of **water retaining structures** and appropriate controls implemented
b) Surface and underground **water retaining structures** must be designed by a **competent person** or group
c) Procedures must be established for the monitoring and inspection of **water retaining structures**

3.10 Where the risk of **uncontrolled inflow** due to **surface waters** entering the mine exists, the following controls must be implemented:

a) Potential **surface water inflow** quantities (e.g.1:100 year event for storms) must be incorporated into the mine pumping system design and water management programs
b) Clear **Trigger Action Response Plans (TARP)** must be in place for storm events

3.11 Where failure of the **Mine Water Management System** poses an **inundation** risk, the system shall:

a) Be designed by a **competent person** or group
b) Be designed based on hydrogeological measurements, predicted inflows, and modelling
c) Be aligned with the current site **water balance** data
d) Have continuous monitoring and alarm systems for critical elements of the **Mine Water Management System**
e) Include systems to actively monitor flow that are routinely calibrated
f) Include procedures for the operation, monitoring, inspection, and maintenance of critical elements of the **Mine Water Management system**
g) Include provision of spares for critical components of the **Mine Water Management System**
h) Provide protection from inundation for electrical installations that are critical to the **Mine Water Management System**
i) Have a reliable power supply. The need for a secondary power feed to the **Mine Water Management System** must be evaluated and documented through a formal **risk assessment**

4.0Key terms

The following key terms are found throughout this standard as **bold text**.

Auxillary pumping/piping	Pumping/piping capacity that exists outside of the normal operating mine water management system that is available for use in the event of an emergency. Examples include: back up/spare electrical pumps and starters; portable diesel pumps; redundant pipelines, large diameter hose. May also include resources from neighbouring operations.
Barrier pillar	A rock pillar, which forms the boundary between working areas or between adjacent mines.
Competent person	Someone who has demonstrable knowledge, experience and skills in all of the areas/disciplines that are covered by the Terms of Reference. Demonstration of this may be through appropriate tertiary qualification, accreditation, membership of professional association, work within the industry or by recognition by peers within the industry as being qualified to participate in the assessment.
Crown pillar	The rock pillar, which separates underground workings from the surface.
Historical mine workings	Old or abandoned mine workings that are no longer active. Examples of mine workings include: tunnels, shafts, raises, stopes, and inaccessible or collapsed areas. This also includes workings from adjacent mines if applicable.
Inflow	Unplanned and/or **uncontrolled inflow** of water into mine workings that pose a hazard to the safety of personnel. Potential sources of origin: Intersection of **surface water** bodies, aquifers, fault zones, historical mine workings, drill/probe holes, failure of a **water retaining structure** or **water retaining pillar**, or atmospheric conditions in which storm water enters the mine. The volume of water is such that it is not generally manageable with normal operating water management capacity.
Inundation	The risk of mine flooding due to potential inflows that exceed the capacity of the **Mine Water Management System**; either through under-design of the system or through failure of part or all of the system. The risk of mine flooding is such that it poses a hazard to the safety of personnel.
Major water bearing structure/feature	Term used for a geological feature that has potential to act as a major water conduit or reservoir. Examples include: faults,

	persistent joints, bedding planes, dykes, shear zones, geological contacts, buried channels, aquifers, seams, strata, and limestone voids that may hold water.
Mine plan	Design drawings that define the specific location of underground openings, utility services, and infrastructure items that are used for planning, scheduling, and mining related purposes.
Mine Water Management System	The network of pumps, piping, and associated energy sources used throughout the mine to manage water.
Probe Drilling	The activity of drilling in advance of development or production drifts to check for the presence of **water bearing structures** or features. Common drill types include: diamond drills, jumbos or production drills
Risk assessment	The method of evaluating the consequence and likelihood of identified hazards or opportunities, and comparing against a defined risk acceptance threshold. The health, safety, environment and quality (HSEQ) risk framework contains three levels of assessment for consideration during risk evaluation.
Surface water	Examples include: tidal waters, lakes, creeks, rivers, oceans, flood planes, surface impoundments or reservoirs, pipelines, storm events, melt water.
Trigger Action Response Plan (TARP)	A proactive risk management system that defines ascending pre-planned responses to escalating levels of risk. A TARP recognises that normal operating conditions may adversely change and proactively establishes pre-set levels of deviation known as triggers. When a trigger is realised a corresponding set of actions is initiated in response to the escalation.

Water balance	Describes flow of water *in* and *out* of a system and includes the effects of precipitation, run off, evaporation, transpiration, and changes in storage. Hydrogeological modelling commonly supports complex water balances.
Water retaining pillar	Any rock pillar, which prevents or may prevent water from entering an underground mine. **Crown pillars** and **barrier pillars** may be considered **water retaining pillars**. To be considered relevant for this standard, failure of the pillar must pose a safety risk to underground workers.
Water retaining structure	A man made structure designed to hold back water. To be considered relevant for this standard, failure of the structure must pose a safety risk to underground workers. Examples include: dams, dykes, bulkheads, weirs, and impoundment areas.

5.0Revision history

First issue	**Effective date**	**Prepared by**	**Approved by**	
1st August 2012	1st January 2013	Lyndon Clark Bill Forsyth	Rio Tinto ExCo	
Revision no.	**Revision date**	**Revised by**	**Approved by**	**Reason for change**

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D1.7 In-rush solids

1.0 Scope

1.1 This standard applies to all Rio Tinto managed, underground mining operations and projects, including;

- Existing sites and new acquisitions
- Exploration, through all development phases and construction
- Operation through to closure
- Post-closure management (where applicable)

2.0 Design

2.1 Each operation must identify the potential for **in-rush of solids** that may be harmful to personnel in the underground environment.

2.2 Where there is a risk from the **in-rush of solids**, the operation will nominate a manager who must establish and implement a Draw Control Plan. The Draw Control Plan must:

a) Incorporate a protocol based on a **risk assessment** to identify **draw points** that have a high risk potential for in-rushes
b) Incorporate a Trigger Action Response Plan (TARP) for extraction from draw points
c) Be reviewed by an independent, **competent person** or group every two years or more frequently as determined by a **risk assessment**, event or when there is a material change to the **mine plan**

2.3 The **risk assessment** for the **in-rush of solids** must consider the potential for:

a) The presence of wet and fine material in **draw points**
b) **Bulkhead** failure that could result in the sudden in-rush of material into working areas where personnel may work or travel
c) The build-up of cuttings/chippings created by the reaming action of the **raise borer**
d) Backfill failure

3.0Implementation

3.1 A **competent person** must conduct periodic surveys of all draw points to monitor:

a) Changes in moisture content
b) Fragmentation

3.2 Where there is a risk of uncontrolled **in-rush of solids** from a **draw point**, the following controls must be implemented:

a) A method of communicating high risk **draw points**

b) A Draw Control Plan that specifies an extraction rate

c) Monitoring of **draw point** extraction rates to reduce the potential for water build up

d) Controls to prevent unauthorised access to all draw points

e) Impedance methods to control the flow of muck where there is a high risk of in-rush

3.3 There must be a method of stabilising the muck pile before any maintenance or rehabilitation takes place in a **draw point**.

3.4 Where the risk of uncontrolled **in-rush of solids** from **bulkhead** failure is identified, the following controls must be implemented:

a) **Bulkheads** must be designed and installed by a **competent person** or group

b) Active **bulkheads** must be periodically inspected by a **competent person**

3.5 Where there is a risk of uncontrolled **in-rush of solids** from **ore passes**, **chutes**, or **raise boring**, the following controls must be implemented:

a) Ore passes and **chutes** must be designed by a **competent person** or group

b) Controls to prevent unauthorised access

c) **Chute** controls are located to ensure the safety of the **chute** operator

d) Procedures established for the operation, maintenance, and inspection of the **chute** under all operating conditions

e) Procedures and methods established to minimise the potential for the build-up of **raise bore** cuttings during the reaming processes

3.6 Where the risk of **in-rush of solids** from backfill failure is identified, the following controls must be implemented:

a) Backfill operations, placement, materials, and procedures must be designed by a **competent person** or group

b) A system of quality control and assurance is established for backfill operations and materials

4.0 Key terms

The following key terms are found throughout this standard as **bold text**.

Backfill	The process of placing material into an excavated void, filling the mined out area with solid material.

Bulkhead	A barrier designed to protect areas of a mine from in-rushes.

Competent person	Someone who has demonstrable knowledge, experience and skills in all of the areas/disciplines that are covered by the Terms of Reference. Demonstration of this may be through appropriate tertiary qualification, accreditation, membership of professional association, work within the industry or by recognition by peers within the industry as being qualified to participate in the assessment.
Chute	A steel structure that is used to control the flow of material from an ore pass.
Draw point	A loading point on the **extraction** level where caved rock is **extracted** from the cave using Load Haul Dump (LHD) vehicles, slushers or any other means of loading.
Extraction (pulling or drawing)	The process of **extracting** caved or broken ore from a cave or stope.
Impedance	Means to deliberately obstruct or slow down the flow of rock
In-rush of solids	The unplanned/uncontrolled sudden inflows of dry or liquefied solids into the mine from **draw points**, **bulkhead**s, **chutes**, **ore passes** or **raise bore passes**.
Ore pass	Steeply inclined excavation used to transfer or store broken rock between levels.
Mine plan	Design drawings that define the specific location of underground openings, utility services, and infrastructure items, which are used for planning, scheduling, and mining related purposes.
Raise bore	A method of developing a raise by reaming.
Risk assessment	The comparison of the results of a risk analysis with risk acceptance criteria or other decision parameters.
Trigger Action Response Plan (TARP)	A proactive risk management system that defines ascending pre-planned responses to escalating levels of risk. A TARP recognises that normal operating conditions may adversely change and proactively establishes pre-set levels of deviation known as triggers. When a trigger is realised a corresponding set of actions is initiated in response to the escalation.

5.0 Revision history

First issue	Effective date	Prepared by	Approved by	
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Revision no.	**Revision date**	**Revised by**	**Approved by**	**Reason for change**

D1.8 Air blast

1.0 Scope

1.1 This standard applies to all Rio Tinto managed, underground mining operations and projects, including;

- Existing sites and new acquisitions
- Exploration, through all development phases and construction
- Operation through to closure
- Post-closure management (where applicable)

2.0 Design

2.1 Each operation must identify the potential for an **air blast** that may be harmful to personnel in the underground environment.

2.2 Where there is a risk of an **air blast**, the operation will nominate a manager who must establish:

a) A Cave Management Plan that defines the strategies used in the management of all aspects of the cave, and the coordination of the interrelated elements
b) A system designed to measure, model, or approximate the changing size and three dimensional characteristics of the cave back and muck pile shall be developed and implemented
c) **Air blast** modelling and methodologies used to define air gap parameters and associated risk levels
d) A management system for the geotechnical monitoring system
e) A **Trigger Action Response Plan (TARP)** prescribing the pre-planned response to escalating levels of risk
f) A **Trigger Action Response Plan (TARP)** for defective or malfunctioning geotechnical monitoring systems. Each operation shall have performed geotechnical investigations to determine local and regional rock properties, stresses, and strengths, to facilitate the building of relevant models
g) Suitably qualified and experienced geotechnical engineers to interpret, and develop the data and resultant models

2.3 Geotechnical investigation methodologies, models, plans, and recommendations shall be reviewed by a competent third party.

3.0 Implementation

3.1 **Cave back** propagation and muck pile monitoring systems shall utilise multiple types of geotechnical monitoring systems to facilitate the cross-examination and validation of data.

3.2 All openings to the cave, which exist above the **extraction level**, shall have barriers installed to protect workers from hazardous wind velocities.

3.3 Protective barriers must be designed, installed, periodically inspected, and maintained by a **competent person** or group.

3.4 Underground personnel must be trained in the recognition of signs, indicators, and energies of potential **air blast** events.

Geotechnical monitoring

3.5 The operation must establish real time **geotechnical** and **subsidence** monitoring which a **competent person** or group must review.

3.6 An independent **competent person** or group must periodically assess results of **geotechnical** and **subsidence** monitoring systems.

Subsidence

3.7 Each operation must identify the potential for **subsidence** that may be harmful to personnel underground and/or persons on the surface.

3.8 Where there is a risk of surface **subsidence**, the operation must ensure the Cave Management Plan provides for:

a) Only suitably qualified and experienced geotechnical engineers to interpret relevant data, and develop the resultant **subsidence** models
b) **Subsidence** zone identification that includes the predicted surface area to be impacted (foot-print) and a suitable **factor of safety** applied
c) The **subsidence** zone must be proactively provided with remote monitoring capabilities
d) An effective means of securely controlling access to the entire surface area of the **subsidence** zone must be implemented prior to causal mining activities

Pillar dependent mines

3.9 Pillar system modelling and design must be developed by a **competent person** and reviewed by an independent **competent person** or group.

3.10 A **competent person** must design pillar extraction activities.

3.11 Procedures must be established for the regular inspection and monitoring of pillars to ensure their integrity is maintained.

3.12 Pillar alterations resulting in a reduction of **factors of safety** must be designed by a **competent person** and be subject to management of change procedures.

3.13 To control Cascading Pillar Failure; compromised pillar integrity must be evaluated for stresses which may be transferred and applied to neighbouring pillars resulting in loading beyond their design capacity.

3.14 Roadways/Haulage-ways/Headings must be inspected on a regular basis and maintained as necessary to protect the integrity of pillars.

Goaf

3.15 A **competent person** shall monitor the goaf to ensure failure is occurring as designed.

3.16 A Trigger Action Response Plan (TARP) prescribing the pre-planned response to escalating levels of risk will be developed and implemented to respond to hazards associated with goaf failure and corresponding air blast potentials.

3.17 Measures to induce collapse in non-failing **goaf** must be implemented as soon as practicable to reduce the magnitude of the potential **air blast**.

4.0Key terms

The following key terms are found throughout this standard as **bold text**.

Air blast	The rapid flow of air through an underground opening following compression of the air in a constrained area. The rush of air, at times explosive in force, is caused by the ejection of air from large underground openings, resulting from the sudden fall of large rock masses, the collapse of pillars, slippage along a fault.
Back	Term used mainly for the roof or upper part of any underground mining cavity. As applied to an arch, the outer or upper surface.
Cave back (Cave crown)	The under-surface of the in situ, but possibly disturbed, rock above a cave or muckpile (caved ore).
Cave monitoring	Measurements of the rock mass' response to caving, typically focussed on tracking the cave propagation, cave subsidence and underground infrastructure stability.
Cave propagation	The process of propagation of an initiated cave by the progressive drawing of broken ore in a planned and

	controlled manner.
Competent person	Someone who has demonstrable knowledge, experience and skills in all of the areas/disciplines that are covered by the Terms of Reference. Demonstration of this may be through appropriate tertiary qualification, accreditation, membership of professional association, work within the industry or by recognition by peers within the industry as being qualified to participate in the assessment.
Draw (pull)	The process of extracting caved or broken ore from a cave or stope
Draw point	A loading point on the extraction level where caved rock is extracted from the cave using LHDs, slushers or any other means of loading.
Extraction level (production level)	The level in a caving mine through which the caved or broken ore is extracted and transported away from the cave.
Factor of safety	It is the ratio or multiplier applied to a critical safety limit that manages the system while allowing for a margin of error.
Geotechnical	The application of scientific methods and engineering principles to the acquisition, interpretation, and use of knowledge of materials of the Earth's crust for the solution of engineering problems. It embraces the fields of soil mechanics and rock mechanics, and many of the engineering aspects of geology, geophysics, hydrology, and related sciences.
Goaf	That part of a mine from which the ore has been removed and the excavated area filled with caved rock, or mechanically placed waste rock.
In situ	In the natural or original position. Applied to a rock, soil, or stress etc., occurring in the original, unaltered state.
Securely controlled	An engineered means of control which provides a physical barrier designed to restrict and manage access to a specified area. Engineering controls will be additionally supported by administrative controls which provide for management of controlled area, e.g. entry protocols and procedures, training, documentation, inspection, and maintenance of systems, etc.
Suitably qualified	Has direct experience and educational background in

	subject matter specialization and is able to produce documented evidence of such.
Trigger Action Response Plan (TARP)	A proactive risk management system that defines ascending pre-planned responses to escalating levels of risk. A TARP recognises that normal operating conditions may adversely change and proactively establishes pre-set levels of deviation known as triggers. When a trigger is realised a corresponding set of actions is initiated in response to the escalation.

5.0Revision history

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D1.9 Explosive agents

1.0 Scope

1.1 This standard applies to all Rio Tinto managed, underground mining operations and projects, including;

- Existing sites and new acquisitions
- Exploration, through all development phases and construction
- Operation through to closure
- Post-closure management (where applicable)

2.0 Design

2.1 Each operation that manufactures, stores, handles, transports or uses **explosives** must have a nominated manager responsible for the implementation of this standard.

2.2 The nominated manager must ensure that **risk assessments** are performed for all aspects of managing, manufacturing, storing, handling, transporting and using **explosives** on site and approve these assessments.

2.3 The nominated manager must arrange for the development of and approve an **Explosives** Management Plan that:

a) Is designed by a **competent person**
b) Is reviewed by an independent **competent person** or group every two years or more frequently as determined by **risk assessment**
c) Includes procedures to control the risks associated with manufacturing, transport, storage, handling, use and disposal of **explosives**
d) Establishes **exclusion zones** to control risk of ignition from extraneous sources e.g. electricity, lightning, projectiles, fire, and impact by mobile equipment
e) Establishes controls that restrict unauthorised access to **explosives**
f) Includes procedures for **explosives** inventory management, control and reconciliations, with records kept for a minimum of two years
g) Includes an assessment and annual review of the likely footprint from an unplanned explosion at an explosive manufacturing or storage facility, by a **competent person**
h) Establishes controls to mitigate the potential effects and impacts an explosion may have on site infrastructure including, but not limited to:

- Commonly used transport routes

2.3 (cont)

- Permanently and temporarily occupied buildings such as:
  - Offices
  - Workshops
  - Control rooms

i) Includes procedures to control the risk of explosions from activities associated with maintenance and servicing of plant and equipment that is used to manufacture, store, transport or handle **explosives**

j) Includes procedures to control the risks of explosions from lightning, dust storms or other significant natural events

k) Establishes the competency and authorisation requirements for all activities associated with **explosives**

l) Establishes an "**explosives** awareness" training programme for all personnel who may:
- Come in contact with **explosives**
- Be in the vicinity of a blast zone

2.4 **Explosives** manufacturing and storage facilities must be designed and annually audited by a **competent person** or group

3.0 Implementation

Transporting explosives

3.1 Vehicles and other conveyances used to transport explosives must:

a) Display signage indicating that explosives are being carried

b) Be under the direct supervision of an authorised person (unless parked in a designated and secure blast area or explosive compound)

3.2 During transport; packaged **explosives**, **high explosives** and **initiating explosives** must:

a) Be stowed in lockable receptacles, which are clearly signed to indicate the nature of the contents

b) Be secured in a manner such that they will remain in a stable position

c) Not be transported with any non-compatible substances, e.g. dangerous goods, chlorate based products or fire risk substances

3.3 **Initiating explosives** must not be stowed in the same airspace as packaged or **high explosives**.

Use of explosives

3.4 All operations that conduct blasting must develop plans and procedures for charging, blasting and reporting processes.

3.5 Blast sites (loaded blast holes/patterns) must be adequately demarcated and made secure to prevent unauthorised or inadvertent access.

3.6 The location of blast sites must be communicated to personnel who work or travel in the vicinity of the blast site.

3.7 Procedures must be in place that ensures drill holes will not intersect previously charged blast holes.

3.8 **Loading** of **explosives** must be under the direct supervision of an authorised person.

3.9 Where **non routine blasting** is carried out, specific procedures must be established and implemented to control the risks

3.10 All operations that conduct blasting must develop and implement a blast firing procedure that includes:

a) The appointment of a qualified blaster/shot-firer as the person responsible for the blast
b) A process for establishing a blast clearance zone based on a **risk assessment** that takes into account the impact for:
    - The immediate blast area
    - Assets outside the immediate blast zone area including:
        - People,
        - Plant/equipment,
        - Facilities/infrastructure
        - Ventilation pathways etc.
c) An assessment of the interactions/impacts on the following, which are outside the blast clearance zone:
    - People
    - Plant/equipment
    - Facilities/infrastructure
    - Ventilation pathways etc.
d) process for notifying, clearing, securing, initiating and subsequently re-entering, the blasting area
e) A process for identifying, addressing, reporting, and investigation of misfires

4.0Key terms

The following key terms are found throughout this standard as **bold text**.

Competent person	Someone who has demonstrable knowledge, experience and skills in all of the areas/disciplines that are covered by the Terms of Reference. Demonstration of this may be through appropriate tertiary qualification, accreditation, membership of professional association, work within the industry or by recognition by peers within the industry as being qualified to participate in the assessment.
Exclusion zone	A designated area, which is used solely for a specific purpose and disallows activities, materials and energies, which are incompatible with its safety and usage.
Explosives	Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion, i.e., with substantially instantaneous release of gas and heat. For the purpose of this standard all forms of ammonium

	nitrate, **high explosives**, **initiating explosives** and explosive devices are identified as **explosives.**
High explosives	Molecular **explosives** such as nitro-glycerine, TNT, HMX, PETN etc. and are usually found in mines as boosters and detonating cord.
Initiating explosives	Devices containing **explosives** that are used to initiate explosive charges (i.e. detonators).
Loading	Placement of explosive charges into drilled holes in preparation of blasting activities.
Non routine blasting	Blasting that is atypical or unconventional by it nature, examples include (blasting in): • Reactive ground • Elevated-temperature ground • Oversize materials • Crushers • Surface blasting near underground workings or facilities
Risk assessment	The method of evaluating the consequence and likelihood of identified hazards or opportunities, and comparing against a defined risk acceptance threshold. The health, safety, environment and quality (HSEQ) risk framework contains three levels of assessment for consideration during risk evaluation.

5.0 Revision history

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D2 – Molten Materials

22 February 2011

1 Scope

This standard is applicable to all Rio Tinto business units and managed operations, including new acquisitions, administration/corporate offices and research facilities located off site; during exploration, through all development phases and construction, operation to closure and, where applicable, for post closure management.

1.1 This standard applies to all activities and equipment involving molten materials.

1.2 Molten materials are, for example, molten metals, alloys, slags, matte, electrolyte bath and liquid pitch.

1.3 Personnel involved in the handling of molten material must be trained and competent in relation to the controls required to safely manage the hazards.

2 Charge materials

2.1 There must be a system for the specification, purchase, inspection and storage of materials, including scrap, used to charge furnaces and ladles.

2.2 The level of moisture and the reactivity of other materials must be such that it does not lead to an explosion or violent reaction.

2.3 There must be a system in place to ensure that bottles, cans and other closed liquid or gas containers are not charged to furnaces and ladles.

2.4 An assessment must be made to determine the potential for hazardous levels of radioactivity to be present in charge materials, including purchased scrap metal. Where the potential for hazardous levels of radioactivity in charge materials exists, then appropriate measures must be taken to manage the risk.

3 Furnaces, ladles, launders, granulation and casting equipment

3.1 All equipment must be designed to prevent the likelihood and implications of a spill, "breakout", "foaming" or splashing of molten material including exposure to excess heat. Appropriate emergency exits must be provided to allow for safe exit from the furnace or vessel area in the event of an emergency.

3.2 Water sumps, drains, piping and potential water accumulation spots should, as far is practicable, be located in areas where contact with molten materials is not possible. To the extent that this cannot be achieved, they must be protected from contact by molten material by suitable heat resistant barriers and diversions.

3.3 Electrical systems, hydraulic, air and water systems (piping), control systems, fuel and oxygen systems and compressed gas cylinders should, as far as is practicable, be located in areas where contact with molten material is not possible. Where contact by molten materials is possible, suitable heat resistant barriers and diversions must be provided.

3.4 The integrity of furnaces, ladles, etc must be checked regularly, i.e. through the frequent monitoring of surface temperatures and/or visual checks for wear, cracking and mechanical damage.

3.5 The structural elements of furnaces must be kept within their operating temperature design limits. A system must be in place to ensure that these are known and monitored. The system must also include a means of managing factors that could impact control, such as the accumulation of dust or other insulating material.

3.6 Furnace binding tie rods will be fitted with retention chains.

3.7 All direct chilled water-cooled continuous casting equipment and water-cooled furnaces must have an assured water supply in the event of power failure, equipment breakdown or other emergency. Procedures for re-establishment of cooling water after an outage must be established.

3.8 Granulation water supply systems must be designed with automatically acting back up supply in the event of failure of the primary water supply.

3.9 Equipment must be designed to "fail safe" in the event of any power or energy source failure.

3.10 Hazard analysis must be used to establish the requirement for explosion containment or vents to allow the controlled release of gases in a low risk direction and to mitigate the effects of explosions.

3.11 Standard operating procedures and adequate indicators and alarms are required for both normal and emergency operations and maintenance. Emergency shutdown procedures shall be reviewed at least once every three years, updated where necessary and operating personnel must conduct drills at least annually.

4 Process management

4.1 Hazard analysis must be used to define access, standard operating conditions and control measures for all molten material processes and take into account risks due to such things as run-outs, hot work, explosions, hazardous fumes, foaming and spillage.

4.2 Operating procedures must exist for inspection, cleaning, blasting and other process maintenance activity.

4.3 The operating temperature of molten materials shall be maintained within the defined limits required by the process. Temperature ranges must be established and a system for identifying, recording and managing any deviations must be in place.

4.4 Fuel combustion systems must be fitted with appropriate flame safety systems to prevent conditions that could lead to an explosion or fire.

4.5 Best practicable technologies and practices must be employed to capture hazardous fumes and gaseous products as low as reasonably practical.

4.6 Working procedures should avoid the necessity of working over an opening into a hot vessel or molten bath by applying engineering controls, i.e. protective covers, barricades etc or suitable mitigation.

Work in the vicinity of an open vessel containing molten material must be performed at a safe distance with appropriate tools and safety equipment. When this is not possible, a risk assessment must be used to define appropriate operating conditions, practices and control measures to be implemented in order to prevent an accidental fall and contact with the molten material within the vessel.

5 Molten material transfer

5.1 A risk analysis of on-site molten material transport roads and rail lines must be carried out to identify and control the hazards that could result in molten metal spillage or loss of vehicle control. Radius of turns, camber and bends, road surface condition and maintenance, operational speeds and vehicle design requirements must be considered as part of this analysis.

The hazards associated with molten material transfer off and on public roads and rail lines must be subjected to a risk analysis and the practice must be authorised by the appropriate government authorities.

Traffic rules for molten material transport vehicles must be developed and rigorously enforced. On-site molten material transport vehicles must be kept away from other vehicles and pedestrians unless effective risk controls have been established and implemented.

5.2 Controls must be implemented to safeguard against the consequences of a dropped load, spill or leak of molten material.

5.3 Transfer systems, e.g. launders, must be built so that excessive flows will be readily diverted to a pit or a designated overflow vessel or receptacle of adequate size to accommodate spills of any size identified during the risk analysis.

5.4 Exposure to extreme temperature must be taken into consideration when specifying design, inspection and operating requirements for lifting equipment used for molten material transfer e.g., ladles, hooks, bail beams, chains.

5.5 There must be a back-up system to control molten material pouring equipment to a safe position in the event of equipment or power (energy source) failure. Suspended loads must be securely held in the event of a power (energy source) failure and a specific emergency procedure must exist.

6 Protective equipment

6.1 A risk assessment must be carried out to establish access control and personal protective equipment (PPE) requirements in areas and for tasks where there is the potential for spillage, emissions of flame or gases, or explosion.

6.2 Vehicle cabs and operating positions (where reasonably practical) exposed to splashes, falling material, explosion or projected particles must be protected or screened with appropriate material, e.g. heat resistant glass or plastic where visibility is a requirement or by metal or fabric shields.

7 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	Jan. 2001	CEO Safety Adviser	Exco	
Version no.	Revision date	Revised by	Approved by	Reason for change
2	Dec. 2008	Paul Dewar, Adrian van Tonder	Rob Davies	Incorporation of suggested changes from operations and alignment with HSEQ management system.
3	Jan. 2011	Patrick James	Suresh Rajapakse	Business review.

D3 – Management of pit slopes, stockpiles, spoil and waste dumps September 2010

1 Scope

1.1 This standard applies to all Rio Tinto business units and managed operations, including new acquisitions. It covers exploration, through all development phases and construction, operation to closure and, where applicable, post closure management.

1.2 This standard covers the geotechnical hazards associated with temporary or permanent slopes excavated for the purposes of mining an ore reserve. It also covers waste dumps, stockpiles, spoil, and land bridges (collectively called "dumps").

1.3 The business unit or managed operation must comply with prevailing mining law and government legislation in the country or state in which it operates and comply with relevant mining title licence conditions.

2 Design

2.1 Each operation with a pit slope or waste dump must have a nominated manager responsible for the implementation of this standard.

2.2 The nominated manager must arrange for the development of a Slope Management Plan (SMP) and Dump Management Plan (DMP) to meet the requirements defined in the Rio Tinto work cycle – Management of pit slopes, stockpiles, spoil and waste dumps – process steps and work practices.

2.3 SMPs and DMPs must:

a) be developed using suitably qualified and experienced engineers, geotechnical and other technical specialists;

b) be based on adequate geologic, geotechnical and hydrogeologic data;

c) include operating and slope monitoring procedures based on adequate geologic, geotechnical and hydrogeologic data;

d) document that slopes and dumps are designed and constructed to specified minimum stability criteria using industry-accepted design techniques;

e) document that the slopes and dumps are designed and constructed to minimise risk during operation and closure;

f) define accountabilities and those roles authorised to change either the design or mine plans; and

g) be reviewed by an independent competent person or group every two years, or more frequently, as determined by a risk assessment or event.

2.4 Risks associated with slopes and dumps must be included in the site HSE risk register and updated at least on an annual basis.

3 Implementation

3.1 A suitably qualified and experienced site representative must be appointed by the nominated manager to be responsible for the slope/dump performance monitoring.

3.2 Personnel exposed to hazards associated with pit slopes and dumps must be trained in geotechnical hazard awareness, evidence of ground movement, rock fall hazards and dump instability.

3.3 Slope failures, dump failures and rock fall travel exceeding controls must be investigated. Records of those events must be maintained.

4 Verification

4.1 Operations must complete routine monitoring on a periodic basis, the intervals for which must be determined by risk assessment.

4.2 Procedures and accountabilities must be in place to verify the conformance of the pit slopes, stockpiles, spoils and waste dumps to design and current conditions.

4.3 Management of change processes must be employed if changes are made to the excavation or dump geometries that depart from the design.

4.4 Accurate surveys of the dump location(s) must be checked against the property and permit boundaries and recorded.

5 Revision history

First issue	Effective date	Prepared by	Approved by	
Sept. 2010	July 2011	Martyn Robotham	Suresh Rajapakse	
Revision no.	Revision date	Revised by	Approved by	Reason for change

D4 – Marine Safety

March 2011

D4.1 – Mooring operations at wharves and shipping terminals

1 Scope

1.1 This standard applies to all Rio Tinto Group businesses and managed operations, including new acquisitions, admin/corporate offices and research facilities located off site, during exploration through all development phases and construction, operation to closure and, where applicable, for post closure management. This standard is underpinned by the Rio Tinto Health, Safety, Environment and Quality (HSEQ) management system standard.

1.2 This standard applies to the management, operation and use of wharf facility or shipping terminals by Rio Tinto Group businesses for loading and unloading of cargo.

1.3 'Critical plant and equipment' for the purpose of this standard is defined as plant and equipment that is used for mooring and accessing the vessel, eg. bollards, quick-release hooks, capstans, dolphins, access control systems, gangways and protective barriers.

1.4 Each Group businesses must comply with relevant international, national or regional legislation, codes of practice, conventions and the Rio Tinto Marine Vessel Acceptance policy.

2 Design

2.1 All mooring operations at wharf facilities and shipping terminals must be subject to a risk assessment. The assessment must involve operators and maintainers of critical plant and equipment, as well as relevant ship-to-shore interface stakeholders.

2.2 Each operation with a wharf facility or shipping terminal must have a nominated manager responsible for the implementation of this standard.

2.3 The nominated manager must arrange for the development of a Shipping Terminal Management plan.

2.4 There must be a system to control access to the wharf and/or shipping terminal.

2.5 There must be a register of critical plant and equipment.

2.6 There must be task and equipment-specific, safe work procedures for the operation of critical plant and equipment.

2.7 There must be a documented inspection and maintenance regime for all critical plant and equipment.

2.8 There must be a documented process for pre-arrival information exchange between the operation and the vessel that complies with relevant codes/guides and meets the minimum requirements set out in the Rio Tinto Mooring operations at wharves and shipping terminals guidance note.

2.9 There must be a ship-to-shore checklist that complies with relevant codes/guides and which meets the minimum requirements set out in the Rio Tinto Mooring operations at wharves and shipping terminals guidance note.

2.10 Procedures must be established to confirm that vessels are safely moored and that they will not pose a safety hazard due to displacement or configuration while moored at the berth.

2.11 Environmental/weather parameters must be established for berthing, working and evacuation of the berth. The parameters must be developed in conjunction with the port operating authority and other relevant parties and consider the time required for the vessel to safely clear the port, as well as notice periods necessary to mobilise pilots and tugs.

3 Berthing and mooring

3.1 The potential for a person to be struck by any parted mooring line must be assessed and appropriate controls implemented.

3.2 There must be a periodic assessment of the wharf to identify and remove obstructions and snag hazards for mooring lines. The frequency of assessment must be a minimum of monthly unless otherwise derived from a risk assessment.

3.3 Bollards used for mooring must be marked with their Safe Working Loads.

3.4 Where practicable, mooring hooks and bollards must be fitted with load cells or other devices that indicate dynamic line tension.

3.5 Procedures must be established to enable warning and response to conditions which may lead to mooring line failure.

3.6 Where mooring hooks are used, they must:

a) be of the quick release type;

b) have a means of releasing lines from outside the snap-back zone;

c) be provided with protective barriers or marked snap back zones; and

d) wherever practicable, be provided with mechanical means for the hauling of mooring lines.

4 Wharf and terminal design criteria

4.1 Unless authorised by the business unit Managing Director, all new cargo handling equipment/facilities must be designed to meet the requirements set out in Rio Tinto *Mooring operations at wharves and shipping terminals* guidance note.

5 Revision history

First issue	Effective date	Prepared by	Approved by	
March 2011	January 2012	Mark Slater	Suresh Rajapakse	
Revision no.	Revision date	Revised by	Approved by	Reason for change

Rio Tinto

Standards

HSE Performance Standards - ENVIRONMENT

Printed: February 2012

Contents page

E2 - Air quality control

Scope

This standard is applicable to all Rio Tinto business units and managed operations including corporate/administration offices and research facilities located off site. It covers emissions from all sources, including fugitive emissions, during exploration, mining, mineral processing, materials handling, smelting, refining and on-site transport, and also their incremental impacts on the ambient air quality. Where the business or operation is also responsible for ancillary activities (eg power generation) or off-site transport (rail, truck and ship), those activities are also under the scope of this standard. Persons living in construction or company accommodation at the operation are included as part of the local community.

Intent: The intent of this standard is to ensure that Rio Tinto operations have identified and minimised air pollutant emissions and their potential impacts from their activities. This is to be accomplished by evaluating and prioritising them according to the significance of their impact, and taking effective measures to design and implement appropriate controls of emissions to ensure protection of ambient air quality.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Greenhouse gas emissions standard
- Land use stewardship standard
- Occupational health standards (occupational hygiene aspects)
- Cleaner production principles
- Air quality guidance note

Programme design

1 Planning

1.1 Determine and maintain records of background ambient air quality, meteorological characteristics affecting pollutant dispersion and other sources of emission in the vicinity of the operation.

1.2 Identify, characterise and document significant pollutant emissions from all sources at the operation, including fugitive emissions, and their method of release into the environment.

1.3 Identify and document community health (and nuisance) hazards and environmental impacts associated with the exposure to individual and combined air pollutant emissions from the operation's facilities. Prioritise emission controls and abatement targets on the basis of risk levels determined through a documented risk assessment.

1.4 Employ environmental hazard identification and change management procedures for new developments or substantive changes to existing facilities to determine and manage potential adverse risks to ambient air quality.

1.5 Demonstrate that, under normal and worst case operating conditions and adverse meteorological conditions, emissions from the operation, current or after a modification, will not cause violation of regional or national air quality regulations, internally derived air quality criteria, and/ or licence conditions.

1.6 Develop internal criteria on ambient air quality when government regulations are absent or incomplete to ensure protection of local community health and the environment. The criteria must have formal approval from the operation's managing director (MD) and be in line with internationally accepted regulations, guidelines and methodologies.

2 Implementation and operation

2.1 Implement appropriate control procedures or control technologies to manage those emissions selected in the risk assessment as having potential or actual significant environmental or community health impacts.

2.2 Prepare emergency procedures to respond to emergency situations, abnormal emission and dispersion conditions, and exceedences of air quality criteria, including immediate measures to protect community health.

3 Performance management

3.1 Implement monitoring programmes or use estimation to quantify all significant emissions (point source and fugitive) to an acceptable degree of accuracy. Implement monitoring programmes for relevant ambient air quality parameters using receptor measurements or dispersion models validated to an adequate degree of accuracy to demonstrate protection of environment and community health, and to comply with regulations.

3.2 In any monitoring program, identify and use the specifications of local regulatory authorities for:

- monitoring equipment and scheduling;
- modelling assumptions;

- modelling programmes; and
- emissions factor.

In the absence of such regulatory requirements, or if incomplete or inadequate adopt recognised internationally acceptable specifications, which must have formal approval from the operation's MD.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

E3 - Acid rock drainage prediction and control

Scope

This standard is applicable to all Rio Tinto business units and managed operations including, where applicable, admin/corporate offices and research facilities located off site. The requirements of this standard are to be followed by all operations that indicate existing or potential Acid Rock Drainage (ARD) conditions. The standard covers the management of sulphide-bearing materials and ARD through the complete mineral project development timeline from exploration through project development, approval and mining, changes in the orebody mineralogy and/or process conditions, through to closure and post-closure periods.

Intent: The intent of the standard is to ensure that ARD risks for Rio Tinto projects and operations are effectively identified through all phases of a business and managed to prevent or minimise adverse environmental impacts and to reduce long-term costs and liabilities. The standard applies to issues related to the potential release of sulphide oxidation products including the formation of acidic and/or saline soils and wastes, the release of low pH water or water with a neutral pH but elevated sulphate-dominated salinity or metals concentrations. The term ARD as used in this standard refers to the

potential environmental impacts that could result from the oxidation of sulphide minerals such as pyrite. The emphasis is on timely and thorough analysis of the risks, early identification and implementation of control (management) strategies and thorough integration of controls with mine planning and operational activities.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Land use stewardship standard
- Mineral waste management standard
- Water use and quality control standard
- Closure standard
- Acid rock drainage prediction and control guidance note

Programme design

1 Planning

1.1 Identify and document the geological setting and the mineralogy of sulphide containing rocks, adjacent lithologies and unconsolidated sediments that will be disturbed or exposed in order to support ARD potential and prediction studies.

1.2 Assess the ARD potential of any new development as part of exploration, order of magnitude, pre-feasibility and feasibility studies, due-diligence reviews for acquisitions, and also for changes in process and/or mineralogy. Ensure that realistic

ARD management costs are estimated and included in project financial evaluations.

1.3 Undertake appropriate environmental baseline studies for ARD before the commencement of a development project or any significant expansions of existing operations.

1.4 Due diligence studies as part of potential project acquisitions must include an assessment of the project's current and potential ARD issues and liabilities.

1.5 Maintain an ARD prediction program for forecasting the short-term and long-term behaviour under local weathering conditions of sulphide-bearing materials such as:

a) The rocks and unconsolidated sediments exposed in open pits and underground mines;
b) Ore, waste rock, block cave rubble, acid sulphate soils and other materials that have been disturbed; and
c) Tailings, spent heap leach ore and other process wastes that have been generated.

1.6 Ensure the ARD prediction program reduces uncertainty about potential risk and liability to a level which permits a decision to be made to either reject the project or initiative, or to put in place effective mining and waste management strategies.

1.7 Ensure that recognised ARD experts are consulted for the initial assessment to determine whether there is an ARD issue at the site, design of the prediction program, the interpretation of its results, and the development of the management plan.

1.8 Develop an ARD management plan, commensurate with the ARD potential of mineral wastes and products and in line with the ARD prediction program, addressing as a minimum:

a) a summary assessment of the ARD setting, hazards and potential impacts;

b) the discharge limits and receiving environment objectives;

c) the ARD management strategy designed to meet the environmental objectives in a reliable and cost effective manner during operation and after closure;

d) the procedures and responsibilities for implementing the management strategy on an ongoing basis under actual field conditions;

e) ongoing ARD characterisation, monitoring and data collection requirements; and

f) contingency measures for response to unplanned conditions or unexpected impacts.

2 Implementation and operation

2.1 Implement the ARD management plan and make sure that it is integrated with mine and processing design, waste scheduling, closure planning, relevant operational procedures, and the business plan.

2.2 Maintain an inventory comprising quantities, location and representative characteristics of materials extracted from a mine or exposed to oxidation with respect to their abilities to generate or mitigate ARD.

2.3 Assign accountabilities at each affected operation for undertaking the ARD prediction program and for developing and implementing the ARD management plan.

2.4 Ensure that induction, general awareness and job specific training contains additional elements relating to ARD risks and how they are managed, where ARD is a significant issue for the operation. In such operations, the management team must have an appropriate knowledge of ARD prediction and control.

3 Performance management

3.1 Maintain a monitoring procedure appropriate to the potential ARD impacts, which, as a minimum, allows adequate early warning of unacceptable impacts, facilitates management

decisions, supports the ongoing prediction program and confirms assumptions used in the management plan.

3.2 Arrange for independent review of the ARD management plan at regular intervals (at least every four years, or more frequently when operational or environmental conditions so dictate). The review must be carried out by an ARD expert and produce an independent document attesting the status of the prediction program and control strategies in place and indicating any potential threats to the operation and the Rio Tinto Group.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Buce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

E4 - Greenhouse gas emissions

Scope

This standard is applicable to all Rio Tinto business units and those managed operations, including admin/corporate offices and research facilities located off site, that significantly (more than 50, 000 tonne CO2Eq or more than 500 TJ energy per annum) contribute to Rio Tinto's total GHG emissions and energy use. It covers all sources of greenhouse gas (GHG) emissions (direct and indirect) during exploration, mining, mineral processing, materials handling, smelting refining and on-site transport. Where the business unit or operation is also responsible for ancillary activities (eg power generation) or off-site transport (rail, truck and ship) those activities will be covered under the scope of this standard.

GHG issues associated with product life cycles are covered in the Product Stewardship guidance note.

Intent: The intent of this standard is to ensure continuous improvement in GHG emission minimisation in Rio Tinto, including through improved efficiency in energy use. This is to be accomplished by identifying GHG sources, evaluating and prioritising them according to significance, and then designing and implementing a Greenhouse gas and energy

efficiency action plan containing the appropriate control, reduction and mitigation measures.

Other relevant documents:

- Rio Tinto Climate change position
- HSEQ management system (or standard E1 EMS for non ABS operations)
- Air quality control standard
- Project evaluation guidelines (for carbon and energy pricing guidance)
- Greenhouse gas emissions guidance note

Programme design

1 Planning

1.1 Develop, document and maintain knowledge of GHG emissions and energy use. This must include an understanding of current and future GHG emission and energy use inventories and the factors that affect these inventories. It must also include comparisons of the operation's (and/or individual processes') performance against external or internal benchmarks. Internal benchmarking must be used where no data for comparative operations or processes are available.

1.2 Identify, document and assess GHG emission reduction and energy efficiency improvement opportunities for the business or

operation. Opportunities include on-site operational and engineering controls, emissions trading and offsets.

1.3 Develop a Greenhouse gas and energy efficiency action plan with GHG emission reduction and/or energy efficiency targets that will lead to benchmark performance. The action plan must include suitable actions and milestones that are adequately resourced and linked to the business planning process.

1.4 Regularly review GHG emission reduction and energy efficiency opportunities for financial and technical viability. Ensure that carbon and energy prices that can be reasonably anticipated (including costs inferred by government imposed carbon tax schemes or CO2 emissions regulations) are used in these reviews and in all project evaluations including:

a) annual business plans and valuations;

b) new project evaluations;

c) capital expenditure programs; and

d) due diligence reviews for divestments and acquisitions.

Factor-in the reviews and changes that can reasonably be anticipated in national and international policies and measures.

2 Implementation and operation

2.1 Implement the Greenhouse and energy efficiency action plan and associated programmes for GHG emission control and reduction and energy efficiency. Upgrade the action plan as the business needs and external requirements change and as there is technological advancement and progress in GHG emission and energy efficiency management.

2.2 Assign clear responsibilities and accountabilities for GHG emission and energy efficiency management. Responsibilities must include those for progressing the Greenhouse and energy efficiency action plan. Maintain access to the necessary GHG emission abatement and energy efficiency knowledge and skill.

3 Performance measurement

3.1 Ensure that the appropriate measures are in place for metering, or estimating where appropriate, GHG emissions and energy use.

3.2 Conduct periodic reviews to identify potential risks (threats and opportunities) associated with achieving best benchmark GHG emission performance and energy efficiency at the business or where appropriate operation. Businesses must regularly review milestones towards achieving targets.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

E5 - Hazardous materials and contamination control

Scope

This standard is applicable to all Rio Tinto business units and managed operations, including admin/corporate offices and research facilities located off site, from exploration/development and acquisition through to closure and post closure. It covers the management of bulk materials to prevent spillage and environmental contamination, secure storage and transport, contamination investigations, site remediation and emergency response. Where the business or operation is also responsible for ancillary activities (eg power generation) or off-site storage or transport (rail, truck and ship), those activities are also under the scope of this standard. Note that the need for purchase controls, Material safety data sheets (MSDS) and environmental risk assessment are now included in Occupational health standard B4, Hazardous substances (OH-B4).

Intent: The intent of this standard is to prevent spillage and environmental contamination from handling, storage and processing of materials. Control measures must be commensurate with risks to the environment, and ensure that environmental impacts due to spills or other releases are minimised. For those cases where site contamination has occurred, the intent of the standard is to ensure that contamination is properly characterised, managed and remediated where necessary.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Occupational health standard B4 (Hazardous substances)
- Non-Mineral waste management standard
- Water use and quality control standard
- Land use stewardship standard
- Mineral waste management standard
- Product stewardship guidance note
- Hazardous materials and contamination control guidance note

Programme design

1 Planning

1.1 Deleted (requirements incorporated into OH-B4 clause 2.2).

1.2 Identify and assess the environmental contamination risks and implement spill prevention controls associated with the transport, storage, use, transfer and disposal of hazardous materials, including failures of secondary containment structures.

1.3 Develop internal criteria for assessment of site contamination when government regulations are absent or incomplete. The criteria must be approved by the managing director (MD) and

be in line with internationally accepted regulations, guidelines, definitions and methodologies.

1.4 Deleted.

1.5 Develop and maintain a contaminated site register, with geographical references, for land currently or previously owned, leased and/or managed (legacy sites). Identify existing contamination and assess its environmental impact. The register must include known contamination for sites previously owned or leased regardless of whether remediation liabilities are retained. Ensure that registers are developed as part of the due diligence process for acquisitions. Key components of the contaminated site register for each site must include:

a) coordinates;

b) description of the wastes and/or potential contaminants of concern and impacted media (soils, sediments, groundwater, surface water);

c) estimated mass, volume and geometry of the contamination (surface area, thickness, buried depth);

d) summary of the site history;

e) exposure risks and related land use and access restrictions if any; and

f) required remedial or administrative actions if any.

1.6 Deleted.

2 Implementation and operation

2.1 Ensure that employees and contractors involved with hazardous materials handling or remediation of contamination are fully aware of the associated environmental hazards and risks and are appropriately trained in routine activities and emergency actions.

2.2 Ensure that hazardous materials, including those brought by contractors, do not adversely impact the environment, can not be accessed by unauthorised personnel and, based on risk, can not come into contact with birds and other animals.

2.3 Deleted

2.4 Maintain effective containment barriers for preventing spills of hazardous material from reaching the environment. All tanks (including flow through process tanks) and drum storages containing hazardous material must have properly designed secondary containment:

a) containment drainage valves must remain closed and locked with the exception of rainwater draining events. Appropriate

signage must be provided, indicating correct valve position and requirement for locks;

b) containment systems must be free from product spillage and other materials; rainwater or snow must be removed to ensure adequate capacity is maintained; and

c) measures must be in place to ensure spills from secondary containment and portable containers can not enter sewers or any body of water or soil.

2.5 Storage tanks and pipelines containing or transporting hazardous materials must be above ground. Any exception must be justified and authorised by the managing director. Any such exception must be based on a risk assessment and provision of additional controls including secondary containment (such as double-wall design), inventory monitoring and reconciliation, and other leak detection or environmental monitoring systems.

2.6 Dispensing hazardous materials must have effective spill prevention and leak/spill detection measures in place. Construction materials must be compatible with the fluid contained in the system.

2.7 Implement selection criteria and control procedures for third party transporters, purchasers and other recipients of

hazardous materials and implement follow-up procedures for any hazardous material sent off the premises.

2.8 Maintain and test emergency response procedures, associated equipment and personnel for responding to potential hazardous material releases.

2.9 Develop, document and implement a remediation strategy for those existing contaminated sites where site investigation has shown there is an unacceptable environmental impact to current land uses, ecological function, surface or ground water resources, or where off-site impacts are occurring or are likely to occur.

3 Performance measurement

3.1 Implement routine inspections, monitoring procedures for leaks and integrity testing for deterioration of storage tanks and pipelines with a frequency and methodology commensurate with the associated environmental hazards and local legislation.

3.2 Maintain spill and leakage detection equipment and emergency response plans that are adequate for the risk posed by the hazardous material to the environment and linked to the appropriate operational control and emergency response unit.

3.3 Deleted

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

E6 - Noise and vibration control

Scope

This standard is applicable to all Rio Tinto business units and managed operations including admin/corporate offices and research facilities located off site. It covers noise and vibration arising from exploration and operations, including mining, mineral processing, materials handling infrastructure and on-site transport, which may significantly impact on people, communities and the surrounding environment. Where the business or operation is also responsible for ancillary activities (eg power generation) or off-site transport (rail, truck and ship), those activities are also under the scope of this standard. Persons living in construction or company accommodation at the operation are included as part of the local community.

Occupational noise and vibration exposure is not covered by this standard but rather by the Occupational health standards B2 and B3.

Intent: The intent of this standard is to ensure that Rio Tinto operations minimise their noise and vibrations impacts on the surrounding environment and communities. This includes impacts on biota, people, heritage aspects and surrounding land use. Control is to be accomplished by identifying noise and vibration sources, evaluating and prioritising the sources according to significance of potential impacts

then taking effective measures to design and implement appropriate controls.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Land use stewardship standard
- Occupational health standards
- Biodiversity guidance note
- Noise and vibration control guidance note

Programme Design

1 Planning

1.1 Develop, document and maintain knowledge of:

a) the baseline, and for existing operations, background noise and vibration levels; and

b) the key receptors and impacts that may result from noise and vibration emissions.

1.2 Employ change management procedures and predictive modelling of near and far field noise and vibration levels as part of the pre-feasibility and feasibility study for:

a) new developments;

b) significant expansions; and

c) changes to existing activities and facilities.

The model will, where applicable, incorporate baseline/background data, community expectations, and regulatory requirements and identify significant exposures to sensitive receptors.

1.3 Identify which components of the facility and which activities are the key contributors to external noise and vibration levels; understand the generation and propagation of noise and vibration and evaluate the potential environmental impact under a range of meteorological and operating conditions.

1.4 Develop internal criteria on noise and vibration performance when government regulations are absent or incomplete to ensure protection of local community health and the environment. The criteria must have formal approval from the operation's managing director (MD) and be in line with internationally accepted regulations, guidelines and methodologies.

2 Implementation and operation

2.1 Implement a procedure to manage noise and vibration where an assessment based on modelling and/or monitoring results indicates the need, in order to meet regulatory requirements and accommodate community expectations.

2.2 Deleted.

2.3 Adopt a hierarchy of noise and vibration controls, with engineering or design controls for noise sources being the first option implemented. If due to safety reasons this is not permissible consider other control processes.

2.4 Incorporate and maintain noise and vibration control requirements into design and operational criteria for relevant exploration and mining activities, including drilling and blasting, processing activities and new facilities.

2.5 Incorporate noise and vibration performance criteria into purchasing requirements for relevant, equipment and machinery.

3 Performance measurement

3.1 Have a procedure in place for monitoring of noise and vibration levels in potentially affected neighbouring areas, including employee/contractor accommodation units.

3.2 Implement a monitoring program to assess noise and vibration impact on the environment and communities under normal and worst case operating conditions and adverse meteorological conditions. The monitoring programme will:

a) support operational control;

b) verify compliance with targets and legal requirements; and

c) periodically validate and maintain the relevance of near and far-field noise and vibration models.

4 Revision history

Version no.	**Effective date**	**Prepared by**	**Authorised by**	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

E7 - Non-mineral waste management

Scope

This standard is applicable to all Rio Tinto business units and managed operations, including admin/corporate offices or research facilities located off site, from exploration/development and acquisition through to closure and post closure. It covers non-mineral wastes generated by the activities of the operation, or non-mineral wastes received by the operation to dispose or manage on behalf of others.

Definition: Non-mineral wastes include but are not limited to used oil, antifreeze, greases, batteries, solvents, coolants, spent reagents and paints, tyres, contaminated soils and debris, solid sewage residues, construction debris, spent pot liners, bath, anode wastes, refractory bricks and any other waste materials from processing, maintenance and medical facilities, canteens, offices, workshops, laboratories and gardens, including off-specification raw materials (other than ore) used in processes. Non-mineral wastes do not include residues directly derived from the mining or processing of rock and unconsolidated sediments.

Mineral wastes generated as a direct result of mining or processing, are addressed in the Mineral waste management standard. Process related

liquid effluents are covered in the Water use and quality control standard.

Intent: The intent of this standard is to ensure sound non-mineral waste management in Rio Tinto operations by the minimisation of waste generation and ensuring the safe handling, treatment and disposal of all generated wastes.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Hazardous materials and contamination control standard
- Mineral waste management standard
- Water use and quality control standard
- Land use stewardship standard
- Air quality control standard
- Non-Mineral waste management guidance note

Programme design

1 Planning

1.1 Identify, assess and document the quantities, characteristics, environmental hazards and risks associated with non-mineral

wastes generated, disposed on-site or transported and disposed off-site or managed on behalf of others.

1.2 Develop and maintain a documented inventory, including quantity per year and cumulative total, of non-mineral wastes generated or received and disposed on or off-site.

1.3 Maintain measurable indicators and targets for hazard and/or quantity reduction of significant non-mineral wastes destined for disposal.

1.4 Develop internal criteria for waste classification and management when government regulations are absent or incomplete. The criteria must have formal approval from the operation's managing director (MD) and be in line with internationally accepted regulations, guidelines, definitions and methodologies.

1.5 Develop and implement a Non-mineral waste management plan. The plan shall give priority to those wastes identified as having significant hazards and the actions must demonstrate that the waste management hierarchy has been considered, as follows in order of preference:

a) waste avoidance and reduction at source;

b) re-use and recycling; and

c) waste storage, treatment and/or disposal.

2 Implementation and operation

2.1 Ensure that non-mineral wastes are segregated at generation and that wastes awaiting further treatment, transport or disposal are securely contained and monitored. Persons that manage or handle hazardous waste must be appropriately trained.

2.2 Maintain operational procedures and effective controls for the safe handling, on-site and off-site transportation, storage and disposal of non-mineral wastes commensurate with their degree of hazard and compatibility.

2.3 Maintain records of wastes sent off-site, and a documented inventory and location of on-site waste landfills and storage areas. Historical and abandoned landfills shall be included in this inventory and their location documented.

2.4 Disposal of waste must only be carried out in engineered and approved facilities and in accordance with established operational procedures and applicable local laws and regulations.

2.5 Undertake verification assessments of contractors and facilities used for wastes sent off-site for disposal or treatment, to verify that the wastes have been dealt with appropriately.

3 Performance measurement

3.1 Establish a procedure to inspect and monitor waste handling and storage facilities commensurate with the degree of hazard of the waste. Corrective action must be taken where unacceptable conditions are identified.

3.2 The Non-mineral waste management plan must be reviewed at least every four years or more frequently when operational or environmental conditions so dictate.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ Management System.

E8 - Mineral waste management

Scope

This standard is applicable to all Rio Tinto business units and managed operations, including – where applicable - admin/corporate offices and research facilities located off site, and covers the management of mining and process waste generated by their activities, or which are taken by the operations to dispose or manage on behalf of others.

Definition: Mineral waste includes: waste rock and overburden, tailings and spent heap leach ore from mineral processing, rock masses disturbed by block caving, rejects from beneficiation or concentration of coal and other minerals, bauxite residue from alumina production, dross, refinery discards and sludges, smelter and other furnace slags, ashes, water treatment sludges, dredging materials and soils contaminated by mineral waste.

Intent: The intent of this standard is to ensure environmentally sound and effective management of mining and process wastes generated or handled by Rio Tinto operations. Waste disposal facilities and sites must be physically, biologically and chemically safe. Waste production and disturbed footprint shall be minimised and waste re-use, in-pit backfill, progressive rehabilitation and recycling maximised.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Air quality control standard
- Non-Mineral waste management standard
- Hazardous materials and contamination control standard
- Closure standard
- Acid rock drainage prediction and control standard
- Land use stewardship standard
- Water use and quality control standard
- Mineral waste management guidance note
- Rio Tinto guideline for six-monthly social and environmental reporting

Programme design

1 Planning

1.1 Identify, assess and document the quantities, physical and chemical characteristics and hazards of the wastes that will be generated by mining and processing of each distinct section of the mineral deposit.

1.2 Develop and maintain an inventory of mineral wastes generated, handled and disposed of, whether on or offsite,

including descriptions of hazard and other characteristics, quantity disposed of per year, total stored on site and details of location and techniques used for handling and disposal.

1.3 Maintain a procedure, including evaluation criteria, for identification of hazards, potential modes of failure and assessment of risks posed by tailings dams and other large waste disposal facilities.

1.4 Maintain, for each waste disposal facility or site, an up to date conceptual and/or numeric model of the long-term physical and chemical waste behaviour and impacts on the environment. The model must be validated using data from prediction tests and monitoring.

1.5 Ensure that design and construction of all waste disposal facilities or sites are:

a) compatible with the waste behaviour, addressing any threats to the environment, particularly those posed by contaminated run-off and seepage, wind and water erosion, direct exposure to chemical hazards, asbestiform minerals, and geotechnical instability;

b) engineered to best available or applicable technology for stability and safety; and

c) located within permit boundaries in a manner that minimises impacts to sensitive receiving environments and water resources.

1.6 New developments will not use tailings disposal facilities for water storage functions. Any existing dual storage of wastes and water must undergo a risk assessment and a study of potential alternatives.

1.7 Apply a change management procedure for the approval of any significant modification to waste disposal facilities, waste generation processes or waste handling and disposal procedures.

1.8 Avoid any uncontrolled riverine disposal of mineral wastes.

1.9 Develop targets to drive improvements in aspects of mineral waste management. Progress towards the targets must be supported by a suitable set of actions.

1.10 Establish and maintain a documented Mineral waste management plan that covers all stages of waste management from generation to final use and/or disposal and that includes at a minimum:

a) a summary assessment of the chemical and physical hazards posed by the waste and disposal facilities;

b) the management plan designed to mitigate the chemical and physical hazards;

c) assignment of clear accountabilities and responsibilities for mineral waste management and for implementing the management plan on an ongoing basis under actual field conditions;

d) ongoing monitoring and data collection requirements; and

e) emergency plans and contingency measures for response to unplanned conditions or unexpected impacts.

2 Implementation and operation

2.1 Maintain operational procedures commensurate with the identified hazards of each waste disposal facility for managing:

a) the waste mass and its physical and chemical reactions;

b) the containment structure and its stability issues;

c) waste placement, segregation and handling requirements; and

d) spills and improperly placed materials.

2.2 Ensure that the supervision and operation of disposal and storage facilities are commensurate with the environmental and safety hazards posed by the waste and the facility. Persons that manage or handle hazardous waste must be appropriately trained.

2.3 Undertake assessments of contractors and facilities used for wastes sent off-site for disposal or treatment, to verify that the wastes have been dealt with appropriately.

3 Performance measurement

3.1 Monitor physical stability parameters of waste disposal structures as an early detection and warning mechanism for potential failure.

3.2 Conduct regular monitoring of the geochemical behaviour of the waste repositories for validation or review of the waste behaviour model and early warning of potential pollution problems.

3.3 Conduct independent and external review by qualified engineering specialist(s) of all major waste storage facilities according to protocols and frequencies adequate to their physical and chemical hazards and level of risks. Frequency of external reviews must not be less than once every two years for physical hazards and once every four years for chemical

hazards. Any significant findings must be reported according to Rio Tinto requirements.

3.4 Maintain an emergency system, including communication with stakeholders, for responding to potential incidents involving waste storage facilities and transport to disposal facilities.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

E9 - Land use stewardship

Scope

This standard applies to all land owned, leased or managed by Rio Tinto (Rio Tinto land) and covers all activities of the Rio Tinto Group, from exploration through project planning, construction and operation to closure. It also includes land managed by administrative and corporate offices or research facilities. It particularly applies to land that is not used directly for mining, processing or ancillary activities and operational land that has been rehabilitated but remains under Rio Tinto control.

Intent: The intent of this standard is to develop management plans, programmes and procedures to ensure sustainable stewardship of the land that Rio Tinto owns, leases or manages. This requires an understanding of the current use and value of the land combined with its potential to fulfil corporate, community and other stakeholders' expectations for beneficial land-uses that can be supported and sustained into the future.

Other relevant documents:

- Land use stewardship guidance note
- HSEQ management system (or standard E1 EMS for non ABS operations)
- Water use and quality control standard and guidance note
- Acid rock drainage prediction and control standard and guidance note
- Mineral waste management standard and guidance note
- Hazardous materials and contamination control standard and guidance Note
- Non-Mineral waste management standard and guidance note
- Rio Tinto closure guidance notes
- Rio Tinto biodiversity strategy
- Rio Tinto communities standard and guidance note
- Rio Tinto cultural heritage guidelines
- Five-year communities plan
- Site operations plans

Programme design

1 Planning

1.1 Develop and maintain a documented description of all Rio Tinto land under the control of the business or operational unit. This must include the following, where relevant:

a) records of land ownership and tenure, including property boundaries, legal title, customary/traditional ownership and leasehold/rental/land access agreements between Rio Tinto and third parties;

b) historic and current land-uses within Rio Tinto land and the surrounding area, including potential legacy issues;

c) current environmental and social conditions, including natural features, known cultural/heritage sites, and other statutorily designated and protected areas;

d) future land-uses within Rio Tinto land and the surrounding area, where these are known; and

e) the policy and regulatory framework, including statutory restrictions for specific types of land-use.

1.2 Develop land-use zones and management objectives for Rio Tinto land that is permanently used as well as those areas

which are temporarily surplus to direct operational requirements. This process must:

a) identify land-use zones where these have been determined by the statutory authorities or, in their absence, develop appropriate sustainable development based land-use zones in consultation with key stakeholders;

b) identify limitations for certain types of land-uses and opportunities to manage land beneficially within specific land-use zones;

c) incorporate Rio Tinto policies and strategies for aspects such as communities development, land rehabilitation, water conservation, biodiversity, environmental offsets, heritage sites and sustainable development; and

d) develop strategic local partnerships that will achieve long-term sustainable management of the land once mining ceases.

1.3 Develop targets to drive improvements in land management. Targets must:

a) be related to specific land-use objectives and land-use zones;

b) identify appropriate performance indicators;

c) be clearly measurable; and

d) be subject to regular reporting and review.

1.4 Develop a Land-Use management plan that promotes an integrated and sustainable approach to land management. The plan must satisfy the current needs of the operation and anticipate what may be required in the future. It must address the following:

a) description of Rio Tinto land;

b) policy and regulatory context;

c) land-use objectives and land-use zones;

d) management plans for land-use zones, including procedures, targets and action plans;

e) programmes and resources; and

f) supporting documentation.

2 Implementation and operation

2.1 Integrate the Land-Use management plan with business unit and/or operations planning, site environmental management plans, closure planning, the Five year communities plan, project evaluations and capital expenditure reviews.

2.2 Assign clear responsibilities and accountabilities for land-use management that include preparation and implementation of the Land-Use management plan.

2.3 Implement an authorisation procedure to ensure that development and land-uses on Rio Tinto land are compatible with the Land-Use management plan.

2.4 Develop management procedures to ensure the content of the Land-Use management plan is regularly reviewed, the objectives and targets are being achieved and significant changes to the Plan are authorised by the general manager (GM or equivalent).

3 Performance measurement

3.1 Conduct a systematic auditing procedure of all aspects of the standard to verify their adequacy, performance and areas of risk and opportunity.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

E10 - Water use and quality control

Scope

This standard is applicable to all Rio Tinto business units and managed operations from exploration and development through to closure. It includes corporate/admin offices and laboratory facilities situated off site. It covers all water management activities for all types and sources of water.

Intent: The intent of this standard is to ensure efficient, safe and sustainable management and protection of water resources and ecosystems in and around Rio Tinto operations. This requires an understanding of the water resources, their spatial and temporal interrelationships, their ownership in the region and the needs of catchment stakeholders. This provides the basis for the development of an integrated and strategic approach to water management including social, environmental, operational and economic aspects.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Water use and quality control guidance note
- Rio Tinto water strategy
- Acid rock drainage prediction and control standard
- Hazardous materials and contamination control standard
- Mineral waste management standard
- Rio Tinto closure standard
- Surface mining standard design and management of slopes; and related guidance
- Surface mining standard design and management of dumps; and related guidance
- Legionnaires disease guidance note
- Annual S & E survey guidelines

Programme design

1 Planning

1.1 Deleted (requirements incorporated into 1.2).

1.2 Develop and maintain an appropriate understanding of the cumulative demands and impacts being placed on water resources and ecosystems in the catchments in which the

operation works. This must include understanding the current and future water requirements of key upstream and downstream users and stakeholders, and the flow regime and quality required to maintain ecosystem integrity.

1.3 Develop and maintain a site water balance that is appropriate to manage the site's water risks and that predicts future water requirements, includes climate variability and identifies opportunities for water management improvements. Where there is significant risk, a solute balance for key contaminants must also be implemented.

1.4 Implement a change management process to ensure that new developments, expansions, modifications or replacement of existing facilities do not degrade the catchment quality, function, use and integrity of surface and subsurface aquatic ecosystems and water resources.

1.5 Develop and implement criteria on water abstraction, dewatering, effluent/discharge or water quality when government regulations are absent, insufficiently protective or ambiguous to ensure protection of surface water and ground water resources. The criteria must have formal approval from the operation's managing director (MD) and be consistent with internationally accepted limits, thresholds, guidelines and methodologies.

1.6 Develop site specific targets for operational areas that drive improvements in site specific risks associated with water management. Progress towards the targets must be supported by appropriate actions as part of the site business plan.

1.7 Develop and implement a Water management plan that describes the operational aspects for water management to comply with the intent of this standard and with regulations and requirements of the pertinent authorities. This plan must be integrated with the site business plan and be updated at least every four years or more frequently when operational, social or environmental conditions so dictate.

2 Implementation and operation

2.1 Assign clear responsibilities and accountabilities for water management considering representation from across the organisational structure. Responsibilities must include tracking and reviewing progress in implementing the Water management plan.

2.2 Design, construct and operate water withdrawal, storage, treatment and discharge facilities in accordance with appropriate practices and:

a) ensure the design includes a risk assessment to identify and correct any potential failure scenarios and facilities will be able

to handle expected flows and quality, including significant storm events;

b) ensure that construction meets relevant standards and regulatory requirements and addresses all the identified significant risks; and

c) ensure that operation of the facility conforms to approved design criteria and operational procedures and includes trigger and response criteria to protect aquatic ecosystems and aquifers.

2.3 Prepare emergency and contingency plans for:

a) drought;

b) flood;

c) failures of large water retention structures; and

d) unplanned effluent discharges.

This must be coordinated and compatible with the similar requirements for large waste storage facilities as contained in the Mineral waste management standard.

3 Performance measurement

3.1 Maintain safety inspection procedures, including the detailed verification of all identified hazards, for major water storage facilities. These requirements must be compatible with the major waste storage facilities inspection and signoff requirements detailed in the Mineral waste management standard.

3.2 Implement a monitoring, checking and corrective action program to:

a) support operational control;

b) verify compliance with targets and regulatory requirements;

c) compare actual and predicted water balances;

d) update water and solute balances, and catchment and ground water models;

e) compare actual and predicted ground water and surface water impacts;

f) assess impact on the environment;

g) assess, where appropriate, cumulative impacts of the operation on the catchment and other users;

h) meet reporting requirements; and

i) meter flows and measure storages that are significant to the site water balance including recycle and reuse streams.

The frequency of monitoring must be based on site water risk or when there are significant changes in the process, operations or the environment impacting water usage and/or quality.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	**Revision date**	**Revised by**	**Authorised by**	**Reason for change**
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.

APPENDIX T

MSDS Sheets

72-62-7925-11 MATERIAL SAFETY DATA SHEET	VALVOLINE	VALVOLINE OIL COMPANY DIVISION OF ASHLAND OIL, INC. P.O. BOX 391 ASHLAND, KENTUCKY 41114 (606) 329-3333	24-HOUR EMERGENCY TELEPHONE (606) 324-1133

000103 #5000/5001/5005

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

****

Product Name: [redacted]

Data Sheet No: 0173318-003
Prepared: 07/02/85
Supersedes: 07/26/84

LINDA M. CASEY
ASHLAND PETROLEUM COMPANY
ENV. & HEALTH AFFAIRS
BL-H

INTER-COMPANY

08 88 101 9133224-741

PRODUCT:
INVOICE: REQST
INVOICE DATE: 10/19/88
TO:

SECTION I - PRODUCT IDENTIFICATION

General or Generic ID: OIL/WATER EMULSION

DOT Hazard Classification: NOT APPLICABLE

SECTION II - COMPONENTS

IF PRESENT, IARC, NTP AND OSHA CARCINOGENS ARE IDENTIFIED IN THIS SECTION
SEE DEFINITION PAGE FOR CLARIFICATION

INGREDIENT	% (by WT)	PEL	TLV	Note
ALIPHATIC PETROLEUM DISTILLATES CAS #: 64742-06-9	30-60	5 MG/M3	5 MG/M3	
PROPYLENE GLYCOL CAS #: 57-55-6	1-5			(1)
ALKANOLAMINE CAS #: 102-71-6	1-5			(2)

Notes:

(1) PEL/TLV NOT ESTABLISHED FOR THIS MATERIAL

(2) PEL/TLV NOT ESTABLISHED FOR THIS MATERIAL

SECTION III - PHYSICAL DATA

Boiling Point	for COMPONENT(30-60%)	212.00 Deg F (100.00 Deg C) @ 760.00 mm Hg
Vapor Pressure	for COMPONENT(30-60%)	17.50 mm Hg @ 68.00 Deg F (20.00 Deg C)
Specific Vapor Density		HEAVIER THAN AIR
Specific Gravity		GREATER THAN WATE
Percent Volatiles		>60%
Evaporation Rate		SLOWER THAN ETHER

SECTION IV - FIRE AND EXPLOSION INFORMATION

FLASH POINT >200 Deg F (> 94 Deg C)

EXPLOSIVE LIMIT UNAVAILABLE

EXTINGUISHING MEDIA: REGULAR FOAM OR CARBON DIOXIDE OR DRY CHEMICAL

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS:, CARBON DIOXIDE AND CARBON MONOXIDE, ETC., NITROGEN COMPOUNDS

FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.

NFPA CODES: HEALTH- 1 FLAMMABILITY- 1 REACTIVITY- 0

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL: NOT ESTABLISHED FOR PRODUCT. SEE SECTION II.

EFFECTS OF ACUTE OVEREXPOSURE: FOR COMPONENT

EYES - CAN CAUSE MODERATE IRRITATION, REDNESS, TEARING.
SKIN - CAN CAUSE SLIGHT IRRITATION.
BREATHING - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION.
SWALLOWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

FIRST AID:

IF ON SKIN: THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.

CONTINUED ON PAGE: 2

SECTION V: HEALTH HAZARD DATA (CONTINUED)

IF IN EYES: FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY, GET MEDICAL ATTENTION.

IF SWALLOWED: DO NOT INDUCE VOMITING, KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

IF BREATHED: REMOVE INDIVIDUAL TO FRESH AIR.

EFFECTS OF CHRONIC OVEREXPOSURE: FOR COMPONENT

THIS PRODUCT CONTAINS A PARAFFINIC PETROLEUM OIL SIMILAR IN NATURE TO THE MINERAL SEAL OIL WHICH EXXON COMPANY REPORTED TO THE EPA UNDER SECTION 8(E) OF THE TOXIC SUBSTANCE CONTROL ACT. THE REPORT WAS SUBMITTED BASED ON PRELIMINARY RESULTS OF AN ONGOING MOUSE SKIN PAINTING STUDY WHICH SHOWED 8 OF AN ORIGINAL 50 ANIMALS DEVELOPED OBSERVABLE SKIN TUMORS.

OVEREXPOSURE TO THIS MATERIAL (OR ITS COMPONENTS) HAS APPARENTLY BEEN FOUND TO CAUSE THE FOLLOWING EFFECTS IN LABORATORY ANIMALS:, LIVER ABNORMALITIES, KIDNEY DAMAGE

SECTION VI: REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH:, STRONG OXIDIZING AGENTS.

SECTION VII: SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: SWEEP UP MATERIAL FOR DISPOSAL OR RECOVERY.

LARGE SPILL: PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED.SHOVEL MATERIAL INTO CONTAINERS. REMAINING MATERIAL MAY BE TAKEN UP WITH SAND, CLAY, EARTH, FLOOR ABSORBENT OR OTHER ABSORBENT MATERIAL AND SHOVELED INTO CONTAINERS.

WASTE DISPOSAL METHOD:

SMALL SPILL: FLUSH DOWN DRAIN WITH LARGE AMOUNTS OF WATER IN ACCORDANCE WITH APPLICABLE REGULATIONS.

LARGE SPILL: DESTROY BY LIQUID INCINERATION.

CONTAMINATED ABSORBENT MAY BE DEPOSITED IN A LANDFILL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION VIII: PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.

VENTILATION: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.

PROTECTIVE GLOVES: NOT NORMALLY REQUIRED.

EYE PROTECTION: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.

OTHER PROTECTIVE EQUIPMENT: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.

SECTION IX: SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATASHEET MUST BE OBSERVED.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

 LAST PAGE--SEE ATTACHMENT PAGE ENCLOSED--LAST PAGE

ARROW CHEMICAL CORP.
MATERIAL SAFETY DATA SHEET

IDENTITY:#620 HI Pressure Detergent
SECTION I

Manufacturer Name:

Rockford International
P.O. Box 103
Jericho, N.Y. 11753

Emergency Telephone Number
516-377-7770
Telephone For Information
516-377-7770
Date Prepared: March 2001
Prepared By: Staff

SECTION II - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Hazardous Components	OSHA PEL	ACGIH TLV	OTHER LIMITS	PERCENT OPTIONAL
*Dipropylene Glycol Methyl Ether CAS#34590-94-8	100ppm	100ppm	NA	<5
**Nonionic Surfactant CAS#9016-45-9	NA	NA		<5
***Tetrasodium salt of ethylenediaminetetraacetic acid CAS# 64-02-8	NA	NA		<5
****Sodium Metasilicate CAS# 6834-92-0	NA	NA		<5

*Dipropylene Glycol Methyl Ether meets the following categories under SARA Sections 311 and 312; An immediate health hazard, and a fire hazard.
**Nonionic Surfactant contains traces of Residual Ethylene Oxide CAS# 75-21-8, which is listed under SARA Sections 302/304. It also contains glycol ethers, which are subject to SARA Section 311.
***This ingredient meets the following categories under SARA Section 311 and 312; An immediate health hazard and a delayed health hazard
****Sodium metasilicate is listed as an immediate health hazard under SARA Section 311/312

Health Rating 1
Flammability 0
Reactivity 0

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS
Boiling Point:.....226deg.F Specific Gravity.(H2O=1)...>1
Vapor Pressure(mm Hg)....NA Melting Point.....:NA
Vapor Density (air=1)....>1 Evaporation Rate.....:<1
Solubility in water.....Complete (Butyl Acetate=1)
Appearance and Odor:Clear blue liquid-mild solvent odor

SECTION IV - FIRE AND EXPLOSION HAZARD
Flash Point (Method Used):None Flammable Limits: LEL:NA UEL:NA
Extinguishing Media:None

Special Fire Fighting Procedures:Not applicable

Unusual Fire and Explosion Hazards:None

SECTION V #520 pg. 2

Stability :Unstable| |Stable|X|Conditions to Avoid:Avoid mixing with unknown chemicals

Incompatibility (materials to avoid):None

Hazardous Decomposition or Byproducts:None

Hazardous Polymerization:May occur| |Will not occur|X|Conditions to Avoid:None

SECTION VI - Health Hazard Data
Route(s) of entry Inhalation? No Skin?Minimal Ingestion? Yes
Health Hazards(Acute and Chronic):Eyes-May cause redness, swelling of the conjunctiva, pain, blindness. May cause minimal irritation to skin. Ingestion-slightly toxic-may cause dizziness, nausea and diarrhea.

Carcinogenicity: NTP? No (ARC Monographs)? No OSHA? No CA Proposition 65? Yes
Residual ethylene oxide is known to the state of California to cause cancer or reproductive toxicity.

Medical Conditions Generally Aggravated by Exposure: None

Emergency and First Aid Procedures:Ingestion and eyes-get immediate medical attention. Eyes-flush with water. Skin-flush with water and see physician if irritation persists. Ingestion- Do not induce vomiting. Get medical attention.

SECTION VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled:Dike spill and vacuum up. Use absorbent to soak up spill.

Waste Disposal Method:According to federal, state and local authorities only.

Precautions For Storing and Handling:Keep from freezing.

Other Precautions:None

SECTION VIII - Control Measures

Respiratory Protection (Specify Type):None
Ventilation |Local Exhaust:Normal Special: Mechanical :
Other:
Protective Gloves:Impermeable gloves
Eye Protection:Goggles or glasses to prevent splashing
Other Protective Clothing or Equipment: Eye wash should be accessible.

Work Hygienic Practices:Wash thoroughly after handling. Launder contaminated clothing before reuse.

Fox Packaging Company

NFPA

-25F Splash Windshield Washer Fluid 6/1 Gallon

3
1 0

SECTION 1 : Chemical Product and Company Identification

MSDS Name: -25F Splash Windshield Washer Fluid 6/1 Gallon
Manufacturer Name:Fox Packaging Company
Address:

51 East Maryland Avenue
St. Paul, MN 55117-4615

Chemical Transportation Emergency Center (for immediate information about a chemical or to seek assistance from a manufacturer): 1-800-424-9300

National Response Center (to report spills of oil and hazardous material): 1-800-424-8802

Business Phone:(651) 489-8211
Business Fax: Facsimile: (651) 489-8247
For information in North America, call: (651) 489-8211
Manufacturer MSDS Revision Date:

March 23, 2005

NFPA

Health: 1
Flammability: 3
Reactivity: 0
Other:

General Use:

Used for cleaning windshields

NFPA HAZARD RATINGS:
OTHER - NOT APPLICABLE

Common Name: Windshield Washer Fluid

Product Identification: Windshield Washer Fluid
Product Codes:

SECTION 2 : Hazardous Ingredients/Identity Information

Chemical Name	CAS#	% Weight	
Methanol (Methyl Alcohol)	67-56-1	Approximate Composition: 38%	

		% Volume Approximate Composition: 41%	

OSHA PEL TWA: **: 200 ppm (260 mg/m3) 8-hour TWA (Skin)

ACGIH TLV TWA: 200 ppm (260 mg/m3) 8-hour TWA

NIOSH REL: 200 ppm (260 mg/m3) 8-hour TWA

NIOSH STEL/Ceiling: 250 ppm (310 mg/m3) Ceiling (Skin)

Hazardous Paragraph:

Hazardous Component*

Other Exposure Guidelines:

ACGIH Threshold Limit Value:
250 ppm (310 mg/m3) Short-term Exposure Limit (15-minute TWA (Skin)

IDLH (NIOSH):
6,000 ppm (0.6 percent in air)

UN 1230
(DOT Guide 28)

Chemical Name	**CAS#**	**% Weight** Approximate Composition: 62% **% Volume** Approximate Composition: 59%	
Water	7732-18-5		

Hazardous Paragraph:

Hazardous Component*

Comments:

* The hazardous component listed is not a known or suspected human carcinogen as listed or determined by the National Agency for Research on Cancer, National Toxicological Program "NTP Seventh Annual Report on Carcinogens", or International Agency for Research on Cancer (IARC) monograph reviews. In addition, it is not considered a carcinogen by the Occupational Safety and Health Administration or the National Institute for Occupational Safety and Health.

** This MSDS contains the 1989 PEL's and from the June 1993 Air Contaminants Final Rule, specified in Tables Z-1, Z-2, and Z-3 [Federal Register; 58(124):35338-35351; June 30, 1993].

Windshield Washer Fluid

Product Use: Used for cleaning windshields

Product Identification: Windshield Washer Fluid

NFPA HAZARD RATINGS:
HEALTH - 1
FLAMMABILITY - 3
REACTIVITY - 0
OTHER - NOT APPLICABLE

SECTION 3 : Physical And Chemical Characteristics

Physical State/Appearance:

The Windshield washer.

Color:

Blue.

Odor:

Mild characteristic pungent odor from the methanol. The odor threshold for methanol is 10 ppm.

Vapor Pressure:

100 mm @ 21.2 deg (methanol)

Vapor Density:

1.11 (methanol)

Boiling Point:

Approximately 160 deg F (for product)

Freezing Point:

-25 deg F

Solubility:

In Water: Soluble

FlashPoint:

80 deg F

Auto Ignition Temp:

878 deg F for methanol

Upper Flammable Explosive Limit:

36 percent for methanol

Lower Flammable Explosive Limit:

6 percent for methanol

Ionization Potential: 10.84 cV (methanol)

SECTION 4 : Fire And Explosion Hazards

Flash Point:

80 deg F

Upper Flammable or Explosive Limit: 36 percent for methanol

Lower Flammable or Explosive Limit: 6 percent for methanol

Auto Ignition Temperature: 878 deg F for methanol

Extinguishing Media:

Small Fires: Dry chemical, carbon dioxide, water spray or alcohol resistant foam. Large Fires: Water spray, fog or alcohol-resistant foam.

Fire Fighting Instructions:

Move container away from fire area if you can do so without risk. Dike fire control water for later disposal; do not scatter the material. Apply cooling water to the sides of containers exposed to flames until well after the fire is out.

Unusual Fire Hazards:

Methanol: Flammable/combustible material; may be ignited by heat, spark or flame. Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors, or in sewers. Runoff to sewer may create fire or explosion hazard.

SECTION 5 : Health Hazards

Applies to all ingredients:

Potential Health Effects:

Eye Contact:

Acute: Eye irritation.

Skin Contact:

Acute: Skin contact results in a cold sensation, dryness, and cracking, possibly

leading to dermatitis.

Inhalation:

Acute: Inhalation can result nose irritation, headache, fatigue, nausea, visual impairment or complete and possible blindness, acidosis, convulsions, circulatory collapse, respiratory fatigue, and death.

Ingestion:

Acute: Ingestion can cause gastrointestinal (GI) irritation followed by the symptoms described for inhalation and possible kidney impairment.

Chronic Health Effects:

Chronic exposure may result in visual impairment or blindness.

Target Organs:

Central nervous system, digestive tract, eyes and skin.

Methanol (Methyl Alcohol):

Route of Exposure:

Route of Entry (Methanol): The primary routes of entry are inhalation, ingestion, and absorption.

Potential Health Effects:

Eye Contact:

Acute Effects: Eye contact results in irritation with lacrimation, inflamed lids, and photophobia.

Skin Contact:

Acute Effects: Methyl alcohol may be absorbed through the skin and may cause headache, fatigue, and visual disturbances.

Signs/Symptoms:

Health Hazards and Signs and Symptoms of Exposure (Methanol): Irritant to eyes, skin, and upper respiratory system. Headaches, drowsiness, dizziness, vertigo, light-headed, nausea, and vomiting. Visual disturbance, optic nerve damage, and blindness. Skin exposure hazard.

Aggravation of Pre-Existing Conditions:

Ocular, respiratory, or dermal disorders may be aggravated by methanol exposure.

SECTION 6 : Emergency And First Aid Procedures

Eye Contact:

Rinse with water 15 to 20 minutes, seek medical assistance.

Skin Contact:

Flush with water for 15 minutes.

Inhalation:

Remove from source to fresh air, provide respiratory support as needed.

Ingestion:

Call Physician, hospital emergency room or Poison Control Center Immediately.

Other First Aid:

GET PROMPT MEDICAL ATTENTION.

SECTION 7 : Reactivity Data

Chemical Stability:

In a closed container, methyl alcohol is stable at room temperature and it is stable under routine handling and storage.

Incompatibilities with Other Materials:

(Material to Avoid): Incompatible with beryllium dihydride; metals; oxidants; potassium tertbutoxide; carbon tetrachloride + metals; dichloromethane. Can react

vigorously with oxidizing materials.

Explosive reaction with chloroform + sodium methoxide; diethyl zinc. Violent reaction with alkyl aluminum salts; acetyle bromide; chloroform + sodium hydroxide; CrO3; cyanuric chloride; (I + ethanol + HgO); Pb(ClO4)2; HClO4; P2O3; (KOH + CHCl2); nitric acid. (1)

Hazardous Polymerization:

Hazardous polymerization will not occur.

Hazardous Decomposition Products:

When methanol is heated to decomposition, carbon dioxide and carbon monoxide may be produced, as well as formaldehyde may be produced, and it emits acrid smoke and irritating fumes.

Comments:

(1) Lewis, Richard J., Sr.: Sax's Dangerous Properties of Industrial Materials, Eighth Edition. New York, New York: Van Nostrand Reinhold, 1992.

SECTION 8 : Precautions For Safe Handling

Spill Cleanup Measures:

Keep unnecessary people away; isolate hazard area and deny entry.
Stay upwind; keep out of low areas.
Shut off ignition sources; no flares, smoking or flames in hazard area.
Positive pressure self-contained breathing apparatus and chemical protective clothing is recommended for personnel involved in clean-up procedures with no fire.
Do not walk through spilled material; stop leak if it can be done without risk.
Water spray may reduce vapor; but it will not prevent ignition in closed spaces.

Waste Disposal:

Dispose of in accordance with federal, state and local regulations.

RCRA Hazard Class:

RCRA Hazardous Waste (40 CFR 261.33): Hazardous Waste No. U154

DOT:

Based on flash point and alcohol content, this is a Class 3, flammable liquid.

DOT Shipping Name:

Flammable liquid., consumer commodity, ORM-D n.o.s

DOT UN Number:

UN 1992

DOT Hazard Class: 3

DOT Packing Group: III

SECTION 9 : Control Measures

Eye/Face Protection:

Splash goggles are recommended when handling the solution. Contact lens use is not recommended.

Protective Clothing/Body Protection:

The selection of protective clothing and gloves is dependent upon anticipated exposure. As reported by the manufacturer, Best Glove style 725R (PVC) offers excellent protection for up to 240 minutes of complete immersion.

Respiratory Protection:

Under normal use conditions (outdoor windshield cleaning), respiratory protection is not justified.

Exposure Limits:

OSHA PEL: The Occupational Safety and Health Administration's Permissible Exposure Limit, which is defined as the maximum concentration of contaminant to which a normal healthy individual may be exposed 8-hours per day, 40-hours per week, without experiencing adverse health effects over a working lifetime.

ACGIH LTV: American Conference of Governmental Industrial Hygienist's Threshold Limit Value, similar to the OSHA PEL but not considered a legal standard.

SECTION 10 : Other Information

Applies to all ingredients:

Section 302:

SARA Extremely Hazardous Substance (40 CFR 355): Not Listed

Section 304:

CERCLA Hazardous Substance (40 CFR 302.4): Not Listed

Section 313 Toxic Release Form:

SARA Toxic Chemical (40 CFR 372.65): Not Listed

NFPA:

Fire Hazard: 3

Health: 1

Reactivity: 0

Specific Hazard: NOT APPLICABLE

MSDS Revision Date:

March 23, 2005

MSDS Author:

MSDS Prepared by: Maxim Technologies, Inc.

Disclaimer:

Judgements as to the suitability herein for the user's purposes are necessarily the user's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Maxim Technologies, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the intended purposes or for the consequences of its use.

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

006 GRAY PRIMER

12/28/2009

PRODUCT NAME: 006 GRAY PRIMER **HMIS CODES: H F R P**
PRODUCT CODE: 006 GRAY PRIMER **2 3 1 B**

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: VALLEY PAINT MANUFACTURING
ADDRESS : 727 SOUTH 950 WEST
WOODS CROSS, UTAH 84087

EMERGENCY PHONE : 801-298-4581 **REVISION DATE : 11/05/08**
INFORMATION PHONE : 800-424-9300 **NAME OF PREPARER : RALPH GRIDER**

SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
* XYLENE	1330-20-7	2.4	68 DEG	44
OSHA VPEL 100 PPM TWA				
OSHA VPEL 150 PPM STEL				
ACGIH TLV 100 PPM TWA				
ACGIH TLV 150 PPM STEL				

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

N = N.T.P. Carcinogen I = I.A.R.C. Carcinogen

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 279 DEG F **DENSITY (H2O=8.33): 9.97031 lb/gl**
VAPOR DENSITY: HEAVIER THAN AIR **EVAPORATION RATE: SLOWER THAN ETHER**
COATING V.O.C.: 4.43 lb/gl **531 g/l**
MATERIAL V.O.C.: 4.43 lb/gl **531 g/l**
SOLUBILITY IN WATER: Non Soluble
APPEARANCE AND ODOR: COMMON TO SOLVENT REDUCED PAINT

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 80 DEG F **METHOD USED: SETAFLASH**
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.0%(V) **UPPER: 6.6%(V)**

EXTINGUISHING MEDIA:
FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG, OTHER

SPECIAL FIREFIGHTING PROCEDURES
Respiratory equipment should be worn to avoid inhalation of concentrated vapors. Water should not be used except as fog to keep nearby containers cool.

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

006 GRAY PRIMER

UNUSUAL FIRE AND EXPLOSION HAZARDS
Handle as flammable liquid. Vapors form an explosive mixture in air between the upper and lower explosive limits which can be ignited by many sources such as pilot lights, open flames, electrical motors and switches.

SECTION V - REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID
Excessive heat, poor ventilation, corrosive atmospheres, excessive aging.

INCOMPATIBILITY (MATERIALS TO AVOID)
Alkaline materials, strong acids and oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
Carbon monoxide, carbon dioxide, oxides of nitrogen, and possibly acrolein.

HAZARDOUS POLYMERIZATION: WILL OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Inhalation: Dizziness, breathing difficulty, headaches & loss of coordination.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Eye contact: Severe irritation, tearing, redness and blurred vision.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Skin contact: Can dry and defat skin causing cracks, irritation, and dermatitis.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Ingestion: Can cause gastrointestinal irritation, vomiting, nausea, and diarrhea.

HEALTH HAZARDS (ACUTE AND CHRONIC)
Inhalation-Dizziness, breathing difficulty, headaches, & loss of coordination. Eye contact-Severe irritation, tearing, redness, and blurred vision. Skin contact-Can dry and defat skin causing cracks, irritation, and dermatitis. Ingestion-Can cause gastrointestinal irritation, vomiting, nausea, & diarrhea. No chronic health effects.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

INFORMATION NOT AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
Anesthesia, respiratory tract irritation, dermatitis, nausea, vomiting.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation overexposure-Move person to fresh air. If breathing stops, apply artificial respiration and seek immediate medical attention. Eye contact-flush with large quantities of water for 15 minutes. Skin contact-Wash thoroughly with

soap and water and see a doctor. Ingestion-Do not induce vomiting, can cause chemical pneumonitis and pulmonary edema. Contact physician immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Eliminate ignition sources, provide good ventilation, dike spill area and add absorbent earth or sawdust to spilled liquid. Thoroughly wet with water and mix.

WASTE DISPOSAL METHOD
Collect absorbent/water/spilled liquid mixture into metal containers and add enough water to cover. Consult local,state & federal hazardous waste regulations before disposing into approved hazardous waste landfills. Obey relevant laws.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Use non-sparking utensils when handling this material. Avoid hot metal surface. Use in cool, well-ventilated areas. Keep containers closed when not in use. Keep away from excessive heat and open flames.

OTHER PRECAUTIONS
Smoking in area where this material is used should be strictly prohibited. Tools used with this material should be made from aluminum, brass or copper. Plastic utensils should not be used. NOTE: This information is accurate to the best knowledge of this company, but is furnished without any expressed or implied warranties.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION
When spraying this material use a NIOSH approved cartridge respirator or gas mask suitable to keep airborne mists and vapor concentrations below the time weighted threshold limit values. When using in poorly ventilated and confined spaces, use a fresh-air supplying respirator or a self-contained breathing apparatus.

VENTILATION
General mechanical ventilation or local exhaust should be suitable to keep vapor concentrations below TLV. Ventilation equip. must be explosion proof.

PROTECTIVE GLOVES
Impermeable chemical handling gloves for skin protection.

EYE PROTECTION
Use chemical safety glasses, goggles, and faceshields for eye protection.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT
Use impermeable aprons and protective clothing whenever possible to prevent skin contact. The use of head caps whenever possible is strongly recommended.

WORK/HYGIENIC PRACTICES

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

006 GRAY PRIMER

Eye washes and safety showers in the workplace are recommended.

SECTION IX - SHIPPING DATA

D.O.T. PROPER SHIPPING NAME.....SOLVENT THINNED PAINT
D.O.T. HAZARD CLASS.....FLAMMABLE LIQUID
D.O.T. LABELS REQUIRED.....FLAMMABLE LIQUID
D.O.T. PLACARDS REQUIRED.....YES FLAMMABLE
BILL OF LADING DESCRIPTION.....PAINT, FLAMMABLE LIQUID
UN/NA CODE.....UN1263

SECTION X - DISCLAIMER

To the best of our knowledge, the information contained herein is accurate, obtained from sources believed by this company to be accurate.

MATERIAL SAFETY DATA SHEET

1. PRODUCT INFORMATION

MATERIAL IDENTITY

Product code and name:

00927 MARFAK 0

Chemical name and/or family or decription:

Greases

Manufacturer's name and address:

Chevron Lubricants Canada Inc.
Lubrifiants Chevron Canada
6975-A Pacific Circle
Mississauga, ONT L5T 2H3
Canada
www.chevronlubricants.com

Telephone numbers:

Transportation emergency:
(800) 567-7455
CHEMTREC (USA): (800) 424-9300
Health emergency-Company: (504) 680-1900
MSDS Assistance (USA):(845)838-7204
Technical Information - Fuels, Fuel Additives: (845) 838-7611
Technical Information - Coolants: (845) 838-7444

Product and/or component(s)

Carcinogenic According to:

NONE

-

WHMIS:

This product is Not Controlled according to WHMIS critieria.

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2. HAZARDOUS INGREDIENTS

Name	Cas nr	Range in %
Non-hazardous mixture of components in highly refined base oil	-	100

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3. PHYSICAL DATA

Appearance:	Semi-solid
Odor:	Mild odor
Vapor Pressure:	Not applicable.
Vapor Density (air=1):	Not applicable.
Boiling Point (degrees C):	Not applicable.
Melting/Freezing point (degrees C):	Not determined.
pH of undiluted product:	Not applicable.
Specific Gravity (water=1):	Not determined.
Solubility in Water (%):	Not determined.
Viscosity (degrees C):	Not applicable.
VOC Content:	Not determined.
Other:	None

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4. FIRE OR EXPLOSION DATA

Ignition Temperature - AIT (degrees C):
Not determined.
Flash Point (degrees C):
Not applicable.
Recommended Fire Extinguishing Agents and Special Procedures:
Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.
Extinguishing Media Which Must Not be Used:
Water jet.
Products Evolved When Subjected to Heat or Combustion:
Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.
-
Unusual or Explosive Hazards:
None
Special Protective Equipment for Firefighters:
Other than normal protective fire-fighting equipment, no special equipment or procedures required.

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5. REACTIVITY DATA

This material reacts violently with:
Strong Oxidizers
Comments:
None

Hazardous Polimerizations:
No

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6. TOXICOLOGICAL PROPERTIES

Primary Route of Exposure:
EYES
SKIN
INHALATION

EFFECTS OF OVEREXPOSURE

Acute:

Eyes:
May cause minimal irritation, experienced as temporary discomfort.

Skin:
Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort.
Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact, see other effects, below, for information regarding potential long term effects.

Inhalation:
Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness.

Ingestion:
If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur.

Chronic:
No adverse effects have been documented in humans as a result of chronic exposure.

Sensitization Properties:
Unknown.

Medical Conditions Aggravated by Over Exposure:
Because of its defatting properties, prolonged and repeated skin contact may aggravate an existing dermatitis (skin condition).

Exposure Control for Total Product:
None established for product. For Mineral oil mist: OSHA PEL-TWA 5 mg/m3, ACGIH TLV-TWA 5 mg/m3.

Other Remarks:
Material from high pressure equipment, pinhole leaks, or high pressure line failure can penetrate the skin and, if not properly treated, can cause severe injury, including disfigurement, loss of function, or even require amputation of the affected area. To prevent such serious injury, immediate medical attention should be sought even if the injection injury appears to be minor.

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Median Lethal Dose

Oral:

LD50 Believed to be > 5.00 g/kg (rat) practically non-toxic

Inhalation:

Not determined.

Dermal:

LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

Irritation Index, Estimation of Irritation (Species)

Skin:

(Draize) Believed to be < 0.5 /8.0 (rabbit) no appreciable effect

Eyes:

(Draize) Believed to be < 15 /110 (rabbit) no appreciable effect

Sensitization:

Not determined.

Other:

None

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

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7. PREVENTATIVE MEASURES

PRECAUTIONARY MEASURES:

-Avoid prolonged breathing of vapor, mist, or gas.

-Workers should wash exposed skin several times daily with soap and water.

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded,

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use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Not applicable.

Procedures in Case of Accidental Release, Breakage or Leakage:

Contain spill if possible, contain with absorbent materials such as clay or soil, and shovel up. Avoid skin and eye contact.

Waste Disposal Methods:

Dispose of this product in accordance with local and/or national regulations.

Remarks:

None

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

DOT:	Not regulated
IMDG:	Not regulated
ICAO:	Not evaluated
TDG:	Not regulated

Regulatory Information:

Regulatory Comments:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substances List (DSL).

This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Other Information:

None

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8. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If more than several mouthfuls of this material are swallowed, give two glasses of water (16 oz.). Get medical attention.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Note to Physician:

High pressure injection of material can cause severe injury. Failure to debride the wound of all residual material can result in disfigurement, loss of function, or may require amputation of the affected area.

Product Code :

Date Issued : 17/08/2000

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place.

Date Issued: 09/17/91
Supercedes: 08/07/91

TEXACO
MATERIAL SAFETY DATA SHEET

NOTE: Read and understand Material Safety Data Sheet before handling or disposing of product

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

Product Code and Name:
01609 SOLUBLE OIL HEAVY DUTY

Chemical Name and/or Family or Description:
Soluble Oil

Manufacturer's Name and Address:
Texaco Lubricants Company
a Division of Texaco Refining and Marketing Inc.
P.O. Box 4427, Houston, TX 77210-4427

Telephone Numbers:
TRANSPORTATION EMERGENCY Company: (914) 831-3400 CHEMTREC: (800) 424-9300
HEALTH EMERGENCY Company: (914) 831-3400
GENERAL MSDS ASSISTANCE (914) 838-7204
TECHNICAL INFORMATION Fuels: (914) 838-7336; Lubricants/Antifreezes: (914) 838-7509
Chemicals: (512) 459-6543

2. COMPOSITION/INFORMATION ON INGREDIENTS

Product and/or Component(s) Carcinogenic According to:	OSHA	IARC	NTP	OTHER	NONE
	-	-	-	-	X

Composition:

Chemical/Common Name	CAS No.	Exposure Limit	Range in %
* > C12 Alkyl carboxylic acid alkanolamine	N.A.	None Established	11.00 - 19.99
* Alkenes, polymerized chlorinated	68410991	NONE ESTABLISHED	1.00 - 3.99
* Sodium sulfonate	68608264	NONE ESTABLISHED	1.00 - 3.99
* Triisopropanolamine	122203	None Established	1.00 - 3.99
* Zinc dithiophosphate	ACC# 81697	None Established	1.00 - 3.99
Solvent-dewaxed heavy paraffinic petroleum distillates	64742650	5mg/m3 OSHA (MIST) 5mg/m3 ACGIH (MIST) 10mg/m3 STEL (MIST)	65.00 - 79.99
Sulfur-containing C4-C8 olefin	MIXTURE	None Established	1.00 - 3.99
Blend of severely solvent refined and/or hydrotreated naphthenic and paraffinic petroleum distillates.		5 mg/m3 ACGIH (MIST)	1.00 - 3.99

Product is non-hazardous according to OSHA (1910.1200), but is hazardous according to Texaco's internal criteria.
* Component(s) is hazardous according to OSHA or one or more state Right-to-Know laws.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance and Odor: Dark red

WARNING STATEMENT

WARNING! AVOID BREATHING VAPOR OR MIST
DO NOT ADD NITRITES - MAY FORM SUSPECTED CANCER CAUSING NITROSAMINES

HMIS				NFPA			
Health:	0	Reactivity:	0	Health:	0	Reactivity:	0
Flammability:	1	Special:	*	Flammability:	1	Special:	*

N.D. - Not Determined N.A. - Not Applicable N.T. - Not Tested
< - Less Than > - Greater Than

3. HAZARD IDENTIFICATION (CONT)

POTENTIAL HEALTH EFFECTS

	EYE	SKIN	INHALATION	INGESTION
Primary Route of Exposure:	X	X	X	-

Effects of Overexposure

Acute

Eyes:
May cause minimal irritation, experienced as temporary discomfort.

Skin:
No adverse effects expected from absorption of material through the skin.

Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort.

Inhalation:
Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness.

Ingestion:
No adverse effects expected. If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur.

Sensitization Properties:
Unknown.

Chronic:
No adverse effects anticipated.

Medical Conditions Aggravated by Exposure:
Because of its defatting properties, prolonged and repeated skin contact may aggravate an existing dermatitis (skin condition).

Other Remarks:
None

4. FIRST AID MEASURES

Eyes:
Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:
Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:
If more than several mouthfuls have been swallowed, give two glasses of water (16 oz.). Get medical attention.

Inhalation:
If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or symptoms persist.

Other Instructions:
Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

N.D. - Not Determined N.A. - Not Applicable N.T. - Not Tested
< - Less Than > - Greater Than

5. FIRE-FIGHTING MEASURES

Ignition Temp. Degrees F.: N.D.
Flash Point Degrees F. (Method): 425F (COC)
Flammable Limits (%) Lower: N.D.
Upper: N.D.

Recommended Fire Extinguishing Agents And Special Procedures:
According to NFPA Guide, use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to cool fire-exposed containers. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for persons attempting to stop the leak.

Unusual or Explosive Hazards:
None

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills Call: CHEMTREC (800) 424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:
Ventilate area. Avoid breathing vapor. Use self-contained breathing apparatus or supplied air for large spills or confined areas. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in Handling and Storage:
Minimum feasible handling temperatures should be maintained. Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:
Chemical type goggles or face shield recommended to prevent eye contact.

Skin Protection:
Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned at least once a week.

Respiratory Protection:
Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated, use respirator approved by MSHA or NIOSH as appropriate. Supplied air respiratory protection should be used for cleaning large spills or upon entry into tanks, vessels, or other confined spaces. See below for applicable permissible concentrations.

Ventilation:
Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for Total Product:
None established for this product; refer to Section 2 for component permissible concentration.

N.D. - Not Determined N.A. - Not Applicable N.T. - Not Tested
< - Less Than > - Greater Than

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Dark red
Boiling Point (Degrees F.): N.D.
Specific Gravity: N.D. (H2O=1)
pH of undiluted product: N.A.
Vapor Pressure: N.D. mmhg
Viscosity: 145 cSt @ 40°C

Percent VOC: 100
Vapor Density: N.D. Air=1
Solubility in Water: N.D.
Other: N.D.

10. STABILITY AND REACTIVITY

This Material Reacts Violently With: (If others is checked below, see comments for details)

Air	Water	Heat	Strong Oxidizers	Others	None of These
-	-	-	X	-	-

Comments:
Do not add or formulate with nitrites. See Section 15, OTHER INFORMATION.

Products Evolved When Subjected to Heat or Combustion:
Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones, and combustion products or compounds of sulfur, nitrogen, chlorine, zinc, and phosphorus.

Hazardous Polymerizations:	OCCUR	DO NOT OCCUR
	-	X

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION(ANIMAL TOXICITY DATA)
Median Lethal Dose (LD50 LC50) (Species)
Oral: believed to be > 5 g/kg (rat); practically non-toxic
Inhalation: N.D.
Dermal: believed to be > 3 g/kg (rabbit); practically non-toxic
Irritation Index, Estimation of Irritation (Species)
Skin: Similar product - 1.42/8.0 (rabbit); slightly irritating
Eyes: Similar product - 7.3/110 (rabbit); no appreciable effect
Sensitization: N.D.
Other:
None

12. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS
This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

REMARKS
None

13. TRANSPORT INFORMATION

TRANSPORTATION
DOT: PROPER SHIPPING NAME: N.D.

IMDG: PROPER SHIPPING NAME: N.D.

IATA: PROPER SHIPPING NAME: N.D.

N.D. - Not Determined N.A. - Not Applicable N.T. - Not Tested
< - Less Than > - Greater Than

13. TRANSPORT INFORMATION (CONT)

TDG: PROPER SHIPPING NAME: N.D.

14. REGULATORY INFORMATION

A. SARA TITLE III

Title III Section 302/304 Extremely Hazardous Substance:

Component	CAS No.	Percent	RQ (lbs)	TPQ (lbs)
NONE				

CERCLA Section 102(a) Hazardous Substance

Component	CAS No.	Percent	RQ (lbs)
NONE			

Title III Section 311 Hazard Categorization

Acute	Chronic	Fire	Pressure	Reactive	Not Applicable
-	-	-	-	-	X

Title III Section 313 Toxic Chemicals

Component	CAS No.	Percent
Zinc dithiophosphate	ACC# 81697	1.00-3.99

B. WHMIS CLASSIFICATION

Not Regulated

C. MICHIGAN CRITICAL MATERIALS

.12% wt. zinc; conversion factor 8.0 lbs/gal.

15. OTHER INFORMATION

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.

This product may be subject to export notification under TSCA section 12(b); contains nonylphenol.

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT FOR PURPOSE OF HAZARD COMMUNICATION AS PART OF TEXACO'S PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL TEXACO PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL TEXACO PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, USER SHOULD CONSULT HIS LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. TEXACO DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

Date: 09-17-91 _ New X Revised, Supersedes: 08-07-91
Date Printed: 09-17-91

Inquiries regarding MSDS should be directed to:
Texaco Inc.
Manager, Product Safety
P.O. Box 509
Beacon, N.Y. 12508

PLEASE SEE NEXT PAGE FOR PRODUCT LABEL

N.D. - Not Determined N.A. - Not Applicable N.T. - Not Tested
< - Less Than > - Greater Than

16. PRODUCT LABEL

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

01609 SOLUBLE OIL HEAVY DUTY

WARNING STATEMENT

WARNING! AVOID BREATHING VAPOR OR MIST
DO NOT ADD NITRITES - MAY FORM SUSPECTED CANCER CAUSING NITROSAMINES

PRECAUTIONARY MEASURES

WORKERS SHOULD WASH EXPOSED SKIN SEVERAL TIMES DAILY WITH SOAP AND WATER

FIRST AID

INGESTION:
If more than several mouthfuls have been swallowed, give two glasses of water (16 oz.). Get medical attention.

INHALATION:
If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or symptoms persist.

EYE CONTACT:
Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

SKIN CONTACT:
Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

FIRE

In case of fire, use foam, dry chemical, or CO2. Use water spray to keep containers cool.

Chemical/Common Name	CAS No.	Range in %
* > C12 Alkyl carboxylic acid alkanolamine	N.A.	11.00 - 19.99
* Alkenes, polymerized chlorinated	68410991	1.00 - 3.99
* Sodium sulfonate	68608264	1.00 - 3.99
* Triisopropanolamine	122203	1.00 - 3.99
* Zinc dithiophosphate	ACC# 81697	1.00 - 3.99
Solvent-dewaxed heavy paraffinic petroleum distillates	64742650	65.00 - 79.99
Sulfur-containing C4-C8 olefin	MIXTURE	1.00 - 3.99
Blend of severely solvent refined and/or hydrotreated naphthenic and paraffinic petroleum distillates.		1.00 - 3.99

Product is non-hazardous according to OSHA (1910.1200), but is hazardous according to Texaco's internal criteria.
* Component(s) is hazardous according to OSHA or one or more state Right-to-Know laws.
Not classified as a hazardous material by DOT definition.

HMIS				National Fire Protection Association			
Health	: 0	Reactivity	: 0	Health	: 0	Reactivity	: 0
Flammability	: 1	Special	: -	Flammability	: 1	Special	: -

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place.

Manufacturer's Name: Texaco Lubricants Company
a Division of Texaco Refining and Marketing Inc.
P.O. Box 4427, Houston, TX 77210-4427

TRANSPORTATION EMERGENCY Company: (914) 831-3400
CHEMTREC: (800) 424-9300

HEALTH EMERGENCY Company: (914) 831-3400

MATERIAL SAFETY DATA SHEET

SECTION 1 — PRODUCT IDENTIFICATION

Product Name: 0386 - Pro-Link EcoPro Biological Enzyme Digester
WHMIS Classification: D2B: Material causing other toxic effects
Product use: Grease & Waste Drain Digester
Product Code Number: BIO200 (69979, 69980, 69981)
MSDS Number: 0386

Supplier name and address:
Pro-Link Canada Sanitary Supplies Inc.
1411A Carling Ave., Suite 406
Ottawa, ON K1Z 1A7
(613) 722-0798

Manufacturer's name and address:
Refer to Supplier

Emergency Telephone #: CANUTEC (613) 996-6666

SECTION 2 — CHEMICAL COMPOSITION/HAZARDOUS INGREDIENTS

Ingredients	CAS #	% (weight)	LD_{50} mg/kg oral/rat	LD_{50} mg/kg skin/rabbit	LC_{50} ppm inh/rat
NONE					

SECTION 3 — HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Routes of entry: Inhalation, ingestion, skin and eye contact.

Signs and symptoms of short-term (acute) exposure:

Inhalation: Inhalation of spray or mist may cause irritation of the respiratory tract.

Skin contact: Prolonged, repeated contact may mild cause irritation. Bacterial infection may occur through open wounds.

Eye contact: Can cause mild eye irritation.

Ingestion: May cause irritation of the gastrointestinal system and vomiting. Nausea, vomiting, or diarrhoea may result from ingestion..

Effects of long-term (chronic) exposure: Skin irritation may occur among hypersensitive individuals following repeated contact.

Other important hazards: n/ap

SECTION 4 — FIRST AID MEASURES

Inhalation: Remove victim to fresh air. If symptoms persist, call a physician.

Skin contact: Remove contaminated clothing. Flush area with plenty of water. If irritation persists, seek medical attention.

Eye contact: Flush eyes with water for at least 15 minutes, holding the eyelids open. If irritation persists, seek medical attention.

Ingestion: DO NOT induce vomiting. If victim is completely conscious/alert, rinse mouth with water and give one glass of water. Seek immediate medical attention.

SECTION 5 — FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability: Product is water based and non-flammable.
Flash point (Method): n/av (>93, PMCC)
Lower flammable limit (% by volume): n/av
Upper flammable limit (% by volume): n/av
Explosion data: *Sensitivity to mechanical impact:* n/ap
Sensitivity to static discharge: n/ap
Oxidizing properties: not an oxidizer
Auto-ignition temperature: n/ap
Suitable extinguishing media: water spray, foam, dry chemical, or carbon dioxide
Special fire-fighting procedures/equipment: Fire-fighters should wear a positive pressure self-contained breathing apparatus, approved by NIOSH/MSHA.
Hazardous combustion products: Oxides of carbon.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal precautions: Gloves and safety glasses. If the release is such that a mist is created, then wear an appropriate NIOSH mask for mists.
Environmental precautions: General ventilation.
Spill response/Cleanup: Before attempting clean-up, review hazard data in this MSDS. Small spills may be absorbed with non-reactive absorbent and placed in suitable, covered and labelled containers.
Prohibited materials: n/ap

SECTION 7 — HANDLING AND STORAGE

Safe handling procedures: Maintain adequate ventilation. Wear recommended personal protection. Wash hands thoroughly after handling.
Storage requirements: Store in a cool, dry place with lid on.
Special packaging materials: n/av

SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ventilation and engineering controls: general ventilation
Respiratory protection: If conditions are such that a mist is created wear a NIOSH/MSHA approved mask for mists.
Protective gloves: Protective gloves such as natural rubber, neoprene, latex, or butyl rubber should be worn to prevent skin contact.
Eye protection: safety glasses.
Other protective equipment: Make sure an eyewash station and safety shower is available.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Physical form, colour and odour: Opaque green liquid. Floral odour
Odour threshold: n/av
pH (as supplied): 6.5-7.5
Boiling point: 100°C
Melting/freezing point: 0 °C
Vapour pressure: n/av
Solubility in water: soluble
Coefficient of oil/water distribution: n/av
Vapour density: n/av
Specific gravity or relative density (water = 1): 1.000
Evaporation rate: n/av
Volatile organic compounds (VOC's): n/av
%Volatile by Weight:approx.98% (w/w)

SECTION 10 — REACTIVITY AND STABILITY DATA

Stability and reactivity: product is stable
Conditions to avoid: contact with strong oxidizers and strong acids.
Materials to avoid: Avoid contact with strong oxidizers and strong acids.
Hazardous decomposition products: Thermal decomposition can produce oxides of carbon and nitrogen, and hydrogen chloride.

SECTION 11 — TOXICOLOGICAL INFORMATION

LD_{50}: See Section 2. **LC_{50}:** See Section 2.
Exposure limits: ACGIH-TLV; ACGIH-STEL; ACGIH-CEILING n/av
Carcinogenicity: No ingredient listed by IARC, ACGIH, NTP, or OSHA as carcinogens.
Teratogenicity, mutagenicity, other reproductive effects: n/av
Sensitization to material: Skin irritation may occur among hypersensitive individuals following repeated contact.
Conditions aggravated by exposure: PRODUCT CONTAINS BACTERIA. Nausea, vomiting, or diarrhoea may result from ingestion. Bacterial infection may occur through open wounds.
Synergistic materials: n/av

SECTION 12 — ECOLOGICAL INFORMATION

Environmental effects: n/av

SECTION 13 — WASTE DISPOSAL

Handling for disposal: Reuse if possible. Do not discharge waste material into the environment.
Methods of disposal: Use only licensed waste disposal services. Follow local, provincial or state, and federal regulations.

SECTION 14 — TRANSPORTATION INFORMATION

Shipping description: not regulated
Please note: This shipping description is of a general nature only. It does not consider package sizes, modes of transport and other specific circumstances. Appropriate regulations should be referenced, and handling for transportation of dangerous goods/hazardous materials should be performed by trained personnel only.

SECTION 15 — REGULATORY INFORMATION

WHMIS information: D2B
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

SECTION 16 — OTHER INFORMATION

Prepared for: Pro-Link Canada Sanitary Supplies Inc.
Telephone number: (613) 722-0798
Preparation date: October 25, 2007
References:

1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2003.
2. International Agency for Research on Cancer Monographs, Supplement 7, 1988.
3. Canadian Centre for Occupational Health and Safety. CHEMINFO database.
4. Material Safety Data Sheets from raw materials suppliers.

n/ap Not applicable n/av Not available

MT/js

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

050 CHROME ALUMINUM EN

12/28/2009

PRODUCT NAME: 050 CHROME ALUMINUM EN
PRODUCT CODE: 050 CHROME ALUMINUM EN

HMIS CODES: H F R P
2 3 1 B

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: VALLEY PAINT MANUFACTURING
ADDRESS : 727 SOUTH 950 WEST
WOODS CROSS, UTAH 84087

EMERGENCY PHONE : 801-298-4581
INFORMATION PHONE : 800-424-9300

REVISION DATE :
NAME OF PREPARER : RALPH GRIDER

SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
* VM&P NAPHTHA	64742-89-8	10.2	68 DEG	30
OSHA VPEL 300 PPM TWA				
OSHA VPEL 400 PPM STEL				
ACGIH TLV 300 PPM TWA				
MINERAL SPIRITS	8032-32-4	2.0	68 DEG	16
OSHA VPEL 100 PPM TWA				
ACGIH TLV 100 PPM TWA				
ALUMINUM PASTE	7429-90-5	NA	NA	15.53

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

N = N.T.P. Carcinogen I = I.A.R.C. Carcinogen

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 240 DEG F - 300 DEG F
VAPOR DENSITY: HEAVIER THAN AIR
COATING V.O.C.: 3.7 lb/gl
MATERIAL V.O.C.: 3.7 lb/gl
SOLUBILITY IN WATER: Non Soluble
APPEARANCE AND ODOR: COMMON TO SOLVENT REDUCED PAINT

DENSITY (H2O=8.33): 8.04978 lb/gl
EVAPORATION RATE: SLOWER THAN ETHER
443 g/l
443 g/l

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 50 DEG F **METHOD USED: SETAFLASH**
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 0.9%(V) **UPPER: 7.0%(V)**

EXTINGUISHING MEDIA:
FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG, OTHER

SPECIAL FIREFIGHTING PROCEDURES
Respiratory equipment should be worn to avoid inhalation of concentrated vapors. Water should not be used except as fog to keep nearby containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Handle as flammable liquid. Vapors form an explosive mixture in air between the upper and lower explosive limits which can be ignited by many sources such as pilot lights, open flames, electrical motors and switches.

SECTION V - REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID
Excessive heat, poor ventilation, corrosive atmospheres, excessive aging.

INCOMPATIBILITY (MATERIALS TO AVOID)
Alkaline materials, strong acids and oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
Carbon monoxide, carbon dioxide, oxides of nitrogen, and possibly acrolein.

HAZARDOUS POLYMERIZATION: WILL OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Inhalation: Dizziness, breathing difficulty, headaches & loss of coordination.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Eye contact: Severe irritation, tearing, redness and blurred vision.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Skin contact: Can dry and defat skin causing cracks, irritation, and dermatitis.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Ingestion: Can cause gastrointestinal irritation, vomiting, nausea, and diarrhea.

HEALTH HAZARDS (ACUTE AND CHRONIC)
Inhalation-Dizziness, breathing difficulty, headaches, & loss of coordination. Eye contact-Severe irritation, tearing, redness, and blurred vision. Skin contact-Can dry and defat skin causing cracks, irritation, and dermatitis. Ingestion-Can cause gastrointestinal irritation, vomiting, nausea, & diarrhea. No chronic health effects.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

INFORMATION NOT AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
Anesthesia, respiratory tract irritation, dermatitis, nausea, vomiting.

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

050 CHROME ALUMINUM EN

EMERGENCY AND FIRST AID PROCEDURES
Inhalation overexposure-Move person to fresh air. If breathing stops, apply artificial respiration and seek immediate medical attention. Eye contact-flush with large quantities of water for 15 minutes. Skin contact-Wash thoroughly with soap and water and see a doctor. Ingestion-Do not induce vomiting, can cause chemical pneumonitis and pulmonary edema. Contact physician immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Eliminate ignition sources, provide good ventilation, dike spill area and add absorbent earth or sawdust to spilled liquid. Thoroughly wet with water and mix.

WASTE DISPOSAL METHOD
Collect absorbent/water/spilled liquid mixture into metal containers and add enough water to cover. Consult local, state & federal hazardous waste regulations before disposing into approved hazardous waste landfills. Obey relevant laws.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Use non-sparking utensils when handling this material. Avoid hot metal surface. Use in cool, well-ventilated areas. Keep containers closed when not in use. Keep away from excessive heat and open flames.

OTHER PRECAUTIONS
Smoking in area where this material is used should be strictly prohibited. Tools used with this material should be made from aluminum, brass or copper. Plastic utensils should not be used. NOTE: This information is accurate to the best knowledge of this company, but is furnished without any expressed or implied warranties.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION
When spraying this material use a NIOSH approved cartridge respirator or gas mask suitable to keep airborne mists and vapor concentrations below the time weighted threshold limit values. When using in poorly ventilated and confined spaces, use a fresh-air supplying respirator or a self-contained breathing apparatus.

VENTILATION
General mechanical ventilation or local exhaust should be suitable to keep vapor concentrations below TLV. Ventilation equip. must be explosion proof.

PROTECTIVE GLOVES
Impermeable chemical handling gloves for skin protection.

EYE PROTECTION
Use chemical safety glasses, goggles, and faceshields for eye protection.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT
Use impermeable aprons and protective clothing whenever possible to prevent skin contact. The use of head caps whenever possible is strongly recommended.

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

050 CHROME ALUMINUM EN

12/28/2009

WORK/HYGIENIC PRACTICES
Eye washes and safety showers in the workplace are recommended.

SECTION IX - SHIPPING DATA

D.O.T. PROPER SHIPPING NAME.....SOLVENT THINNED PAINT
D.O.T. HAZARD CLASS.....FLAMMABLE LIQUID
D.O.T. LABELS REQUIRED.....FLAMMABLE LIQUID
D.O.T. PLACARDS REQUIRED.....YES FLAMMABLE
BILL OF LADING DESCRIPTION.....PAINT, FLAMMABLE LIQUID
UN/NA CODE.....UN1263

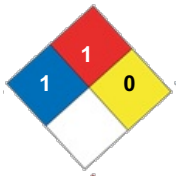
SECTION X - DISCLAIMER

To the best of our knowledge, the information contained herein is accurate, obtained from sources believed by this company to be accurate.

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Product Name:	**1-Part Epoxy Concrete & Garage Floor Paint Slate Gray No. 902**
Product Code:	902
MSDS Manufacturer Number:	902
Manufacturer Name:	BEHR Process Corporation
Address:	3400 W. Segerstrom Avenue Santa Ana, CA 92704
General Phone Number:	(714) 545-7101
General Fax Number:	(714) 241-1002
Customer Service Phone Number:	(800) 854-0133 ext. 2
CHEMTREC:	For emergencies in the US, call CHEMTREC: 800-424-9300
Canutec:	In Canada, call CANUTEC: (613) 996-6666 (call collect)
MSDS Creation Date:	June 26, 2006
MSDS Revision Date:	March 31, 2012
MSDS Format:	According to ANSI Z400.1-2004

NFPA



HMIS

Health Hazard	1
Fire Hazard	1
Reactivity	0
Personal Protection	

* Chronic Health Effects

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Ingredient Percent
Dipropylene glycol butoxy ether	29911-28-2	1 - 5 by weight
2-diethylaminoethanol	100-37-8	1 - 5 by weight
Clay (kaolin)	1332-58-7	5 - 10 by weight
Amine salt of modified acrylic copolymer	Proprietary	10 - 30 by weight
Ethylene glycol	107-21-1	1 - 5 by weight
Nepheline Syenite	37244-96-5	1 - 5 by weight
Dipropylene glycol monomethyl ether	34590-94-8	1 - 5 by weight
Titanium Dioxide	13463-67-7	1 - 5 by weight
Proprietary	No Data	1 - 5 by weight
Water	7732-18-5	30 - 60 by weight
Alcohols, C12-14-secondary, ethoxylated	84133-50-6	1 - 5 by weight

SECTION 3 - HAZARDS IDENTIFICATION

Emergency Overview:	Irritant.
Potential Health Effects:	
Eye:	May cause irritation.
Skin:	May cause irritation.
Inhalation:	Prolonged or excessive inhalation may cause respiratory tract irritation.
Ingestion:	May be harmful if swallowed. May cause vomiting.
Chronic Health Effects:	Prolonged or repeated contact may cause skin irritation.
Signs/Symptoms:	Overexposure may cause headaches and dizziness.
Target Organs:	Eyes. Skin. Respiratory system. Digestive system.
Aggravation of Pre-Existing Conditions:	None generally recognized.

SECTION 4 - FIRST AID MEASURES

Eye Contact:	Immediately flush eyes with plenty of water for 15 to 20 minutes. Get medical attention, if irritation or symptoms of overexposure persists.
Skin Contact:	Immediately wash skin with soap and plenty of water. Get medical attention if irritation develops or persists.
Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate

	medical attention.
Ingestion:	If swallowed, do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.
Other First Aid:	Due to possible aspiration into the lungs, DO NOT induce vomiting if ingested. Provide a glass of water to dilute the material in the stomach. If vomiting occurs naturally, have the person lean forward to reduce the risk of aspiration.

SECTION 5 - FIRE FIGHTING MEASURES

Flash Point:	No Data
Lower Flammable/Explosive Limit:	Not applicable.
Upper Flammable/Explosive Limit:	Not applicable.
Extinguishing Media:	Use alcohol resistant foam, carbon dioxide, dry chemical, or water fog or spray when fighting fires involving this material.
Protective Equipment:	As in any fire, wear Self-Contained Breathing Apparatus (SCBA), MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA Ratings:

NFPA Health:	1
NFPA Flammability:	1
NFPA Reactivity:	0

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personnel Precautions:	Use proper personal protective equipment as listed in section 8.
Environmental Precautions:	Avoid runoff into storm sewers, ditches, and waterways.
Spill Cleanup Measures:	Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container. Provide ventilation. Clean up spills immediately observing precautions in the protective equipment section.

SECTION 7 - HANDLING and STORAGE

Handling:	Use with adequate ventilation. Avoid breathing vapor and contact with eyes, skin and clothing.
Storage:	Store in a cool, dry, well ventilated area away from sources of heat, combustible materials, and incompatible substances. Keep container tightly closed when not in use.
Hygiene Practices:	Wash thoroughly after handling. Avoid contact with eyes and skin. Avoid inhaling vapor or mist.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION - EXPOSURE GUIDELINES

Engineering Controls:	Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Good general ventilation should be sufficient to control airborne levels. Where such systems are not effective wear suitable personal protective equipment, which performs satisfactorily and meets OSHA or other recognized standards. Consult with local procedures for selection, training, inspection and maintenance of the personal protective equipment.
Eye/Face Protection:	Wear appropriate protective glasses or splash goggles as described by 29 CFR 1910.133, OSHA eye and face protection regulation, or the European standard EN 166.
Skin Protection Description:	Chemical-resistant gloves and chemical goggles, face-shield and synthetic apron or coveralls should be used to prevent contact with eyes, skin or clothing.
Respiratory Protection:	A NIOSH approved air-purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.
Other Protective:	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

EXPOSURE GUIDELINES

Clay (kaolin) :

Guideline ACGIH:	TLV-TWA: 2 mg/m3 (Respirable)

Guideline OSHA:	OSHA-TWA: 5 mg/m3 Respirable

Ethylene glycol :

Guideline ACGIH:	TLV-STEL: C 100 mg/m3 (Aerosol only)

Dipropylene glycol monomethyl ether :

Guideline ACGIH:	TLV-TWA: 100 ppm TLV-STEL: 150 ppm
Guideline OSHA:	OSHA-TWA: 100 ppm OSHA-STEL: 150 ppm

Titanium Dioxide :

Guideline ACGIH:	TLV-TWA: 10 mg/m3
Guideline OSHA:	OSHA-TWA: 15 mg/m3

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

Physical State Appearance:	Liquid.
Color:	Gray
Boiling Point:	No Data
Melting Point:	No Data
Density:	8 - 10 Lbs./gal.
Vapor Density:	Greater than 1 (Air = 1).
pH:	8.5 to 9.5
Molecular Formula:	Mixture
Molecular Weight:	Mixture
Flash Point:	No Data
VOC Content:	Material VOC: 73 gm/l (Includes Water) Coating VOC.: 187 gm/l (Excludes Water) The addition of colorant may add VOCs.

SECTION 10 - STABILITY and REACTIVITY

Chemical Stability:	Stable under normal temperatures and pressures.
Hazardous Polymerization:	Not reported.
Conditions to Avoid:	Heat, flames, incompatible materials, and freezing or temperatures below 32 deg. F.
Incompatible Materials:	Oxidizing agents. Strong acids and alkalis.

SECTION 11 - TOXICOLOGICAL INFORMATION

Dipropylene glycol butoxy ether :

RTECS Number:	UA8200000
Eye:	Eye - Rabbit Standard Draize test.: 100 mg (RTECS)
Skin:	Administration onto the skin - Rabbit LD50: 5860 uL/kg [Behavioral - Somnolence (general depressed activity) Gastrointestinal - Hypermotility, diarrhea Lungs, Thorax, or Respiration - Other changes] (RTECS)
Ingestion:	Oral - Rat LD50: 1620 uL/kg [Behavioral - Somnolence (general depressed activity) Behavioral - Ataxia Skin and Appendages - Hair] (RTECS)

2-diethylaminoethanol :

RTECS Number:	KK5075000
Eye:	Eye - Rabbit Standard Draize test.: 5 mg (RTECS)
Skin:	Administration onto the skin - Rabbit LD50: 1260 uL/kg [Details of toxic effects not reported other than lethal dose value] Administration onto the skin - Guinea pig LD50: 1 mL/kg [Details of toxic effects not reported other than lethal dose value] Administration onto the skin - Rabbit Open irritation test: 10 mg/24H Administration onto the skin - Rabbit Open irritation test: 500 mg (RTECS)
Inhalation:	Inhalation - Mouse LC50: 5000 mg/m3 [Brain and Coverings - recordings from specific areas of CNS Sense Organs and Special Senses (Eye) - Conjunctive irritation Behavioral - Convulsions or effect on seizure threshold] (RTECS)
Ingestion:	Oral - Rat LD50: 1300 mg/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)

Clay (kaolin) :

RTECS Number:	GF1670500

Ethylene glycol :

RTECS Number:	KW2975000

Eye:	Eye - Rabbit TDLo: 10 pph [Sense Organs and Special Senses (Eye) - Conjunctive irritation] Eye - Rat Standard Draize test.: 0.012 %/3D Eye - Rabbit Standard Draize test.: 500 mg/24H Eye - Rabbit Standard Draize test.: 100 mg/1H Eye - Rabbit Standard Draize test.: 0.012 ppm/3D Eye - Rabbit Standard Draize test.: 1440 mg/6H (RTECS)
Skin:	Administration onto the skin - Rabbit LD50: 9530 uL/kg [Details of toxic effects not reported other than lethal dose value] Administration onto the skin - Rabbit Open irritation test: 555 mg (RTECS)
Ingestion:	Oral - Rat LD50: 4700 mg/kg [Details of toxic effects not reported other than lethal dose value] Oral - Guinea pig LD50: 6600 mg/kg [Details of toxic effects not reported other than lethal dose value] Oral - LD50: 2000 mg/kg [Details of toxic effects not reported other than lethal dose value] Oral - Mouse LD50: 5500 mg/kg [Details of toxic effects not reported other than lethal dose value] Oral - LD50: 5500 mg/kg [Kidney/Ureter/Bladder - Other changes] Oral - LD50: 1650 mg/kg [Kidney/Ureter/Bladder - Other changes] Oral - Guinea pig LD50: 6610 mg/kg [Behavioral - Somnolence (general depressed activity) Gastrointestinal - Other changes Kidney/Ureter/Bladder - Other changes] (RTECS)

Nepheline Syenite :

RTECS Number:	QP9365000

Dipropylene glycol monomethyl ether :

RTECS Number:	JM1575000
Eye:	Eye - Human Standard Draize test.: 8 mg Eye - Rabbit Standard Draize test.: 500 mg/24H (RTECS)
Skin:	Administration onto the skin - Rabbit LD50: 10 mL/kg [Details of toxic effects not reported other than lethal dose value] Administration onto the skin - Rabbit Open irritation test: 500 mg (RTECS)
Ingestion:	Oral - Rat LD50: 5400 uL/kg [Details of toxic effects not reported other than lethal dose value] Oral - LD50: 7500 mg/kg [Lungs, Thorax, or Respiration - Other changes] Oral - Rat LD50: 5.5 mL/kg [Details of toxic effects not reported other than lethal dose value] (RTECS)

Titanium Dioxide :

RTECS Number:	XR2275000
Skin:	Administration onto the skin - Human Standard Draize test.: 300 ug/3D (Intermittent) (RTECS)
Carcinogenicity:	13463-67-7

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity:	No ecotoxicity data was found for the product.
Environmental Fate:	No environmental information found for this product.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal:	Consult with the US EPA Guidelines listed in 40 CFR Part 261.3 for the classifications of hazardous waste prior to disposal. Furthermore, consult with your state and local waste requirements or guidelines, if applicable, to ensure compliance. Arrange disposal in accordance to the EPA and/or state and local guidelines.

SECTION 14 - TRANSPORT INFORMATION

DOT UN Number:	No Data
DOT Hazard Class:	No Data

SECTION 15 - REGULATORY INFORMATION

California PROP 65:	WARNING: This product contains a chemical known to the state of California to cause cancer and birth defects or other reproductive harm.

Dipropylene glycol butoxy ether :

TSCA Inventory Status:	Listed
Canada DSL:	Listed

2-diethylaminoethanol :

TSCA Inventory Status:	Listed
State Regulations:	Listed in the State of Massachusetts Hazardous Substance List. Listed in the Pennsylvania State Hazardous Substances List.

Canada DSL:	Listed

Clay (kaolin) :

TSCA Inventory Status:	Listed
State Regulations:	Listed in the Pennsylvania State Hazardous Substances List.
Canada DSL:	Listed

Ethylene glycol :

TSCA Inventory Status:	Listed
State Regulations:	Listed in the New Jersey State Right to Know List. Listed in the Pennsylvania State Hazardous Substances List.
Canada DSL:	Listed

Nepheline Syenite :

TSCA Inventory Status:	Not listed
Canada DSL:	Listed

Dipropylene glycol monomethyl ether :

TSCA Inventory Status:	Listed
State Regulations:	Listed in the New Jersey State Right to Know List. Listed in the Pennsylvania State Hazardous Substances List.
Canada DSL:	Listed

Titanium Dioxide :

TSCA Inventory Status:	Listed
State Regulations:	Listed in the New Jersey State Right to Know List. Listed in the Pennsylvania State Hazardous Substances List.
Canada DSL:	Listed

SECTION 16 - ADDITIONAL INFORMATION

HMIS Health Hazard:	1
HMIS Fire Hazard:	1
HMIS Reactivity:	0
HMIS Other:	x
MSDS Creation Date:	June 26, 2006
MSDS Revision Date:	March 31, 2012
MSDS Revision Notes:	Quarterly formula update
MSDS Author:	Actio Corporation
Disclaimer:	This Health and Safety Information is correct to the best of our knowledge and belief at the date of its publication but we cannot accept liability for any loss, injury or damage which may result from its use. We shall ensure, so far as is reasonably practicable, that any revision of this Data Sheet is sent to all customers to whom we have directly supplied this substance, but must point out that it is the responsibility of any intermediate supplier to ensure that such revision is passed to the ultimate user. The information given in the Data Sheet is designed only as a guidance for safe handling, storage and the use of the substance. It is not a specification nor does it guarantee any specific properties. All chemicals should be handled only by competent personnel, within a controlled environment. Should further information be required, this can be obtained through the sales office whose address is at the top of this data sheet.
Trademark:	The trademarks, service marks, graphics and logos used on this MSDS are registered or unregistered trademarks of BEHR Process Corporation. All Rights Reserved.

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

101 SATIN BLACK ENAMEL

12/28/2009

PRODUCT NAME: 101 SATIN BLACK ENAMEL
PRODUCT CODE: 101 SATIN BLACK ENAMEL

HMIS CODES: H F R P
2 3 1 B

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: VALLEY PAINT MANUFACTURING
ADDRESS : 727 SOUTH 950 WEST
WOODS CROSS, UTAH 84087

EMERGENCY PHONE : 801-298-4581
INFORMATION PHONE : 800-424-9300

REVISION DATE : 11/05/08
NAME OF PREPARER : RALPH GRIDER

SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
MINERAL SPIRITS	8032-32-4	2.0	68 DEG	30
OSHA VPEL 100 PPM TWA				
ACGIH TLV 100 PPM TWA				
* XYLENE	1330-20-7	2.4	68 DEG	15
OSHA VPEL 100 PPM TWA				
OSHA VPEL 150 PPM STEL				
ACGIH TLV 100 PPM TWA				
ACGIH TLV 150 PPM STEL				

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

N = N.T.P. Carcinogen I = I.A.R.C. Carcinogen

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 279 DEG F - 300 DEG F
VAPOR DENSITY: HEAVIER THAN AIR
COATING V.O.C.: 3.92 lb/gl
MATERIAL V.O.C.: 3.92 lb/gl
SOLUBILITY IN WATER: Non Soluble
APPEARANCE AND ODOR: COMMON TO SOLVENT REDUCED PAINT

DENSITY (H2O=8.33): 8.76114 lb/gl
EVAPORATION RATE: SLOWER THAN ETHER
469 g/l
469 g/l

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 80 DEG F **METHOD USED: SETAFLASH**
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.0%(V) **UPPER: 6.6%(V)**

EXTINGUISHING MEDIA:
FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG, OTHER

SPECIAL FIREFIGHTING PROCEDURES
Respiratory equipment should be worn to avoid inhalation of concentrated vapors. Water should not be used except as fog to keep nearby containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Handle as flammable liquid. Vapors form an explosive mixture in air between the upper and lower explosive limits which can be ignited by many sources such as pilot lights, open flames, electrical motors and switches.

SECTION V - REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID
Excessive heat, poor ventilation, corrosive atmospheres, excessive aging.

INCOMPATIBILITY (MATERIALS TO AVOID)
Alkaline meterials, strong acids and oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
Carbon monoxide, carbon dioxide, oxides of nitrogen, and possibly acrolein.

HAZARDOUS POLYMERIZATION: WILL OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Inhalation: Dizziness, breathing difficulty, headaches & loss of coordination.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Eye contact: Severe irritation, tearing, redness and blurred vision.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Skin contact: Can dry and defat skin causing cracks, irritation, and dermatitis.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Ingestion: Can cause gastrointestinal irritation, vomiting, nausea, and diarrhea.

HEALTH HAZARDS (ACUTE AND CHRONIC)
Inhalation-Dizziness, breathing difficulty, headaches, & loss of coordination. Eye contact-Severe irritation, tearing, redness, and blurred vision. Skin contact-Can dry and defat skin causing cracks, irritation, and dermatitis. Ingestion-Can cause gastrointestinal irritation, vomiting, nausea, & diarrhea. No chronic health effects.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

INFORMATION NOT AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
Anesthesia, respiratory tract irritation, dermatitis, nausea, vomiting.

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

101 SATIN BLACK ENAMEL

EMERGENCY AND FIRST AID PROCEDURES
Inhalation overexposure-Move person to fresh air. If breathing stops, apply artificial respiration and seek immediate medical attention. Eye contact-Flush with large quantities of water for 15 minutes. Skin contact-Wash thoroughly with soap and water and see a doctor. Ingestion-Do not induce vomiting, can cause chemical pneumonitis and pulmonary edema. Contact physician immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Eliminate ignition sources, provide good ventilation, dike spill area and add absorbent earth or sawdust to spilled liquid. Thoroughly wet with water and mix.

WASTE DISPOSAL METHOD
Collect absorbent/water/spilled liquid mixture into metal containers and add enough water to cover. Consult local,state & federal hazardous waste regulations before disposing into approved hazardous waste landfills. Obey relevant laws.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Use non-sparking utensils when handling this material. Avoid hot metal surface. Use in cool, well-ventilated areas. Keep containers closed when not in use. Keep away from excessive heat and open flames.

OTHER PRECAUTIONS
Smoking in area where this material is used should be strictly prohibited. Tools used with this material should be made from aluminum, brass or copper. Plastic utensils should not be used. NOTE: This information is accurate to the best knowledge of this company, but is furnished without any expressed or implied warranties.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION
When spraying this material use a NIOSH approved cartridge respirator or gas mask suitable to keep airborne mists and vapor concentrations below the time weighted threshold limit values. When using in poorly ventilated and confined spaces, use a fresh-air supplying respirator or a self-contained breathing apparatus.

VENTILATION
General mechanical ventilation or local exhaust should be suitable to keep vapor concentrations below TLV. Ventilation equip. must be explosion proof.

PROTECTIVE GLOVES
Impermeable chemical handling gloves for skin protection.

EYE PROTECTION
Use chemical safety glasses, goggles, and faceshields for eye protection.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT
Use impermeable aprons and protective clothing whenever possible to prevent skin contact. The use of head caps whenever possible is strongly recommended.

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

101 SATIN BLACK ENAMEL

WORK/HYGIENIC PRACTICES
Eye washes and safety showers in the workplace are recommended.

SECTION IX - SHIPPING DATA

D.O.T. PROPER SHIPPING NAME.....SOLVENT THINNED PAINT
D.O.T. HAZARD CLASS.....FLAMMABLE LIQUID
D.O.T. LABELS REQUIRED.....FLAMMABLE LIQUID
D.O.T. PLACARDS REQUIRED.....YES FLAMMABLE
BILL OF LADING DESCRIPTION.....PAINT, FLAMMABLE LIQUID
UN/NA CODE.....UN1263

SECTION X - DISCLAIMER

To the best of our knowledge, the information contained herein is accurate, obtained from sources believed by this company to be accurate.

MATERIAL SAFETY DATA SHEET

I. PRODUCT INFORMATION

TRADE NAME (as labeled):
1040

DATE PREPARED/REVISED:
February 12, 1992

MANUFACTURER'S NAME:
Hydro Engineering, Inc.
865 West 2600 South
Salt Lake City, Utah 84119

PHONE NUMBER(S):
801/972-1181 In Utah
800/247-8424 Toll Free

II. HAZARDOUS INGREDIENTS

Chemical Names	CAS Numbers	Percent	Exposure Limits in Air (give units) ACGH TLV	OSHA PEL
Other(specify)				
Alkaline Phosphate detergent	N/A	N/A	None Established	

III. PHYSICAL PROPERTIES

Vapor density (air=1): > 1
Specify gravity (H_20=1): 1.01
Solubility in water: 100%
Vapor pressure (mmHg @ 20 ^{0}C): > 1
Appearance and odor: Amber color, light musty smell.

Melting point of range (^{0}F): N/A
Boiling point or range (^{0}F): 215^0
Evaporation rate (butyl acetate=1): < 1

IV. FIRE AND EXPLOSION

Flash point (^{0}F) (give method): N/A
Auto ignition temperature (^{0}F): Not tested

Flammable limits in air (volume %): **lower (LEL):** Unknown **upper (UEL):** Unknown

Fire extinguishing materials:

_X_ water spray	_X_ carbon dioxide ($C0_2$)	_____ other (alcohol type)
_X_ foam	_____ dry chemical	

Special fire fighting procedures: Use self-contained breathing apparatus for confined spaces.

Unusual fire and explosion hazards: None known.

V. HEALTH HAZARD INFORMATION

SYMPTOMS OF OVEREXPOSURE (for each potential route of exposure).

Inhaled: Possible irritant to nose and throat when breathing concentrated vapors.

Absorbed through skin: Irritation to skin.

Swallowed: Nausea and vomiting.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: Explain in lay terms.

Acute: Short term exposure drying of the dermal contact area. Itching to skin area for people with sensitive skin.

Cronic: None observed.

FIRST AID EMERGENCY PROCEDURES:

Eye contact: Flush with water for at least 15 minutes. Seek immediate medical attention if irritation persists.

Skin contact: Wash area with water. Seek medical attention if irritation persists.

Inhaled: Remove from source or irritation to fresh air.

Swallowed: Drink large quantities of or water to dilute, induce vomiting.

SUSPECTED CANCER AGENT?

__X__**NO: This product's ingredients are not found on the list below.**

YES: _____**Federal OSHA** _____**NTP** _____**IARC**

California employers using Cal/OSHA -- regulated carcinogen must register with Cal/ OSHA. The Cal/OSHA and Federal OSHA lists are similar.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None.

VI. REACTIVITY DATA

Stability: __X__**Stable** _____**Unstable**

Conditions to avoid: Store in cool dry area.

Incompatibility (materials to avoid): Avoid strong Acids.

Hazardous decomposition products (including combustion products): Caron Proxide and carbon Monoxide

Hazardous polymerization: _____**May occur** __X__**Will not occur**

Conditions to avoid: None

VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures): Collect & use if not contaminated.

Preparing wastes for disposal (container types, neutralization, etc.): As locally required for Phosphate Detergents.

NOTE: Dispose of all wastes in accordance with federal, state, and local regulations.

VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls: None required.

Respiratory protection (type): None required.

Eye protection (type): Goggles

Gloves (specify material): Rubber or Plastic

Other clothing and equipment: Eye wash and safety shower.

Work practices, hygiene practices: Wash hands in soap and water after handling.

Other handling and storage requirements: Irritant. Avoid unnecessary contact. Keep out of reach of children, keep container closed when not in use, avoid freezing.

Protective measures during maintenance of contaminated equipment: None required.

IX. REPORTING REQUIREMENTS & ADDITIONAL INFORMATION

-- Contains no photochemically reactive solvents.
-- Contains no volatile organic compounds per EPA Method #24.
-- Drain acceptable to a treatment plant, after soil release, when used as directed.
-- This product contains no other component considered hazardous according to the criterion of 29 CFR 1910.1200.

NFPA 704 Code System Rating = Health 0; Flammability 0; Reactivity 0.
HMIS Code System Rating = Health 0; Flammability 0; Reactivity 0.

PRODUCT NAME: 1040C

MATERIAL SAFETY DATA SHEET

I. PRODUCT INFORMATION

TRADE NAME (as labeled):
1040C

DATE PREPARED/REVISED:
February 12, 1992

MANUFACTURER'S NAME:
Hydro Engineering, Inc.
865 West 2600 South
Salt Lake City, Utah 84119

PHONE NUMBER(S):
801/972-1181 In Utah
800/247-8424 Toll Free

II. HAZARDOUS INGREDIENTS

Chemical Names Other(specify)	CAS Numbers	Percent	Exposure Limits in Air (give units) ACGH TLV	OSHA PEL
Alkaline Phosphate detergent	N/A	N/A	None Established	

III. PHYSICAL PROPERTIES

Vapor density (air=1): > 1
Specify gravity (H_20=1): 1.01
Solubility in water: 100%
Vapor pressure (mmHg @ 20 °C): > 1
Appearance and odor: Amber color, light musty smell.

Melting point of range (°F): N/A
Boiling point or range (°F): 215°
Evaporation rate (butyl acetate=1): < 1

IV. FIRE AND EXPLOSION

Flash point (°F) (give method): N/A
Auto ignition temperature (°F): Not tested

Flammable limits in air (volume %): **lower (LEL):** Unknown **upper (UEL):** Unknown

Fire extinguishing materials:

__X__ water spray
__X__ foam
__X__ carbon dioxide ($C0_2$)
_____ dry chemical
_____ other (alcohol type)

Special fire fighting procedures: Use self-contained breathing apparatus for confined spaces.

Unusual fire and explosion hazards: None known.

V. HEALTH HAZARD INFORMATION

SYMPTOMS OF OVEREXPOSURE (for each potential route of exposure).

Inhaled: Possible irritant to nose and throat when breathing concentrated vapors.

Absorbed through skin: Irritation to skin.

Swallowed: Nausea and vomiting.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: Explain in lay terms.

Acute: Short term exposure drying of the dermal contact area. Itching to skin area for people with sensitive skin.

Cronic: None observed.

FIRST AID EMERGENCY PROCEDURES:

Eye contact: Flush with water for at least 15 minutes. Seek immediate medical attention if irritation persists.

Skin contact: Flush with water for at least 15 minutes. Seek immediate medical attention if irritation persists.

Inhaled: Remove from source or irritation to fresh air.

Swallowed: Drink large quantities of or water to dilute, induce vomiting.

SUSPECTED CANCER AGENT?

_X_NO: This product's ingredients are not found on the list below.

YES: _____Federal OSHA _____NTP _____IARC

California employers using Cal/OSHA -- regulated carcinogen must register with Cal/OSHA. The Cal/OSHA and Federal OSHA lists are similar.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

None

VI. REACTIVITY DATA

Stability: _X_Stable _____Unstable

Conditions to avoid: Store in cool dry area.

Incompatibility (materials to avoid): Avoid strong Acids.

Hazardous decomposition products (including combustion products): Carbon Dioxide and carbon Monoxide

Hazardous polymerization: _____May occur _X_Will not occur

Conditions to avoid: N...

VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill response procedures (include employee protection measures): Collect & use if not contaminated.

Preparing wastes for disposal (container types, neutralization, etc.): As locally required for Phosphate Detergents.

NOTE: Dispose of all wastes in accordance with federal, state, and local regulations.

VIII. SPECIAL HANDLING INFORMATION

Ventilation and engineering controls: None required.

Respiratory protection (type): None required.

Eye protection (type): Goggles.

Gloves (specify material): Rubber or Plastic.

Other clothing and equipment: Eye wash and safety shower.

Work practices, hygiene practices: Wash hands in soap and water after handling.

Other handling and storage requirements: Irritant. Avoid unnecessary contact. Keep out of reach of children, keep container closed when not in use, avoid freezing.

Protective measures during maintenance of contaminated equipment: None required.

IX. REPORTING REQUIREMENTS & ADDITIONAL INFORMATION

- Contains no photochemically reactive solvents.
- Contains no volatile organic compounds per EPA Method #24.
- Drain acceptable to a treatment plant, after soil release, when used as directed.
- This product contains no other component considered hazardous according to the criterion of 29 CFR 1910.1200.

NFPA 704 Code System Rating = Health 0; Flammability 0; Reactivity 0.
HMIS Code System Rating = Health 0; Flammability 0; Reactivity 0.

Permatex, Inc.
10 Columbus Blvd.
Hartford, CT 06106 USA
Telephone: 1-87-Permatex
(877) 376-2839
Emergency: 800-255-3924
International Emergency: +01-813-248-0585

Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Product Name: **133K ANTI-SEIZE LUBRICANT 8OZ**
Item No: **80078**
Product Type: **Lubricant**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight%	ACGIH; TLV-TWA	OSHA PEL
DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC 64742-52-5	20-40	Not listed	Not listed
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT NAPHTHENIC 64742-53-6	20-40	5 mg/m^3 TWA ACGIH	Not listed
CALCIUM OXIDE 1305-78-8	15-25	2 mg/m^3	5 mg/m^3
ALUMINIUM POWDER 7429-90-5	<10	1 mg/m^3	15 mg/m^3
GRAPHITE 7782-42-5	<10	2 mg/m^3	15 mppcf
MINERAL OIL 64741-44-2	<5	5 mg/m^3	Not listed

3. HAZARDS IDENTIFICATION

Toxicity: May cause eye and skin irritation. May cause nose, throat and respiratory irritation. May cause gastrointestinal irritation. High concentrations may cause central nervous system (CNS) depression.

Primary Routes of Entry: Eye and skin contact, ingestion, inhalation

Signs and Symptoms of Exposure: Overexposure may cause eye and skin redness, difficulty breathing and vomiting. Excessive accidental exposure may cause headache, dizziness, nausea and mild respiratory irritation. Inhalation of dust at levels above recommended exposure limit may cause metallic or sweet taste, irritation of pharynx and possible ulceration with performation of the nasal septum.

Medical Conditions Recognized as Being Aggravated by Exposure: Persons with respiratory problems such as emphysema and asthma should avoid inhalation. Since this product contain copper compounds, individuals with Wilson´s Disease should avoid exposure to this product.

4. FIRST AID MEASURES

Ingestion: Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move to fresh air in case of accidental inhalation of vapours. If symptoms persist, call a physician.

Skin Contact: Wash off with soap and water. If skin irritation persists, call a physician.

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

5. FIRE FIGHTING MEASURES

Flash Point °F(C°): >200° F TCC

Recommended Extinguishing Media: Carbon Dioxide, Dry Chemicals, Foam.

Special Fire-Fighting Procedures: Firefighters should wear self-contained breathing apparatus. Water spray may be ineffective on flames but should be used to keep fire-exposed containers cool.

Hazardous Products of Combustion: Oxides of carbon, Metal oxide fumes

Unusual Fire/Explosion Hazards: May ignite when sufficient heat is applied.

5. FIRE FIGHTING MEASURES

Lower Explosive Limit: 30% aluminum metal; 1% oil
Upper Explosive Limit: 7% oil

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Eliminate all sources of ignition. Maintain good ventilation. Take up with an inert absorbent. Store in a closed waste container until disposal.

7. HANDLING AND STORAGE

Storage: Store away from heat, sparks or open flame. Do not store at temperatures above 100°F (38°C).
Handling: Avoid prolonged skin contact. Keep away from eyes. Do not inhale vapors. Do not use near heat, sparks or open flame. Wash hands and face after handling this compound.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes: Safety glasses.
Skin: Neoprene or nitrile gloves recommended.
Ventilation: General; local exhaust ventilation as necessary to control any air contaminants to within their exposure limits (or to the lowest feasible levels when limits have not been established) during the use of this product.
Respiratory Protection: An approved organic vapor respirator should be worn when exposures are expected to exceed the applicable limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Silver paste
Odor: Petroleum distillates
Boiling Point: Not determined
pH: Does not apply
Solubility in Water: Nil
Specific Gravity: 1.17
VOC(Wt.%): None
Vapor Pressure: <5 mm Hg
Vapor Density (Air=1): <1
Evaporation Rate: <1 (butyl acetate = 1)

10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal conditions
Hazardous Polymerization: Will not occur.
Incompatabilities: Strong oxidizers, alkalies, mineral acids, selected amines.
Conditions to Avoid: Heat.
Hazardous Products of Combustion: Oxides of carbon, Metal oxide fumes

11. TOXICOLOGICAL INFORMATION

See Section 3

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended Method of Disposal: Disposal should be made in accordance with federal, state and local regulations..
US EPA Waste Number: NH - Not a RCRA Hazardous Waste Material

14. TRANSPORTATION INFORMATION

DOT (49CFR 172)

Ground Transport (DOT)

DOT Shipping Name: Not Regulated
Hazard Class: None
UN/ID Number: None

IATA

Proper Shipping Name: Not regulated
Class or Division: None

14. TRANSPORTATION INFORMATION

UN/ID Number: None

IMDG

Proper Shipping: Not regulated
Hazard Class: None
UN Number: None

Marine Pollutant: None

15. REGULATORY INFORMATION

SARA 313 Chemicals: The following component(s) is listed as a SARA Section 313 Toxic Chemical.

NONE

California Proposition 65: No California Prop 65 chemicals are known to be present at or above the No Significant Risk Level

TSCA Inventory Status: All components of this product are listed (or exempt) on the EPA TSCA inventory.

16. OTHER INFORMATION

Estimated NFPA Rating: HEALTH 1, FLAMMABILITY 1 REACTIVITY 1 .
Estimated HMIS Classification: HEALTH 1, FLAMMABILITY 1, PHYSICAL HAZARD 0
NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

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Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Product Name: **133MA ANTI-SEIZE LUBRICANT 8.5OZ AE**
Item No: **81464**
Product Type: **Aerosol lubricant**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight%	ACGIH; TLV-TWA	OSHA PEL
HEPTANE 142-82-5	10-30	400 ppm	500 ppm; 2000 mg/m^3
DISTILLATES (PETROLEUM), HYDROTREATED HEAVY NAPHTHENIC 64742-52-5	10-30	Not listed	Not listed
PROPANE 74-98-6	10-30	1000 ppm	1000 ppm; 1800 mg/m^3
CALCIUM OXIDE 1305-78-8	5-15	2 mg/m^3	5 mg/m^3
ALUMINIUM POWDER 7429-90-5	<7	1 mg/m^3	15 mg/m^3
GRAPHITE 7782-42-5	<5	2 mg/m^3	15 mppcf
TOLUENE 108-88-3	<2	20 ppm	200 ppm

3. HAZARDS IDENTIFICATION

Toxicity: May cause eye, skin and respiratory irritation. Long term exposure to high concentrations of vapor may cause lung, liver or kidney damage. Intentional misuse by concentrating and inhaling the vapor may be harmful or fatal. High concentrations may cause central nervous system (CNS) depression.

Primary Routes of Entry: Eye and skin contact, ingestion, inhalation

Signs and Symptoms of Exposure: Excessive accidental exposure may cause headache, dizziness, nausea and mild respiratory irritation. May cause redness to eyes and irritation to nasal passages.

Component	Weight%	NTP	ACGIH Carcinogens	IARC
TOLUENE 108-88-3	<2	male rat-no evidence; female rat-no evidence; male mice-no, female mice-no	A4 - Not Classifiable as a Human Carcinogen	Group 3; Monograph 71, 1999; Monograph 47, 1989

Medical Conditions Recognized as Being Aggravated by Exposure: Persons with preexisting respiratory, liver, kidney, eye or skin diseases may be adversely affected.

4. FIRST AID MEASURES

Ingestion: Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move to fresh air in case of accidental inhalation of vapours. Oxygen or artificial respiration if needed. Obtain medical attention.

Skin Contact: Wash off with soap and water. If skin irritation persists, call a physician.

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

5. FIRE FIGHTING MEASURES

Flash Point °F(C°): Flammable aerosol per flame projection

Recommended Extinguishing Media: Carbon Dioxide, Dry Chemicals, Foam.

5. FIRE FIGHTING MEASURES

Special Fire-Fighting Procedures: Firefighters should wear self-contained breathing apparatus. Keep containers cool. Use equipment or shielding required to protect against bursting or venting of containers. Water spray may be ineffective on flames but should be used to keep fire-exposed containers cool.

Hazardous Products of Combustion: Oxides of carbon, Copper oxide

Unusual Fire/Explosion Hazards: Contents under pressure Exposure to temperatures over 120 degrees F. may cause bursting or venting Use equipment or shielding to protect personnel from bursting containers

Lower Explosive Limit: 1.0

Upper Explosive Limit: 9.5

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Eliminate all sources of ignition. Maintain good ventilation. Take up with an inert absorbent. Store in a closed waste container until disposal.

7. HANDLING AND STORAGE

Storage: Store away from heat, sparks or open flame. Do not store at temperatures above 100°F (38°C). Exposure to high temperatures may cause container to burst.

Handling: Do not use near heat, sparks or open flame. Vapors may accumulate readily and may ignite explosively. Avoid contact with skin and eyes. Avoid breathing vapors, if exposed to high vapor concentration, leave area at once. Use only in a well ventilated area. Extinguish all flames, pilot lights and heaters. Turn off stoves, electric tools and appliances, and other sources of ignition. Do not puncture or incinerate container. Intentionally concentrating and inhaling the vapor may be harmful or fatal.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes: Safety glasses.

Skin: Neoprene or nitrile gloves recommended.

Ventilation: General; local exhaust ventilation as necessary to control any air contaminants to within their exposure limits (or to the lowest feasible levels when limits have not been established) during the use of this product.

Respiratory Protection: An approved organic vapor respirator should be worn when exposures are expected to exceed the applicable limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Gray liquid

Odor: Solvent

Boiling Point: Not determined

pH: Does not apply

Solubility in Water: Nil

Specific Gravity: 0.77-0.81

VOC(Wt.%): 45%

Vapor Pressure: Not Determined

Vapor Density (Air=1): >1 (air = 1)

Evaporation Rate: Not determined

10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal conditions

Hazardous Polymerization: Will not occur

Incompatabilities: Strong oxidizers

Conditions to Avoid: Keep away from heat, sparks and open flame. - No smoking

Hazardous Products of Combustion: Oxides of carbon, Copper oxide

11. TOXICOLOGICAL INFORMATION

See Section 3

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended Method of Disposal: Disposal should be made in accordance with federal, state and local regulations.. This container may be recycled in aerosol recycling centers. Before offering for recycling, empty the can by using the product according to the label. If recycling is not available, wrap the container and discard in the trash.

US EPA Waste Number: D001 as per 40CFR 261.21

14. TRANSPORTATION INFORMATION

DOT (49CFR 172)

Ground Transport (DOT)

DOT Shipping Name: Consumer Commodity
Hazard Class: ORM-D
UN/ID Number: None

IATA

Proper Shipping Name: Consumer Commodity (Not more than 1 liter)
Class or Division: Class 9
UN/ID Number: ID 8000

IMDG

Proper Shipping: Aerosols, Limited Quantity
Hazard Class: Class 2.1
UN Number: UN 1950

Marine Pollutant: None

15. REGULATORY INFORMATION

SARA 313 Chemicals: The following component(s) is listed as a SARA Section 313 Toxic Chemical.

Toluene

California Proposition 65: WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm

TSCA Inventory Status: All components of this product are listed (or exempt) on the EPA TSCA inventory.

16. OTHER INFORMATION

Estimated NFPA Rating: HEALTH 2, FLAMMABILITY 4 , REACTIVITY 1.
Estimated HMIS Classification: HEALTH 2, FLAMMABILITY 4, PHYSICAL HAZARD 0

NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

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Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Product Name: **14D THREAD SEALANT WITH PTFE 16 FL.OZ.**
Item No: **80633**
Product Type: **Sealant**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight%	ACGIH; TLV-TWA	OSHA PEL
ETHANOL 64-17-5	20-40	1000 ppm	1000 ppm; 1900 mg/m^3
TALC 14807-96-6	20-40	2 mg/m^3	20 mppcf
CASTOR OIL 8001-79-4	20-40	Not listed	Not listed
POLYVINYL RESIN 63148-65-2	<10	Not listed	Not listed
2-PROPANOL 67-63-0	<5	200 ppm	400 ppm; 980 mg/m^3
TITANIUM DIOXIDE 13463-67-7	<3	10 mg/m^3	15 mg/m^3
METHANOL 67-56-1	<2	200 ppm	200 ppm; 260 mg/m^3
POLYTETRAFLUOROETHYLENE 9002-84-0	<2	Not listed	Not listed

3. HAZARDS IDENTIFICATION

Toxicity: May cause eye, skin and respiratory irritation. Methanol may cause blindness or death if swallowed.
Primary Routes of Entry: Eye and skin contact, ingestion, inhalation
Signs and Symptoms of Exposure: Excessive accidental exposure may cause headache, dizziness, nausea and mild respiratory irritation. Overexposure may cause eye and skin redness.

Component	Weight%	NTP	ACGIH Carcinogens	IARC
ETHANOL 64-17-5	20-40		A4 - Not Classifiable as a Human Carcinogen	
TALC 14807-96-6	20-40	male rat-some evidence, female rat-clear evidence, male mice-no evidence, female mice-no evidence	A4- Not classifiable as a human carcinogen	Group 3 Supplement 7, 1987 Monograph 42, 1987
2-PROPANOL 67-63-0	<5		A4 - Not classifiable as a human carcinogen	Group 3 Monograph 71, 1999; Supp.7, 1987; Monograph 15, 1977
TITANIUM DIOXIDE 13463-67-7	<3	male rat-negative, female rat-negative, male mice-negative, female mice-negative	A4	Group 2B; Vol 93,2006; Vol 47,1989
POLYTETRAFLUOROETHYLENE 9002-84-0	<2			Group 3 Supplement 7, 1987; Monograph 19, 1979

Medical Conditions Recognized as Being Aggravated by Exposure: Preexisting eye, skin and respiratory disorders may be aggravated by overexposure to this product.

4. FIRST AID MEASURES

Ingestion: Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move to fresh air in case of accidental inhalation of vapours. Oxygen or artificial respiration if needed. Obtain medical attention.

Skin Contact: Wash off with soap and water. If skin irritation persists, call a physician.

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

5. FIRE FIGHTING MEASURES

Flash Point °F(C°): 74°F TCC

Recommended Extinguishing Media: Carbon Dioxide, Dry Chemicals, Foam.

Special Fire-Fighting Procedures: Firefighters should wear self-contained breathing apparatus. Water spray may be ineffective on flames but should be used to keep fire-exposed containers cool.

Hazardous Products of Combustion: Oxides of carbon, Fluoride compounds

Unusual Fire/Explosion Hazards: Closed containers may rupture or explode when exposed to extreme heat.

Lower Explosive Limit: 2.3

Upper Explosive Limit: 12.7

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Eliminate all sources of ignition. Maintain good ventilation. Take up with an inert absorbent. Store in a closed waste container until disposal. Residues may be cleaned up with isopropyl alcohol.

7. HANDLING AND STORAGE

Storage: Store away from heat, sparks or open flame. Do not store at temperatures above 100°F (38°C).

Handling: Avoid contact with skin and eyes. Do not inhale vapors. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes: Safety glasses.

Skin: Neoprene or nitrile gloves recommended.

Ventilation: General; local exhaust ventilation as necessary to control any air contaminants to within their exposure limits (or to the lowest feasible levels when limits have not been established) during the use of this product.

Respiratory Protection: An approved organic vapor respirator should be worn when exposures are expected to exceed the applicable limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White paste

Odor: Alcoholic

Boiling Point: 180° F

pH: Does not apply

Solubility in Water: Partial

Specific Gravity: 1.06-1.10

VOC(Wt.%): 36.5%; 395 g/L

Vapor Pressure: 33 mm Hg @ 68°F

Vapor Density (Air=1): 2.07

Evaporation Rate: 7.7 (ether = 1)

10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal conditions

Hazardous Polymerization: Will not occur

Incompatabilities: Strong oxidizers

Conditions to Avoid: Keep away from heat, sparks and open flame. - No smoking.

Hazardous Products of Combustion: Oxides of carbon, Fluoride compounds

11. TOXICOLOGICAL INFORMATION

See Section 3

12. ECOLOGICAL INFORMATION

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended Method of Disposal: Disposal should be made in accordance with federal, state and local regulations..
US EPA Waste Number: D001 as per 40CFR 261.21

14. TRANSPORTATION INFORMATION

DOT (49CFR 172)

Ground Transport (DOT)

DOT Shipping Name: Consumer Commodity (not more than one liter)
Hazard Class: ORM-D
UN/ID Number: None

IATA

Proper Shipping Name: Consumer Commodity (Not more than 1 liter)
Class or Division: Class 9
UN/ID Number: ID 8000

IMDG

Proper Shipping: Adhesives containing flammable liquid, Limited Quantity
Hazard Class: Class 3 PGIII
UN Number: UN 1133

Marine Pollutant: None

15. REGULATORY INFORMATION

SARA 313 Chemicals: The following component(s) is listed as a SARA Section 313 Toxic Chemical.

Methanol

California Proposition 65: No California Prop 65 chemicals are known to be present.

TSCA Inventory Status: All components of this product are listed (or exempt) on the EPA TSCA inventory.

16. OTHER INFORMATION

Estimated NFPA Rating: HEALTH 2, FLAMMABILITY 3 , REACTIVITY 0.
Estimated HMIS Classification: HEALTH 2, FLAMMABILITY 3, PHYSICAL HAZARD 0
NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

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Revision Date: August 11, 2010
Revision Number: 7

VALLEY PAINT MANUFACTURING
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MATERIAL SAFETY DATA SHEET

150 FIRE ORANGE ENAMEL

12/28/2009

PRODUCT NAME: 150 FIRE ORANGE ENAMEL **HMIS CODES: H F R P**
PRODUCT CODE: 150 FIRE ORANGE ENAMEL **2 3 1 B**

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: VALLEY PAINT MANUFACTURING
ADDRESS : 727 SOUTH 950 WEST
WOODS CROSS, UTAH 84087

EMERGENCY PHONE : 801-298-4581 **REVISION DATE :**
INFORMATION PHONE : 800-424-9300 **NAME OF PREPARER : RALPH GRIDER**

SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
MINERAL SPIRITS	8032-32-4	2.0	68 DEG	31
OSHA VPEL 100 PPM TWA				
ACGIH TLV 100 PPM TWA				
I CRYSTALLINE SILICA	14808-60-7	NA	NA	14.15
TINT PASTE	NA	NA	NA	10
* XYLENE	1330-20-7	2.4	68 DEG	8
OSHA VPEL 100 PPM TWA				
OSHA VPEL 150 PPM STEL				
ACGIH TLV 100 PPM TWA				
ACGIH TLV 150 PPM STEL				

* Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.

N = N.T.P. Carcinogen I = I.A.R.C. Carcinogen

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 279 DEG F - 325 DEG F **DENSITY (H2O=8.33): 8.83153 lb/gl**
VAPOR DENSITY: HEAVIER THAN AIR **EVAPORATION RATE: SLOWER THAN ETHER**
COATING V.O.C.: 3.46 lb/gl **414 g/l**
MATERIAL V.O.C.: 3.46 lb/gl **414 g/l**
SOLUBILITY IN WATER: Non Soluble
APPEARANCE AND ODOR: COMMON TO SOLVENT REDUCED PAINT

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 80 DEG F **METHOD USED: SETAFLASH**
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1.0%(V) **UPPER: 6.6%(V)**

EXTINGUISHING MEDIA:

FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG, OTHER

SPECIAL FIREFIGHTING PROCEDURES
Respiratory equipment should be worn to avoid inhalation of concentrated vapors. Water should not be used except as fog to keep nearby containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Handle as flammable liquid. Vapors form an explosive mixture in air between the upper and lower explosive limits which can be ignited by many sources such as pilot lights, open flames, electrical motors and switches.

SECTION V - REACTIVITY DATA

STABILITY: STABLE
CONDITIONS TO AVOID
Excessive heat, poor ventilation, corrosive atmospheres, excessive aging.

INCOMPATIBILITY (MATERIALS TO AVOID)
Alkaline materials, strong acids and oxidizing materials.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
Carbon monoxide, carbon dioxide, oxides of nitrogen, and possibly acrolein.

HAZARDOUS POLYMERIZATION: WILL OCCUR

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Inhalation: Dizziness, breathing difficulty, headaches & loss of coordination.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Eye contact: Severe irritation, tearing, redness and blurred vision.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Skin contact: Can dry and defat skin causing cracks, irritation, and dermatitis.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE
Ingestion: Can cause gastrointestinal irritation, vomiting, nausea, and diarrhea.

HEALTH HAZARDS (ACUTE AND CHRONIC)
Inhalation-Dizziness, breathing difficulty, headaches, & loss of coordination. Eye contact-Severe irritation, tearing, redness, and blurred vision. Skin contact-Can dry and defat skin causing cracks, irritation, and dermatitis. Ingestion-Can cause gastrointestinal irritation, vomiting, nausea, & diarrhea. No chronic health effects.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

INFORMATION NOT AVAILABLE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Anesthesia, respiratory tract irritation, dermatitis, nausea, vomiting.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation overexposure-Move person to fresh air. If breathing stops, apply artificial respiration and seek immediate medical attention. Eye contact-flush with large quantities of water for 15 minutes. Skin contact-Wash thoroughly with soap and water and see a doctor. Ingestion-Do not induce vomiting, can cause chemical pneumonitis and pulmonary edema. Contact physician immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Eliminate ignition sources, provide good ventilation, dike spill area and add absorbent earth or sawdust to spilled liquid. Thoroughly wet with water and mix.

WASTE DISPOSAL METHOD

Collect absorbent/water/spilled liquid mixture into metal containers and add enough water to cover. Consult local,state & federal hazardous waste regulations before disposing into approved hazardous waste landfills. Obey relevant laws.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Use non-sparking utensils when handling this material. Avoid hot metal surface. Use in cool, well-ventilated areas. Keep containers closed when not in use. Keep away from excessive heat and open flames.

OTHER PRECAUTIONS

Smoking in area where this material is used should be strictly prohibited. Tools used with this material should be made from aluminum, brass or copper. Plastic utensils should not be used. NOTE: This information is accurate to the best knowledge of this company, but is furnished without any expressed or implied warranties.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION

When spraying this material use a NIOSH approved cartridge respirator or gas mask suitable to keep airborne mists and vapor concentrations below the time weighted threshold limit values. When using in poorly ventilated and confined spaces, use a fresh-air supplying respirator or a self-contained breathing apparatus.

VENTILATION

General mechanical ventilation or local exhaust should be suitable to keep vapor concentrations below TLV. Ventilation equip. must be explosion proof.

PROTECTIVE GLOVES

Impermeable chemical handling gloves for skin protection.

EYE PROTECTION

Use chemical safety glasses, goggles, and faceshields for eye protection.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

VALLEY PAINT MANUFACTURING
727 South 950 West • Woods Cross, Utah 84087

MATERIAL SAFETY DATA SHEET

150 FIRE ORANGE ENAMEL

Use impermeable aprons and protective clothing whenever possible to prevent skin contact. The use of head caps whenever possible is strongly recommended.

WORK/HYGIENIC PRACTICES
Eye washes and safety showers in the workplace are recommended.

SECTION IX - SHIPPING DATA

D.O.T. PROPER SHIPPING NAME.....SOLVENT THINNED PAINT
D.O.T. HAZARD CLASS.....FLAMMABLE LIQUID
D.O.T. LABELS REQUIRED.....FLAMMABLE LIQUID
D.O.T. PLACARDS REQUIRED.....YES FLAMMABLE
BILL OF LADING DESCRIPTION.....PAINT, FLAMMABLE LIQUID
UN/NA CODE.....UN1263

SECTION X - DISCLAIMER

To the best of our knowledge, the information contained herein is accurate, obtained from sources believed by this company to be accurate.

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Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Product Name: **18E HEAVY DUTY RADIATOR CLEANER 32 FO BO**
Item No: **80030**
Product Type: **Cleaner**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight%	ACGIH; TLV-TWA	OSHA PEL
WATER 7732-18-5	40-80	Not listed	Not listed
HYDROCHLORIC ACID 7647-01-0	10-40	Not listed	Not listed

3. HAZARDS IDENTIFICATION

Toxicity: Extremely corrosive to eyes and skin. Extremely corrosive by ingestion. Ingesting large quantities can cause severe pain, nausea and even death. Inhaling high concentrations may be dangerous.

Primary Routes of Entry: Eye and skin contact, ingestion, inhalation

Signs and Symptoms of Exposure: Can cause severe and painful burns on contact to eyes, skin and if taken internally.

Component	Weight%	NTP	ACGIH Carcinogens	IARC
HYDROCHLORIC ACID 7647-01-0	10-40			Group 3 Vol 54; 1992

Medical Conditions Recognized as Being Aggravated by Exposure: None known.

4. FIRST AID MEASURES

Ingestion: If swallowed, DO NOT induce vomiting. Drink water or milk. Seek medical attention immediately. Never give fluids or induce vomiting if the victim is unconscious or having convulsions.

Inhalation: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention..

Skin Contact: In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse.

Eye Contact: Flush eyes with clean water for at least 20 minutes while gently holding eyelids open, lifting upper and lower lids. Get immediate medical attention.

5. FIRE FIGHTING MEASURES

Flash Point °F(C°): None

Recommended Extinguishing Media: Water fog, carbon dioxide, foam, dry chemical.

Special Fire-Fighting Procedures: Firefighters should wear self-contained breathing apparatus. Water spray may be ineffective on flames but should be used to keep fire-exposed containers cool.

Hazardous Products of Combustion: Flammable hydrogen gas

Unusual Fire/Explosion Hazards: Extinguish all nearby sources of ignition since flammable hydrocarbon gas will be liberated from contact with some metals (aluminum, magnesium and others).

Lower Explosive Limit: Not determined.

Upper Explosive Limit: Not determined.

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Eliminate all sources of ignition. Maintain good ventilation. Take up with an inert absorbent. Store in a closed waste container until disposal. Prevent from entering waterways or sewers. Wear appropriate protective and respiratory equipment.

7. HANDLING AND STORAGE

Storage: Store in a cool, dry area.

Handling: Avoid contact with skin and eyes. Avoid breathing vapors, if exposed to high vapor concentration, leave area at once. Do not take internally. Remove clothing immediately if the product gets inside. Then, wash thoroughly and put on clean clothing..

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes: Chemical goggles; also wear a face shield if splashing hazard exists.

Skin: Heavy rubber gloves needed.

Ventilation: Sufficient mechanical ventilation to maintain exposures below the TLV, but general mechanical ventilation is not recommended as the sole means of controlling exposure. Make up air should always be supplied to balance air exhausted.

Respiratory Protection: An approved organic vapor respirator should be worn when exposures are expected to exceed the applicable limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Green liquid

Odor: Pungent odor.

Boiling Point: >200°F

pH: Unknown

Solubility in Water: SOLUBLE

Specific Gravity: 1.10

VOC(Wt.%): 0

Vapor Pressure: Not Determined

Vapor Density (Air=1): >1 (air = 1)

Evaporation Rate: Slower than ether

10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal conditions

Hazardous Polymerization: Will not occur.

Incompatabilities: Active metals, Caustic materials such as lime, soda ash, caustic soda, strong alkali, oxidizing or reducing materials.

Conditions to Avoid: Contact with certain metals produces hydrogen gas.

Hazardous Products of Combustion: Flammable hydrogen gas

11. TOXICOLOGICAL INFORMATION

See Section 3

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended Method of Disposal: Dispose of in accordance with local, state and federal regulations.

US EPA Waste Number: D002 as per 40CFR 261.22

14. TRANSPORTATION INFORMATION

DOT (49CFR 172)

Ground Transport (DOT)

DOT Shipping Name: Consumer Commodity (not more than one liter)

Hazard Class: ORM-D

UN/ID Number: None

IATA

Proper Shipping Name: Hydrochloric acid solution

Class or Division: Class 8, PG II

UN/ID Number: UN1789

IMDG

Proper Shipping: Hydrochloric acid solution

Hazard Class: Class 8, PGII

UN Number: UN 1789

Marine Pollutant: None

15. REGULATORY INFORMATION

SARA 313 Chemicals: The following component(s) is listed as a SARA Section 313 Toxic Chemical.

HYDROGEN CHLORIDE

California Proposition 65: WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm

TSCA Inventory Status: All components of this product are listed (or exempt) on the EPA TSCA inventory.

16. OTHER INFORMATION

Estimated NFPA Rating: HEALTH 3, FLAMMABILITY 0 , REACTIVITY 1.
Estimated HMIS Classification: HEALTH 3, FLAMMABILITY 0, PHYSICAL HAZARD 0
NFPA is a registered trademark of the National Fire Protection Assn.
HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By: Denise Boyd, Manager-Environmental, Health & Safety
Company: Permatex. Inc. 10 Columbus Blvd. Hartford, CT USA 06106
Telephone No.: 1-87-Permatex (877) 376-2839

Revision Date: March 09, 2010
Revision Number: 4

Cutting Rebar Construction crew

ITEM: 1DXP1 - Flap Disc 4.5x5/8-11 480 Grit RPM

MSDS: A9524 **ORDER: 0039499020** **LP NUMBER: U218202481-A**

MATERIAL SAFETY DATA SHEET (MSDS)

This MSDS should be attached or kept with the respective product with which it is associated.

MATERIAL SAFETY DATA SHEET - A9524

Associated Grainger Items
6RP09, 6RP12, 6RP15, 6RP16, 6RP18, 6RP22, 6RP69, 1DXN6, 1DXN7, 1DXN8, 1DXN9
1DXP1, 1DXP2, 1DXP3, 1DXP4, 1DXP5, 1DXP6, 1DXP7, 1DXP8, 1DXP9, 1DXR1, 1DXR2
6RP08, 6RP13, 6RP17, 6RP20, 6RP24, 6RP26, 6RP27, 6RP29, 6RP30, 6RP31, 6RP55
6RP56, 6RP57, 6RP58, 6RP59, 6RP60, 6RP61, 6RP62, 6RP63, 6RP65, 6RP66, 6RP67
6RP68, 6RP70, 6RP71, 6RP72, 6RP73, 6RP87, 6RR61, 6RT32, 6RT37, 6RV91, 6RX24
6RX25, 6RX43, 6RX46, 6RX64, 6RX65, 6RX66, 6RZ20, 6RZ21, 6RZ22

3M

MATERIAL SAFETY DATA SHEET

3M MATERIAL SAFETY DATA SHEET 3M(TM) SCOTCH-BRITE(TM), CLEAN & STRIP (WHEELS, DISCS, BRUSHES, UNITIZED BLOCKS), COATING REMOVAL DISC, MARINE CLEANING DISC

07/11/2006

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:
3M(TM) SCOTCH-BRITE(TM), CLEAN & STRIP (WHEELS, DISCS, BRUSHES, UNITIZED BLOCKS), COATING REMOVAL DISC, MARINE CLEANING DISC

MANUFACTURER: 3M
DIVISION: ABRASIVES SYSTEMS DIVISION

ADDRESS:
3M CENTER
ST. PAUL, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 OR (651) 737-6501 (24 HOURS)

ISSUE DATE: 07/11/2006

SUPERCEDES DATE: 06/11/2006

DOCUMENT GROUP: 06-8728-5

PRODUCT USE:
SPECIFIC USE: ABRASIVE PRODUCT

SECTION 2: INGREDIENTS

INGREDIENT	C.A.S. NO.	% BY WT
SILICON CARBIDE MINERAL	409-21-2	35-75
CURED ADHESIVE	NONE	10-50
NON WOVEN NYLON FIBER WEB	NONE	15-30
FILLER	MIXTURE	1-10
LUBRICANT	4485-12-5	0-2
CARBON BLACK	1333-86-4	< 2

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW:

ODOR, COLOR, GRADE: SOLID ABRASIVE PRODUCT

GENERAL PHYSICAL FORM: SOLID

IMMEDIATE HEALTH, PHYSICAL, AND ENVIRONMENTAL HAZARDS:
CONTAINS A CHEMICAL OR CHEMICALS WHICH CAN CAUSE CANCER. THIS DOCUMENT COVERS ONLY THE 3M PRODUCT. FOR COMPLETE ASSESSMENT, WHEN DETERMINING THE DEGREE OF HAZARD, THE MATERIAL BEING ABRADED MUST ALSO BE CONSIDERED.

3.2 POTENTIAL HEALTH EFFECTS:

EYE CONTACT:
MECHANICAL EYE IRRITATION:
SIGNS/SYMPTOMS MAY INCLUDE PAIN, REDNESS, TEARING AND CORNEAL ABRASION. DUST CREATED BY CUTTING, GRINDING, SANDING, OR MACHINING MAY CAUSE EYE IRRITATION. SIGNS/SYMPTOMS MAY INCLUDE REDNESS, SWELLING, PAIN, TEARING, AND BLURRED OR HAZY VISION.

SKIN CONTACT:
MECHANICAL SKIN IRRITATION:
SIGNS/SYMPTOMS MAY INCLUDE ABRASION, REDNESS, PAIN, AND ITCHING.

INHALATION:
DUST FROM CUTTING, GRINDING, SANDING OR MACHINING MAY CAUSE IRRITATION OF THE RESPIRATORY SYSTEM. SIGNS/SYMPTOMS MAY INCLUDE COUGH, SNEEZING, NASAL DISCHARGE, HEADACHE, HOARSENESS, AND NOSE AND THROAT PAIN.

PROLONGED OR REPEATED EXPOSURE MAY CAUSE:
PNEUMOCONIOSIS:
SIGN/SYMPTOMS MAY INCLUDE PERSISTENT COUGH, BREATHLESSNESS, CHEST PAIN, INCREASED AMOUNTS OF SPUTUM, AND CHANGES IN LUNG FUNCTION TESTS.

INGESTION:
PHYSICAL BLOCKAGE:
SIGNS/SYMPTOMS MAY INCLUDE CRAMPING, ABDOMINAL PAIN, AND CONSTIPATION.

CARCINOGENICITY: CONTAINS A CHEMICAL OR CHEMICALS WHICH CAN CAUSE CANCER.

INGREDIENT	C.A.S. NO.	CLASS DESCRIPTION	REGULATION
CARBON BLACK	1333-86-4	GROUP 2B	INTERNATIONAL AGENCY FOR RESEARCH ON CANCER

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES:
THE FOLLOWING FIRST AID RECOMMENDATIONS ARE BASED ON AN ASSUMPTION THAT APPROPRIATE PERSONAL AND INDUSTRIAL HYGIENE PRACTICES ARE FOLLOWED.

EYE CONTACT:
FLUSH EYES WITH LARGE AMOUNTS OF WATER. IF SIGNS/SYMPTOMS PERSIST, GET MEDICAL ATTENTION.

SKIN CONTACT:
WASH AFFECTED AREA WITH SOAP AND WATER. IF SIGNS/SYMPTOMS DEVELOP, GET MEDICAL ATTENTION.

INHALATION:
REMOVE PERSON TO FRESH AIR. IF SIGNS/SYMPTOMS DEVELOP, GET MEDICAL ATTENTION.

IF SWALLOWED:
DO NOT INDUCE VOMITING UNLESS INSTRUCTED TO DO SO BY MEDICAL PERSONNEL. GIVE VICTIM TWO GLASSES OF WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES:

AUTOIGNITION TEMPERATURE: NOT APPLICABLE

FLASH POINT: NOT APPLICABLE

FLAMMABLE LIMITS - LEL: NOT APPLICABLE
FLAMMABLE LIMITS - UEL: NOT APPLICABLE

5.2 EXTINGUISHING MEDIA:
ORDINARY COMBUSTIBLE MATERIAL. USE FIRE EXTINGUISHERS WITH CLASS A EXTINGUISHING AGENTS (E.G., WATER, FOAM).

5.3 PROTECTION OF FIRE FIGHTERS:

SPECIAL FIRE FIGHTING PROCEDURES:
WEAR FULL PROTECTIVE EQUIPMENT (BUNKER GEAR) AND A SELF-CONTAINED BREATHING APPARATUS (SCBA).

UNUSUAL FIRE AND EXPLOSION HAZARDS:
NOT APPLICABLE. NONE INHERENT IN THIS PRODUCT.

NOTE:
SEE STABILITY AND REACTIVITY (SECTION 10) FOR HAZARDOUS COMBUSTION AND THERMAL DECOMPOSITION INFORMATION.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: NOT APPLICABLE.

IN THE EVENT OF A RELEASE OF THIS MATERIAL, THE USER SHOULD DETERMINE IF THE RELEASE QUALIFIES AS REPORTABLE ACCORDING TO LOCAL, STATE, AND FEDERAL REGULATIONS.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING:
FOR INDUSTRIAL OR PROFESSIONAL USE ONLY. AVOID BREATHING OF DUST CREATED BY SANDING, GRINDING OR MACHINING. DAMAGED PRODUCT CAN BREAK APART DURING USE AND CAUSE SERIOUS INJURY TO FACE OR EYES. CHECK PRODUCT FOR DAMAGE SUCH AS CRACKS OR NICKS PRIOR TO USE. REPLACE IF DAMAGED. ALWAYS WEAR EYE AND FACE PROTECTION WHEN WORKING AT SANDING OR GRINDING OPERATIONS OR WHEN NEAR SUCH OPERATIONS. SPARKS AND PARTICLES FLYING FROM THE PRODUCT DURING SANDING OR GRINDING CAN CAUSE INJURY AND FIRE.

7.2 STORAGE: STORE IN A COOL, DRY PLACE.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS:
USE WITH APPROPRIATE LOCAL EXHAUST VENTILATION. USE GENERAL DILUTION VENTILATION AND/OR LOCAL EXHAUST VENTILATION TO CONTROL AIRBORNE EXPOSURES TO BELOW OCCUPATIONAL EXPOSURE LIMITS AND/OR CONTROL DUST, FUME, OR AIRBORNE PARTICLES. IF VENTILATION IS NOT ADEQUATE, USE RESPIRATORY PROTECTION EQUIPMENT. PROVIDE APPROPRIATE LOCAL EXHAUST VENTILATION FOR SANDING, GRINDING OR MACHINING.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE):

8.2.1 EYE/FACE PROTECTION:
AVOID EYE CONTACT. TO MINIMIZE THE RISK OF INJURY TO FACE AND EYES, ALWAYS WEAR EYE AND FACE PROTECTION WHEN WORKING AT SANDING OR GRINDING OPERATIONS OR WHEN NEAR SUCH OPERATIONS.

8.2.2 SKIN PROTECTION:
AVOID SKIN CONTACT. GLOVES ARE NOT REQUIRED. SELECT AND USE GLOVES AND/OR PROTECTIVE CLOTHING TO PREVENT SKIN CONTACT BASED ON THE RESULTS OF AN EXPOSURE ASSESSMENT. CONSULT WITH YOUR GLOVE AND/OR PROTECTIVE CLOTHING MANUFACTURER FOR SELECTION OF APPROPRIATE COMPATIBLE MATERIALS. WEAR APPROPRIATE GLOVES TO MINIMIZE RISK OF INJURY TO SKIN FROM CONTACT WITH DUST OR PHYSICAL ABRASION FROM GRINDING OR SANDING.

8.2.3 RESPIRATORY PROTECTION:
UNDER NORMAL USE CONDITIONS, AIRBORNE EXPOSURES ARE NOT EXPECTED TO BE

SIGNIFICANT ENOUGH TO REQUIRE RESPIRATORY PROTECTION. AVOID BREATHING OF DUST CREATED BY SANDING, GRINDING OR MACHINING. ASSESS EXPOSURE CONCENTRATIONS OF ALL MATERIALS INVOLVED IN THE WORK PROCESS. CONSIDER MATERIAL BEING ABRADED WHEN DETERMINING THE APPROPRIATE RESPIRATORY PROTECTION. SELECT AND USE APPROPRIATE RESPIRATORS TO PREVENT INHALATION OVEREXPOSURE.

8.2.4 PREVENTION OF SWALLOWING:
WASH HANDS AFTER HANDLING AND BEFORE EATING. NOT AN EXPECTED ROUTE OF EXPOSURE.

8.3 EXPOSURE GUIDELINES:

INGREDIENT	AUTHORITY	TYPE	LIMIT	ADDITIONAL INFORMATION
CARBON BLACK	ACGIH	TWA	3.5 MG/M3	TABLE A4
CARBON BLACK	CMRG	TWA	0.5 MG/M3	
CARBON BLACK	OSHA	TWA	3.5 MG/M3	TABLE Z-1
SILICON CARBIDE MINERAL	ACGIH	TWA, AS FIBROUS FORMS, INCLUDING WHISKERS	0.1 FIBER/CC	TABLE A2
SILICON CARBIDE MINERAL	ACGIH	TWA, AS NON-FIBROUS, RESPIRABLE	3 MG/M3	
SILICON CARBIDE MINERAL	ACGIH	TWA, AS NON-FIBROUS, INHALABLE FRACTION	10 MG/M3	
SILICON CARBIDE MINERAL	OSHA	TWA, RESPIRABLE	5 MG/M3	TABLE Z-1
SILICON CARBIDE MINERAL	OSHA	TWA, VACATED, AS DUST	10 MG/M3	
SILICON CARBIDE MINERAL	OSHA	TWA, AS TOTAL DUST	15 MG/M3	TABLE Z-1
STEARATES	ACGIH	TWA, AS TOTAL DUST	10 MG/M3	TABLE A4

VAC VACATED PEL:
VACATED PERMISSIBLE EXPOSURE LIMITS (PEL) ARE ENFORCED AS THE OSHA PEL IN SOME STATES. CHECK WITH YOUR LOCAL REGULATORY AGENCY.

SOURCE OF EXPOSURE LIMIT DATA:
ACGIH: AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS
CMRG: CHEMICAL MANUFACTURER RECOMMENDED GUIDELINE
OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
AIHA:
AMERICAN INDUSTRIAL HYGIENE ASSOCIATION WORKPLACE ENVIRONMENTAL EXPOSURE LEVEL (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

ODOR, COLOR, GRADE: SOLID ABRASIVE PRODUCT

GENERAL PHYSICAL FORM: SOLID

AUTOIGNITION TEMPERATURE: NOT APPLICABLE

FLASH POINT: NOT APPLICABLE

FLAMMABLE LIMITS - LEL: NOT APPLICABLE
FLAMMABLE LIMITS - UEL: NOT APPLICABLE

BOILING POINT: NOT APPLICABLE

VAPOR DENSITY: NOT APPLICABLE

VAPOR PRESSURE: NOT APPLICABLE

SPECIFIC GRAVITY: NOT APPLICABLE

pH: NOT APPLICABLE

MELTING POINT: NOT APPLICABLE

SOLUBILITY IN WATER: NOT APPLICABLE

SECTION 10: STABILITY AND REACTIVITY

STABILITY: STABLE.

MATERIALS AND CONDITIONS TO AVOID: NOT APPLICABLE

HAZARDOUS POLYMERIZATION: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

SUBSTANCE	CONDITION
CARBON MONOXIDE	DURING COMBUSTION
CARBON DIOXIDE	DURING COMBUSTION

HAZARDOUS DECOMPOSITION:
UNDER RECOMMENDED USAGE CONDITIONS, HAZARDOUS DECOMPOSITION PRODUCTS ARE NOT EXPECTED. HAZARDOUS DECOMPOSITION PRODUCTS MAY OCCUR AS A RESULT OF OXIDATION, HEATING, OR REACTION WITH ANOTHER MATERIAL.

SECTION 11: TOXICOLOGICAL INFORMATION

PLEASE CONTACT THE ADDRESS LISTED IN SECTION 1 OF THIS MSDS FOR TOXICOLOGICAL INFORMATION ON THIS MATERIAL AND/OR ITS COMPONENTS.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: NOT DETERMINED.

CHEMICAL FATE INFORMATION: NOT DETERMINED.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
THE SUBSTRATE THAT WAS ABRADED MUST BE CONSIDERED AS A FACTOR IN THE DISPOSAL METHOD FOR THIS PRODUCT.
DISPOSE OF WASTE PRODUCT IN A SANITARY LANDFILL. AS A DISPOSAL ALTERNATIVE, INCINERATE IN AN INDUSTRIAL OR COMMERCIAL FACILITY.
SINCE REGULATIONS VARY, CONSULT APPLICABLE REGULATIONS OR AUTHORITIES BEFORE DISPOSAL.

SECTION 14: TRANSPORT INFORMATION

PLEASE CONTACT THE EMERGENCY NUMBERS LISTED IN SECTION 1 OF THIS MSDS FOR TRANSPORTATION INFORMATION FOR THIS MATERIAL.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS: CONTACT 3M FOR MORE INFORMATION.

311/312 HAZARD CATEGORIES:
FIRE HAZARD - NO
PRESSURE HAZARD - NO
REACTIVITY HAZARD - NO
IMMEDIATE HAZARD - YES
DELAYED HAZARD - NO

STATE REGULATIONS: CONTACT 3M FOR MORE INFORMATION.

CALIFORNIA PROPOSITION 65:

INGREDIENT	C.A.S. NO.	CLASSIFICATION
CARBON BLACK	1333-86-4	**CARCINOGEN

** WARNING:
CONTAINS A CHEMICAL WHICH CAN CAUSE CANCER.

CHEMICAL INVENTORIES:
THIS PRODUCT IS AN ARTICLE AS DEFINED BY TSCA REGULATIONS, AND IS EXEMPT FROM TSCA INVENTORY LISTING REQUIREMENTS.
CONTACT 3M FOR MORE INFORMATION.

INTERNATIONAL REGULATIONS: CONTACT 3M FOR MORE INFORMATION.

THIS MSDS HAS BEEN PREPARED TO MEET THE U.S. OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA HAZARD CLASSIFICATION:
HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 0
SPECIAL HAZARDS: NONE

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD RATINGS ARE DESIGNED FOR USE BY EMERGENCY RESPONSE PERSONNEL TO ADDRESS THE HAZARDS THAT ARE PRESENTED BY SHORT-TERM, ACUTE EXPOSURE TO A MATERIAL UNDER CONDITIONS OF FIRE, SPILL, OR SIMILAR EMERGENCIES. HAZARD RATINGS ARE PRIMARILY BASED ON THE INHERENT PHYSICAL AND TOXIC PROPERTIES OF THE MATERIAL BUT ALSO INCLUDE THE TOXIC PROPERTIES OF COMBUSTION OR DECOMPOSITION PRODUCTS THAT ARE KNOWN TO BE GENERATED IN SIGNIFICANT QUANTITIES.

REVISION CHANGES:
SECTION 1: PRODUCT NAME WAS MODIFIED.
SECTION 1: PRODUCT USE INFORMATION WAS MODIFIED.
SECTION 16: NFPA HAZARD CLASSIFICATION FOR HEALTH WAS MODIFIED.
SECTION 8: ENGINEERING CONTROLS INFORMATION WAS MODIFIED.
SECTION 8: SKIN PROTECTION PHRASE WAS MODIFIED.
SECTION 8: RESPIRATORY PROTECTION INFORMATION WAS MODIFIED.
SECTION 3: IMMEDIATE OTHER HAZARD(S) WAS MODIFIED.
SECTION 2: INGREDIENT TABLE WAS MODIFIED.
PAGE HEADING: PRODUCT NAME WAS MODIFIED.
SECTION 15: 311/312 DELAYED HAZARD SCORE WAS MODIFIED.
SECTION 15: CALIFORNIA PROPOSITION 65 INGREDIENT INFORMATION WAS MODIFIED.
SECTION 3: CARCINOGENICITY TABLE WAS MODIFIED.
SECTION 8: EXPOSURE GUIDELINES INGREDIENT INFORMATION WAS MODIFIED.
SECTIONS 3 AND 9: ODOR, COLOR, GRADE INFORMATION WAS MODIFIED.

(061805-0535@ -50092133-97920080)	DATE OF ISSUE 04/18/91	SUPERSEDES 11/11/87

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS	TRADE NAME & SYNONYMS
COATED ABRASIVE	2" FLAP WHEEL
CHEMICAL FAMILY	FORMULA
ALUMINA OXIDE AND RESIN BINDER	<--MIXTURE

MANUFACTURERS NAME:
X-ERGON, A PARTSMASTER CO., DIV OF NCH

ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE)
BOX 152170
IRVING, TEXAS 75015

PREPARED BY:	PRODUCT CODE NUMBER	EMERGENCY TELEPHONE NUMBER
LINDA M. SILAS	97920080	214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV	PEL	CAS#
ALUMINUM OXIDE	IRRITANT	10MG/M3	15MG/M3	1349-28-1

SECTION III - PHYSICAL DATA

BOILING PT.(FAHRENHEIT)	N/A	SPEC GRAVITY (H2O=1)	:N/A
VAPOR PRESSURE (MM HG).	N/A	COLOR	CLOTH COATED WITH
VAPOR DENSITY (AIR=1)	N/A	ODOR	ABRASIVE MATERIAL

PH @ 100%	N/A	CLARITY	OPAQUE
PERCENT, VOLATILE BY VOLUME (%)	0	EVAPORATION RATE (BU AC = 1)	0
SOLUBILITY IN WATER	NEGLIGIBLE		
VISCOSITY	SOLID		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
N/A N/A		N/A	N/A

EXTINGUISHING MEDIA "ALCOHOL"
<--FOAM <--FOAM <--CO2 DRY <--CHEMICAL <--WATER SPRAY <--OTHER

SPECIAL FIRE FIGHTING PROCEDURES
BACKINGS AND RESIN BINDER WILL BURN OR DECOMPOSE; USE RESPIRATORY PROTECTION.

UNUSUAL FIRE & EXPLOSION HAZARDS
N/A

NFPA HAZARD RATING (0=INSIGNIFICANT;1=SLIGHT;2=MODERATE;3=HIGH;4=EXTREME):
1 <--HEALTH 0 <--FLAMMABILITY 0 <--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

N/A

EFFECTS OF OVEREXPOSURE

- ACUTE - (SHORT TERM EXPOSURE)

INHALATION: MAY CAUSE COUGHING, SHORTNESS OF BREATH
INGESTION: NO KNOWN ADVERSE EFFECTS, BUT INGESTION NOT RECOMMENDED.
SKIN: NOT ABSORBED THROUGH SKIN; MAY CAUSE ABRASIONS.
EYE: DUST MAY IRRITATE EYES.
OTHER POTENTIAL HEALTH RISKS: DURING USE ON SOME MATERIALS, ELEVATED SOUND LEVELS MAY BE CREATED WHICH AFFECT HEARING.

- CHRONIC - (LONG TERM EXPOSURE)

INHALATION: MAY EFFECT BREATHING CAPACITY

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
A FORMALDEHYDE OR PHENOLIC RESIN ODOR FROM THE
BINDING SYSTEM MAY ON OCCASION BE RELEASED
DURING STORAGE.

OTHER PRECAUTIONS
N/A

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
ALUMINUM OXIDE	1344-28-1	90

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.
IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND LABELED FOR MAINTAINING MOTOR VEHICLES.

CALIFORNIA PROPOSITION 65
WARNING: THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE (1) CANCER OR (2) BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:
NONE

SECTION XII - TRANSPORTATION * (FOR FUTURE USE)

APPLICABLE REGULATIONS
<--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (AFR 71-4)

SHIPPING NAME

HAZARD CLASS | ID NUMBER | REPORT QTY

LABELS | LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER | NET EXPLOSIVE WT.

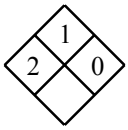
AEROSOL PROPELLANT(S)

1. "THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES FOR 1989-1990", AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS.
2. "AIR CONTAMINANTS - PERMISSIBLE LIMITS" CFR 29 (1910.1000), U.S.DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

MATERIAL SAFETY DATA SHEET

VENDEE AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THIS PRODUCT IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THE DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR SUCH INJURY. FURTHERMORE, VENDOR SHALL NOT BE LIABLE FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ANY ABNORMAL USE OF THIS PRODUCT EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED.
ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. POSTING THIS DOCUMENT FOR EMPLOYEE NOTIFICATION IS RECOMMENDED BY THE VENDOR.

N. F. P. A.



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME **"2000"® Arctic Grade**

SYNONYMS Not Applicable **INTENDED USE** Industrial

MANUFACTURER'S NAME Bestolife Corporation **TELEPHONE #** (214)631-6070

ADDRESS 2777 Stemmons Freeway Suite 1800, Dallas, Texas 75207 **TRANSP. EMERGENCY #** (800)424-9300

FOR ADDITIONAL INFORMATION CONTACT Bestolife Corporation **DATE** June 2011 Revised

2. COMPOSITION, INFORMATION ON INGREDIENTS

MATERIAL OR COMPONENT	WEIGHT	OSHA		ACGIH		Other
(CAS#)	%	PEL/TWA	Ceiling	TLV/TWA	TLV/STEL	
Petroleum Grease Mixture (CAS# 64742-53-6, 3159-62-4, 64742-52-5, Mixture)	35-60	5mg/m³**	None	5mg/m³**	10mg/m³**	Not Applicable
Copper (CAS# 7440-50-8)	1-5	0.1mg/m³***	None	0.2mg/m³***	None	Not Applicable
Other Non-Hazardous Ingredients						

*Respirable Dust **Oil Mist, Mineral ***Fume

3. HAZARDS IDENTIFICATION

Routes of Exposure for Users

Skin Contact	May cause irritation.
Skin Absorption	Organic compounds contained herein may be absorbed through the skin.
Eye Contact	May cause irritation.
Ingestion	This product may be absorbed by the digestive system. Ingestion can result in both acute and chronic overexposure.
Inhalation	If the grease base has been removed, i.e. by volatile solvents, heat, etc., the remaining powders and metallics can pose an inhalation hazard resulting in both acute and chronic overexposure as well as lung irritation, lung injury, or other health effects.

Effects of Overexposure

Acute Product may cause irritation to the eyes and/or skin. Ingestion of the product may cause gastrointestinal irritation and upset.

Chronic Prolonged and repeated contact with the product may cause a defatting of the skin, dermatitis, folliculitis and/or oil acne.

Signs and Symptoms of Exposure Skin or eye irritation; see effects of overexposure described above.

Aggravated Medical Conditions Chronic forms of kidney, liver, and hematopoietic diseases; preexisting respiratory and cardiovascular disorders may be aggravated by ingestion or inhalation of large doses. Preexisting eye or skin disorders may be aggravated by prolonged contact with this product.

Notes to Physician The hydrocarbons contained in this product are mild irritants of the eyes and mucous membranes, central nervous system depressants, and primary chemical irritants of the skin. Prolonged or repeated skin contact, especially with poor personal hygiene, may cause skin disorders. For combustion product effects see Hazardous Combustion Products in Section 5. Fire Fighting Measures.

4. FIRST AID MEASURES

Eyes	Flush with copious amounts of water. Get immediate medical attention.
Skin	Wash thoroughly with soap and water after use. If irritation occurs, get medical attention.
Ingestion	Get immediate medical attention. DO NOT INDUCE VOMITING! Possible aspiration hazard.
Inhalation	Remove from exposure. Get medical attention if experiencing cough, irritation or difficult breathing.

5. FIRE FIGHTING MEASURES

Flash Point Minimum 330°F (166°C) Test Method: ASTM D 92, C.O.C.

Flammable Limits in Air (% by volume, estimated) Lower: Not Available Upper: Not Available

Auto-ignition Temperature Not Available

Hazardous Combustion Products Combustion products are highly dependent on the combustion conditions. CO, CO_2, CaO, LiO_2, fluorides, oxygenates, and unidentified organic compounds may be formed during combustion. High temperatures may produce metal fume, vapor, and/or dust. Combustion products may cause effects of overexposure as noted in Section 3. Hazards Identification. They may also cause headache; dizziness; coma; convulsion; weakness; drowsiness; tachypnea; nausea; paresthesias; dyspnea; asphyxiation; mild to severe eye, skin or respiratory tract irritation; metal fume fever; metallic taste in mouth; cough; pneumonia; pneumoconiosis; ulceration or perforation of the nasal septum; polymer fume fever; cumulative bone damage; excessive salivation; thirst; sweating; stiff spine; calcification of ligaments of ribs and pelvis; lung damage; and/or central nervous system effects. Other unidentified health effects may occur.

Conditions Contributing to Flammability High temperatures; open flame; combining with strong oxidizer or acid

Extinguishing Media Dry chemical, water fog, foam, or carbon dioxide may be suitable for extinguishing fires involving this product. Do not spray water directly on burning material. Observe caution when using water or foam as frothing may occur.

Special Fire Fighting Procedures Use full-body protection and full-face, self-contained breathing apparatus operated in a positive-pressure mode. Use water spray (fog) to cool containers and disperse vapors.

Unusual Fire and Explosion Hazards Product fume and/or vapor may be irritating or toxic if inhaled. The product, or its dust, can react vigorously with strong oxidizing agents.

Sensitivity to Impact Not Applicable **Sensitivity to Static Discharge** Not Applicable

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled Clean area with an appropriate cleanser. Keep petroleum products out of streams and waterways. Assure conformity with applicable governmental regulations.

Neutralizing Chemicals Not Applicable

7. HANDLING AND STORAGE

The two major means of metal absorption are inhalation and ingestion. After use, always wash hands before smoking, eating, or drinking. Smoking, eating, and drinking should be confined to uncontaminated areas.

Work clothes and equipment should remain in designated areas. Before reuse, launder contaminated clothing separate from personal clothing.

Avoid skin contact and use personal protection when handling product, waste product, or contaminated equipment. Wash with soap and water after use. Prolonged and repeated contact can cause defatting action of the skin and may cause disorders such as dermatitis, folliculitis, and oil acne.

This product is intended for industrial use only. KEEP OUT OF REACH OF CHILDREN.

This product may separate. Stir well before use. The flash point of this product depends on the degree of separation. Store in a cool, dry area where accidental contact with acids is not possible. Keep storage containers closed when not in use. Do not store or handle near high temperature or open flame.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Ventilation Requirements No special requirements under conditions of normal use (air concentrations below PEL/TLV levels).

Specific Personal Protection Equipment

RESPIRATORY	None required for normal use. Dry residue may be created by high downhole temperatures; if the residue is removed without a solvent or other means of controlling dust, workers should wear air-purifying respirators.
EYE	Vented goggles or safety glasses with side shields should be worn when using this product.
GLOVE	Oil-resistant gloves should be worn when handling this product.
OTHER CLOTHING AND EQUIPMENT	As appropriate for the industrial environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT @ 760 mm Hg	500°F (260°C) Approx. IBP	**MELTING POINT**	285°F (140°C) dropping point of grease
SPECIFIC GRAVITY (H_2O = 1)	1.2	**VAPOR PRESSURE (Reference Temperature)**	Not Available
VAPOR DENSITY (Air = 1)	Greater than 1	**SOLUBILITY IN H_2O (% by wt.)**	Negligible
% VOLATILE BY VOLUME	Not Available	**EVAPORATION RATE (Butyl Acetate = 1)**	Less than 1
COEFF. WATER/OIL DISTRIBUTION	Not Available	**pH**	Not Available
FREEZING POINT	Not Available	**ODOR THRESHOLD**	Not Available
APPEARANCE AND ODOR	Black-copper semisolid, oil/grease odor, noncombustible, nonvolatile under normal use		

10. STABILITY AND REACTIVITY

Conditions Contributing to Instability Not Applicable **Reactivity** Not Applicable

Incompatibility Strong oxidizers or acids combined with this product may liberate hydrogen gas.

Hazardous Decomposition Products Under normal temperatures this product will not decompose.

Conditions Contributing to Hazardous Polymerization Not Applicable

11. TOXICOLOGICAL INFORMATION

Toxicity, Mutagenic, Teratogenic, Synergistic and Sensitization Information LD_{50} and LC_{50} information on the oil and grease is not available. OSHA Trade Secret has an Acute oral $LD_{50(rat)}$ of 7780 mg/ kg. Other LD_{50} and LC_{50} information is not available. Rare cases of allergic contact dermatitis have been reported in people working with copper dust.

Carcinogenicity According to the OSHA Hazard Communication Standard, a carcinogenic warning statement is not required.

12. ECOLOGICAL INFORMATION

Not Available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Discard in accordance with local, state, and federal regulations. Empty containers are exempt from RCRA Subtitle C if they contain no more than 2.5 cm of their original contents in the bottom of the container or less than 3% of the original net weight (less than 0.3% by weight for containers over 110 gallons), or if the residue is analyzed and demonstrated to be nonhazardous.

"Empty" Container Warning "Empty" containers retain residue and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY AND/OR DEATH. "Empty" containers should be completely drained and properly sealed. Recycle or discard plastic liner, pail or drum in accordance with local, state, and federal regulations. "Empty" drums may be sent to a drum reconditioner.

14. TRANSPORT INFORMATION

U.S. DOT: Not regulated by Ground unless it is being shipped by vessel, then it may be classified on documentation as UN3082, Environmentally Hazardous Substance, Liquid n.o.s. (Copper Metal Powder), Class 9, PGIII, Marine Pollutant, (Prepared in compliance with IMDG).
ICAO/IATA: Not regulated.
IMDG: UN3082 Environmentally Hazardous Substance, Liquid, n.o.s. (Copper Metal Powder), Class 9, PGIII, Marine Pollutant.

Canadian Transportation of Dangerous Goods This product is not considered a Hazardous Material for shipping under Canadian Transportation of Dangerous Goods.

15. REGULATORY INFORMATION

Toxic Chemical Release Reporting, EPA Regulation 40 C.F.R. §372 (SARA Section 313) Reportable chemicals in product: 1-5% copper (CAS #7440-50-8)

Toxic Substances Control Act (TSCA), EPA Regulation 40 C.F.R. §710 The product is a mixture as defined by TSCA. The chemical ingredients in this product are in the Section 8(b) Chemical Substance Inventory (40 C.F.R. §710) and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, this company relies on the assurance of responsible third parties in providing this statement.

Canadian Workplace Hazardous Materials Information System
This MSDS has been prepared to meet WHMIS and OSHA requirements using the ANSI 16 heading MSDS format.

16. OTHER INFORMATION

Not Applicable

MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT IDENTIFICATION

PRODUCT NAME	Willert Item No.
24 oz. Para Block w/Hang-Up Carton	24
Willert Closet Freshener Lavender Scented 2oz.	126LA
Willert Closet Freshener Lemon Scented 2oz.	126LE
Giant Deodorant Blocks	200
Bowl Fresh Toilet Bowl Deodorizer Cherry Spanish	201
Bowl Fresh Toilet Bowl Deodorizer Cherry	203
Bowl Fresh Toilet Bowl Deodorizer w/Wire Hanger 3 oz.	207
Bowl Fresh Toilet Bowl Deodorizer Cherry w/Plastic Hanger 4oz.	208
Protecto Toilet Bowl Deodorizer Cherry	213
Bowl Fresh Toilet Bowl Deodorizer Potpourri	215
Deluxe Cherry Toilet Bowl Deodorizer	216
Bowl Fresh Toilet Bowl Deodorizer	400
Bowl Fresh Lemon Toilet Bowl Deodorizer	410
Bowl Fresh Potpourri Toilet Bowl Deodorizer	412
Willert Closet Freshener Lavender Scented	499LA
Willert Closet Freshener Lemon Scented	499LE
Willert Closet Freshener Spring Bouquet Scented	499SB
Bowl Fresh Tissue Holder Refill	549
Bowl Fresh Bathroom Freshener and Tissue Roll Holder	598
Cedar Para Moth Balls 150 Gram	B150
Cedar Para Moth Balls	B400
2/20 Lb. Jumbo Deodorant Blocks	BBB
Strawberry Bathroom Bouquet Air Freshener	C41DS
Willert Garbage Can Deodorizer	G35
PARADICHLOROBENZENE	PARANR
Puro Perfumed Deodorant Block	P102B
Bowl Fresh Toilet Bowl Deodorizer Cherry	P203
Willert Solid Sachet Air Freshener	R30
Bowl Fresh Toilet Bowl Deodorizer	WM400
Bowl Fresh Toilet Bowl Deodorizer	WM404

Willert Home Products
4044 Park Avenue
St. Louis, MO 63110

EMERGENCY TELEPHONE NUMBER: 314-772-2822 (8:30 AM to 4:30 PM CST)
CHEMTREC 800-424-9300

THE INFORMATION CONTAINED IN THIS MATERIAL SAFETY SHEET IS DIRECTED AT OCCUPATIONAL EXPOSURE AND MAY NOT BE APPLICABLE TO CONSUMER USE OF THE PRODUCTS.

SECTION 2: HAZARDOUS COMPONENT INFORMATION

Hazardous Ingredients	CAS Number	Wt. %
p-dichlorobenzene (1,4-dichlorobenzene)	106-46-7	95+

SECTION 3: HAZARDS IDENTIFICATION

Emergency Overview: White balls, blocks and cakes. Some products may be incased in plastic containers and some products contain fragrance. Harmful if swallowed or inhaled. Dust and vapors may cause eye and respiratory tract irritation. Flammable.

Potential Health Effects:

Relevant Routes of Exposure: Inhalation, Ingestion, Eye Contact, Skin Contact.

Acute Effects:

Ingestion: Symptoms may also include nausea, vomiting, diarrhea, and stomach distress.
Eyes: Vapors may cause irritation. Dust or particles can cause severe irritation.
Inhalation: Dust and vapors can cause respiratory tract irritation. Vapor concentrations of p-dichlorobenzene that exceed permissible exposure limits can cause central nervous system depression. Symptoms could include the dizziness, blurred vision, nausea, feeling of drunkenness, unconsciousness and even death.
Skin: Repeated or prolonged contact may cause a skin irritation.

Carcinogenicity: Listed by NTP and IARC as a carcinogen.

Reproductive Effects: None known.

Target Organs: Ocular, respiratory, dermal, liver, kidneys, central nervous (CNS).

Medical Conditions Aggravated By Exposure: Liver, kidney, chronic respiratory disease.

SECTION 4: FIRST AID PROCEDURES

First Aid Procedures:

EYES: Immediately flush eyes with a directed stream of water for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. Remove contact lenses, if present, after the first five minutes and continue rinsing the eye. Call a physician or poison control center immediately.

SKIN: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Wash clothing before reuse. If irritation occurs, get medical attention.

INHALATION: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

INGESTION: Do not give anything by mouth to an unconscious person. Call poison control center or doctor immediately for treatment advice. Have person rinse the mouth with water. If able to swallow, have the person sip a glass of water. Do not induce vomiting unless told to do so by a poison control center or doctor.

NOTE TO PHYSICIAN: Treatment is mainly symptomatic and supportive.

SECTION 5: FIRE HAZARDS,

Unusual Fire and Explosion Hazards: Flammable solid, liquid and vapors.

Fire Fighting Procedures:

NIOSH approved positive pressure, self-contained breathing apparatus and full protective turn-out gear.

Evacuate personnel to an area upwind to avoid smoke and vapors.

Remove containers of this material if it can be done safely.

Use water to keep fire exposed containers cool.

Protective clothing and equipment must be decontaminated if contact with the material or vapors has occurred.

Extinguishing Media: All common extinguishing media are suitable.

Conditions to Avoid: Elevated temperatures.
Hazardous Combustion Products: May produce irritating and toxic smoke and fumes. The composition of the combustion products have not been determined.

Flash Point: 65° C (Cleveland Open Cup)

Flammability Limits: **Lower:** Not determined **Upper:** Not determined

Autoignition Temperature: Not determined.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Pre-Entry Spill Procedure:

Shut off source of spill if it is safe to do so.

Eliminate sources of ignition.

Review Section 3 - Hazards Identification and Section 8- Exposure Control/Personal Protection before proceeding with the clean up.

Clean Up and Containment:

Scoop or shovel spilled material into suitable labeled containers with a tight fitting lid.

Secure the drum cover and move the container to a safe holding area.

Check area for residual material and repeat clean up if detected.

Environmental Concerns: None known.

Treatment and Disposal:

Decontaminate or dispose of all protective clothing and equipment.

See Section 13 - Disposal Recommendations for disposal information.

Reporting Requirements:

The United States Environmental Protection Agency (USEPA) has established a Reportable Quantity (RQ) for release of this material. See Section 15.

Report all releases, which are likely to endanger the public health, harm the environment, or cause complaint to the appropriate State or Local officials.

SECTION 7: HANDLING AND STORAGE

General Measures:

Store at room temperature, in airtight containers and protect from light.

Do not generate dust or exposure to ignition source.

Keep away from heat, sparks, and flame.

Materials or Conditions to Avoid:

Contact with oxidizing and reducing agents.

Elevated temperatures.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

General Hygienic Practices:

Do not get on eyes, skin, or clothing.

Do not breathe vapors, dust or fumes.

Wash thoroughly after handling.

Recommended Exposure Limits:

p-dichlorobenzene: ACGIH TLV: 10 ppm (60 mg/m^3) 8-hr TWA A3*
*ACGIH has designated this component as an "A3"substance thereby including it among substances that are animal carcinogens with unknown relevance to man.

OSHA PEL: 75 ppm (450 mg/m^3) 8-hr TWA

Mexican OEL: 450 mg/m^3 8-hr TWA
Mexican OEL: 675 mg/m^3 15-minute STEL

Personal Protective Equipment:

Eyewear: Chemical goggles.

Skin: Gloves are required if there is a potential for skin contact. A plastic or Vitron polyvinyl alcohol provides a physical barrier is required. Use disposable spun polyolefin (e.g. Tyvek) coveralls or equivalent to protect against contact. Consult the glove and clothing manufacturers, suppliers and/or industrial hygienist for further information.

Respiratory Protection: Respiratory protection is required whenever air contamination (dust, mist, or vapors) is generated by the process. A NIOSH approved high efficiency toxic dust/mist/fume respirator is recommended.

Work Practices and Engineering Controls:

General room ventilation is adequate unless the process generates dust or fumes.

Work-clothing should be removed in a change room on site and laundered professionally.

Employees should shower and change into street clothes before leaving the facility.

Prevent the accumulation of dust in the work area by thorough periodic cleaning of the area.

Protective Measures During Repair and Maintenance: No special measures are required. Follow the recommendation for personal protective equipment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Balls, blocks and cakes. (Some products may be incased in plastic containers.)
Color: White.
Odor: Pleasant characteristic odor (mothballs). Some products contain a fragrance.
Taste: Not determined.
pH: Not applicable.
Volatile (Wt. or Vol.), %: 100%.
Moisture Content, (Wt.) %: Not determined.
Solubility in Water: 0.08 g/l at 25^0 C
Solubility - other solvents: Soluble in ethanol, benzene.
Specific Gravity/Bulk Density: Varies with product type.
Vapor Pressure: 0.59 mm Hg at 20^0 C; 11.5 mm Hg at 60^0 C
Vapor Density (air = 1): 5.1.
Evaporation Rate: p-dichlorobenzene sublimes at room temperature.
Boiling Point: 174^0 C
Melting Point: 53.5°C

SECTION 10: STABILITY AND REACTIVITY

General Stability Considerations: Stable at room temperature.

Incompatible Materials: Oxidizing and reducing agents.

Hazardous Decomposition Products: Not determined.

Hazardous Polymerization: Does not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

p-Dichlorobenzene: Acute Toxicity: Oral - rat LD_{50} = 2512 mg/kg; Oral - rabbit LD_{50} = 2812 mg/kg; Oral - mouse LD_{50} = 2950-3220 mg/kg; Oral – guinea pig LD_{50} = 7595 mg/kg; Dermal - rat LD_{50} = >8g/kg; Inhalation - cat 30 minute LCL_0 = 37 g/m^3; Oral guinea pig Intraperitoneal - mouse LDL_0 = 2800 mg/kg; Oral human LDL_0 = 857 mg/kg; Dermal - rabbit LD_{50} = >2 g/kg mg/kg.

Reproductive/Teratogenicity Effects: p-Dichlorobenzene has not been shown to cause birth defects (teratogenic) in laboratory animals.

Mutagenicity/Genotoxicity Information: -Dichlorobenzene has not been shown to be mutagenic.

Carcinogenicity and Chronic Toxicity: Two-year oral dosing studies with p-dichlorobenzene, by the National Toxicology program (NTP), indicated clear evidence for carcinogenicity in the livers of male and female mice and in the kidneys of male rats. The relevance of these studies to humans has not been determined.

SECTION 12: ECOLOGICAL INFORMATION

Environmental Fate: p-Dichlorobenzene: Soil absorption: log K_{oc} (Fullerton soil, 0.06% organic carbon) =850 ; log P_{oct} 3.39 at 20°C; Biodegradation: domestic sewage, Closed Bottle test, 28 day = 67% of ThOD.

Ecotoxicity: p-Dichlorobenzene: Grass shrimp (Palaemonetes pugio) 48 hour = 129 mg/L; earth worms (Eisenia Andrei) = 14 day LC_{50} = 12-347 ug/L; flathead minnow 48 hour LC_{50} = 34 mg/L; sheephead minnow 96 hour LC_{50} = 7.4 mg/L

SECTION 13: DISPOSAL RECOMMENDATIONS

Waste Disposal Method: Dispose of material, liners, and containers in accordance with all applicable federal, state, and local environmental regulations.

SECTION 14: TRANSPORTATION INFORMATION

The classifications provided in this section are for information purposes only. Apply the appropriate regulations to properly classify you shipment for transportation.

U.S. DOT Class: Environmentally Hazardous Substance, solid, n.o.s. (p-Dichlorobenzene), 9 UN3077, III*

U.S. DOT label: Class 9*

*Applies only to packages, which contain 100 lbs. or more (RQ quantity, See Section 15). Special Provisions: this material meets the definition of Marine Pollutant.

IATA: Environmentally Hazardous Substance, solid, n.o.s. (p-Dichlorobenzene), 9 UN3077, III*

IMDG Code: See DOT

SECTION 15: REGULATORY INFORMATION

SARA TITLE III: Section 302. Not listed as an Extremely Hazardous Substance.
Section 311, 312 - Acute Health Hazard. Chronic Health Hazard. Fire Hazard.
Section 313. 1,4-dichlorobenzene

CERCLA Hazardous Substance: Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 100 lbs.1,4-dichlorobenzene (Release of more than the Reportable Quantity to the environment in a 24 hour period requires notification to the National Response Center (800-424-8802 or 202-426-2675).

RCRA Hazardous Substance: Hazardous waste number: U072
Compound: p-dichlorobenzene

California Prop. 65 List: Listed (carcinogen).

Massachusetts Substance List: Listed.

New Jersey Right to Know Hazardous Substance List: Listed.

Pennsylvania Hazardous Substance List: Listed.

Canadian WHMIS List: Class D1B – Toxic Materials. Sensitization to product: None known. Reproductive toxicity: None known. Odor threshold: Not known. Product use: Urinal blocks, moth control.

SECTION 16: OTHER INFORMATION

HMIS RATINGS

Health Hazard: 2
Flammability Hazard: 2
Reactivity Hazard: 0
Additional Information: C

Willert MSDS No. 1, Ver. 2
Date: 1-6-06
Supercedes: Not applicable

LIST OF ACRONYMS

ACGIH: American Conference of Governmental Industrial Hygiene

AIHA WEEL: American Industrial Hygienists Association - Workplace Environmental Exposure Level

ANSI: American National Standards Institute

C: Ceiling

California Prop. 65: California Safe Drinking Water and Toxic Enforcement Act (Prop 65)

Canadian WHMIS: Canadian Workplace Hazardous Materials Information System Ingredient Disclosure

CASRN: Chemical Abstracts Service Registry Number

CERCLA: Comprehensive Emergency Response, Compensation and Liability Act

DOT: U. S. Department of Transportation

HMIS: Hazardous Materials Identification System

IARC: International Agency for Research on Cancer

IATA: International Air Transport Association

IMDG: International Maritime Dangerous Goods

IMO: International Maritime Organization

N/A: Not Applicable

NOR: Not Otherwise Regulated

NTP: National Toxicology Program

OSHA: Occupational Safety and Health Administration

PEL: OSHA Permissible Exposure Limit

RCRA: Resource Conservation and Recovery Act

RQ: Reportable Quantity

SARA: Superfund Amendment Reauthorization Act

STEL: Short-Term Exposure Limit

TLV: Threshold Limit Values (registered trademark of ACGIH)

TPQ: Threshold Planning Quantity

TSCA: Toxic Substances Control Act

TWA: Time Weighted Average

HACH LANGE
UNITED FOR WATER QUALITY

Safety Data Sheet

according to Regulation (EC) No 1907/2006

26599-01 STABLCAL® FORMAZIN STANDARD; 10 NTU

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

26599-01 STABLCAL® FORMAZIN STANDARD; 10 NTU

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture

Water analysis

1.3. Details of the supplier of the safety data sheet

Company name:	HACH LANGE GmbH
Street:	Willstätterstr. 11
Place:	D-40549 Düsseldorf
Telephone:	+49 (0)211 5288-383
e-mail:	SDS@hach-lange.de
Internet:	www.hach-lange.com
Responsible Department:	HACH LANGE Ltd. Pacific Way Salford Manchester M50 1DL - United Kingdom Tel. +44 (0) 161 872 1487 e-Mail: info@hach-lange.co.uk HACH LANGE Ltd. Unit 1, Chestnut Road Western Industrial Estate IRL-Dublin 12 Tel. +353 (0)1 4602522 e-Mail: info@hach-lange.ie

1.4. Emergency telephone number:

Poison Control Center Mainz: Tel: +49 (0) 6131 19240 - 24 hour emergency service -

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Indications of danger: Xn - Harmful
R phrases:
May cause sensitisation by inhalation and skin contact.

GHS classification

Hazard categories:
Respiratory/skin sensitization: Resp. Sens. 1
Respiratory/skin sensitization: Skin Sens. 1
Hazard Statements:
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.

2.2. Label elements

Signal word:	Danger
Pictograms:	GHS08

Hazard statements

H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.

Precautionary statements

P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P363	Wash contaminated clothing before reuse.

Additional advice on labelling

Classification according to EU Directives 67/548/EEC or 1999/45/EC

The product is classified as dangerous in accordance with Regulation (EC) No. 1272/2008.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Hazardous components

EC No	Chemical name	Quantity
CAS No	Classification	
Index No	GHS classification	
REACH No		
231-791-2	Water	90-95 %
7732-18-5		
202-905-8	methenamine; hexamethylenetetramine	1-5 %
100-97-0	F - Highly flammable R11-43	
612-101-00-2	Flam. Sol. 2, Skin Sens. 1; H228 H317	

Full text of R and H phrases: see Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Take off all contaminated clothing immediately.

After inhalation

Move to fresh air.

After contact with skin

Wash off immediately with plenty of water.

After contact with eyes

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

After ingestion

Induce vomiting, but only if victim is fully conscious.

4.2. Most important symptoms and effects, both acute and delayed

No known effect.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. The product itself does not burn.

5.2. Special hazards arising from the substance or mixture

Fire may liberate hazardous vapours. Ammonia, Carbon monoxide, Formaldehyde, Nitrogen dioxide

5.3. Advice for firefighters

In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

Additional information

Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

6.4. Reference to other sections

13. Disposal considerations

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Use only in well-ventilated areas.

Advice on protection against fire and explosion

None known.

See also section 5

Further information on handling

Observe label precautions.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep in a dry, cool place.

Storage temperature: 5-25 °C

Advice on storage compatibility

None known.

7.3. Specific end use(s)

Reagent for analysis

Standard solution

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Additional advice on limit values

None known.

8.2. Exposure controls

Appropriate engineering controls

The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Protective and hygiene measures

Wash hands before breaks and after work.
General industrial hygiene practice.

Eye/face protection

Safety glasses with side-shields

Hand protection

Use barrier skin cream.
Chemical resistant gloves made of butyl rubber or nitrile rubber category III according to EN 374. In full contact: Gloves material: Viton, Layer thickness: 0.70 mm, Breakthrough time: >480 min. In splash contact: Glove material: nitrile rubber, Layer thickness 0,20 mm, Breakthrough time: > 30 min

Skin protection

Remove and wash contaminated clothing before re-use.

Respiratory protection

Ensure adequate ventilation, especially in confined areas.
In case of insufficient ventilation, wear suitable respiratory equipment.
In the case of vapour formation use a respirator with an approved filter.
Respirator with a gas filter (gas filter type A or B or K)

Environmental exposure controls

Do not flush into surface water or sanitary sewer system.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	liquid
Colour:	colourless
Odour:	odourless

		Test method
pH-Value (at 20 °C):	8,48	
Changes in the physical state		
Melting point:	not applicable	
Boiling point:	100 °C	
Sublimation point:	no data available	
Softening point:	no data available	
Pour point:	no data available	
:	no data available	
Flash point:	not applicable	
Flammability		
Solid:	not applicable	
Gas:	not applicable	

Explosive properties

no data available

Lower explosion limits:	not applicable
Upper explosion limits:	not applicable
Ignition temperature:	not applicable
Auto-ignition temperature	
Solid:	not applicable
Gas:	not applicable
Decomposition temperature:	no data available
Oxidizing properties	
no data available	
Vapour pressure:	no data available
Vapour pressure:	no data available
Density (at 20 °C):	1,01 g/cm³
Bulk density:	no data available
Water solubility: (at 20 °C)	completely soluble
Solubility in other solvents	
no data available	
Partition coefficient:	no data available
Viscosity / dynamic:	no data available
Viscosity / kinematic:	no data available
Flow time:	no data available
Vapour density:	no data available
Evaporation rate:	no data available
Solvent separation test:	no data available
Solvent content:	no data available

9.2. Other information

Solid content:	no data available

no data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity Hazard: Oxidizing agents

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous polymerisation does not occur.

10.4. Conditions to avoid

No dangerous reaction known under conditions of normal use.

10.5. Incompatible materials

No dangerous reaction known under conditions of normal use.
Oxidizing agents

10.6. Hazardous decomposition products

Decomposition products: Carbon monoxide, Formaldehyde, Ammonia

Further information

This information is not available.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicocinetics, metabolism and distribution

No toxicology information is available.

Acute toxicity

No data is available on the product itself.

CAS No	Chemical name				
	Exposure routes	Method	Dose	Species	Source
100-97-0	methenamine; hexamethylenetetramine				
	oral	LD50	9200 mg/kg	Ratte	

Irritation and corrosivity

May cause eye and skin irritation.

Sensitising effects

May cause sensitisation by skin contact.
May cause sensitisation by inhalation.

STOT-single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Severe effects after repeated or prolonged exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Carcinogenic/mutagenic/toxic effects for reproduction

Contains no ingredient listed as a carcinogen

Specific effects in experiment on an animal

No data is available on the product itself.

Additional information on tests

None known.

Practical experience

Observations relevant to classification

May cause allergic skin reaction. May cause allergic respiratory reaction.

Other observations

None known.

Further information

Other dangerous properties can not be excluded. Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological information

12.1. Toxicity

No data is available on the product itself.
Do not flush into surface water or sanitary sewer system.

CAS No	Chemical name					
	Aquatic toxicity	Method	Dose	h	Species	Source
100-97-0	methenamine; hexamethylenetetramine					
	Acute fish toxicity	LC50	49800 mg/l	96	Fisch	

12.2. Persistence and degradability

no data available

12.3. Bioaccumulative potential

no data available

12.4. Mobility in soil

no data available

12.5. Results of PBT and vPvB assessment

no data available

12.6. Other adverse effects

no data available

Further information

no data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal

In accordance with local and national regulations.

Waste disposal number of waste from residues/unused products

160506 WASTES NOT OTHERWISE SPECIFIED IN THE LIST; gases in pressure containers and discarded chemicals; laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals
Classified as hazardous waste.

Waste disposal number of used product

160506 WASTES NOT OTHERWISE SPECIFIED IN THE LIST; gases in pressure containers and discarded chemicals; laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals
Classified as hazardous waste.

Waste disposal number of contaminated packaging

160506 WASTES NOT OTHERWISE SPECIFIED IN THE LIST; gases in pressure containers and discarded chemicals; laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals
Classified as hazardous waste.

SECTION 14: Transport information

Land transport (ADR/RID)

Other applicable information (land transport)

Not subject to transport regulations.

Inland waterways transport (ADN)

Other applicable information (inland waterways transport)

Not tested

Marine transport (IMDG)

Other applicable information (marine transport)

Not subject to transport regulations.

Air transport (ICAO)

Other applicable information (air transport)

Not subject to transport regulations.

14.5. Environmental hazards

Dangerous for the environment: no

14.6. Special precautions for user

no data available

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not relevant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulatory information

Additional information

Classification according to EU Directives 67/548/EEC or 1999/45/EC

The product is classified as dangerous in accordance with Regulation (EC) No. 1272/2008.

National regulatory information

Water contaminating class (D): 1 - slightly water contaminating

15.2. Chemical safety assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information

Changes

Revision:: 14.01.2013

Safety datasheet sections which have been updated: 4,7,10,11

Full text of R phrases referred to under Sections 2 and 3

11	Highly flammable.
42/43	May cause sensitisation by inhalation and skin contact.
43	May cause sensitisation by skin contact.

Full text of H statements referred to under Sections 2 and 3

H228	Flammable solid.
H317	May cause an allergic skin reaction.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Further Information

The information is based on present level of our knowledge. It does not, however, give assurances of product properties and establishes no contract legal rights.

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)

****** MATERIAL SAFETY DATA SHEET ******

28202 ISO HEET Gas Line Antifreeze

**** SECTION 1 - CHEMICAL PRODUCT AND MANUFACTURER IDENTIFICATION ****

Product Name: 28202 ISO HEET Gas Line Antifreeze

Part Number:

28202

Product CAS: (None)

Product Code: 28202

Synonyms: 28202 ISO HEET Gas Line Antifreeze

MANUFACTURER IDENTIFICATION
Name: Gold Eagle Company
Address: 4400 S. Kildare Blvd.
City: Chicago **State:** IL **Zip:** 60632-4372

For information call: 773-376-4400

Emergency Number: N/A

Emergency Agency: INFOTRAC

Agency Number: 1-800-535-5053

MSDS Effective Date: 8/5/2005

MSDS Supersedes Date: 3/11/2010

Miscellaneous:
Product CAS: Mixture

Chemical Name: Isopropanol

Brief Description: Gas line antifreeze for automobiles.

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**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

Chemical Name	CAS	MIN	MAX
Isopropanol	67-63-0	99	99
Proprietary Additive	(none)	1	1

Miscellaneous:

CHEMICAL NAME	LIMIT VALUES
Isopropanol	PEL 400 ppm
	PEL 980 mg/m3

Proprietary Additive (CAS#=Mixture) N/A

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**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW:

NFPA: Health: 2 **Fire:** 3 **Reactivity:** 0 **Specific Hazard:** None

HMIS: Health: 2 **Flammability:** 3 **Reactivity:** 0 **PPE:** B

Miscellaneous:
This product does not contain any components above de minimus concentrations that are considered carcinogenic by OSHA, IARC or NTP.

POTENTIAL HEALTH EFFECTS
Target Organs/Primary Route(s) of Entry:

Eye:
Irritant.

Skin:
Prolonged or repeated skin contact may cause dermatitis, scaling and possible systemic effects.

Ingestion:
Low level of toxicity, small amounts of liquid aspirated into the respiratory system during ingestion may cause pulmonary edema.

Inhalation:
Narcotic chemical affecting central nervous system resulting in: dizziness, nausea, visual impairment, narcosis and muscular impairment.

Miscellaneous:

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**** SECTION 4 - FIRST AID MEASURES ****

Eye:
If the product contacts the eyes, immediately wash the eyes with large quantities of room temperature water for at least 15 minutes, occasionally lifting the lower and upper lids. Get medical attention immediately. A follow up visit to an ophthalmologist should be made. Contact lenses should not be worn when working with this chemical.

Skin:

If the product contacts the skin, promptly wash the contaminated skin with soap and water for at least 15 minutes. If this product penetrates the clothing, promptly remove the clothing and wash the skin with soap and water. Systemic effects may be delayed 18 to 72 hours, therefore keep individual under observation.

Ingestion:
If this product is ingested. DO NOT INDUCE A PERSON TO VOMIT. Get medical attention immediately.

Inhalation:
Move the exposed person to fresh air at once and call emergency medical care. If breathing has stopped, give artificial respiration. If breathing is difficult, give humidified oxygen.

Notes to Physician:
No data available.

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**** SECTION 5 - FIRE FIGHTING MEASURES ****

Flash Point: 54 F. (12.2 C.) TOC

AutoIgnition Temperature: N/A

Flammable Limits
Lower Limit: Explosive Limit (LEL): 2.0

Upper Limit: Explosive Limit (UEL): 12.0

Extinguishing Media:
Use halon replacement or carbon dioxide extinguishers or alcohol foam for small fires. Water spray or fog can cool fire but may not be effective in extinguishing fire. Large fires should be extinguished with alcohol foam. Use water spray to cool containers exposed to fire. Containers may explode in heat or fire.

Unusual Fire and Explosion Hazards:
Dangerous fire and explosion hazard when exposed to heat or flame. Isopropanol is extremely flammable and forms explosive mixtures with air. Isopropanol vapors may travel considerable distance to a source of ignition and flash back.

Special Fire Fighting Procedures:
Wear NIOSH approved SCBA respirator in the positive pressure mode and chemical protective clothing.

General Information:
Flammable Limits: 2.0 to 12.0

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**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

Small Spill: Remove sources of heat or ignition, provide adequate ventilation, contain leak using absorbent, inert, non-combustible material.

Large Spill: Contain spill, transfer to secure containers. In the event of an uncontrolled material release, the user should determine if release is reportable

under applicable laws and regulations.

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**** SECTION 7 - HANDLING AND STORAGE ****

Handling:
See other sections of MSDS.

Storage:
See other sections of MSDS.

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**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

GENERAL HYGIENE CONSIDERATIONS:
Use normal hygiene practices.

OTHER PRECAUTIONS:
Product is flammable, handle accordingly.

ENGINEERING CONTROLS:
Local Exhaust: Provide local ventilation to maintain exposure levels below recommended exposure limits.

Mechanical (General): In confined spaces, mechanical ventilation may be required.

Special Ventilation: Review Permissible Exposure Level (PEL's).

Other Ventilation: N/A

PERSONAL PROTECTIVE EQUIPMENT
Eyes/face:
Use splash proof chemical, safety goggles or appropriate full-face respirator. Contact lenses should not be worn when working with this chemical.

Skin:
Use natural rubber or neoprene gloves as required.

Respirators:
Do not use air purifying respirator. Use NIOSH approved respirator approved supplied or self contained respirator. Respirators must be selected based on the airborne levels found in the workplace and must not exceed the working limits of the respirator.

Other Protective Clothing/Equipment:
If there is a possibility of exposure of an individual's body to the product, wear body covering work clothes to avoid prolonged or repeated exposure.

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**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Appearance/Odor:
Water white liquid, solvent odor

pH: N/A

Vapor Pressure: (MM HG): 97.0

Vapor Density(Air=1): GT 1.0

Evaporation Rate: N/A

Viscosity: N/A

Boiling Point: 180 F. (82.2 C.)

Freezing/Melting Point: N/A

Decomposition Temperature: N/A

Solubility in Water: Soluble

Specific Gravity: 0.787

Molecular Formula: N/A

Molecular Weight: N/A

VOC Coating (minus water): 0 Lbs/Gallon

Coating Density : 0 Lbs/Gallon

Solvent Density : 0 Lbs/Gallon

Percent Solvent (volume): 0

Percent Solids (volume): 0

Percent Water (volume): 0

Percent Volatile by Weight: 0

Miscellaneous:
% Volatile/Volume: 100.0

Specific Gravity (H2O = 1): N/A

Percent Solvent (Volume): N/A

Percent Solids (Volume): N/A

Percent Water (Volume): N/A

Product is flammable, keep away from sources of ignition, combustibles, oxidizing material and acid. Store in an area equipped with automatic sprinklers or fire extinguishing system. Empty containers contain product residues, assume empty container to have the same hazards as full containers.

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****** SECTION 10 - STABILITY AND REACTIVITY ******

Chemical Stability:
Stable: Yes

Conditions to Avoid:
Store in a well ventilated place away from sources of ignition, combustibles, oxidizing materials and acid.

Incompatibilities with Other Materials:
Strong oxidizing agents, amines, chlorinated compounds and caustic materials.

Hazardous Decomposition Products:
Excessive heating and/or incomplete combustion will produce carbon monoxide.

Hazardous Polymerization:
Hazardous Polymerization May Occur: No

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****** SECTION 11 - TOXICOLOGICAL INFORMATION ******

No data available.

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****** SECTION 12 - ECOLOGICAL INFORMATION ******

No data available.

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****** SECTION 13 - DISPOSAL CONSIDERATIONS ******

Dispose of product in accordance with local, state, and federal regulations. Before attempting clean up, refer to other sections of MSDS for hazard warning information.

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****** SECTION 14 - TRANSPORT INFORMATION ******

Transportation Information:
Shipping Information (CFR 49 and IMDG):

Proper Shipping Name: Alcohol, antifreeze
DOT Hazard Class: Consumer commodity, ORM-D
DOT UN Number: None required.
IMDG Shipping Name: Dangerous Goods in Limited Quantities of Class 3.2 (Isopropanol), PGII

Label Information:

No data available.

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****** SECTION 15 - REGULATORY INFORMATION ******

SARA Title III:

Section 302: None
Section 304: None
Section 311: Hazard categories-Fire Hazard-Yes; Acute=Yes and Chronic=Yes
Section 313: None

CERCLA:

Section 311(b)(4): Requires discharges of crude oil and petroleum products in any kind or form to waters must immediately be reported to the National Response Center at (800) 424-8802.

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****** SECTION 16 - ADDITIONAL INFORMATION ******

Disclaimer: Information presented herein is believed to be factual, as it has been derived from the works and opinions of persons believed to be qualified experts. However, nothing contained in this information is to be taken as warranty or representation for which the Gold Eagle Co. bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.

Prepared by: Mike Profetto

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MATERIAL SAFETY DATA SHEET : 3" FLAP WHEEL PAGE : 01

(061805-0535@ *50092133-97930080)	DATE OF ISSUE 04/18/91	SUPERSEDES 11/11/87

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS COATED ABRASIVE	TRADE NAME & SYNONYMS 3" FLAP WHEEL
CHEMICAL FAMILY ALUMINA OXIDE AND RESIN BINDER	FORMULA <--MIXTURE
MANUFACTURERS NAME: X-ERGON, A PARTSMASTER CO., DIV OF NCH	
ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE) BOX 152170 IRVING, TEXAS 75015	
PREPARED BY: LINDA M. SILAS	PRODUCT CODE NUMBER 97930080
	EMERGENCY TELEPHONE NUMBER 214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV	PEL	CAS#
ALUMINUM OXIDE	IRRITANT	10MG/M3	15MG/M3	1349-28-1

SECTION III - PHYSICAL DATA

BOILING PT.(FAHRENHEIT)	N/A	SPEC GRAVITY (H2O=1)	N/A
VAPOR PRESSURE (MM HG).	N/A	COLOR	CLOTH COATED WITH
VAPOR DENSITY (AIR=1)	N/A	ODOR	ABRASIVE MATERIAL

3" FLAP WHEEL

(CONTINUED) SECTION III - PHYSICAL DATA PAGE : 02

PH @ 100%	N/A	CLARITY	OPAQUE
PERCENT, VOLATILE BY VOLUME (%)	0	EVAPORATION RATE (BU AC = 1)	0
SOLUBILITY IN WATER	NEGLIGIBLE		
VISCOSITY	SOLID		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED) N/A N/A	FLAMMABLE LIMITS	LEL N/A	UEL N/A

EXTINGUISHING MEDIA "ALCOHOL" DRY WATER
<--FOAM <--FOAM <--CO2 <--CHEMICAL <--SPRAY <--OTHER

SPECIAL FIRE FIGHTING PROCEDURES
BACKINGS AND RESIN BINDER WILL BURN OR DECOMPOSE; USE RESPIRATORY PROTECTION.

UNUSUAL FIRE & EXPLOSION HAZARDS
N/A

NFPA HAZARD RATING (0=INSIGNIFICANT;1=SLIGHT;2=MODERATE;3=HIGH;4=EXTREME):
1 <--HEALTH 0 <--FLAMMABILITY 0 <--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

N/A

EFFECTS OF OVEREXPOSURE

- ACUTE - (SHORT TERM EXPOSURE)

INHALATION: MAY CAUSE COUGHING, SHORTNESS OF BREATH
INGESTION: NO KNOWN ADVERSE EFFECTS, BUT INGESTION NOT RECOMMENDED.
SKIN: NOT ABSORBED THROUGH SKIN; MAY CAUSE ABRASIONS.
EYE: DUST MAY IRRITATE EYES.
OTHER POTENTIAL HEALTH RISKS: DURING USE ON SOME MATERIALS, ELEVATED SOUND LEVELS MAY BE CREATED WHICH AFFECT HEARING.

- CHRONIC - (LONG TERM EXPOSURE)

INHALATION: MAY EFFECT BREATHING CAPACITY

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
A FORMALDEHYDE OR PHENOLIC RESIN ODOR FROM THE
BINDING SYSTEM MAY ON OCCASION BE RELEASED
DURING STORAGE.

OTHER PRECAUTIONS
N/A

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
ALUMINUM OXIDE	1344-28-1	80

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.
IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND LABELED FOR MAINTAINING MOTOR VEHICLES.

CALIFORNIA PROPOSITION 65
WARNING: THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE (1) CANCER OR (2) BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM:
NONE

SECTION XII - TRANSPORTATION - (FOR FUTURE USE)

APPLICABLE REGULATIONS
<--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (AFR 71-4)

SHIPPING NAME

HAZARD CLASS | ID NUMBER | REPORT QTY

LABELS | LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER | NET EXPLOSIVE WT.

AEROSOL PROPELLANT(S)

1. "THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES FOR 1989-1990", AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS.
2. "AIR CONTAMINANTS - PERMISSIBLE LIMITS" CFR 29 (1910.1000), U.S.DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer:	WD-40 Company	Telephone:	
		Emergency only:	1-888-324-7596 (PROZAR)
Address:	1061 Cudahy Place (92110)	Information:	(619) 275-1400
	P.O. Box 80607	Chemical Name:	Petroleum Hydrocarbon Mixture
	San Diego, California, USA 92138-0607	Trade Name:	**3-IN-ONE Professional Engine Starter**

II. HAZARDOUS INGREDIENTS

Chemical Name	CAS Number	%	Exposure Limit ACGIH/OSHA
Aliphatic Petroleum Distillates	8052-41-3	50-60	100 ppm (PEL)
Hydrocarbon Propellant	68-476-86-8	40-50	600 ppm (TLV)
Petroleum Base Oil	64742-65-0	10-15	5mg/m^3 (TWA) mist

III. PHYSICAL DATA

Boiling Point	NA	Evaporation Rate (Butyl Acetate=1):	Less than 1
Vapor Density (air = 1):	Greater than 1	Vapor Pressure:	70 +/- 10 PSI @70°F
Solubility in Water:	insoluble	Appearance:	light amber
Specific Gravity (H_2O)	0.785 @ 70° F	Odor:	pleasant odor
Percent Volatile (volume):	90.0%		

IV. FIRE AND EXPLOSION

Flash Point:	-20° F (Tag Closed CUP)
Flammable Limits:	(Lel) 1.0% (Uel) 6.0% (solvent portion)
Extinguishing Media:	CO_2, dry chemical, foam
Special Fire Fighting Procedures:	EXTREMELY FLAMMABLE. UFC level 3 Aerosol.
Unusual Fire and Explosion Hazards:	Contents under pressure. Keep away from ignition source and open fire.

V. HEALTH HAZARD / ROUTE(S) OF ENTRY

Threshold Limit Value:	Aliphatic Petroleum Distillates lowest TLV (ACGIH 100 ppm)
Symptoms of Overexposure:	
Inhalation (Breathing):	May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation.
Skin contact:	May cause drying of skin and/or irritation.
Eye contact:	May cause irritation, tearing and redness.
Ingestion (Swallowed):	May cause irritation, nausea, vomiting and diarrhea.
First Aid Emergency Procedures:	
Ingestion (Swallowed):	Do not induce vomiting, seek medical attention.
Eye Contact:	Immediately flush eyes with large amounts of water for 15 minutes.
Skin Contact:	Wash with soap and water.
Inhalation (Breathing):	Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.Pre-existing medical conditions such as eye, skin and respiratory disorders may be aggravated by exposure.
DANGER!	
Aspiration Hazard:	If swallowed, can enter lungs and may cause chemical pneumonitis. Do not induce vomiting. Call physician immediately.
Suspected Cancer Agent	The components in this mixture have been found to be noncarcinogenic by NTP, IARC and OSHA.
Yes___ No_X_	

VI. REACTIVITY DATA

Stability:	Stable_X_	Unstable:_____
Conditions to avoid:	Heat and open flame	
Incompatibility:	Strong oxidizing agents	
Hazardous decomposition products:	Carbon monoxide and/or carbon dioxide	
Hazardous polymerization:	May occur____	Will not occur__X__

VII. SPILL OR LEAK PROCEDURES

Spill Response Procedures
Spill unlikely from aerosol cans. Leaking cans should be placed in plastic bag or open pail until pressure has dissipated.
Waste Disposal Method
Empty aerosol cans should not be punctured or incinerated; bury in land fill. Liquid should be incinerated or buried in land fill. Dispose of in accordance with local, state and federal regulations.

VIII. SPECIAL HANDLING INFORMATION

Ventilation:	Sufficient to keep solvent vapor less than TLV.
Respiratory Protection:	Advised when concentrations exceed TLV.
Protective Gloves:	Advised to prevent possible skin irritation.
Eye Protection:	Approved eye protections to safeguard against potential eye contact, irritation or injury.
Other Protective Equipment:	None required.

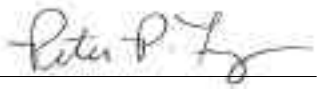
IX. SPECIAL PRECAUTIONS

Keep from sources of ignition. Avoid excessive inhalation of spray particles, do not take internally. Do not puncture, incinerate or store container above 120°F. Exposure to heat may cause bursting. Keep can away from electrical current or battery terminals. Electrical arcing can cause burn-through (puncture) which may result in flash fire, causing serious injury. Keep from children.

X. REGULATORY INFORMATION

All ingredients for this product are listed on the TSCA inventory.

SARA Title III chemicals:	None
California Prop 65 chemicals:	None
CERCLA reportable quantity:	None
RCRA hazardous waste no:	D001

SIGNATURE: Peter Fougner  TITLE: Director of Global Quality Assurance

REVISION DATE: December, 2004 SUPERSEDES: February, 2004

NA: Not applicable NDA: No data available < = Less than > = More than

APPENDIX U

Hydrocarbon Management Plan

RESOLUTION COPPER MINING, LLC

HYDROCARBON MANAGEMENT PLAN

Prepared by:

102 Magma Heights
Superior, Arizona 85273
(520) 689-9374

February 19, 2013

Table of Contents

1. PURPOSE

The purpose of this plan is to provide Resolution Copper Mining (RCM) employees and contractors with RCM's hydrocarbon management requirements to ensure hydrocarbons are appropriately stored, dispensed, used and disposed of. The benefits of properly managing hydrocarbon resources results in environmental protection, properly maintained equipment and reduced fuel, coolant and lubricant use and as such is critical to the way RCM conducts its business.

2. SCOPE

This plan applies to all individuals working for or on behalf of RCM on any RCM controlled site. It addresses the storage, handling, use, disposal and spill response aspects of hydrocarbon management on site. This plan is to be used in conjunction with any site Spill Prevention Control and Countermeasures Plan (SPCC), Storm Water Pollution Prevention Plan (SWPPP) and site emergency response plans.

3. HAZARDOUS SUBSTANCES REGISTER AND SAFETY DATA SHEETS

It is the responsibility of an individual using a substance to be familiar with its associated safety data sheet (SDS) and to comply with information provided in the SDS. In order to facilitate easy and centralized access to the SDS's for all chemical products RCM has on site, an internet based repository, Maxcom GHS, is utilized by RCM for the storage and retrieval of current SDS's. All employees and contractors employed by RCM are provided access to Maxcom GHS via centralized computers located at each site. If a printed copy of a SDS is to be used it must be checked against the SDS in Maxcom GHS to ensure currency.

4. APPROVAL TO BRING SUBSTANCES ONSITE

Permission to bring new substances onto RCM controlled property is required prior to the substance's arrival onsite. Approved substances can be located by logging into Maxcom GHS (login information is provided during the site induction training). The individual requesting to bring a new substance onto RCM property must submit a Chemical Product Approval request form (*RCML HSEMS E07 Form – Chemical Product Approval Request*) to designated RCM HSE personnel for internal review and approval. The requestor will be notified of the substance's approval or denial for use onsite, and if approved, a copy of the substance's SDS will be loaded into Maxcom GHS.

5. SPILL PREVENTION

5.1. Hydrocarbon Delivery

All hydrocarbons must be delivered and/or removed from site by a transport carrier, driver and vehicle with the appropriate licensing, permits and vehicle placarding for the substances/goods involved.

Transport carriers must complete RCM's site induction or be escorted by a site inducted person when accessing the East or West Plant sites.

All deliveries must promptly be brought to their storage locations and unloaded in an area with appropriate secondary containment.

RCM or contractor personnel responsible for receiving/accepting bulk petroleum product containers (e.g. drums and totes) will be trained in visual inspection procedures. Drums and totes containing petroleum products which will be delivered to the project by outside vendors will be visually inspected for signs of leaks and corrosion prior to acceptance. Petroleum products in damaged containers will not be accepted.

5.2. Fuel Loading/Unloading Bulk Storage Containers

When refueling or emptying tanks which contain hydrocarbons the following actions must be taken by the individuals performing the refueling/unloading task **prior** to fueling or draining tanks:

- If a spill containment apron is present, park the transport vehicle within the containment area.
- Set the transport vehicle's parking brake.
- Secure the transport vehicle with wheel chocks and interlocks.
- Turn off any cellular devices.
- Verify that adequate spill containment materials are within a reasonable distance of the work area. If a spill kit is present, verify its contents.
- Visually check all hoses for leaks and wet spots.
- Verify that there is sufficient volume in the storage tank for the delivery contents.

- Lock, in the closed position, any drainage valves that may be present for any secondary containment structure.
- Verify the proper alignment of valves and proper functioning of the pumping system.
- Establish adequate bonding/grounding prior to connecting to the fuel transfer point.

During the refueling/unloading process the following requirements apply:

- The transport driver must stay with the transport vehicle at all times.
- All systems, hoses and connections must be periodically inspected.
- Continually check for leaks through visual observation, sounds or smell during the refueling/unloading process.
- When loading, keep internal and external valves on the receiving tank open along with the pressure relief valves.
- When making a connection, shut off the engine of the transport vehicle. When transferring Class 3 materials, shut off the vehicle engine unless it must be used to operate a pump. Class 3 materials delivered to site will also require that a Permit to Unload (*20110000 RCML HSEMS E10 Permit Unload*) be completed and approved by RCM personnel before the transfer can begin.
- Monitor the liquid level in the receiving tank to prevent overflow.
- Monitor flow meters to determine rate of flow.
- When topping off the tank, reduce the flow rate to prevent overflow.

Upon **completion** of the transfer, the following steps should be taken:

- Make sure the transfer is complete.
- Close all tank and loading valves before disconnecting.
- Securely close all vehicle internal, external and dome cover valves before disconnecting.
- Secure all hatches.

- Disconnect grounding/bonding wires.
- Make sure the hoses are drained to remove the remaining fuel before moving them away from the connection. Use a drip pan.
- Cap the end of the hose and other connecting devices before moving them to prevent uncontrolled leakage.
- Remove wheel chocks and interlocks.
- Inspect the lowermost drain and all outlets on the tank prior to departure. If necessary, tighten, adjust or replace caps, valves or other equipment to prevent fuel leakage while in transit.

All bulk storage containers without liquid level sensing devices will not be filled or refilled unless they have secondary containment sufficient to contain the capacity of the largest container in the containment and all filling or refilling will be supervised by trained personnel to ensure that any spills or overflows from filling or refilling are promptly cleaned up and disposed of in accordance with the RCM's spill response procedures. In the event that a spill occurs during the fueling/unloading process, please refer to Section 6 (Spill Response) of this plan.

5.3. Hydrocarbon Storage

Hydrocarbons stored onsite at any RCM owned or managed location must be stored in aboveground containers constructed to be compatible with the material being stored and must be labeled for identification. The materials must be stored in a manner that will prevent contact by unauthorized personnel, birds and other animals, and will not pose a risk for discharge to streams, drainages or the environment.

Storage containers for hydrocarbons must be engineered to have a means of secondary containment and be placed in areas with adequate secondary containment which meets the following criteria:

- Containment drainage valves remain closed and locked except for draining rainwater. Signage must be provided that indicates proper valve position and requirements for locks.
- Containment systems must be free from product spillage. Rainwater or snow must be removed to maintain adequate capacity.
- Measures must be in place to prevent a release from secondary containment from reaching sewer systems, bodies of water or soil.

Methods of secondary containment include a combination of control structures, land-based spill response equipment and backup containment areas to prevent pollution from reaching navigable waters.

Typical secondary containment structures found at RCM property include double walled tanks, earthen berms and engineered secondary containment structures. Secondary containment at RCM is typically designed with sufficient freeboard to contain rainfall from a 25-year, 24-hour storm event.

5.4. Inspections

Storage areas for hydrocarbons are to be inspected on a routine basis to monitor for leaks and the structural integrity of the storage containers.

RCM or contractor employees will perform daily inspections of their work area and equipment on each shift. This daily visual inspection includes:

- Tank/piping integrity (ensure there are no leaks/damage)
- Soil (ensure there is on staining or discoloration of soils)
- Containment areas (ensure there is no accumulation of water or solution that would impact the containment's performance in the event of a spill)
- Equipment checks (ensure no equipment is leaking)

In addition to daily inspections documented quarterly inspections are performed on bulk storage containers located within secondary containment structures.

Annual inspections are performed for operational-use containers, which include oil-filled transformers. In addition, any out-of-service containers will require annual inspections until they are "permanently closed" or removed from site. "Permanently closed" is defined by federal regulations as a container for which:

- All liquid and sludge has been removed from the container and connecting lines;
- All connecting lines and piping have been disconnected and blanked off;
- All valves (except ventilation valves) have been closed and locked; and
- Conspicuous signs have been posted on each container stating that it is a permanently closed container and noting the date of closure.

6. SPILL RESPONSE

Small, incidental releases that may result from transfer operations will be handled by trained RCM or contractor employees using an appropriate absorbent. Spill kits, absorbent materials, empty drums and shovels will be located throughout the project site for this purpose.

No employee will be required to respond to any type of release if conditions are unsafe.

Response procedures are as follows:

1. Identify the character, source, amount and extent of the release. ***Do not enter*** a hazardous area until hazards have been assessed and controlled. ***Stay upwind/uphill*** of any release.

2. Evaluate the situation from a distance and assess whether a fire or explosion is possible. If there is a risk of fire or explosion, move a safe distance away from the area and evacuate personnel in the area. Turn off nearby sources of ignition (***if this can be done safely***).

3. **Immediately notify the front desk at 520-689-9374 or security at 520-689-0115 for any of the following discharges:**

    - Discharge of any quantity that poses an imminent danger or involves injured personnel;

    - Discharge of any quantity that reaches a wash, creek or stream; or

    - Discharge of any quantity that is not contained by a secondary containment basin or diversionary structures.

4. If you have not been trained to respond to releases, take no further action and wait for trained personnel to arrive.

5. If you have been trained to respond to releases, take active measures to contain the release ***without undue risk of personal injury.*** Make sure that proper personal protective equipment (PPE) is worn to provide skin and respiratory protection from the hazards involved with spill containment, cleanup and disposal. PPE may include a hardhat, boots, safety glasses, gloves and/or respirators.

    - Attempt to extinguish any incipient stage fires.

- Shut off pumps, close valves, etc. if material is still being released.
- For releases in a diked area, make sure any valves in the containment wall are closed.
- For small releases in undiked areas, place absorbent materials directly on the spilled oil.
- For large releases in undiked areas, develop a security perimeter around the impacted area; construct makeshift dikes of absorbent materials, booms, or other available materials around the release.

7. SPILL REPORTING AND INCIDENT TERMINATION

Once a release has been contained and cleaned-up, and any required verbal notifications have been made, the Emergency Response Coordinator (ERC)/work area supervisor is responsible for ensuring that all emergency/spill response equipment is clean and is fit for immediate use in the event of another spill. If emergency response equipment is not usable or disposable equipment is not replaced immediately, work is temporarily suspended until replacement of equipment is completed.

The responsible organization should complete and submit a Spill Information form (*20120530 RCML HSEMS E-14 Spill Information*), which will be routed to RCM's Environmental Department. This form is available via RCM's intranet site. If access to a computer is not available, a hand completed form may be used and submitted to RCM's Environmental Department.

The Environmental Department will review incident/spill report forms to evaluate if any follow up actions are required and to verify that no reportable quantities were met or exceeded and that there were no discharges to surface or ground water. For non-minor emergencies, the ERC will conduct an incident critique to identify any improvements that may be required to RCM's spill response procedures or to equipment design/use.

RCM's Environmental Manager is responsible for contacting outside regulatory agencies in the event of a release. For more information on spill reporting procedures, please refer to RCM's Emergency Response and Contingency Plan (*20120000 RCML HSEMS E12 Emergency Response and Contingency Plan*).

8. DISPOSAL

Used absorbent material and contained hydrocarbons from releases will be placed in 55-gallon metal drums or other appropriate containers and stored in an appropriate containment area. Drums will be appropriately labeled and kept closed except when

adding waste. If necessary, RCM may also contract a disposal company to assist with waste recovery and removal. The Environmental Department will coordinate all waste disposal and ensure that a shipping receipt or manifest is received from the disposal contractor and properly completed.

Used oil is transported off site for recycling through an authorized transporter. No RCM or contractor employee will be permitted to transport used oil off the project area or on public roads.

9. TRAINING

All employees and contractors who will handle hydrocarbons on RCM property are required to attend general hydrocarbon management training, which covers release prevention and response procedures, prior to working in areas where hydrocarbon products are stored or handled.

In addition to general hydrocarbon management training (typically provided in Employee/Contractor Induction Training) Spill Prevention, Control and Countermeasures (SPCC) training is required for new employees and/or existing employees assigned to oil-handling duties.

Transport carriers must complete RCM's site induction or be escorted by a site inducted person when accessing the East or West Plant sites.

Before refueling any tank on RCM property delivery drivers are required to:

- Know where the nearest spill kit is located and must visually inspect all drains, outlets and valves for leaks prior to filling and departing the fuel loading/unloading areas.
- Understand RCM's procedures for unloading the product.

All training records are kept with RCM's Training Coordinator.

10. ACCOUNTABILITY

All Employees/Contractors – All employees and contractors are responsible for reviewing and understanding this Plan, and for complying with this Plan and other Site Procedures relating to hydrocarbon management, hazardous substances and/or contamination control. All employees and contractors are also responsible for utilizing the management of change process to correct and deficiencies with this plan.

Health & Safety/Environmental Manager – The Health & Safety Manager and the Environmental Manager are responsible for ensuring that all personnel required to approve requests to bring new substances onsite have been trained in assessing hazardous substances.

IT Manager – The IT Manager is responsible for ensuring that all computers connected to RCM's network have access to Maxcom GHS.

Training Coordinator–The Training Coordinator is responsible for ensuring that all personnel/contractors who may potentially purchase hydrocarbons and/or other hazardous substances have been trained on how to check Maxcom GHS to determine which substances have been approved for site use and therefore authorized for purchase.

Supervisors – Supervisors are responsible for ensuring that all personnel working with hydrocarbons and/or other hazardous substances have been trained.

11. RELATED DOCUMENTS

Document Number:	**Document Name:**	**Document Type:**
20120000 RCML HSEMS E10	Spill Prevention, Controls & Countermeasures Plan – West Plant	Plan
20120000 RCML HSEMS E10	Spill Prevention, Controls & Countermeasures Plan – East Plant	Plan
20120112 RCML HSEMS E10	SWPPP – East Plant	Plan
20120109RCML HSEMS E10	SWPPP – West Plant	Plan
20121201 RCML HSEMS E10	SWPPP – Drilling	Plan
20120000 RCML HSEMS E05	Environmental Materials Management Plan	Plan
20120000 RCML HSEMS E12	Emergency Response and Contingency Plan	Plan
20120507 RCML HSEMS HSB04	Hazardous Substances	Procedure

20120506 RCML HSEMS E10 HSB04	Entering Chemicals Into Maxcom	Procedure
20120530 RCML HSEMS E-14	Spill Information	Form
20110000 RCML HSEMS E07	Chemical Product Approval Request	Form
20110000 RCML HSEMS E10	Permit to Unload	Form

12. REVISIONS

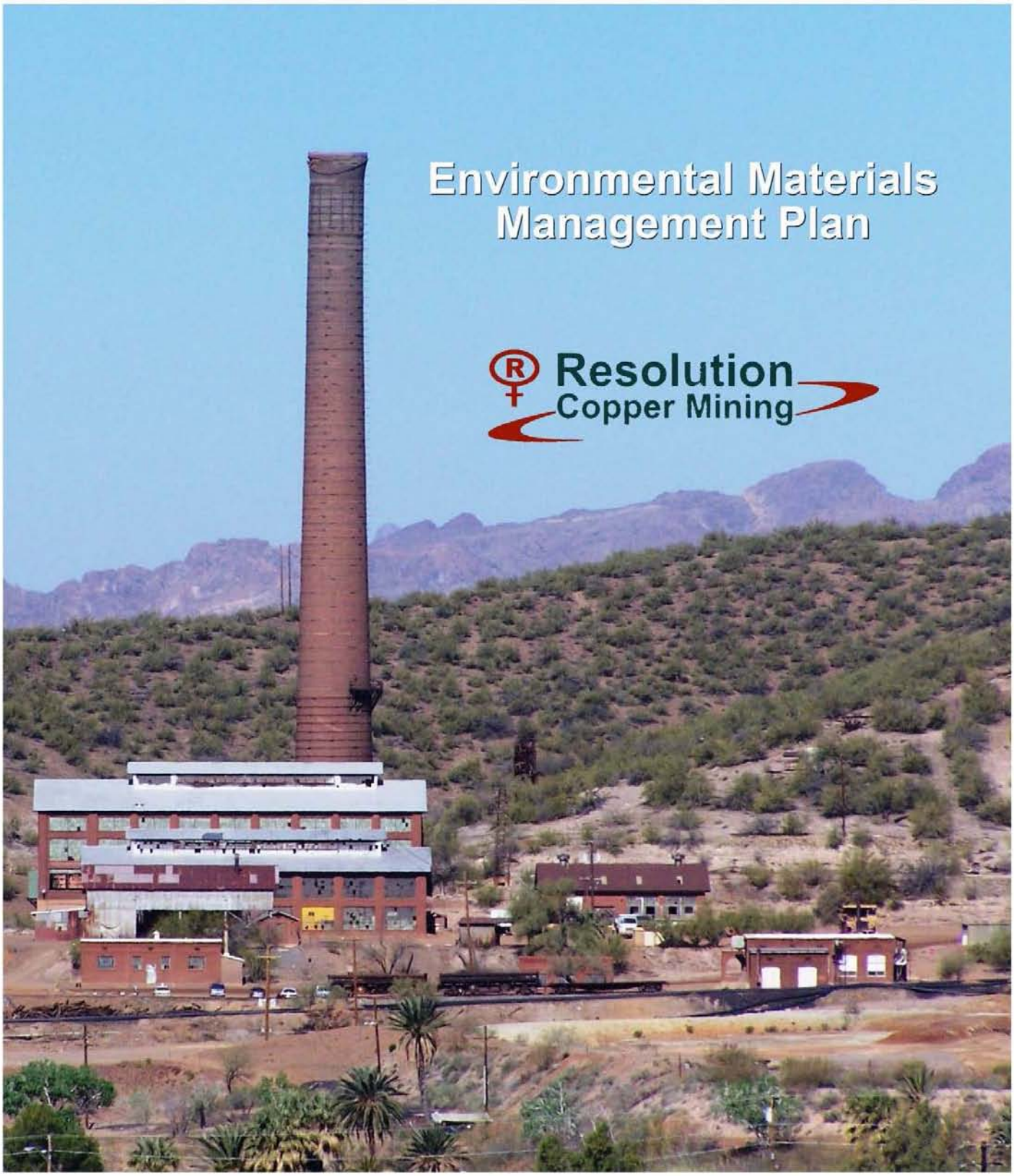
Version:	Date:	Prepared by:	Approved by:	Reason for Change:
1	2/20/2012	M. Morissette	V. Peacey	NA

APPENDIX V

Environmental Materials Management Plan

Environmental Materials Management Plan

Resolution Copper Mining



RESOLUTION COPPER MINING

ENVIRONMENTAL MATERIALS MANAGEMENT PLAN

September 2014

Table of Contents

Appendices

Appendix A – Procedures for Specific Waste Streams
Appendix B – Forms

Acronyms, Definitions and Regulations

1A1 (49 CFR 178.502) – Steel drum with a non-removable head.

1A2 (49 CFR 178.502) – Steel drum with a removable head.

A.A.C. – Arizona Administrative Code

Accumulation End Date – In satellite accumulation areas, the date at which the container is filled (used interchangeably with Accumulation Start Date).

Accumulation Start Date (40 CFR 262.34) – The date at which hazardous waste was first placed in the hazardous waste storage container (**for satellite accumulation containers, the accumulation start date is the date the container is filled**).

ACM – Asbestos containing material

Acutely Hazardous – A hazardous waste where a small amount can cause severe health effects. Wastes designated in 40 CFR 261.33 and A.A.C. R18-8-261.A ("P" listed wastes and "F" listed dioxins).

ADEQ – Arizona Department of Environmental Quality

ADHS – Arizona Department of Health Services

ADOT – Arizona Department of Transportation

AHERA – Asbestos Hazard Emergency Response Act

A.R.S – Arizona Revised Statutes

Asbestos (40 CFR 61.141) – Naturally occurring fibers used in thermal insulation, building materials, equipment, tank liners, and transite materials that may be harmful if inhaled. Asbestos means, the asbestos form varieties of serpentinite (chrysotile) reibecktite (crodidolite) cummingtonite-grunerite, anthophyllite, and actinolite-tremolite.

AST – Aboveground storage tank

AZSERC – Arizona Emergency Response Commission

BTEX - Benzene, Toluene, Ethylbenzene, Xylenes

CFR – Code of Federal Regulations

a. 29 CFR contains regulations pertaining to the safety and health of workers;
b. 30 CRF contains regulations pertaining to the safety and health of miners;
c. 40 CFR contains regulations pertaining to the protection of the environment; and
d. 49 CFR contains regulations pertaining to the transportation of hazardous materials.

Caustic – A corrosive material that is alkaline as opposed to acid (pH equal to or great than 12.5 for RCRA regulations).

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

Characteristics of Hazardous Waste (40 CFR 261 Subpart C) – Any waste that possesses the following characteristics:

a. *Ignitability (40 CFR 261.21)*
   (1) A liquid having a flash point at or below 140°F (60°C).
   (2) It is not a liquid and is capable of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.
   (3) It is an ignitable compressed gas as defined in 49 CFR 173.115(a)
   (4) It is an oxidizer as defined in 49 CFR 173.127(a).
b. *Corrosivity (40 CFR 261.22)*
   (1) It is aqueous and has a pH ≤ 2 or ≥ 12.5.
   (2) It is a liquid and corrodes steel at a rate greater than 0.250" (6.35 mm) per year, at a test temperature of 130°F (54°C).
c. *Reactivity (40 CFR 261.23)*
   (1) It is normally unstable and readily undergoes violent change without detonating.
   (2) It reacts violently with water.
   (3) It forms potentially explosive mixtures with water.
   (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
   (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
   (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.
   (7) It is readily capable of detonation or explosive reaction at standard temperature and pressure.
   (8) It is a forbidden explosive as defined in 49 CFR 173.54, or a Class A (Division 1.1 or 1.2) explosive or a Class B (Division 1.2 or 1.3) explosive as defined in 49 CFR 173.50 and 173.53.
d. *Toxicity (40 CFR 261.24)*
   (1) A solid waste exhibits the characteristic of toxicity if a representative sample contains any contaminants equal to or greater than the respective values listed in Table 1*. The following table lists maximum concentrations of contaminants of concern for the toxicity characteristic for RCM Operations.

EPA Waste Code	Contaminant	Regulatory Level (mg/L)
D004	Arsenic	5.0
D005	Barium	100.0
D018	Benzene	0.5
D006	Cadmium	1.0
D007	Chromium	5.0
D008	Lead	5.0
D009	Mercury	0.2
D035	Methyl Ethyl Ketone	200.00
D010	Selenium	1.0
D040	Trichloroethylene	0.5

* This is not a complete list. There are many other contaminants with listed regulatory levels.

Combustible Liquid (40 CFR 173.120(b)) – Any liquid with a flash point above 140°F (60°C) and below 200°F (93°C).

Conditionally Exempt Small Quantity Generator (CESQG) (40 CFR 261.5(g)(2)) – A generator that generates less than 100 kg (220 lbs) of a hazardous waste or less than one kg (220 lbs)of acutely hazardous wastes in a calendar month. CESQG's must not accumulate more than 1,000 kg (2,200 lbs.) of hazardous waste onsite at any time.

CWA - Clean Water Act

Declaration of Environmental Use Restriction (DEUR) (A.A.C. R18-7-208) – An environmental document that has been completed in which the property owner elects to leave contamination on a property that exceeds the applicable residential standard for the property or elects to use an institutional control or an engineering control to meet requirements.

Disposal Facility (40 CFR 260.10) – A permitted facility for final disposal of hazardous wastes.

DOT – Department of Transportation.

DOT Approved – Drums and containers available for shipment must be in good condition to comply with DOT regulations. Drums/Containers not approved for transport may contain any one of the following conditions:

a. Interior of the drum is badly rusted.
b. Badly bulged head of bottom.
c. Stripped bung threads.
d. Broken or missing flange.
e. Pipe flange or gate valve welded or rusted in bung.
f. Any hole in the drum.
g. Top or bottom chimes with sharp dents.
h. Any significant dents on drum especially on the rolling hoops.

Empty Container (40 CFR 261.7) – A container, the contents of which have the following characteristics:

a. No more than 2.5 cm (one inch) of residue remain on the bottom of the container or inner liner, or
b. No more than 3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 119 gallons in size, or
c. No more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 119 gallons in size.
d. A container that has held a hazardous waste that is a compressed gas is empty when the pressure in the container approaches atmospheric pressure.

EPA – Environmental Protection Agency.

EPA Identification Number (40 CFR 260.10; 40 CFR 262.12) – Number assigned by the EPA to a generator, transporter, or a treatment, storage, or disposal facility (TSDF). As of 1996, EPA identifications numbers were changed to be RCRA Identification Numbers.

EPCRA – Emergency Planning and Community Right-to-Know Act

Flammable Liquid (49 CFR 173.120(a)) – A liquid having a flash point below 140°F (60.5°C), or any material in a liquid phase with a flash point at or above 100°F (37.8°C)that is intentionally heated and offered for transportation or transported at or below its flash point in a bulk packaging.

Flash Point (49CFR 173.120(c)) – The minimum temperature at which a liquid gives off vapor in a sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

FAR – Facility Annual Report

Generator (40 CFR 260.10) – Any person whose act or process produces hazardous waste identified or listed in Part 261 or whose act first causes a hazardous waste to become subject to regulation.

Generator Knowledge (40 CFR 262.11(c)(2)) – A Generator may apply knowledge of the hazard characteristic(s) of the waste in light of testing the materials and processes used.

Hazardous Material (40 CFR 171.8) – A substance or material capable of posing an unreasonable risk to health, safety, and property.

HMTA - Hazardous Materials Transportation Act

Hazmat Employee (40 CFR 171.8) – A person who in the course of employment directly affects hazardous materials transportation safety. This term includes an individual who:

a. Loads, unloads, or handles hazardous materials;
b. Tests, reconditions, repairs, modified, marks or otherwise represents containers, drums, or packaging as qualified for use in the transportation of hazardous materials;
c. Prepares hazardous materials for transportation;
d. Is responsible for safety of transporting hazardous materials; or
e. Operates a vehicle used to transport hazardous materials.

Hazardous Waste (40 CFR 261.3) – A solid waste is a hazardous waste when it meets any of the following criteria:

a. The waste is a listed hazardous waste.
b. The waste is a mixture of a solid waste and one or more listed hazardous wastes.
c. When the waste exhibits any of the characteristics of a hazardous waste.

HazWoper – Hazardous Waste Operations and Emergency Response

HSE – Health Safety and Environmental

kg – Kilogram – A kilogram is roughly equivalent to 2.2 lbs.

Large Quantity Generator (LQG) (40 CFR 262.34(b)) – A generator that generates greater than 1,000 kg (2,200 lbs.) of hazardous waste or 2.2 lbs. of acute hazardous waste in a calendar month. A LQG may accumulate hazardous waste onsite for 90 days or less (once the waste is in a central accumulation area – timing requirements do not apply to satellite accumulation areas) without a permit.

LDR - Land Disposal Restriction

LEPC – Local Emergency Planning Committee

LQHUW – Large Quantity Handler of Universal Wastes

Manifest (40 CFR 260.10)) – The shipping document EPA form 8700-22 for hazardous and PCB wastes, and if necessary form 8700-22A, originated and signed by the generator in accordance with the instruction included in the appendix to Part 262.

MSHA – Mine Safety and Health Administration.

NESHAP – National Emission Standards for Hazardous Air Pollutants

Non-fuel, non-solvent petroleum product (A.A.C. R18-8-1601(6)) – Petroleum-based substance refined from virgin crude oil that is not used as a solvent or fuel including minerals oils and hydraulic oils.

OSHA (29 CFR) – Occupational Safety and Health Administration.

PAH - Polynuclear aromatic hydrocarbons

PCB (40 CFR 761) – Polychlorinated biphenyl

PCS – Petroleum Contaminated Soil

PPE – Personal Protective Equipment

ppm – parts per million

RCM – Resolution Copper Mining, LLC

RCRA (40 CFR 260-299) – Resource Conservation and Recovery Act; also known as the "cradle to grave" regulation which tracks hazardous waste to final disposal.

RCRA Identification Number – Formerly known as EPA Identification Numbers. Number assigned by the EPA to a generator, transporter, or a treatment, storage, or disposal facility (TSDF). As of 1996, EPA identifications numbers were changed to be RCRA Identification Numbers.

Rebuttable Presumption (40 CFR 261.3; 40 CFR 279.10(b)(1)(ii)) – For used oil with halogen content greater than 1,000 ppm, a generator may rebut the presumption that hazardous waste was mixed with used oil.

Reportable Quantity (RQ) – Identifies this material has a hazardous substance which is reportable to EPA and DOT in the event of a spill exceeding the reportable quantity identified in Appendix A to 49 CFR §172.101. Also, CERCLA lists additional RQs.

Satellite Accumulation Area (40 CFR 262.34(c)) – Designated area to accumulate up to 55 gallons of hazardous waste or one quart of acutely hazardous waste in containers at or near the point of generation and under the control of the operator. Arizona regulations allow a site to accumulate up to 55 gallons per waste stream or one quart of acutely hazardous waste in a satellite accumulation area.

SDS –Safety Data Sheet

SDWA – Safe Drinking Water Act

Small Quantity Generator (SQG) (40 CFR 262.34(d)) – A generator who generates greater than 100 kg (220 lbs.) but less than 1000 kg (2,200 lbs.) of hazardous waste in a calendar month (and the quantity of waste accumulated onsite never exceeds 6,000 kg [13,200 lbs.]). A SQG may accumulate hazardous waste onsite for 180 days or less without a permit.

SQHUW - Small Quantity Handler of Universal Wastes

Solid Waste (40 CFR 261.2) – Any discarded material that is abandoned, recycled, or inherently waste-like that is not listed in the exclusions. A solid waste may be solid, liquid, or semi-solid or may be a material which contained gaseous materials that can no longer be used for its intended purpose.

SPCC - Spill Prevention, Control and Countermeasures (40 CFR 112) – A plan to avoid oil spills and minimize impacts of spills to public health and the environment

SWPPP - Storm Water Pollution Prevention Plan - a plan required for an industrial facility that discharges stormwater

TCLP – Toxicity Characteristics Leaching Procedure

TOC – Total Organic Content

TPH – Total Petroleum Hydrocarbons

TRI - Toxic Chemical Release Inventory

TSCA – Toxic Substance Control Act

TSD – Transfer, Storage and Disposal

TSDF – Transfer, Storage and Disposal Facility

VOC – Volatile Organic Compounds

List of Applicable Federal and State Regulations

Section	Citation	Description
Training	29 CFR 1910-120	OSHA HazWoper regulations
Chemical contaminated soils and spills information	40 CFR 110	Discharge of oil
Waste Identification	40 CFR 261.2 through 261.6	Hazardous wastes and solid waste definitions and exemptions
Waste Management	40 CFR 261.7	Residuals of hazardous wastes in empty containers
Waste Identification	40 CFR 261 Subpart C	Hazardous waste characterization definitions (ignitability, corrosivity, reactivity, toxicity [TCLP])
Waste Identification	40 CFR 261 Subpart D	Lists of hazardous wastes
Waste Identification	40 CFR 261 Appendices	Hazardous waste test methods and basis for listing hazardous wastes
Waste Identification	40 CFR 262 Subpart A	Hazardous waste determination

Section	Citation	Description
Waste Management	40 CFR 262 Subpart C	Pre-transportation requirements for hazardous wastes including labeling, packaging, marking, and accumulation
Recordkeeping and Reporting	40 CFR 262 Subpart D	Hazardous waste generator recordkeeping and reporting requirements
Training	40 CFR 265 Subpart B	General facility standards for hazardous waste treatment, storage and disposal facilities.
Waste Management	40 CFR 265 Subpart I	Use and management of containers
Training	40 CFR 265.19	RCRA regulations
Specific Waste Stream Management	40 CFR 266 Subpart G	Spent acid batteries requirements
Specific Waste Stream Management	40 CFR 268	Land disposal restrictions
Waste Management	40 CFR 273	Universal waste management standards
Specific Waste Stream Management	40 CFR 279	Used oil management standards
Recordkeeping and Reporting	40 CFR 761	PCB information
Chemical contaminated soils and spills information	40 CFR 302	Superfund, emergency planning and community right to know programs: designation, RQ, and notification
Chemical contaminated soils and spills information	40 CFR 355	Emergency planning and notification
Training	49 CFR 172	DOT HazMat regulations
Waste Management	49 CFR 172 Subpart C	DOT HazMat regulations – shipping papers
Waste Management	49 CFR 172 Subpart D	DOT HazMat regulations - marking
Waste Management	49 CFR 173 Subpart D	Definitions, classification , and packing group assignments for hazardous wastes (except for Class I and Class 7, explosives and radioactive material)
Specific Waste Stream Management	A.R.S. Title 44 Chapter 9, Article 8	Arizona’s waste tire disposal requirements
Waste Management	A.R.S. Title 49 Chapter 1, Article 3	Arizona’s environmental nuisances
Landfills	A.R.S. Title 49 Chapter 4, Article 4	Arizona’s regulations of solid wastes
Waste Management	A.R.S. Title 49 Chapter 4, Article 7	Arizona used oil management standards
Specific Waste Stream Management	A.R.S. Title 44 Chapter 9, Article 9	Arizona’s sale and disposal of batteries requirements
Pollution Prevention and Waste Minimization	A.R.S. Title 49 Chapter 5, Article 4	Arizona’s pollution prevention requirements

Section	Citation	Description
Waste Management	A.R.S. Title 49 Chapter 5, Article 2	Arizona's hazardous waste management
Specific Waste Stream Management	A.A.C. R11-1-1501 though 1521	Arizona's mine acid plant and leaching requirements
Waste Identification	A.A.C. R18-7 -203	Arizona's soil remediation standards
Waste Management	A.A.C. R18-8-262	Arizona's standards applicable to generators of hazardous waste
Waste Management	A.A.C. R18-8-273	Arizona's universal waste standards
Waste Management	A.A.C. R18-8-280	Arizona's hazardous waste program compliance requirements
Specific Waste Stream Management	A.A.C. R18-13-1201 through 1210	Arizona's waste tire standards

Quick Reference Guide

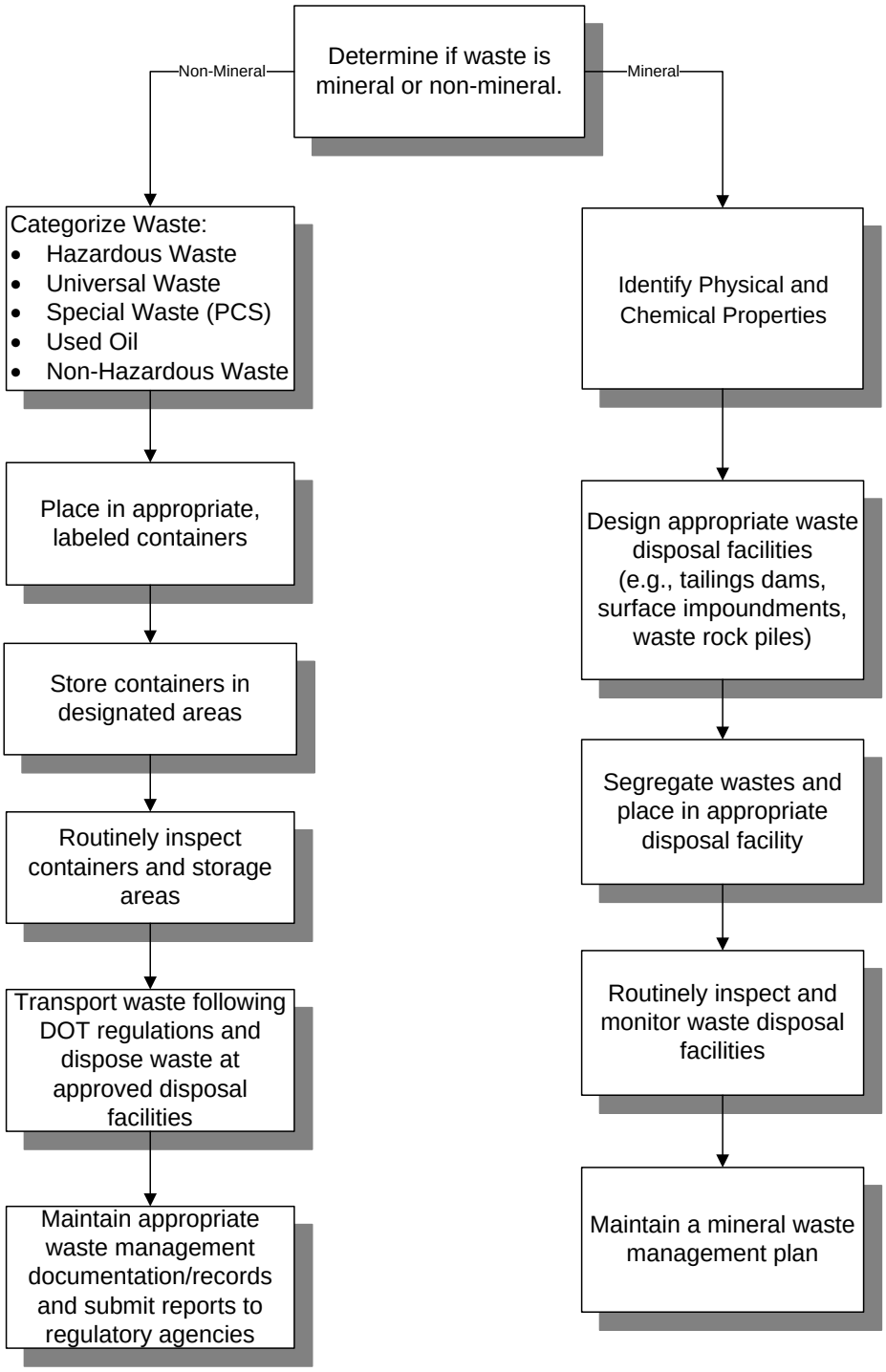
Roles & Responsibilities

The following table provides a general summary of roles and responsibilities for Resolution Copper Mining, LLC (RCM) employees and contractors with regards to environmental materials management at RCM managed facilities.

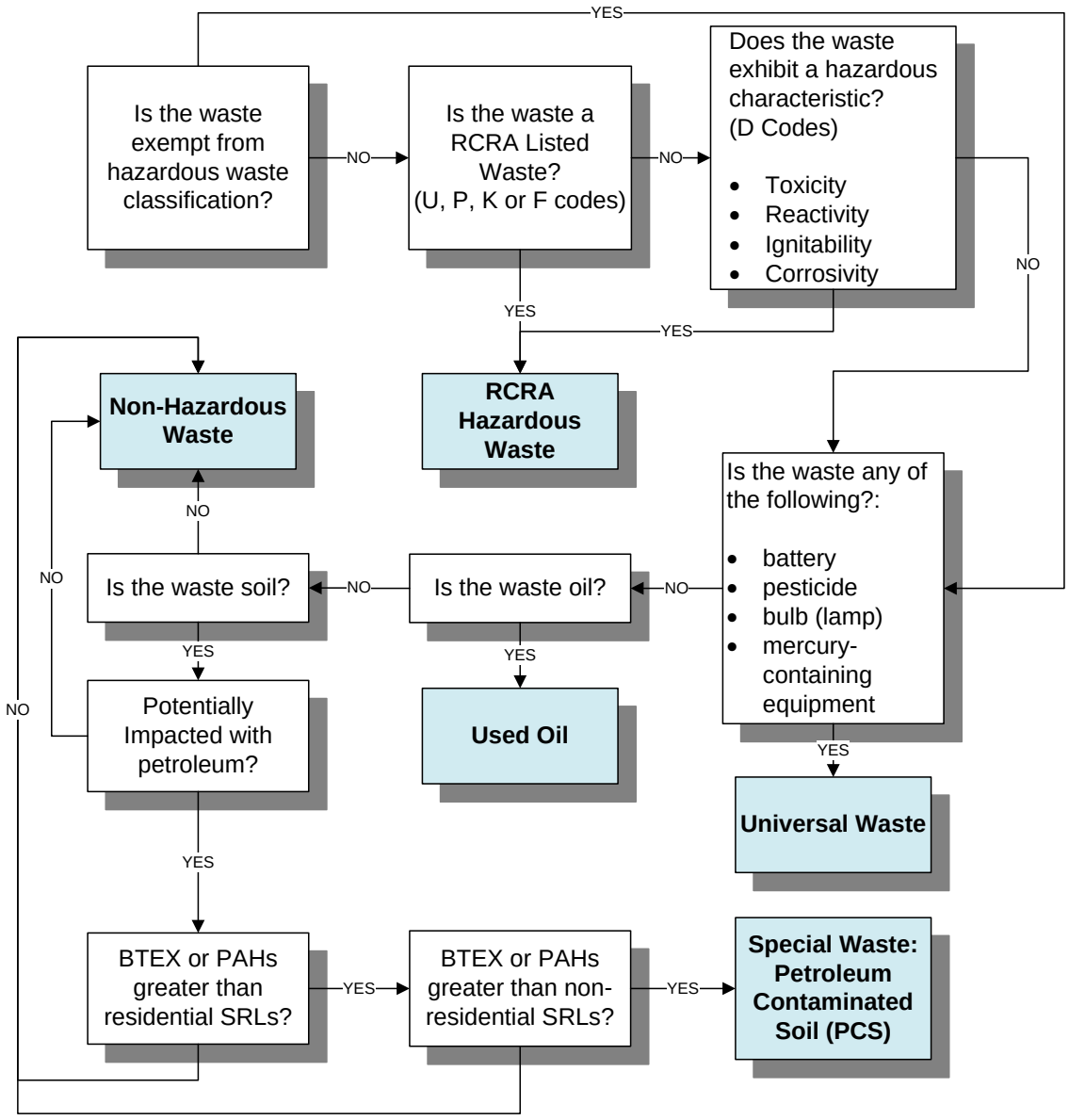
Role	Responsibilities
RCM Environmental Manager	Program approval, guidance, and oversight
RCM HSE	Chemical review and approval through MaxCom
RCM Environmental Staff	Plan implementation and enforcement and employee and contractor support
RCM Employees and Contractors	Compliance with MaxCom and Plan guidelines

Flow Chart Operational Procedures

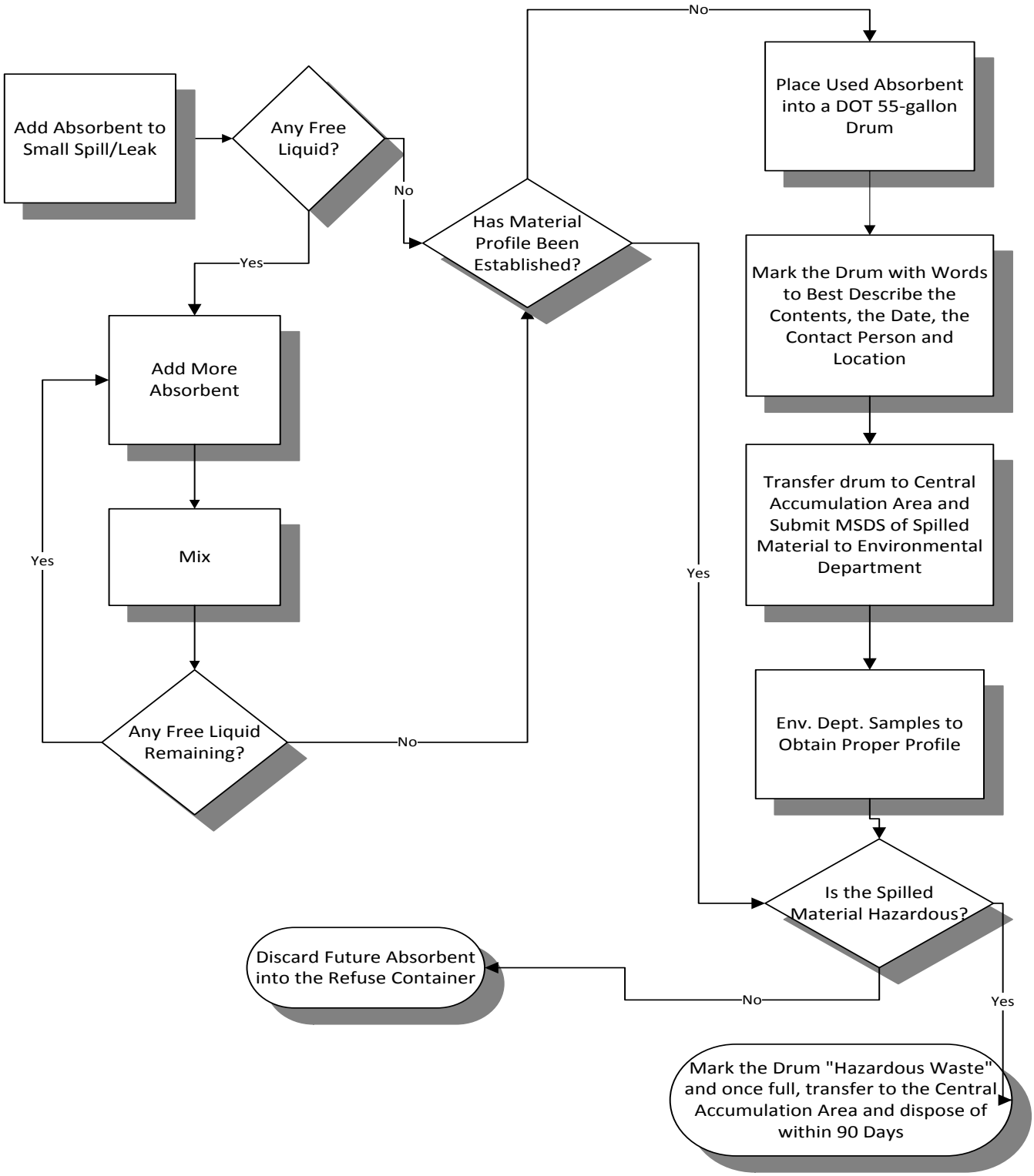
- Waste Management Overview
- Non-mineral Waste Identification Overview
- Specific Waste Stream Procedures
  - Used Absorbent Handling Procedures for Operators
  - Waste Aerosol Can Handling Procedures for Operators
  - Used / Waste Antifreeze Handling Procedures for Operators
  - Asbestos Handling Procedures for Operators
  - Spent Batteries Handling Procedures for Operators
  - CFC - Freon™ Handling Procedures for Operators
  - Chemical Contaminated Soils and Spill handling Procedures for Operators
  - New Cleaning and Solvent Product Approval Handling Procedures for Operators
  - Compressed Gas Cylinder Handling Procedures for Operators
  - Used/Waste Diesel Handling Procedures for Operators
  - Empty Determination and Disposal Procedures for Non-Aerosol Containers for Operators
  - Used Grease Handling Procedures for Operators
  - Used Gasoline Handling Procedures for Operators
  - Landfill Procedures for Operators
  - Oil-Filled Electrical Devices / PCB Ballasts / Capacitors (not Transformers)Handling Procedures for Operators
  - Oil-Filled Electrical Devices Transformers Handling Procedures for Operators
  - Used Oil Filter Handling Procedures for Operators
  - Intact Used Mercury Lamp (Universal Waste) Handling Procedures for Operators
  - Broken Mercury Lamp (Hazardous Waste) Handling Procedures for Operators
  - Spent Mercury Thermostat Handling Procedures for Operators
  - Used Paint (Latex/Non-Hazardous) Handling Procedures for Operators
  - Waste Paint Materials Handling Procedures for Operators
  - Shop Rags Handling Procedures for Operators
  - Scrap Metal Handling Procedures for Operators



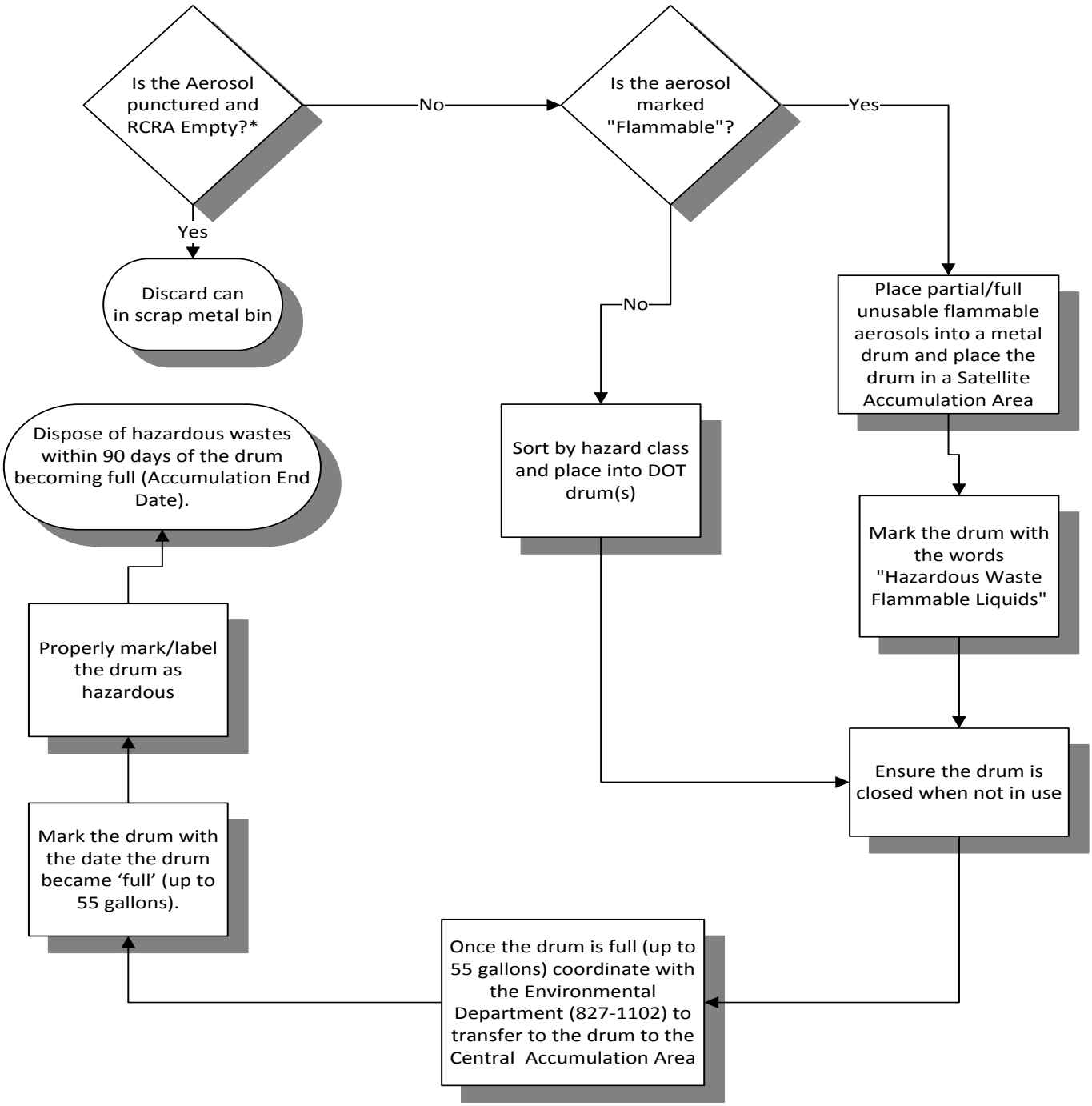
WASTE MANAGEMENT OVERVIEW



NON-MINERAL WASTE IDENTIFICATION OVERVIEW

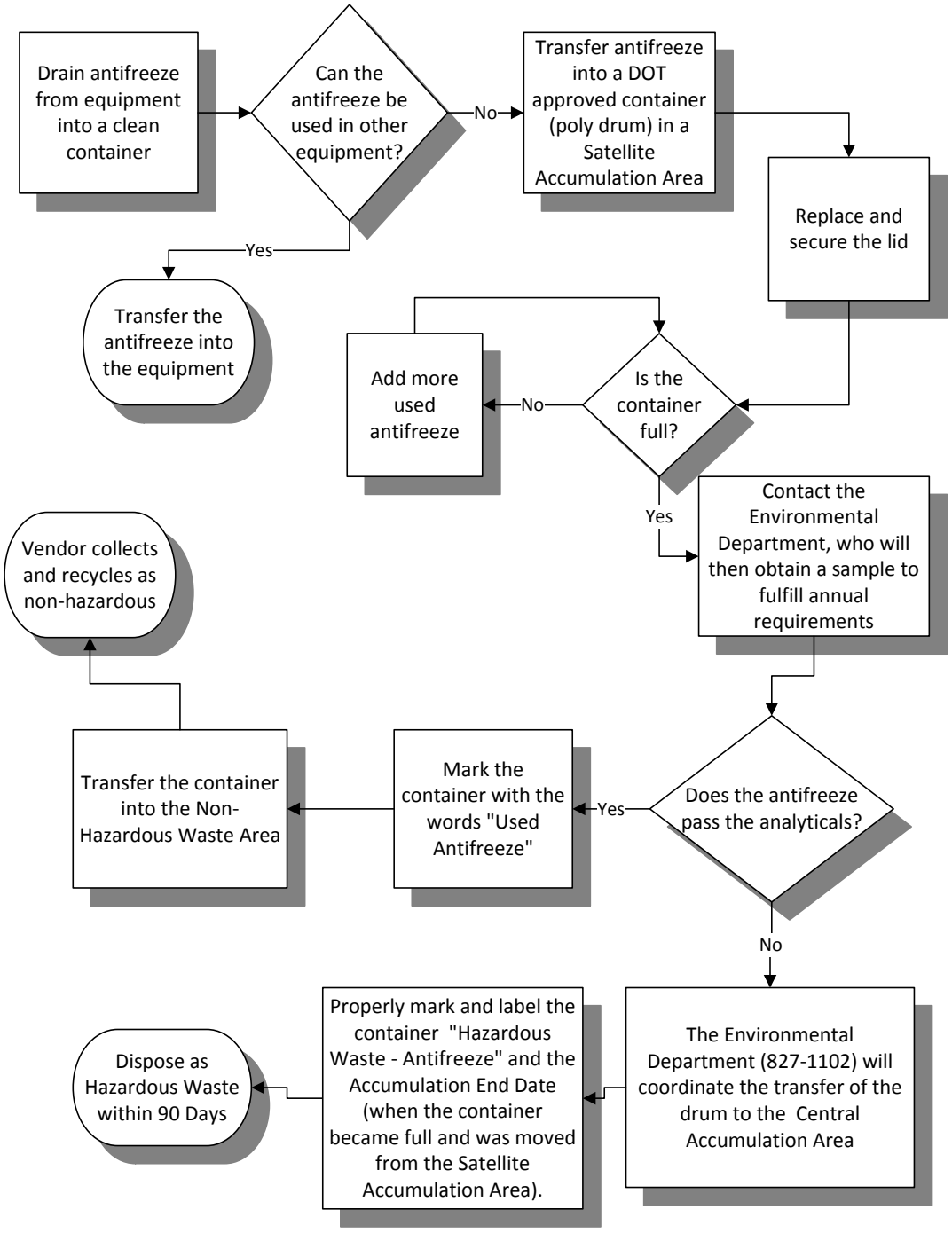


USED ABSORBENT HANDLING PROCEDURES FOR OPERATORS

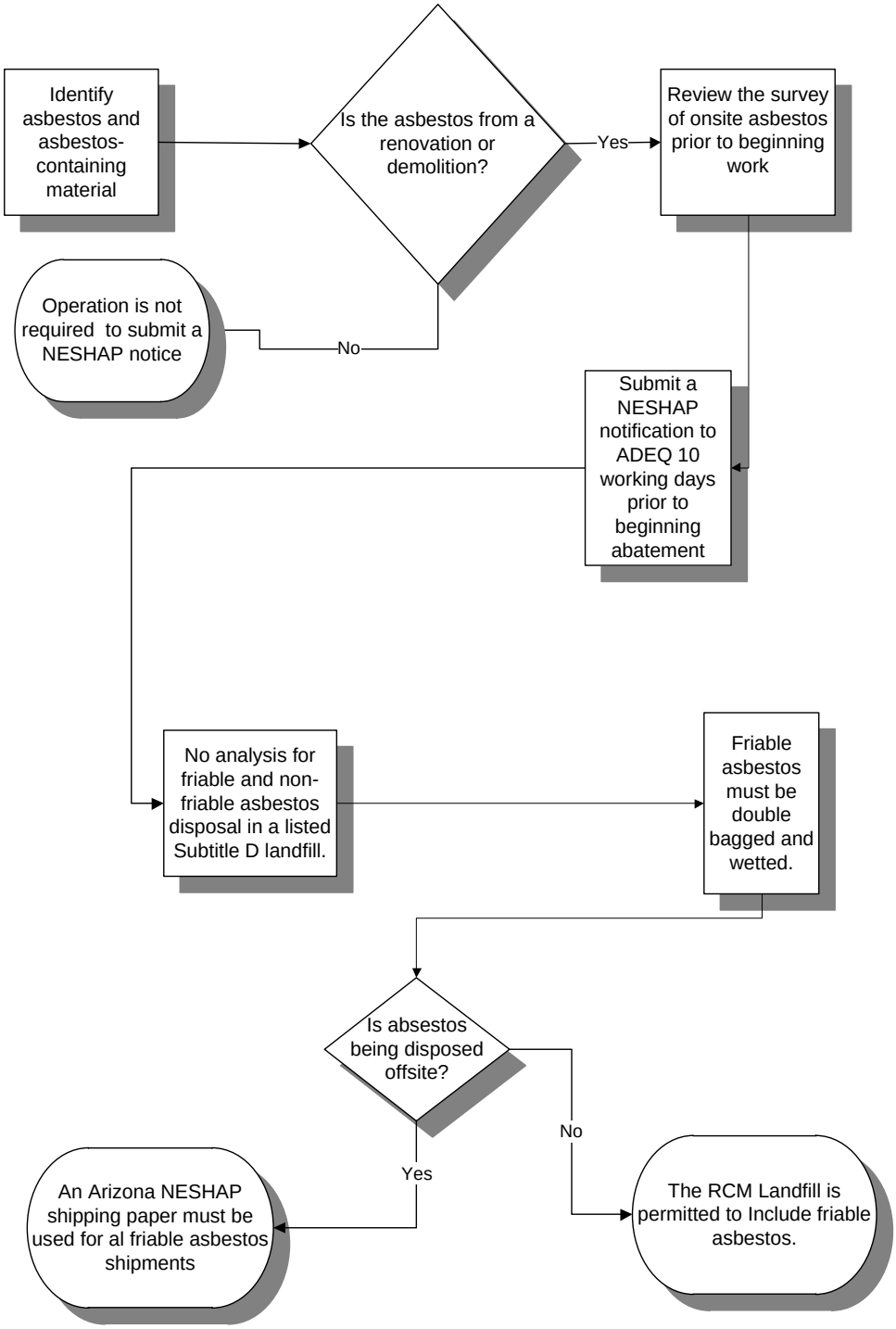


WASTE AEROSOL CAN HANDLING PROCEDURES FOR OPERATORS

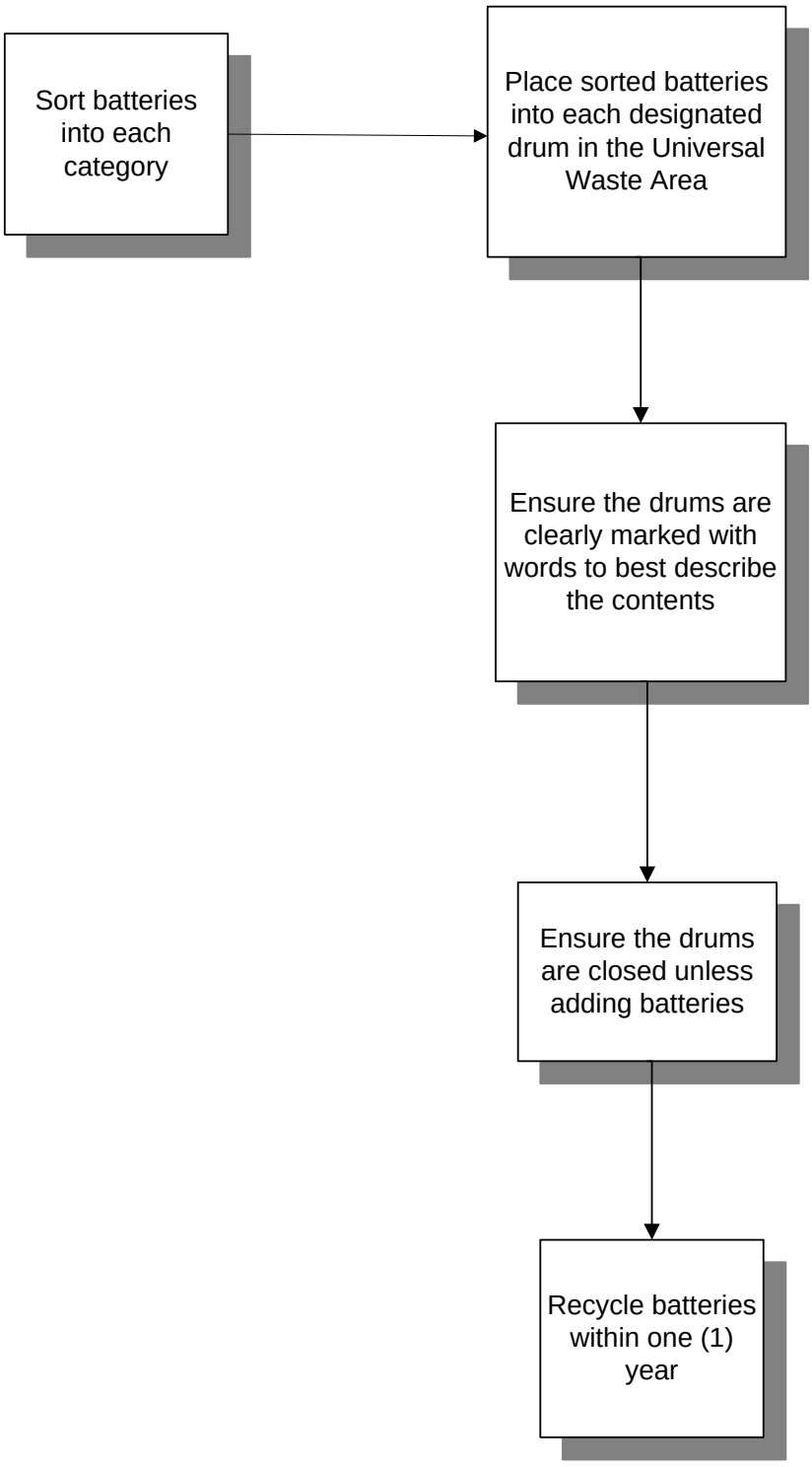
* Refer to Sections 1.13 and 2.14



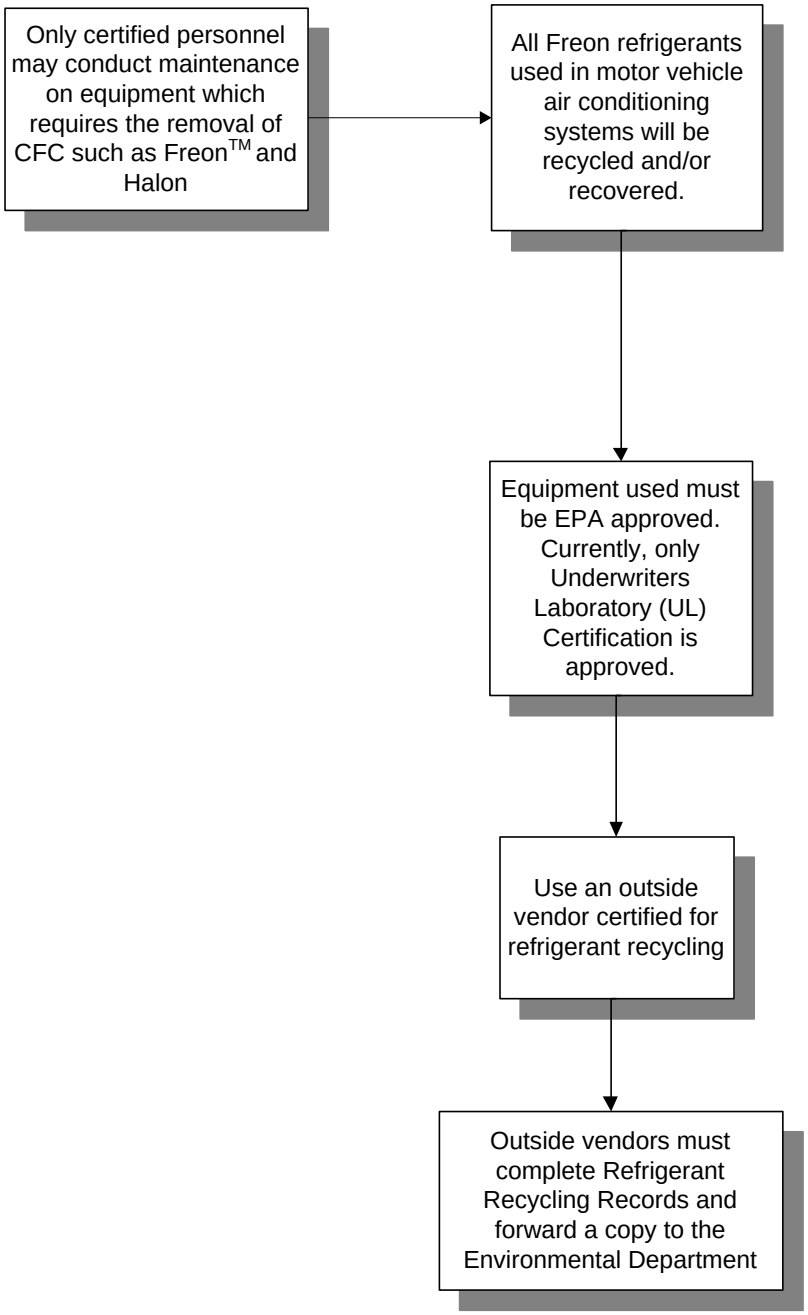
USED / WASTE ANTIFREEZE HANDLING PROCEDURES FOR OPERATORS



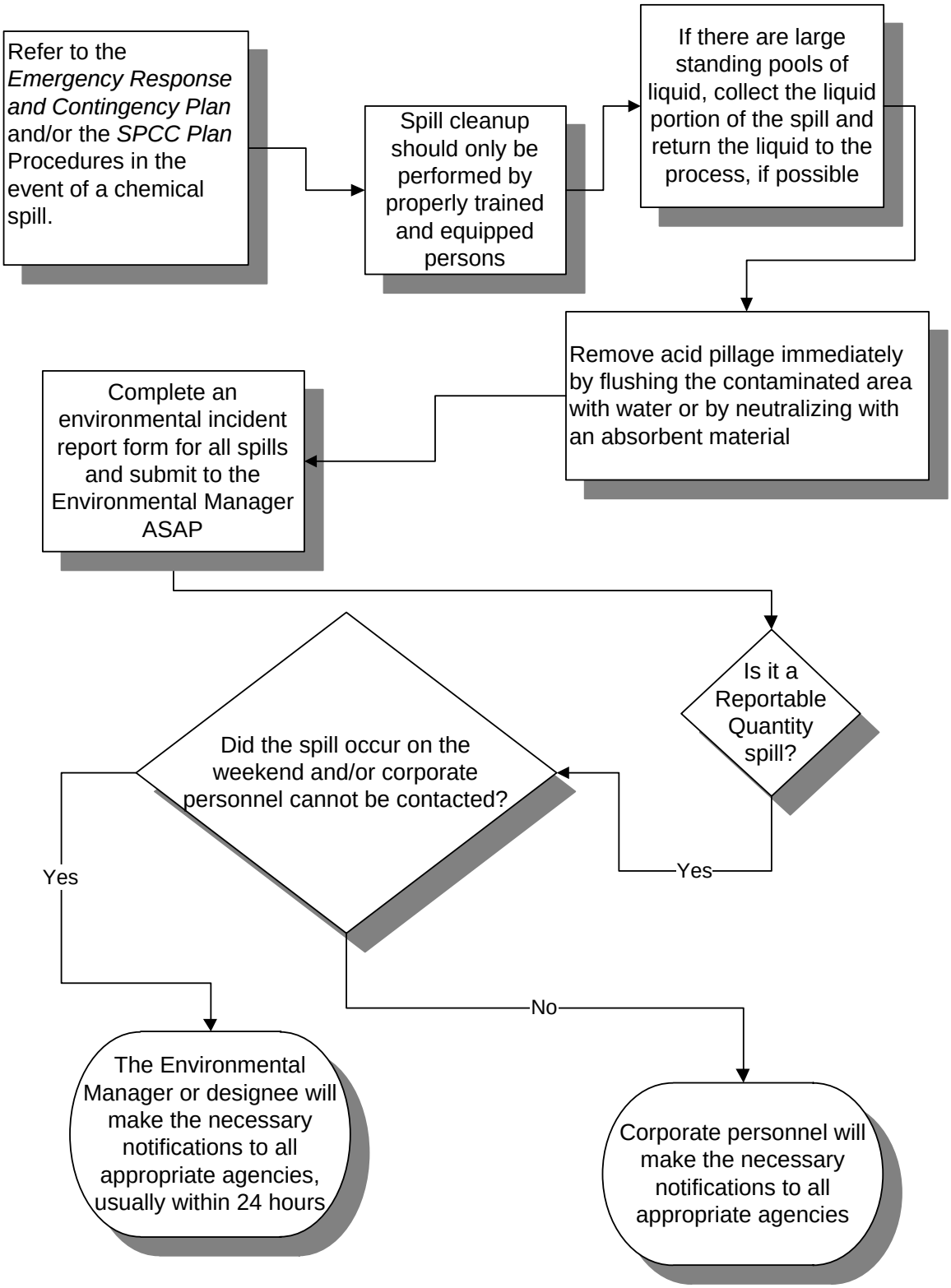
ABESTOS HANDLING PROCEDURES FOR TRAINED OPERATORS



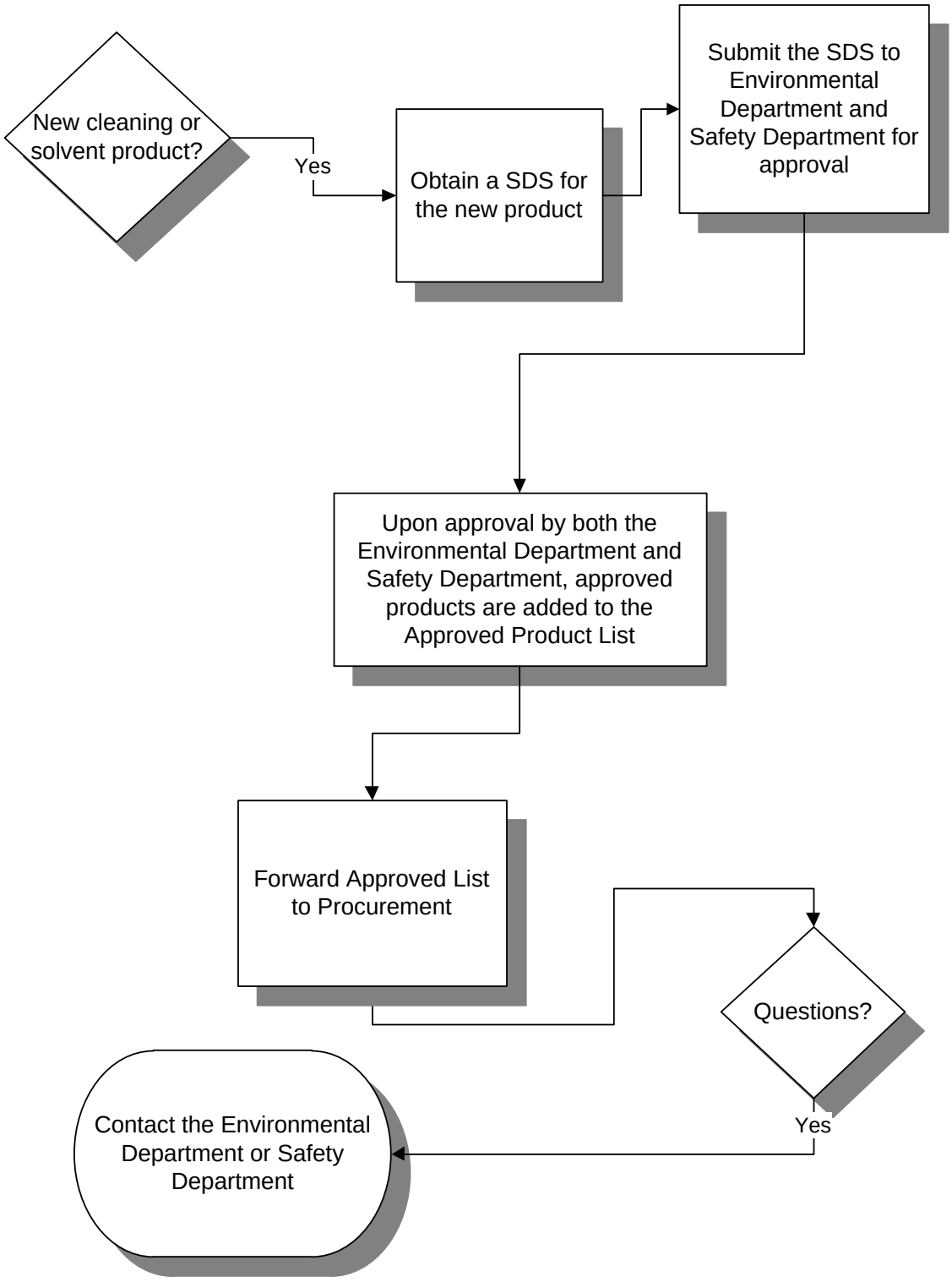
SPENT BATTERIES HANDLING PROCEDURES FOR OPERATORS



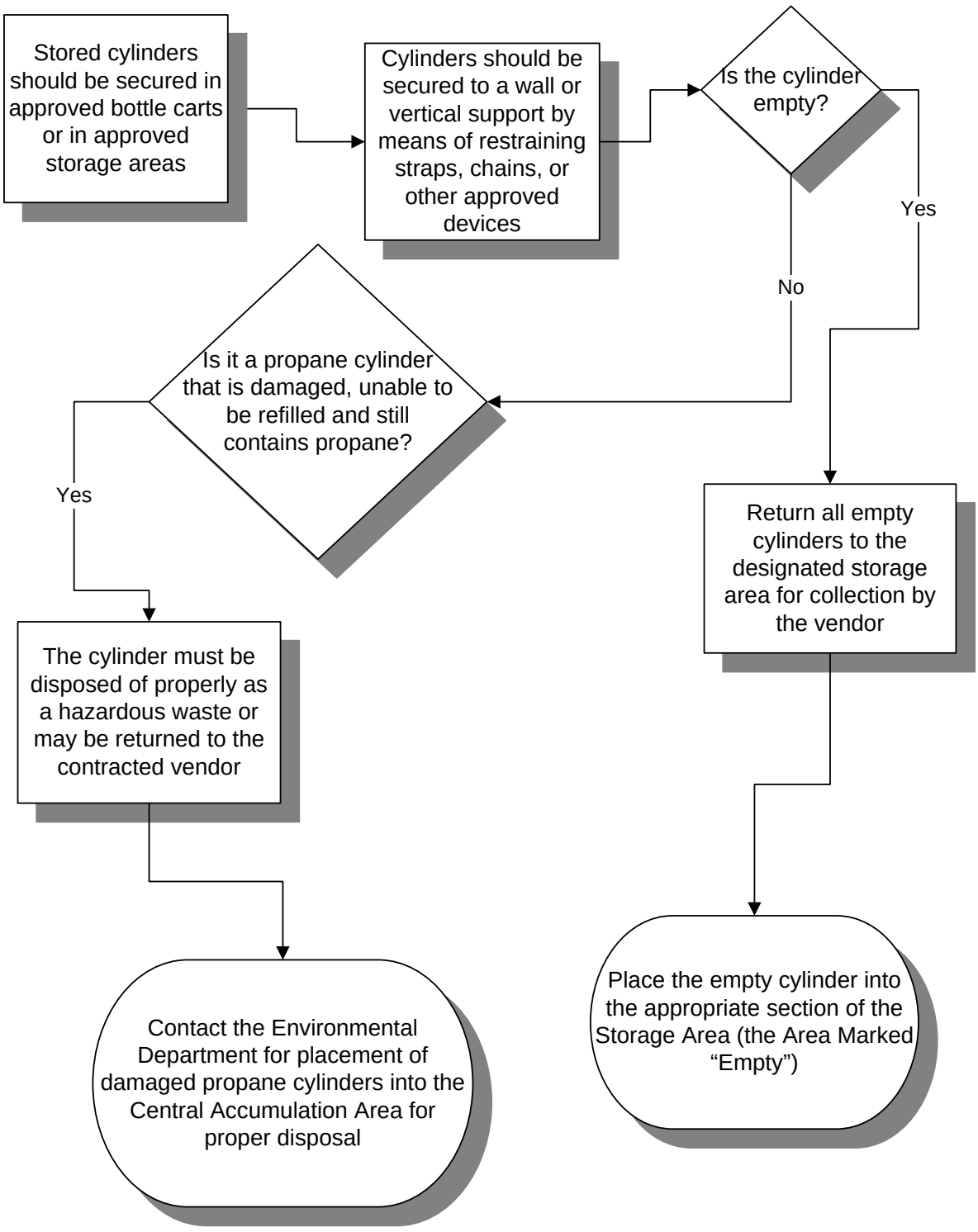
CFC – Freon™ HANDLING PROCEDURES FOR OPERATORS



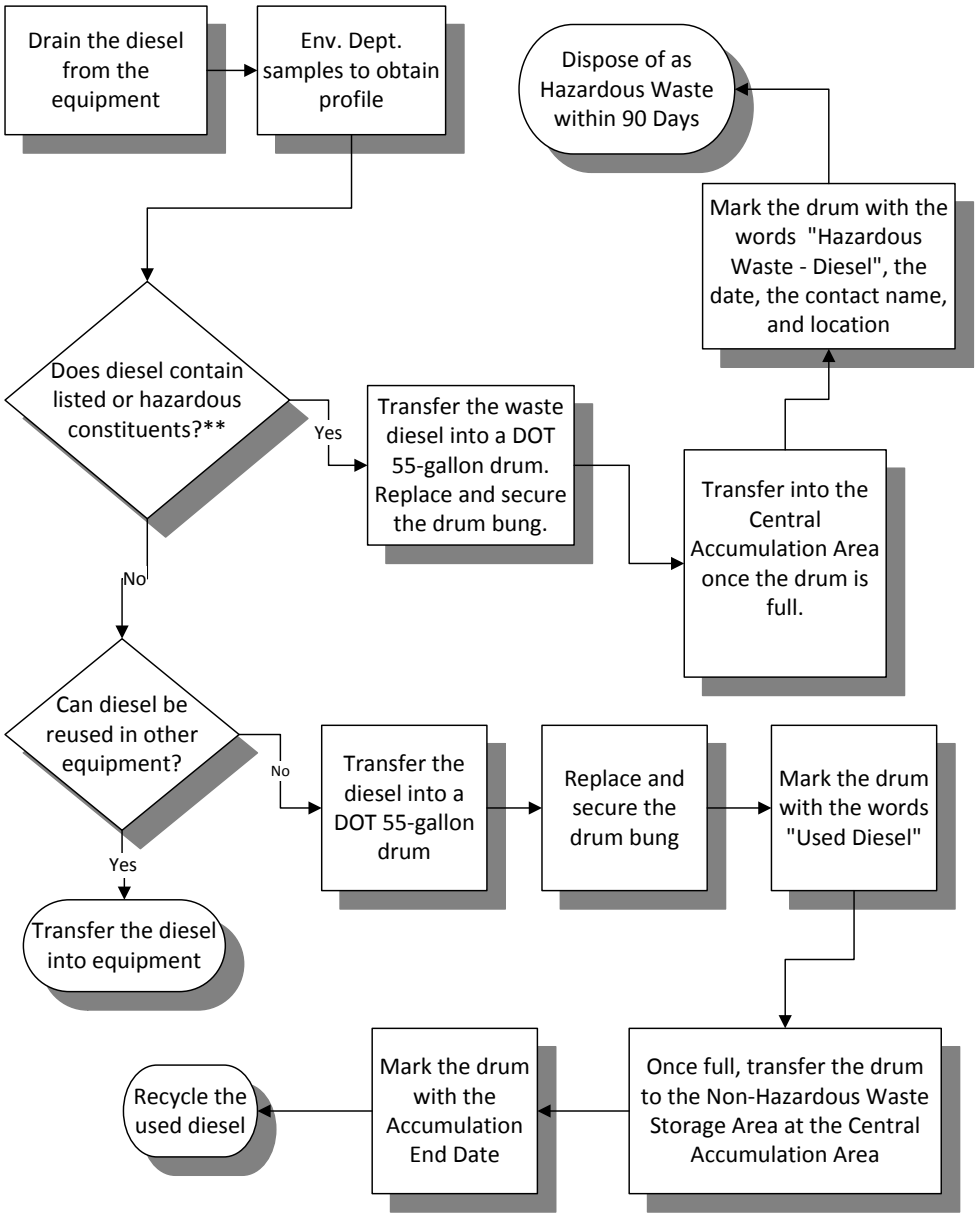
CHEMICAL CONTAMINATED SOILS AND SPILL HANDLING PROCEDURES FOR OPERATORS



NEW CLEANING AND SOLVENT PRODUCT APPROVAL HANDLING PROCEDURES FOR OPERATORS

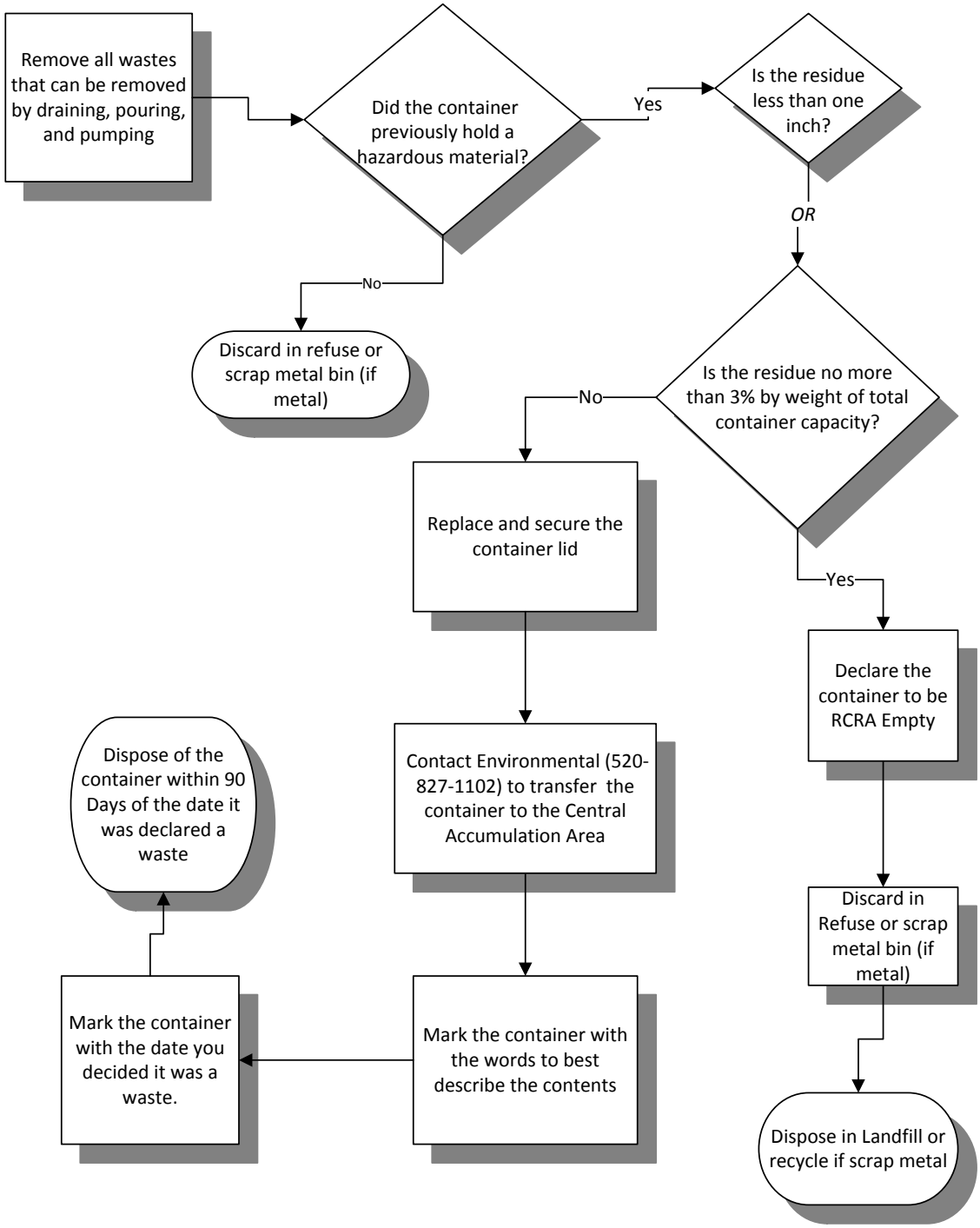


COMPRESSED GAS CYCLINDER HANDLING PROCEDURES FOR OPERATORS

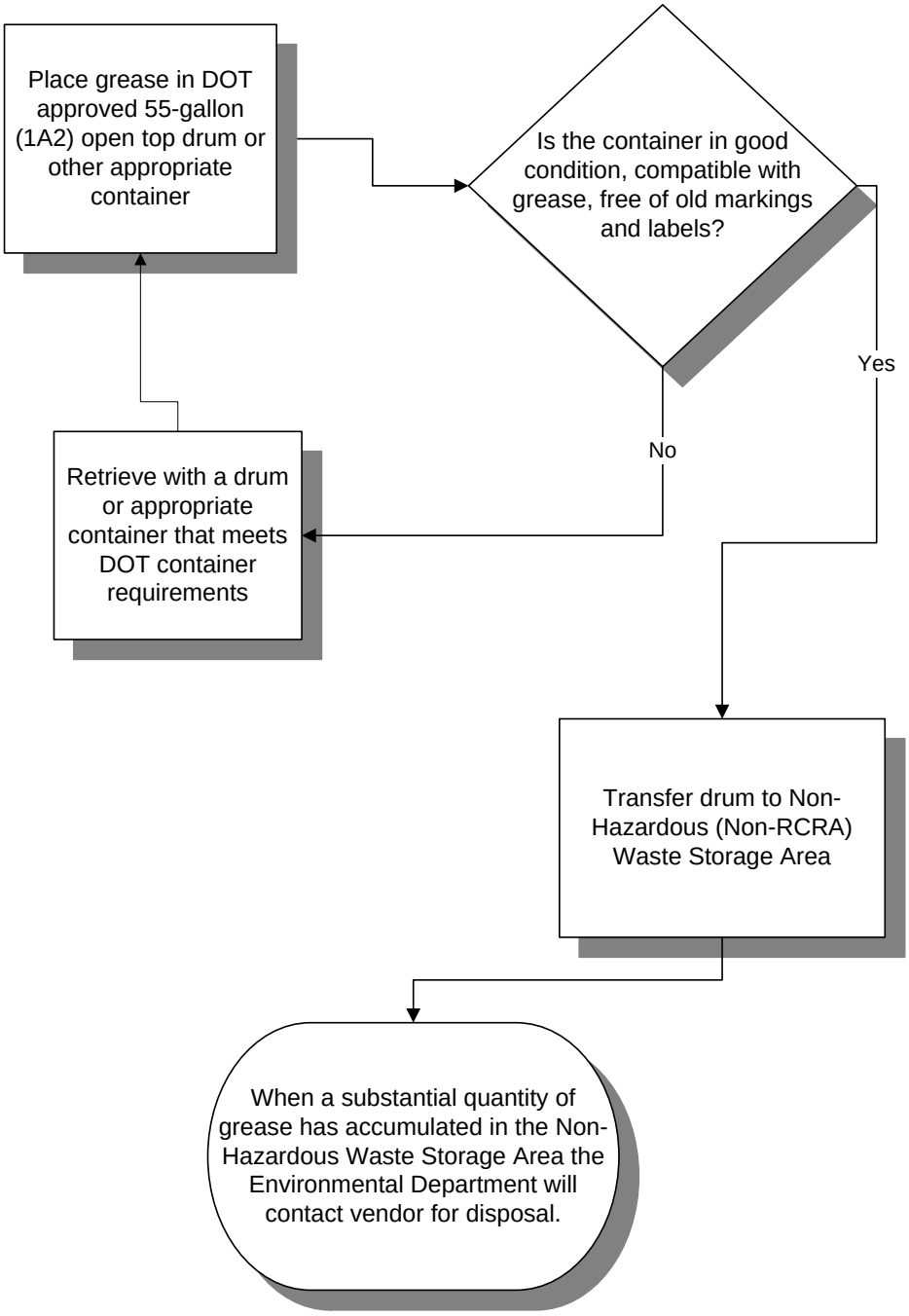


USED / WASTE DIESEL HANDLING PROCEDURES FOR OPERATORS

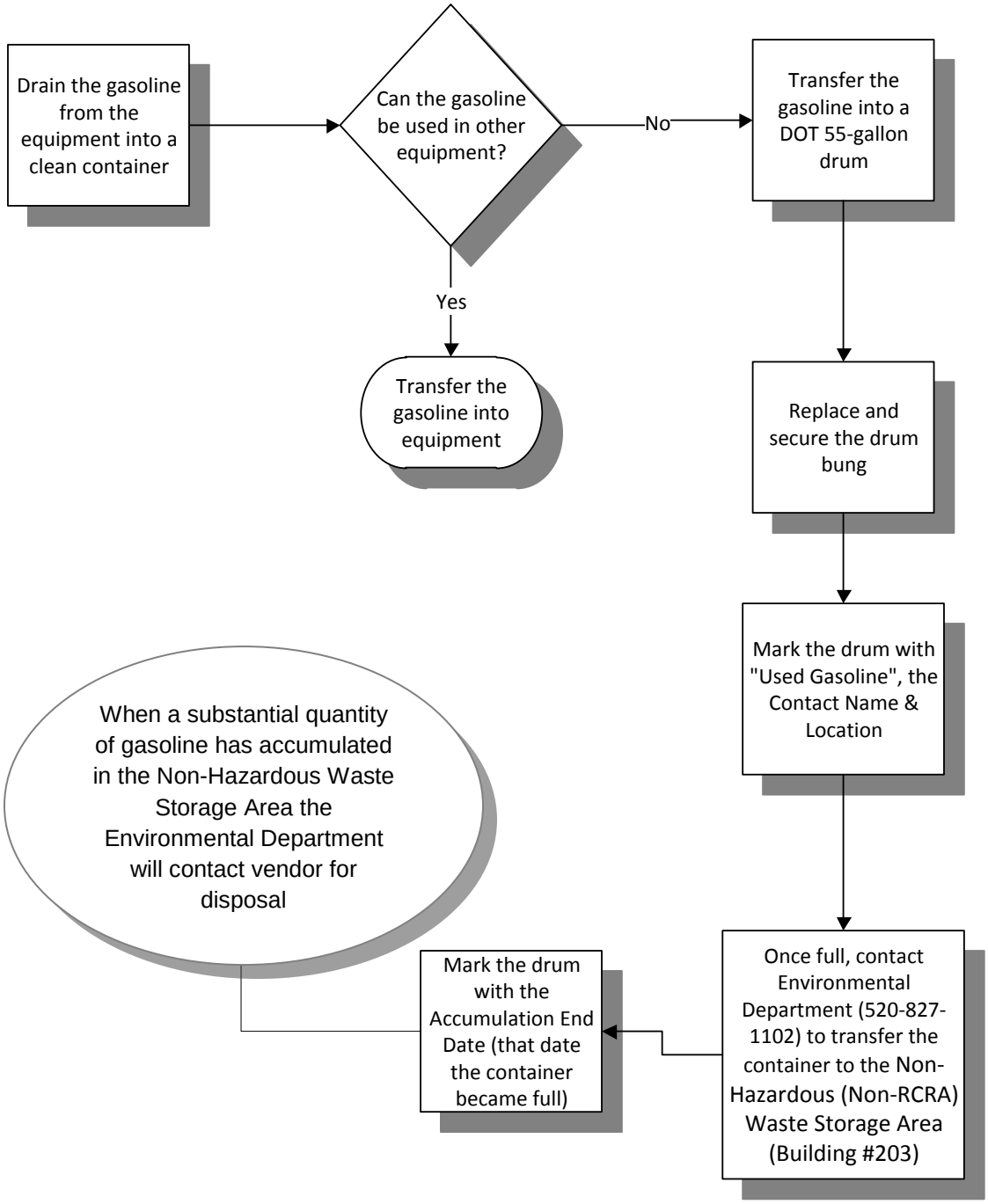
** Contact Environmental Department for guidance



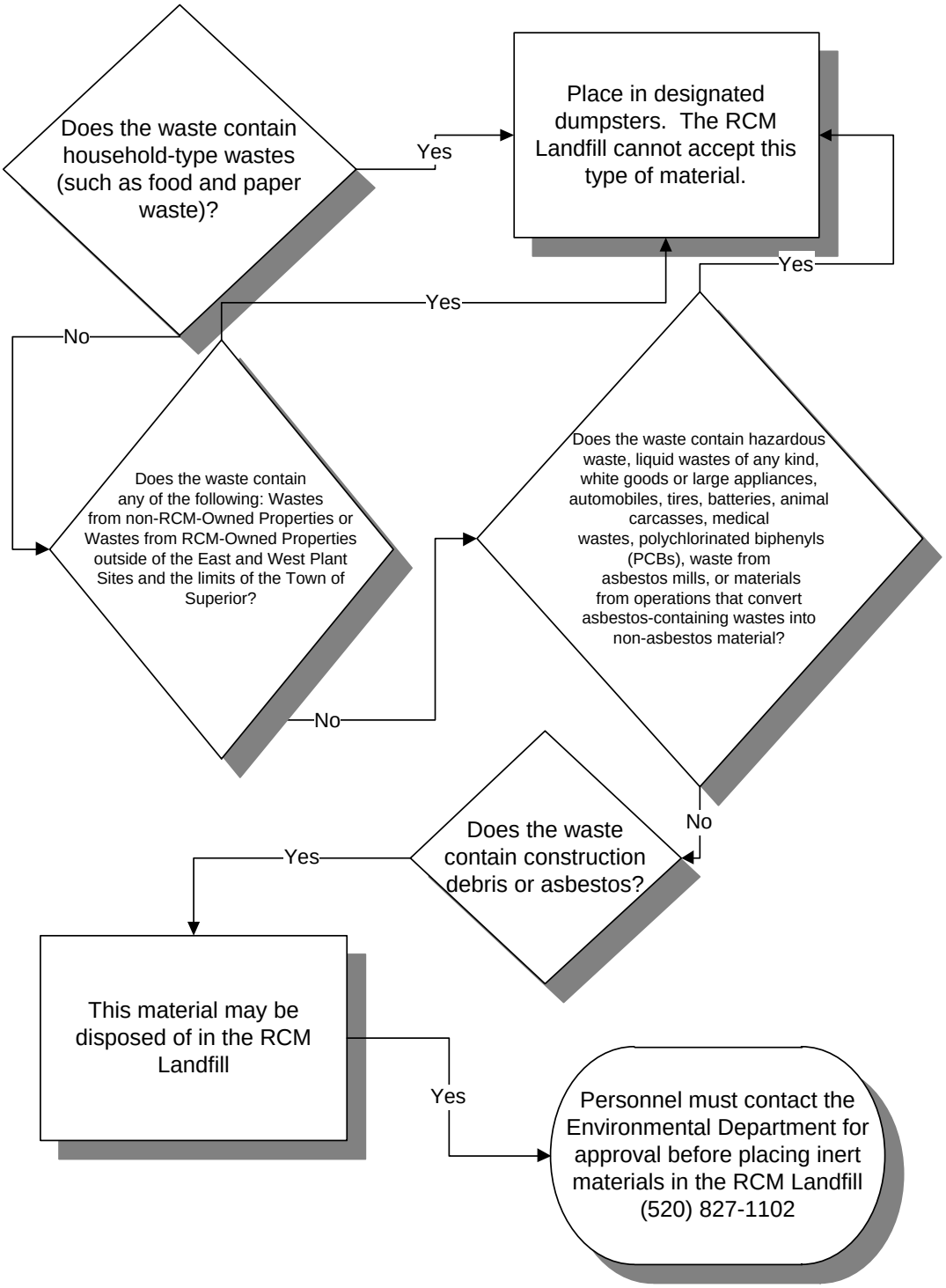
EMPTY DETERMINATION AND DISPOSAL PROCEDURES FOR NON-AEROSOL CONTAINERS FOR OPERATORS



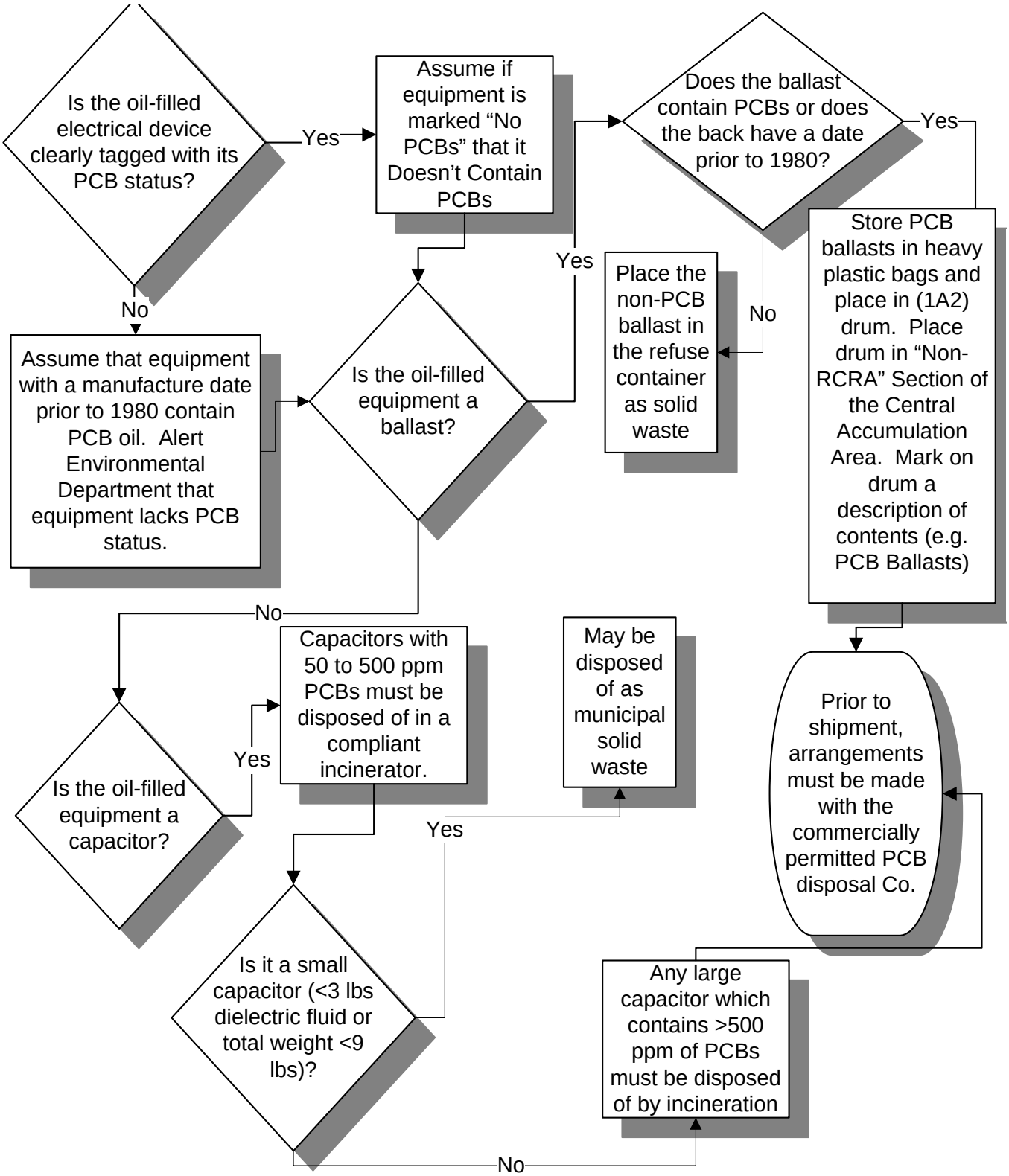
USED GREASE HANDLING PROCEDURES FOR OPERATORS



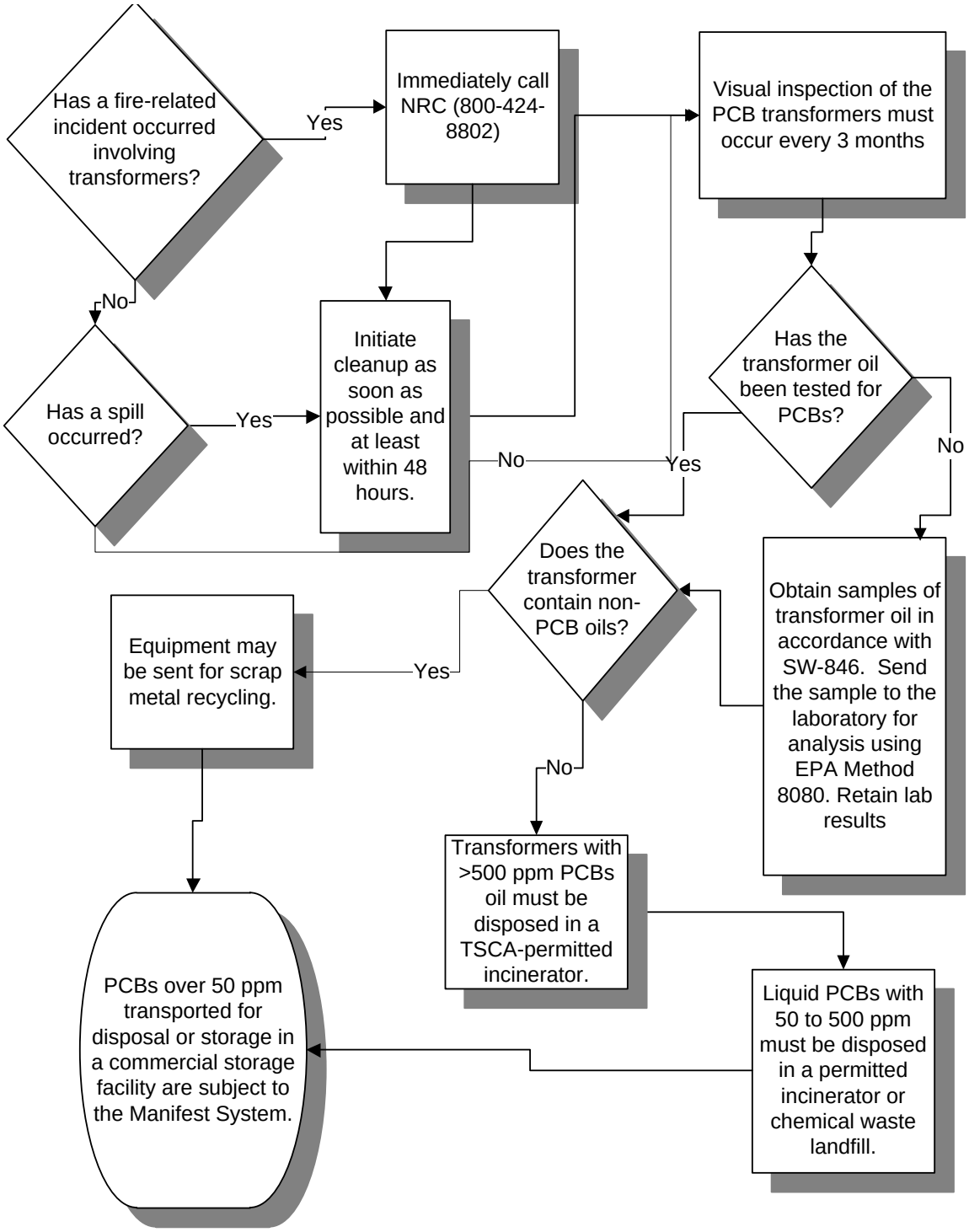
USED GASOLINE HANDLING PROCEDURES FOR OPERATORS



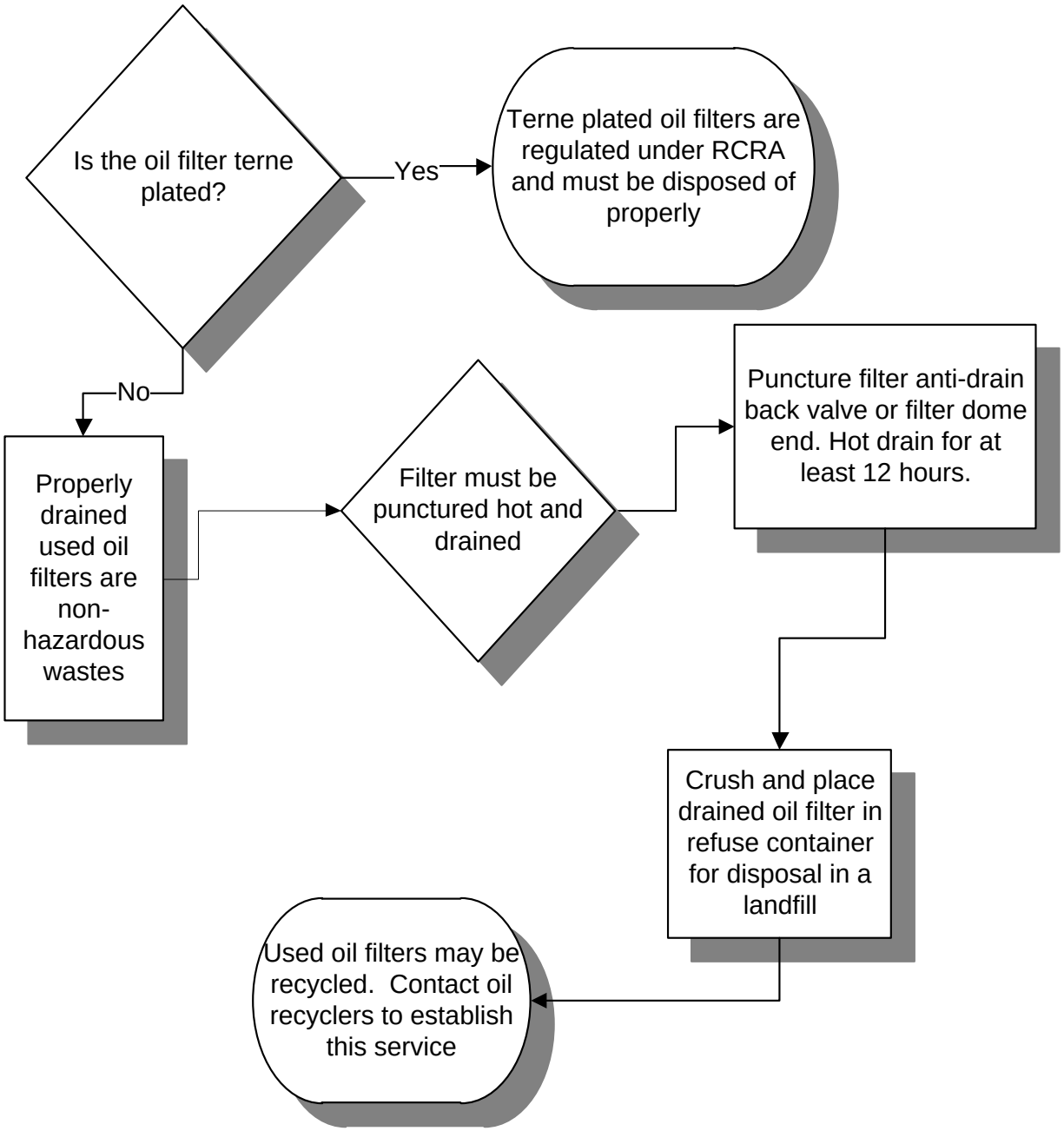
LANDFILL PROCEDURES FOR OPERATORS



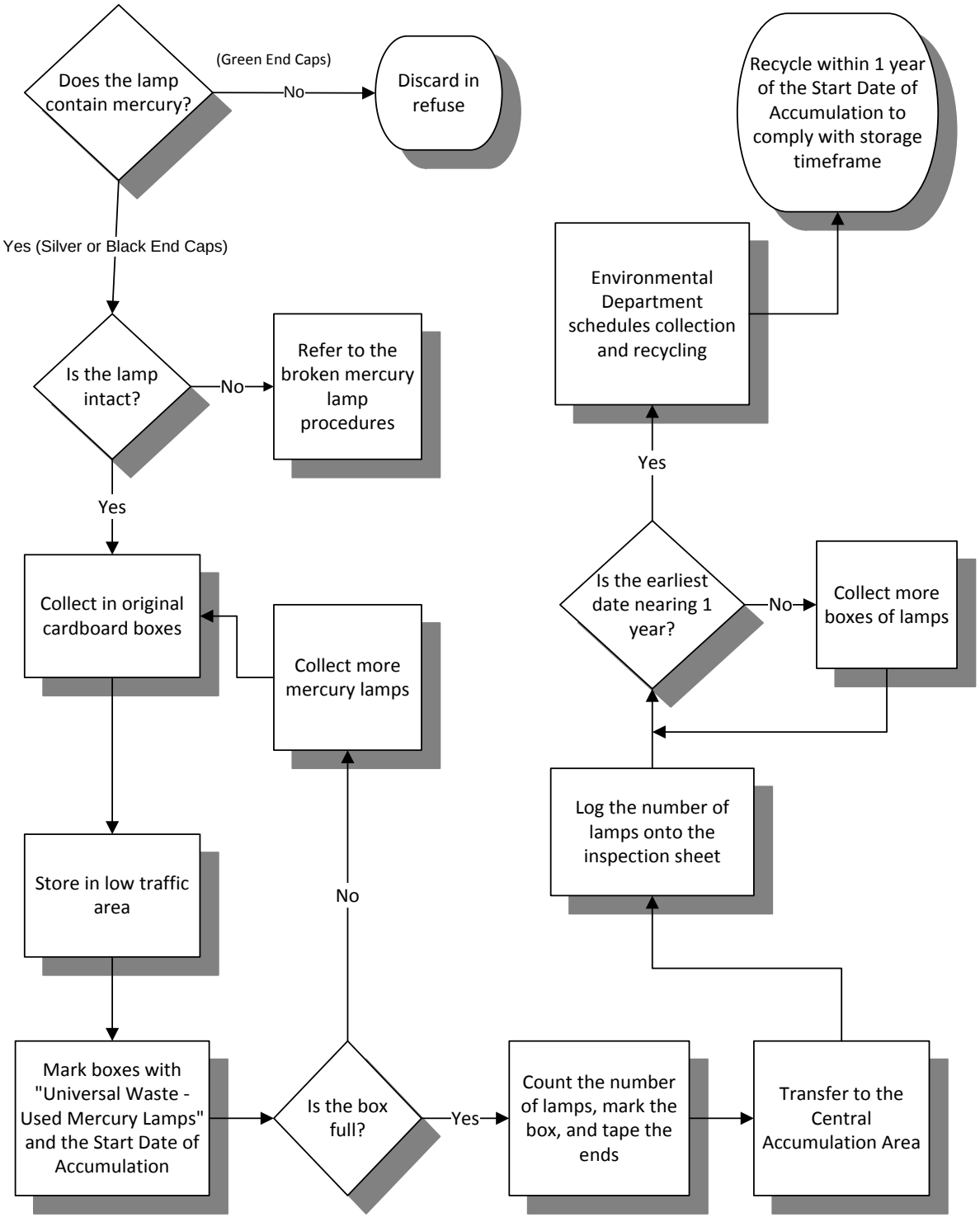
OIL-FILLED ELECTRICAL DEVICE/PCB BALLAST/CAPACITOR (NOT TRANSFORMERS) HANDLING PROCEDURES FOR OPERATORS



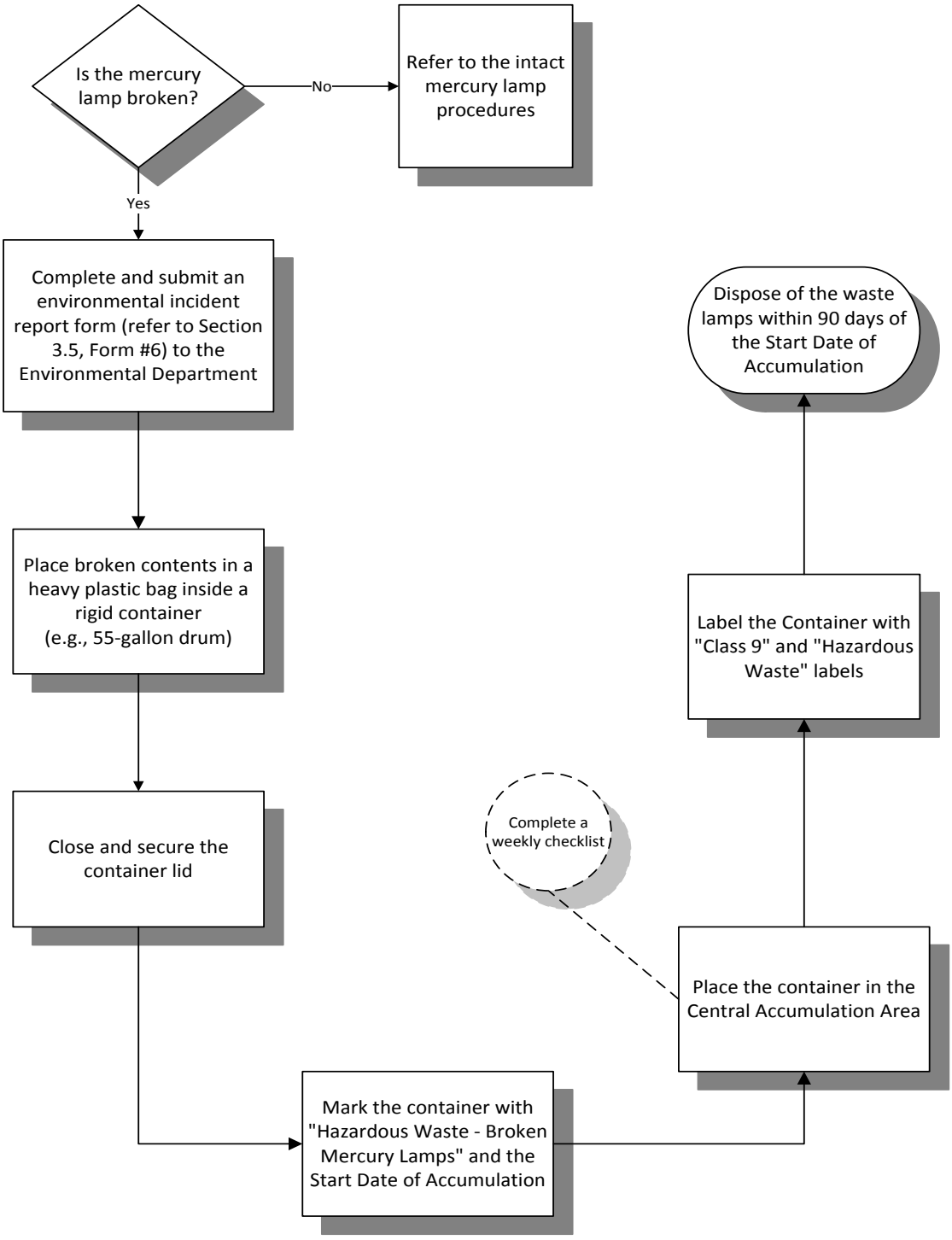
OIL-FILLED ELECTRICAL DEVICES
TRANSFORMERS HANDLING PROCEDURES
FOR OPERATORS



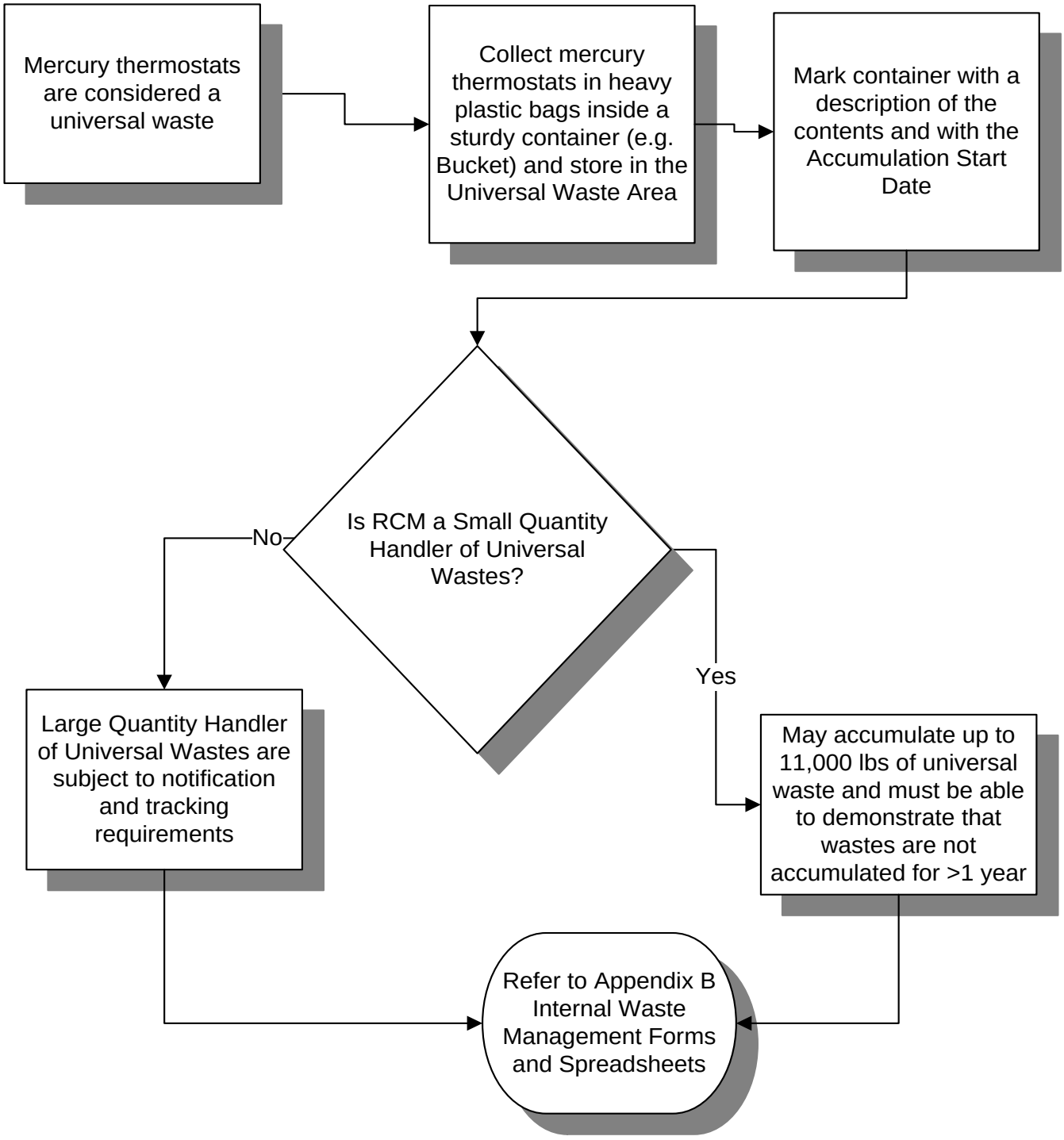
USED OIL FILTER HANDLING PROCEDURES FOR OPERATORS



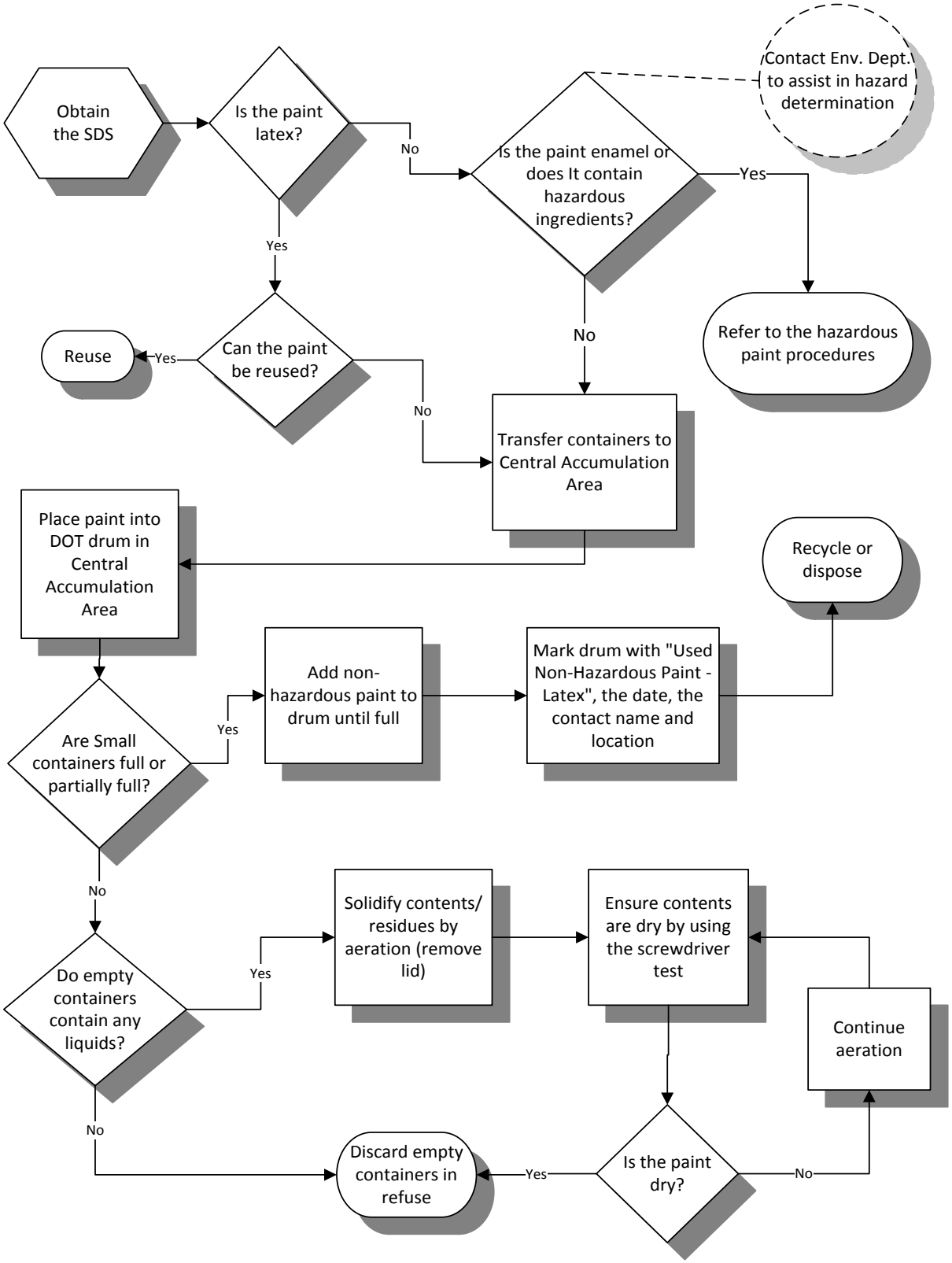
INTACT USED MERCURY LAMP (UNIVERSAL WASTE) HANDLING PROCEDURES FOR OPERATORS



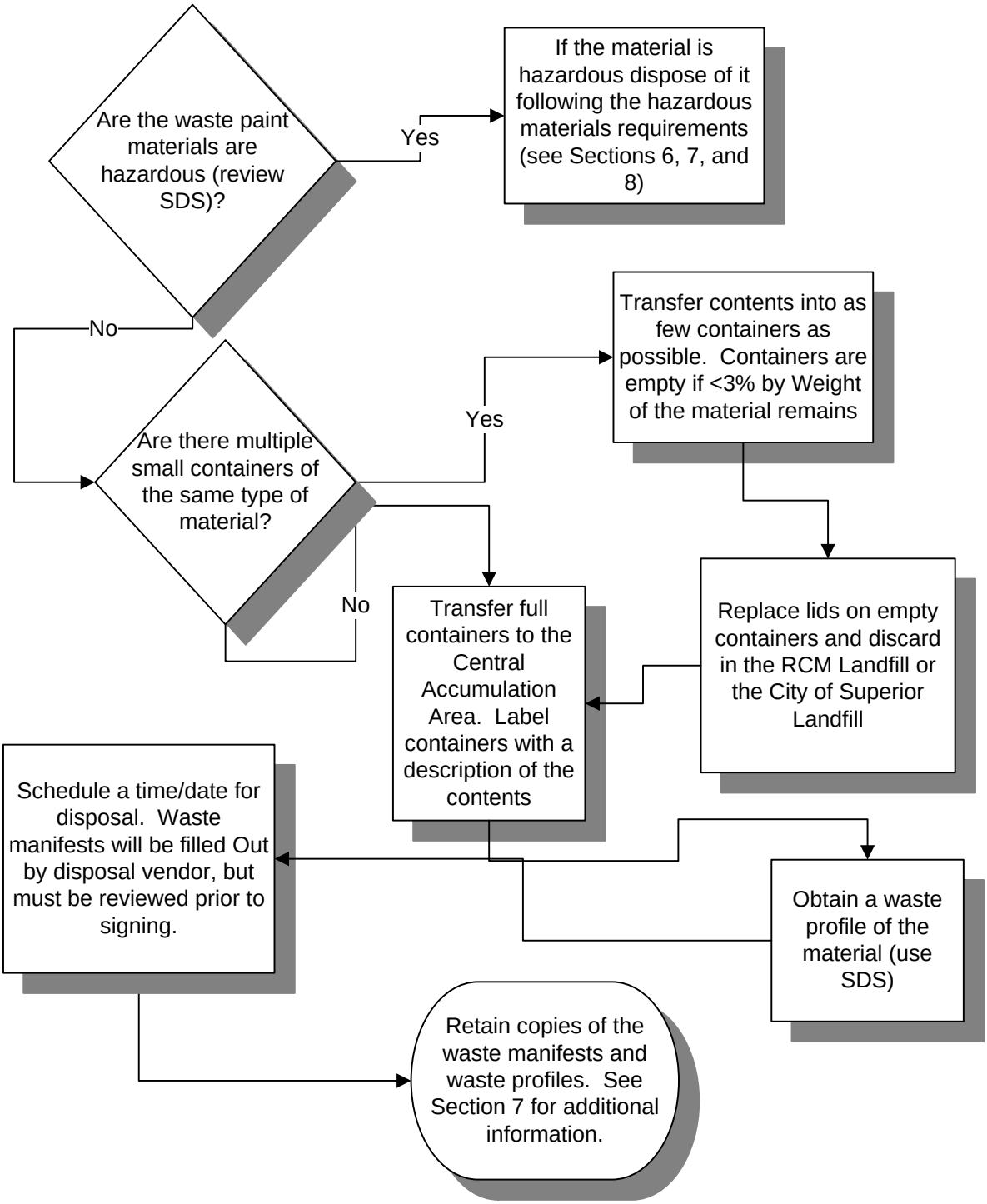
BROKEN MERCURY LAMP (HAZARDOUS WASTE)
HANDLING PROCEDURES FOR OPERATORS



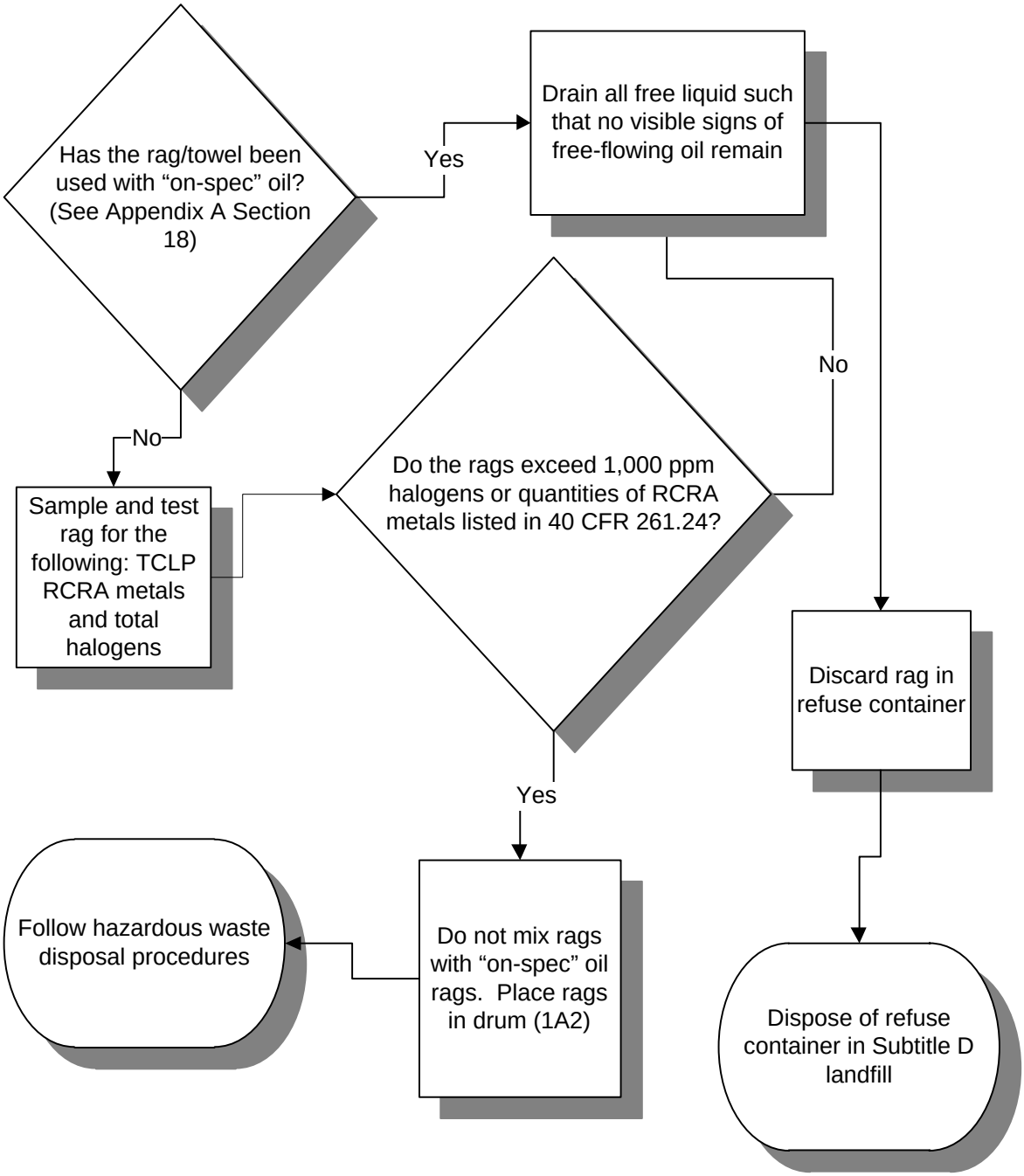
SPENT MERCURY THERMOSTAT HANDLING PROCEDURES FOR OPERATORS



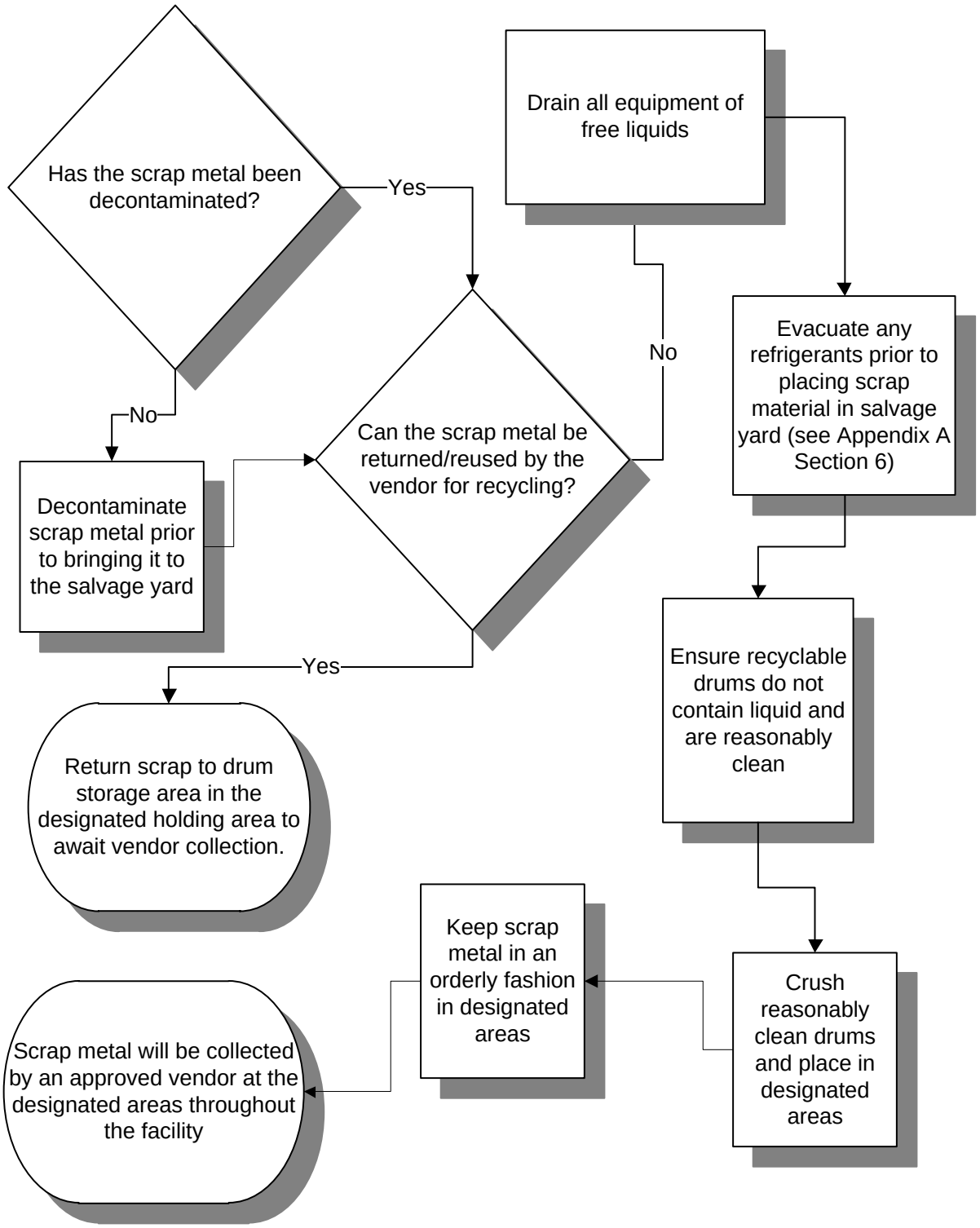
USED PAINT (LATEX/NON-HAZARDOUS) HANDLING PROCEDURES FOR OPERATORS



WASTE PAINT MATERIALS HANDLING PROCEDURES FOR OPERATORS



SHOP RAGS HANDLING PROCEDURES FOR OPERATORS



SCRAP METAL HANDLING PROCEDURES FOR OPERATORS

1 Introduction

1.1 *Purpose and Use of the Document*

The purpose of this document is to provide personnel in all areas of the Resolution Copper Mining LLC (RCM) operation access to procedures for the proper handling and disposal of hazardous materials and hazardous waste so as to protect the environment and to comply with laws and regulations.

1.1.1 Disclaimer

1. The procedures in this handbook are provided to aid in the proper handling and disposal of materials in order to prevent releases to the environment and in compliance with environmental regulations and the Rio Tinto Health Safety and Environment (HSE) Performance Standards. Although procedures may recommend the use of personal protective equipment, this document does not address the procedures needed for protecting the health and safety of workers.
2. Workers should consult with their supervisor and the Safety Department regarding any concerns related to personal safety and job training.
3. Some procedures described in this document may require specialized training of personnel prior to commencing work activities.
4. Adherence to the procedures in this document does not guarantee full compliance with all hazardous waste statutes and rules. Resource Conservation and Recovery Act (RCRA) is a complex law with correspondingly complex regulations that have been the subject of ongoing clarification in the courts. How the rules are implemented is under constant adjustment and interpretation.
5. When a question arises regarding a handling of disposal procedure, the appropriate statutes and rules should be consulted as the authority. The rule citations provided in this document may not include all of the pertinent rules, regulations, laws or sections of same that would apply to the subject topic.
6. This document does not purport to have identified every waste stream for the proposed RCM operation. The absence of a waste stream from this document does not mean that there are no corresponding procedures that should be followed or regulations that would apply. Additional identified waste streams may be added to the document throughout operations if identified.

2 Hazardous Material Management

Rio Tinto has developed a HSE performance standard for hazardous materials and contamination control (HSE Environment Standard E5). The purpose of the standard is to prevent spillage and environmental contamination as a result of the handling, storage and processing of materials. The following sections outline how RCM complies with Rio Tinto Corporate HSE Environment Standard E5 and hazardous materials management is regulated and managed under RCRA. Compliance is also demonstrated via the operational procedure flow charts.

2.1 *Planning*

HSE Environment Standard E5 requires that each facility identify potential contamination risks at each site so that appropriate transport, storage, use, transfer and disposal can be implemented. This includes identifying hazardous materials at the site (i.e., virgin materials such as fuel or acid) as well as contamination areas that have not been remediated.

An inventory of oil products to be managed at the facility can be found in the facility's Spill Prevention, Control and Countermeasure (SPCC) Plan. Other hazardous materials to be managed at the site are identified in the facility's storm water pollution prevention plan (SWPPP). A Contaminated Sites / Hazardous Materials Sites Register is also maintained on site through the Environmental Department.

2.2 *Storage and Handling*

Hazardous materials at RCM are to be stored in aboveground containers constructed to be compatible with the material being stored. The materials will be stored in a manner that will prevent contact by unauthorized personnel, birds and other animals, and will not pose a risk for discharge to streams, drainages, or the environment.

2.3 *Secondary Containment*

Hazardous materials containers (including flow through process tanks) will be placed in areas with adequate secondary containment that meet the following criteria:

- Containment drainage valves remain closed and locked except for draining rainwater. Signage must be provided that indicates proper valve position and requirement for locks.
- Containment systems must be free from product spillage. Rainwater or snow must be removed to maintain adequate capacity.
- Measures must be in place to prevent a release from secondary containment from reaching sewer systems, bodies of water or soil.
- Must be able to contain 110% of the volume of the container.

RCM's East Plant and West Plant SPCC Plans and site specific SWPPPs for current activities outline the secondary containment and control measures implemented at the hazardous materials storage areas. SPPC and SWPPPs for the proposed mine plan are contained as appendices to the general plan of operations.

2.4 *Inspections*

Hazardous materials storage areas are inspected on a routine basis to monitor for leaks and the structural integrity of the storage containers. The inspection procedures are outlined in RCM's SPCC Plans and site specific SWPPPs for the current activities and proposed operation.

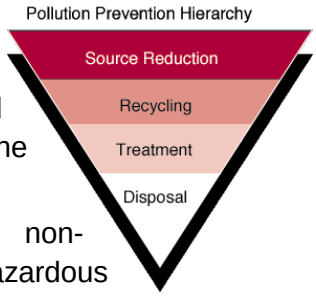
2.5 *Leak Detection*

Leak detection equipment and/or routine inspections are utilized to determine if a hazardous material leaks from its container. The leak detection equipment, inspection procedures, and or emergency response procedures are outlined in RCM's SPCC Plans and site specific SWPPPs for the current activities and proposed operation.

3 Pollution Prevention and Waste Minimization

3.1 *Pollution Prevention Hierarchy*

Pollution Prevention activities may include any of the following, (order of preference, if applicable):



1. **Source reduction / Conservation** (e.g. print double-sided documents, using email, purchase products only in the volumes needed, etc.).
2. **Substitution** (e.g. replacing chlorinated products with non-chlorinated products, replacing products containing other hazardous constituents with non-hazardous products).
3. **Recycling** of wastes or secondary materials – send off-site (e.g. diesel, gasoline, used oil, scrap metal, batteries, toner cartridges, etc.).
4. **Reuse** – onsite reuse (e.g. diesel, gasoline, process water, etc.).
5. **Reclamation** (e.g. lead from vehicle batteries).
6. **Volume reduction** (e.g. transferring contents of several small containers of the same substance into one container for disposal).

3.2 *Arizona Pollution Prevention Regulation*

The Arizona Revised Statues (A.R.S.) require the development and implementation of a pollution prevention plan for facilities that exceed thresholds related to hazardous waste generation or shipment, and/or toxic substance use. These thresholds are based on the amount of hazardous waste generated, hazardous waste shipped, and/or toxic substances used at a facility. Toxic substances are defined by the toxic chemicals on the EPA's Toxic Chemical Release Inventory (TRI) list. The threshold values established include the following:

- 12,000 kg of hazardous wastes shipped off-site annually
- 1 kg of acutely hazardous wastes shipped off-site annually
- 1 kg (average) of acutely hazardous wastes or 1,000 kg (average) of hazardous waste generated monthly
- 25,000 pounds of a toxic substance manufactured/processed annually
- 10,000 pounds of a toxic substance used annually

Additionally, if a facility meets all three of the following conditions, it is also subject to the Arizona state pollution prevention regulatory requirements:

- The facility filed an EPA TRI form.
- The total number of hours worked by all employees in a calendar year is 20,000 hours or more.
- The facility falls under one of the following SIC codes: 2000-3900, 1021, 1031, 1041, 1044, 1061, 1099, 1221, 1231, 4911, 4931, 4939, 4953, 5169, 5171, and 7389.

3.3 *Pollution Prevention Targets*

RCM meets the requirements for the preparation and implementation of a pollution prevention plan, has an active plan with ADEQ, and reports on an annual basis. This plan will be updated through operations as facilities and environmental protections and mitigations change. The following sections outline pollution prevention targets established for the facility.

3.3.1 Purchasing of Products

Prior to bringing any product on site, the product must first be approved through the MaxCom system. To initiate the approval process, a product Request/Approval form must be submitted along with an SDS that is less than five years old. Considerations for product purchase include the following:

1. Amounts: For standard materials, limit inventories and individual stockpiling.

   For special projects, purchase only the amount needed for a particular project. Require contractors to remove all of their material from the site when a job is complete.

2. Type: Ensure use of only approved chemical products.

   Refer to **Appendix A, Section 8 Cleaning and Solvent Products** for product evaluation procedures.

3.3.2 Proper Chemical Use and Storage

1. Close chemical product containers tightly between uses.
2. Ensure containers are correctly labeled.
3. Ensure that incompatible products are segregated from each other.
4. Implement inventory control:
   a. Use the entire volume of the product.
   b. Open as few containers of the same product as needed.
   c. Rotate stock by placing the new purchase to the back of the inventory. Use the oldest container first to reduce the need for disposal.
   d. If one department cannot use the entire amount of the product, call or contact other departments that may be able to use the remainder of the product.

3.3.3 Management Practices

1. Employees must contact the Environmental Department if a container has residual product that is no longer useable for waste disposal. Containers must be properly marked stored in the Central Accumulation Area for collection until disposal arrangements are made.
2. Employees must contact the Safety Department (refer to existing information on MAXCOM or the product manufacturer for obtaining the proper Safety Data Sheet [SDS]), if their department does not possess the SDS.

3. Employees must provide a SDS to the Environmental Department to assist in determining any regulatory requirements prior to disposal.

3.4 *Performance Monitoring*

Performance monitoring is tracked through our Yearly Goals Update that is submitted to ADEQ on an annual basis.

4 Waste Management

4.1 *Overview*

There are two main types of wastes generated at RCM: mineral wastes and non-mineral wastes. The following sections outline how waste materials generated at RCM should be managed.

4.2 *Mineral Waste Identification*

Mineral Wastes include the following:

That portion of the mined geological deposit that is not conveyed or transported from the operation as product and is not generated by processing activities:

- Includes development rock and overburden brought to the surface from underground development or mining activities.
- Typically by-products / outputs which do not meet grade requirements due to size, texture etc.

That portion of the mined geological deposit that is not transported from the operation as product and is generated by processing activities such as:

Tailings from mineral processing

Mineral Wastes are divided into two categories: reactive and non-reactive.

Reactive mineral wastes are defined as mineral waste whose innate physical, chemical or biological properties could now or in the future create an environmental exposure hazard above and beyond risks posed by geotechnical issues, inert dust in air or inert total suspended solids in water.

If the mineral waste does not meet the above criteria it is considered a non-reactive mineral waste.

4.3 *Non-Mineral Waste Identification*

RCM will determine, based on applicable regulations and laws, if non-mineral wastes (solid wastes) generated by its operations and activities are hazardous or non-hazardous.

4.3.1 Identification of Hazardous Wastes

1. A solid waste is a hazardous waste if it is not excluded from hazardous waste regulation, and it:
    a. Is listed as a hazardous waste in subpart D of 40 Code of Federal Regulations (CFR) part 261;
    b. Is mixed with a waste listed in subpart D of 40 CFR part 261; or
    c. Exhibits a characteristic of hazardous waste as described in subpart C of 40 CFR part 261:

(1) ignitability
(2) corrosivity
(3) reactivity
(4) toxicity

2. Determine if a solid waste is hazardous waste by:
   a. Evaluating the exemptions
   b. Reviewing the listed hazardous wastes in subpart D of 40 CFR 261.
   c. Either testing the waste according to the methods set forth in subpart C of 40 CFR part 261 or applying knowledge of the hazard characteristic(s) of the waste in light of the materials and processes used.
   d. Initial and periodic sampling and analysis may be used as the basis for subsequent use of knowledge that the materials are not hazardous. Regulators and vendors may request the analysis for the hazardous/non-hazardous determination of materials being disposed.

4.3.1.1 Assignment of Hazardous Waste Codes

1. Consider the regulations in the following order to assign the proper hazardous waste code to a waste (lists are in 40 CFR 261 Subparts C and D)
   a. U-list: Non-acutely Hazardous Commercial Chemical Products;
   b. P-list: Acutely Hazardous Commercial Chemical Products;
   c. K-list: Hazardous Waste from Specific Sources;
   d. F-list: Hazardous Waste from Non-specific Sources; and
   e. D-numbers: Characteristically Hazardous Waste.

- *An example of a U-listed waste is a container of pure, unused acetone (U002)*
- *If the acetone container has been used as a solvent, and contains the ignitable characteristic, the F003 (over 10%) code would apply.*
- *Wastes containing less than 10% acetone (with no other F-listed solvents) and possess a flash point of less than 140 degrees F would be a D001 (ignitability).*

2. No analytical testing is required to identify a waste as a listed waste (U, P, K, and F-lists). A listed waste is hazardous by definition, and a single waste stream should carry only a single listed waste number. The only time you would have a waste with more than one listed code is when you mix two or more different listed wastes.
3. If a waste is identified as a P or U-listed waste, do not consider the hazardous characteristics. The P and U listings account for any hazard that the chemical may present. This is also true for the K-listed wastes; however, assign a D code to a mixture of K-listed waste and characteristically hazardous waste.

4. P and U-listed wastes are commercially **pure, unused**, grades of the chemical. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in the P and U waste codes.
5. F-listed wasted should carry only one F code, unless the waste was mixed with more than one waste. Pay careful attention to the listing descriptions, especially the percentage limitations.
6. The characteristically hazardous waste numbers (D codes) are based upon analytical results. A waste can exhibit more than one characteristic.

4.3.2 Identification of Petroleum Contaminated Soils (PCS)

All spills, regardless of size, are required to be reported to the Environmental Department.

1. When a spill occurs, the Environmental Department will provide assistance in assessing the situation to determine how to manage the soil.
2. If it is determined that excavation is necessary, excavate soils contaminated with petroleum products with the necessary equipment, such as a shovel for small spills or a backhoe for larger spills.
3. Place the petroleum-contaminated soils (PCS) in an appropriate container for disposal (55-gallon drum for smaller spills, a roll-off bin for larger spills).
4. Mark the drum with the words that best describe the waste, such as “Diesel Contaminated Soil”, Gear Oil Contaminated Soil”, or “Gasoline Contaminated Soil), etc.
5. The Environmental Department will determine if the excavated soil meets the definition of PCS, solid waste PCS, or non-regulated soil by sampling and performing analysis in accordance with EPA SW-845.
6. Excavated soil contaminated with petroleum products in excess of any of the following concentrations listed in **Table 5-1** shall be designated as Petroleum Contaminated Soil (PCS).

Table 5.1

Soil Remediation Levels (SRLs)

	Regulated Contaminant	Soil Remediation Standards	
		Residential, Solid Waste (in ppm, mg/kg)	Non-Residential Special Waste (in ppm, mg/kg)
BTEX Commonly found in gasoline EPA Method 8031	Benzene	0.65	1.4
	Toluene	650	650
	Ethylbenzene	400	400
	Total Xylenes	270	420

	Regulated Contaminant	Soil Remediation Standards	
		Residential, Solid Waste (in ppm, mg/kg)	Non-Residential Special Waste (in ppm, mg/kg)
PAHs Polynuclear aromatic hydrocarbons Commonly found in diesel EPA Method 8310	Acenaphthene	3,700	29,000
	Anthracene	22,000	240,000
	Benz[a]anthracene	0.69	21
	Benzo[a]pyrene	0.069	2.1
	Benzo[b]fluoranthene	0.69	21
	Benzo[k]fluoranthene	6.9	210
	Chrysene	68	2,000
	Dibenz[a,h]anthracene	0.069	2.1
	Fluoranthene	2,700	26,000
	Indeno[1,2,3-cd]pyrene	0.69	21
	Naphthalene	56	190
	Pyrene	2,300	29,000

7. Sample in accordance with the methodologies specified in A.A.C. R18-8-1604.b.
8. Analysis shall be for total recoverable concentrations of contaminants and shall be conducted by a laboratory licensed by the Arizona Department of Health Service (ADHS).

4.3.3 Identification of Universal Wastes

The Standards for Universal Waste Management and the Arizona Administrative Codes establish the requirements for managing the following wastes:

1. Used Batteries
2. Mercury Thermostats
3. Pesticides
4. Used Mercury Lamps

Universal Wastes are less stringently regulated than Hazardous Wastes, as long as the following protocols are followed:

1. The above listed wastes are intact and not broken.
2. The wastes are recycled and not disposed of.
3. The wastes are recycled within one (1) year of the start date of accumulation.
4. The containers are properly marked and stored until recycled.
5. Employees are properly trained on handling and emergency response procedures.
6. Releases are immediately contained.

4.3.4 Identification of Used Oil

Used oil has been defined by the federal regulatory programs as any oil that has been refined from crude oil, or any synthetic oil that has been used, handled, transported, or stored, and as a result of such use, handling, transportation, or storage, is contaminated by physical or chemical impurities, and is no longer suitable for its originally intended purpose. In addition to the federal definition of used oil, Arizona's legislator adopted additional provisions which include the following definitions:

- Used oil includes oil that has become contaminated as a result of its handling, transportation, or storage.
- Off-specification used oil means used oil which exceeds any of the allowable levels in 40 CFR 279.11.
- On-specification used oil means used oil that is not off-specification used oil.

In general used oil has the following characteristics:

- Used oil includes motor oils, metalworking fluids, emulsions, transmission fluids, brake fluids, coolants, heating media, refrigeration oils, electrical oils, buoyants, and hydraulic fluids.
- Used oil does not include antifreeze, cleaning agents, and animal and vegetable oils.
- Gasoline, jet, and diesel fuels are not used oil; however, if mixed with used oil, these fuels must be regulated as used oil.
- Used oil is presumed to be recyclable. If it is not recyclable, it is waste oil.
    - The U.S. EPA and Arizona considers burning of used oil for energy recovery a form of recycling.

5 Waste Management

5.1 *Mineral Waste Management*

Procedures for management of mineral waste at RCM are summarized in the appendix called "Overview of Acid Rock Drainage Operational and Post-Closure Water Management Strategies at Resolution Copper Mining for the Protection of Groundwater and Surface Water."

5.2 *Hazardous Waste Management*

Generators of hazardous waste must complete a hazardous waste determination based on process knowledge and/or sampling and analysis. Generators shipping waste for disposal off-site must obtain a RCRA Identification Number; must utilize transporters and transfer storage and disposal (TSD) facilities with RCRA Identification Numbers; and must comply with the Department of Transportation (DOT) requirements.

5.2.1 Labeling Requirements

Properly mark hazardous waste containers with the following:

1. Words to best describe the contents,
2. The words "Hazardous Waste", if applicable,
3. Mark the container with the start date of accumulation (for satellite accumulation areas mark the container with the date it became filled).
4. Appropriate DOT labels before transporting off-site for disposal,

5.2.2 Container Requirements

Appropriate containers should be used to accumulate wastes as well as to transport wastes. In most cases, containers in which new hazardous materials were shipped should be re-used to transport the same materials after they become wastes. However, for some wastes, purchase of containers may be necessary for compliance, if appropriate containers are not otherwise available. Use of containers must be approved by the Environmental Manager or designee prior to placing wastes in the proposed container.

5.2.2.1 Instructions for all Containers

1. Ensure containers are in good condition.
2. Drums and containers available for shipment must be in good condition and comply with DOT regulations.
3. Containers must be compatible with the waste contents and securely closed.
4. Old markings and labels on containers must be removed or painted over to avoid confusion about the contents.
5. Ensure the lid (and bung if present) is closed and secure.

Drums/containers not approved for transport may contain any <u>one</u> of the following conditions:

1. Interior of the drum is badly rusted.

2. Badly bulged head or bottom.
3. Stripped bung threads.
4. Broken or missing flange.
5. Pipe flange or gate valve welded or rusted in bung.
6. Any hole in the drum.
7. Top or bottom chimes with sharp dents.
8. Any significant dents on drum, especially on the rolling hoops.
6. Container is not compatible with the waste that is stored in it.

5.2.3 Storage Requirements

5.2.3.1 Central Accumulation Area

There are two designated Central Accumulation Areas for current activities. The Central Accumulation Area for West Plant activities is located within Building #203. Then Central Accumulation Area for East Plant activities is located adjacent to the SRP substation. Refer to **Figures** for the Central Accumulation Areas site locations. The locations of these facilities may change during operations.

5.2.3.2 Instructions for Hazardous Waste Containers

1. Once a drum has been filled (55 gallons max for each waste stream) in a satellite accumulation area, transfer the drum to the “90-day” (LQG) Central Accumulation Area. See Figures 2 and 3, for location of the Central Accumulation Area.
2. Hazardous waste is disposed of within 90 days once moved from the satellite accumulation areas to the Central Accumulation Area for Large Quantity Generators (LQGs). If amounts of hazardous waste generated exceeds 1,000 kg (2,200 lbs.) in any calendar month, LQG requirements apply. RCM operates as a LQG.
3. Hazardous waste is disposed of within 180 days once moved from the satellite accumulation areas to the Central Accumulation Area for Small Quantity Generators (SQGs). If the amount of hazardous waste generated exceeds 100 kg (220 lbs.) but is less than 1,000 kg (2,200 lbs.) in any calendar month, SQG requirements apply.
4. Refer to the Arizona Department of Environmental Quality (ADEQ) Inspection Checklist for waste compliance issues.
5. Complete a weekly checklist of the Central Accumulation Areas (**Appendix B**) (40 CFR 65.174).
6. File the completed checklist and retain for three (3) years.

5.2.3.3 Inspection Procedures

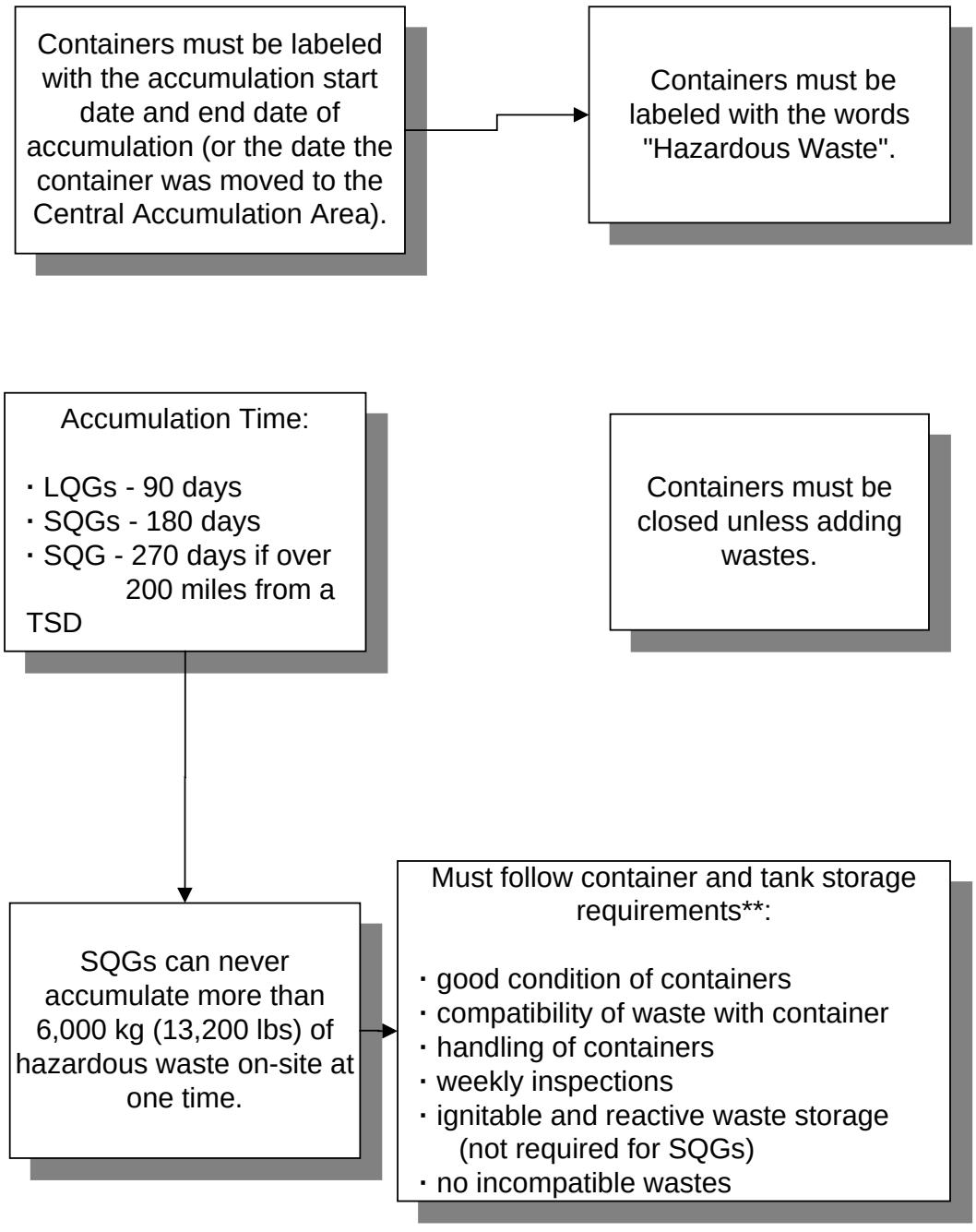
When performing inspections regarding hazardous waste, ensure the following:

1. The waste is packaged in accordance with DOT regulations (49 CFR 172.101; 40 CFR 262.30).

2. A container is made of, or lined with, a material that is compatible with the hazardous waste to be stored. This will prevent the waste from reacting with or corroding the container (40 CFR 265.172).
3. The containers are marked with hazardous waste labels, or equivalent, to identify the contents in accordance with DOT regulations (49 CFR 172.101; 49 CFR 172.301; 49 CFR 172.400, 40 CFR 262.34(a)(3)).
4. The containers are in good shape, and if not, the contents are transferred to a container in good condition (40 CFR 265.171).
5. The containers are closed (40 CFR 265.173(a)).
6. The waste storage areas are inspected weekly (refer to **Appendix B Forms**) and the inspection records are maintained on-site (40 CFR 265.174; A.A.C. R18-8-262.L) for a period of three (3) years. The inspection log must include the following information: inspection date, inspector's name and signature, and remarks or corrections. The completed inspection logs are filed in the Environmental Department.

Central Accumulation Area Flowchart

The following flowchart displays general requirements for the Central Accumulation Areas.



* 40 CFR 262.34
** 40 CFR 265 Subparts I and J

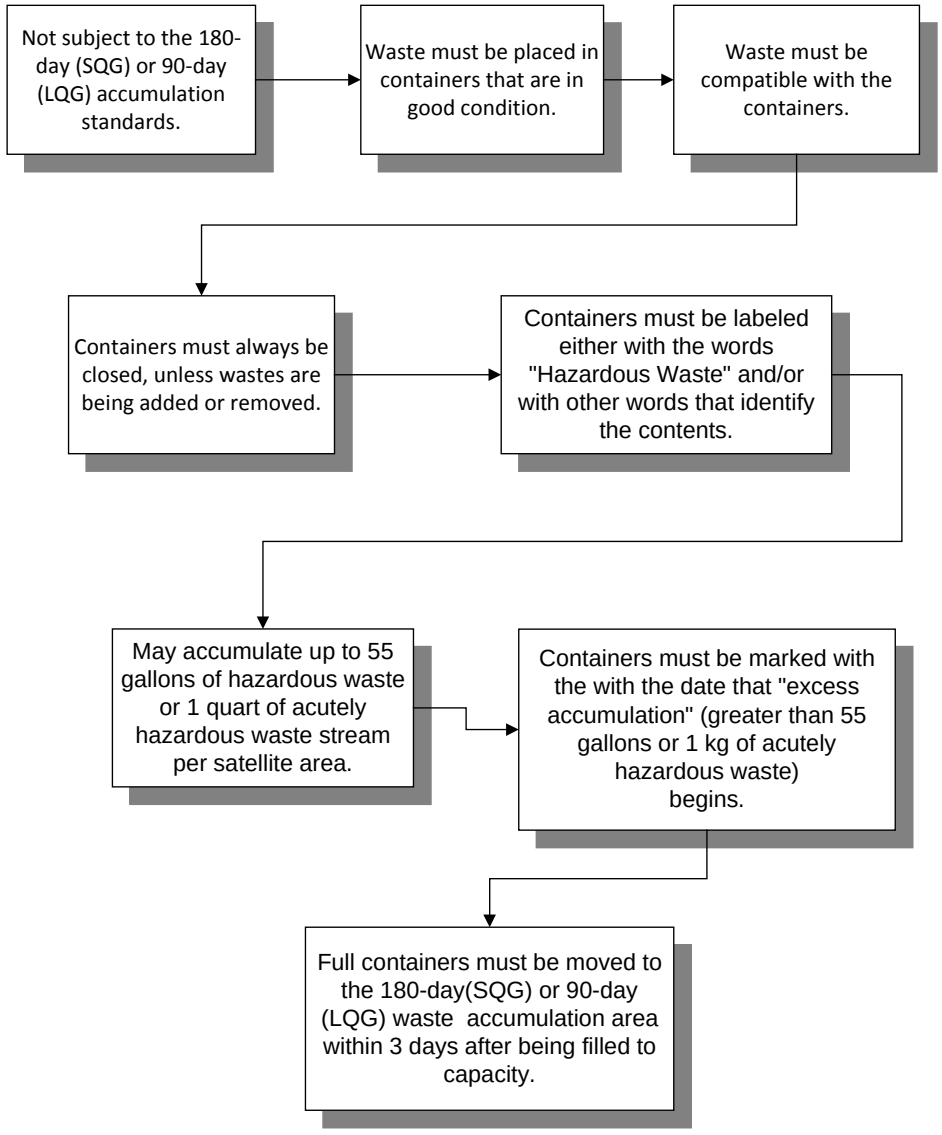
5.2.3.4 Satellite Accumulation Areas

At present, RCM has three (4) established satellite accumulation areas. One of the satellite accumulation areas is located in the E&M shop at the East Plant Site, one (1) satellite accumulation area is located at the Core Processing Facility and the last satellite accumulation area is located within Building 203. Refer to ADEQ's Inspection Checklist for an example of an inspection guidance checklist for hazardous waste compliance. During operations, additional satellite accumulation areas will be in place in per and managed the requirements listed below. **Instructions for Satellite Accumulation Area**

1. Ensure that no more than 55 gallons of any one hazardous waste stream or one quart of acutely hazardous waste is accumulated in this area (40 CFR 262.34(c)(1)).
2. Ensure that the Satellite Accumulation Areas are at or near the point of generation where the waste initially accumulates (40 CFR 262.4(c)(1)).
3. Ensure that the Satellite Accumulation Area is under the control of the operator of the process which generates the waste (40 CFR 262.34(c)(1)).
4. Transfer full drums to the 90-day Central Accumulation Area (refer to **Figures**) **within 72 hours** of becoming full.
5. The containers are marked with a hazardous waste label, or equivalent to identify the contents.
6. The containers are in good shape, and if not, transfer the contents to a container in good condition.
7. The containers are closed unless adding or removing contents.

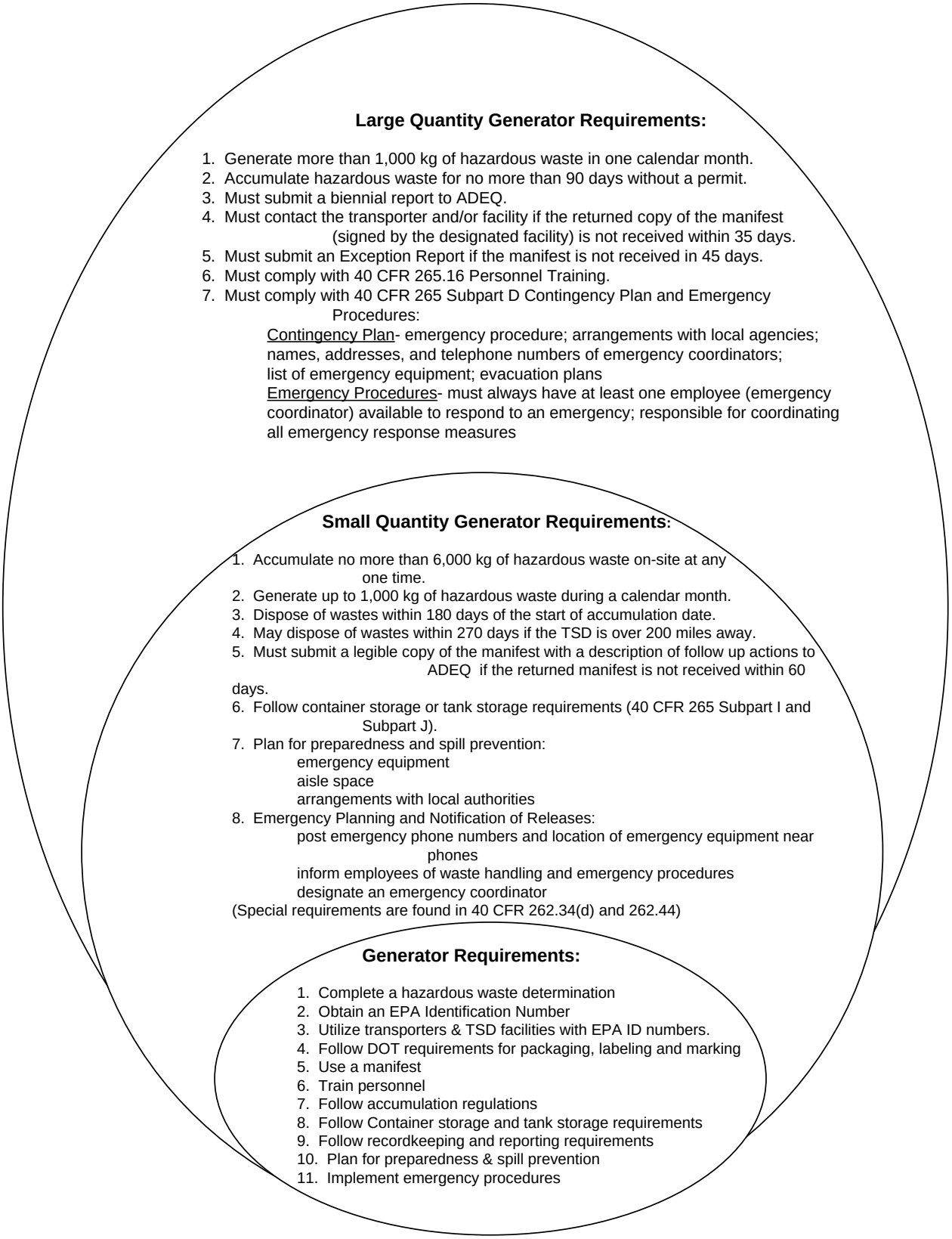
5.2.4 Satellite Accumulation Requirements Flowchart

The following flowchart displays regulatory requirements for satellite accumulation areas.



SATELLITE ACCUMULATION REQUIREMENTS**

**40 CFR 262.34(c)



GENERATOR REQUIREMENTS

5.3 *Universal Waste Management*

5.3.1 Requirements for a Small Quantity Handler of Universal Waste (SQHUW)

1. Small Quantity Handlers of Universal Wastes (SQHUW) may accumulate 5,000 kg (11,000 lbs.) of universal waste (all universal waste categories combined) for up to one (1) year.
2. SQHUW are not subject to notification and tracking requirements.
3. Employees that handle or manage universal wastes must be trained on the proper handling and emergency procedures appropriate to the type(s) of universal waste handled at the facility.

5.3.2 Requirements for a Large Quantity Handler of Universal Waste (LQHUW)

1. Large Quantity Handlers of Universal Wastes (LQHUW) are classified as facilities that accumulate over 5,000 kg (11,000 lbs.) of all types of universal wastes and are subject to notification and tracking requirements.
2. Provide notification of the LQHUW status on the EPA Form 8700-12 and submit the completed form to the ADEQ.
3. Provide the tracking requirement by calculating and logging the number of pounds of all types of universal wastes stored in the calendar year.
4. Provide training to inform employees that handle or manage universal wastes of the proper handling and emergency procedures appropriate to the type(s) of universal waste handled at the facility (40 CFR 273.36).

5.3.3 Universal Waste Recycling Procedures

1. Recycle all Universal Wastes each year to comply with the Universal Waste Regulations accumulation timeframe of one (1) year (40 CFR 273.15(a)).
2. Collect mercury lamp containers at the Universal Waste Storage Area and log the number of lamps onto the inspection sheet for recycling recordkeeping (refer to **Appendix B, Form #1-A**) Refer to **Figures** for the Universal Waste Storage Area location.
3. Contact the recycling vendor for used mercury lamps and mercury containing devices.
4. Collect battery drums at the Universal Waste Storage Area. Weigh the drums to estimate the cost for recycling and determine universal waste handler status.
5. Contact battery recycling vendors for services.

5.4 *Special Waste Management*

5.4.1 Procedures for Special Waste Application, Identification Number and Manifest

1. Apply for an Arizona Special Waste Identification Number for generators as described by A.A.C. R18-8-302-A. Appendix A. ADEQ will issue the identification number to the generator within 30 days.
2. RCM's Special Waste Identification Number is 302437.
3. Prior to off-site consignment of special waste, RCRA/DOT certified RCM personnel will perform the following actions:
   a. Complete and sign the "Generator" section of a special waste manifest.
   b. Obtain the handwritten signature of the special waste shipper on the special waste manifest.
   c. Retain the generator's copy of the special waste manifest.
   d. Give the special waste manifest and the remaining attached copies to the special waste shipper, or forward it to the receiving facility.
4. A federal manifest, shipping paper or shipping record may be used in lieu of the Arizona special waste manifest form given the documents include all the required information. Within fourteen (14) days after shipment is accepted by a special waste shipper, submit one (1) legible copy of each manifest to ADEQ.
5. If RCM does not receive a completed returned manifest copy from the receiving facility, contact the shipper and receiving facility operator to determine the status of the special waste.
6. Submit an exception report within 45 days of the date the waste was accepted by the initial special waste shipper.
7. Retain a legible copy of each signed special waste manifest for at least three (3) years from the date of acceptance of a shipment of special waste for off-site consignment.
8. Analyze for the following parameters for PCS if disposing in a Subtitle D landfill:
   a. Diesel fuel, unused motor oil, transformer fluids, etc. (excluding used oils).
      (1) PAHs – EPA SW-846 Method 8310.
      (2) Benzene, Toluene, Ethyl Benzene and Total Xylenes – EPA SW 846 Method 8020, Aromatic Volatile Organic Compounds.
      (3) PCBs – EPA SW-846 Method 8080 (may use generator knowledge to eliminate this analysis).
   b. Unknown sources of petroleum contamination, used oil, etc.
      (1) PAHs – EPA SW-846 Method 8310.
      (2) RCRA TCLP Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) – EPA SW-846 Method 8240/8270.
      (3) RCRA TCLP Volatiles and Semi Volatiles – EPA SW-846 Method 8240/8270.

(4) Total Benzene, Toluene, Ethyl Benzene and Total Xylenes – EPA SW-846 Method 8021.

(5) PCPs – SW-846 Method 8080 (may use generator knowledge to eliminate this analysis).

c. Gasoline (unleaded), jet fuel and kerosene.

(1) PAHs – EPA SW-846 Method 8310.

(2) Benzene, Toluene, Ethyl Benzene and Total Xylenes – EPA SW-846 Method 8021.

(3) Paint filter test EPA SW-846 Method 9095.

9. Submit a “Declaration of Environmental Use Restriction” (DEUR) when remediation is performed to a level less protective than residential standards that has been completed and RCM agrees to restrict the property to non-residential use. A DEUR is a written document, signed by the real property owner and the Arizona Department of Environmental Quality (ADEQ), and recorded with the county recorder on the chain of title for a particular parcel of real property.
10. Prepare and submit annual waste report (including special waste) to the ADEQ by March 1 of each year.

6 Disposal Coordination

6.1 *Hazardous and Non-Hazardous Waste Disposal Procedures*

1. Select and contact the disposal vendor for the appropriate waste streams.
2. Establish a waste profile for each hazardous and non-hazardous waste stream with the selected disposal vendor. (Refer to **Appendix A, Section 15** for general acceptance criteria for non-hazardous wastes from a Subtitle D landfill facility.)
   a. Sample and obtain a baseline analysis for each waste stream or, if possible, use information obtained from the Safety Data Sheet (SDS).
   b. The vendor will assist in the completion of the profile by obtaining information from SDSs, analysis results, generator knowledge, etc.
   c. Review the profile for accuracy.
   d. Retain a copy of the profile for documentation with the copy of the hazardous waste manifest.
   e. Waste recycling/disposal companies require re-certification of waste profiles each year, but may accept “generator knowledge” of certain waste streams if processes, procedures, and products do not change.
3. Retain a copy of the profile.
4. Schedule a time and date for the collection, transportation, and disposal of the hazardous and non-hazardous wastes in agreement with the vendor. Provide information, such as the quantity of waste, the number of containers, the sizes of the containers, the exact collection site, the point of contact, and any other relevant information to the vendor to avoid delays.
5. Dispose of the wastes within 90 days of the start date of accumulation for Large Quantity Generators (LQGs) or 180 days of the start date of accumulation for Small Quantity Generators (SQGs).

   Note: For containers that are located in satellite accumulation areas, the start date of accumulation is the date that a waste is moved from a satellite accumulation area to the central accumulation area. This typically happens when a waste stream has reached the 55 gallon maximum (or 1kg of acutely hazardous waste) in a satellite accumulation area.
6. The vendor will provide the necessary shipping documents, such as the hazardous waste manifest and the land disposal restrictions forms.
7. Complete the hazardous waste manifest (EPA Form 8700-22) in accordance with 40 CFR 262.23:
   a. Instructions to complete the hazardous waste manifest are contained in 40 CFR 262, Appendix to Part 262.
   b. RCM information to be inserted on the manifest including the Generator U.S. RCRA ID No., Generator Name, Mailing Address, and Phone number as follows:

Line Item 1 AZD001886654

Line Item 3 Resolution Copper Mining – Superior Operations
PO Box 1944
Superior, AZ 85173

Line Item 4 (520) 689-3254

c. RCM personnel authorized to sign the manifests must be trained in 49 CFR Transportation of Hazardous Materials.

8. Complete the Land Disposal Restriction (LDR) form in accordance with 40 CFR 268 and retain for five (5) years.

6.2 *Transportation of Hazardous Materials*

6.2.1 Introduction

The Arizona Department of Transportation (ADOT) administers the Hazardous Materials Transportation Act (HMTA). The regulations for the transportation of hazardous materials are located in 49 CFR.

6.2.2 Determination of a Hazardous Substance

A hazardous substance is a material, including its mixtures and solutions that:

1. Is listed in **Appendix A** to 49 CFR 172.101;
2. Is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in **Appendix A** to 49 CFR 172.101; and
3. Is in a mixture or solution at a concentration by weight of the contaminate which equals or exceeds the concentration corresponding to the RQ of the contaminated material (will require total metals analysis to determine metals concentration in the waste material).

Substance	Reportable Quantity of Impacted Material (RQ) (pounds)	Concentration by Weight of Contaminant (percent)
Ag	1,000	2
As	1	0.002
Be	10	0.02
Cd	10	0.02
Cr	5,000	10
Cu	5,000	10
Hg	1	0.002
H_2SO_4	1,000	2
Ni	100	0.0
Pb	10	0.02
Sb	5,000	10
Se	100	0.0
Ti	1,000	2
Az	1,000	2

For example, a mixture containing a listed substance whose RQ is 5,000 lbs. is regulated in transportation only when the concentration of the listed substance is 10 percent or greater **and** at least 5,000 lbs. of the listed substance is present in one package.

6.2.3 Transportation

RCM contracts with various Department of Transportation (DOT) approved firms to transport various materials and waste; confirm approved vendors through SAP.

6.2.4 Shipping Papers

1. All shipping papers must be signed by authorized, DOT trained Resolution Copper Mining employees or contractors.
2. Copies of all shipping papers will be forwarded to the Environmental Department for documentation and recordkeeping for at least three (3) years.
3. The Environmental Department will retain documents for a minimum of three (3) years.

6.2.5 Procedures for Hazardous Waste Manifests

1. All hazardous waste manifests must be reviewed for accuracy and signed by authorized, RCM personnel certified in 49 CFR Transportation of Hazardous Materials.
2. Copies of all hazardous waste manifests must be forwarded to the Environmental Department for documentation and recordkeeping for at least three (3) years.
3. Hazardous waste manifests (EPA Form 8700-22) must be completed in accordance with 40 CFR 262.23.
4. If a manifest for a shipment of hazardous waste is improperly completed, ADEQ may return it and require the generator to properly complete and resubmit the manifest with a fee of twenty dollars ($20).
5. Instructions to complete the hazardous waste manifest are contained in the 40 CFR 262, Appendix to Part 262.
6. Information to be inserted on the manifest for the Generator – The U. S. RCRA ID No., Generator Name and Mailing Address, and Phone number for RCM is as follows:

   Line Item 1 AZD001886654

   Line Item 3 Resolution Copper Mining – Superior Operations
   PO Box 1944
   Superior, AZ 85173

   Line Item 4 (520) 689-3383
7. Generators must retain one copy of each signed manifest received from the designated facility which received the waste for three (3) years. This signed copy must be retained for at least three (3) years from the date the waste was accepted by the initial transporter.

8. Within 45 days following the end of a month when hazardous waste was shipped off-site under a manifest, the generator must send a copy of the returned manifest to the ADEQ. Send a copy of the manifest to the address below:

   Arizona Department of Environmental Quality
   Hazardous Waste, Facilities Assistance Unit (FAU)
   1110 West Washington
   Phoenix, AZ 85007

   Note: Manifests used to document shipments of special waste need to be submitted to ADEQ within 14 days
9. Upon discovering a significant discrepancy, the owner or operator (of the TSD facility) must attempt to reconcile the discrepancy with the waste generator or transporter (e.g., with telephone conversations).
10. Significant discrepancies are listed below:
    (1) For bulk waste, variations greater than 10 percent (10%) in weight, and
    (2) For batch waste, any variation in piece count, such as a discrepancy of one drum in a truckload.
11. Submit a letter describing the discrepancy and attempts to reconcile it and a copy of the manifest or shipping paper at issue to ADEQ. On the copy of the manifest, mark through the incorrect information, insert the correct information, and initial the change. Ensure the words “Corrected Copy” are noted on the manifest to provide clarification for the ADEQ submittal and the facility records.

6.2.5.1 Authorized Personnel and Requirements to Sign Manifests

RCM or contractors authorized to sign manifests have been trained and certified in 49 CFR Transportation of Hazardous Materials.

6.2.6 Land Disposal Restrictions (LDR)

1. General LDR and waste information:
   a. For wastes subject to land disposal restriction, a land disposal notification must accompany the waste shipment to the treatment and disposal facility.
   b. The LDR treatment standards are given in the table in 40 CFR 268-40. This table lists waste code, waste description, regulated constituents, and treatment standards for wastewater and non-wastewater. The table includes several categories for certain waste codes. For instance, there are three categories of D001 waste.
   c. Types of Waste
      (1) *Listed Wastes*. The regulations set standards for specified constituents. There is no need to consult the universal treatment standards for listed wastes.
      (2) *Listed Wastes which also exhibit a hazardous characteristic*. If the listed waste treatment standard addressed the characteristic, then the listed

standard is sufficient. However, if the treatment standard for the listed waste code does not address the characteristic, both the listed and characteristic standards apply.

(3) *Characteristic Wastes*.

- ***D001***. The treatment standards for ignitable wastes are divided into three categories. High-TOC (Total Organic Carbon) D001 wastes that are treated in Clean Water Act (CWA) systems may be treated by deactivation (removing the ignitable characteristics). Dilution may be used to achieve deactivation. All other D001 wastes must be treated by combustion, recovery of organics or deactivation, (removing the ignitable characteristic). Dilution may be used to achieve deactivation. All other D001 wastes must be treated by combustion, recovery of organic, or deactivation - dilution is prohibited. In addition, these wastes must be treated for applicable underlying hazardous constituents.
- ***D002***. The D002 corrosive wastes are divided into two categories, corrosives managed in CWA or Class 1 Safe Drinking Water Acts (SDWA) systems, and all other D002 wastes. Corrosives managed in CWA wastewater treatment systems or in SDWA Class 1 injection wells may be diluted to meet the treatment standards. All other D002 wastes must be deactivated and treated for underlying hazardous constituents.
- ***D004-D011***. These wastes are characteristically hazardous for heavy metals. Most must be treated to remove the toxicity characteristic. High concentration mercury wastes must be treated by a specific method.

6.2.6.1 Procedures for Land Disposal Restrictions (LDR)

1. Determine the waste code (i.e. D001, F006).
2. Assess the presence of underlying hazardous constituents (UHCs) (as required).
3. Determine the matrix (Wastewater/Non-wastewater).
4. Research and determine treatment standards in 40 CFR 268.40.
5. Determine if the waste meets LDR treatment standards.
6. Determine if UHCs meet treatment standards in CFR 268.48 (as required).
7. Prepare appropriate LDR Notification Form.
8. Ship the Waste with the manifest and LDR Form.
9. File copies of the manifest and LDR forms.
10. Maintain records for five (5) years.

6.2.7 DOT Eight Step Procedure for Preparation of Hazardous Materials Shipment

Procedure	Reference (49 CFR)
1. Determine proper shipping name, hazard, class/division, ID number and packaging group	172.101(2), (3), (4), and (5)
2. Is this material regulated by 49 CFR? a. As a hazardous material? b. As a hazardous substance? c. Marine pollutant? d. By highway mode? e. As a poison inhalation hazard?	172.101(1) and (2) Appendix A to 172.101 Appendix B to 172.101 172.101, Column (1) 172.101, Column (7)
3. Determine proper packaging a. Determine if an exception is authorized for the particular hazardous materials. b. If no exception is authorized, determine the specific packaging requirements. c. Determine the maximum net quantity of the hazardous material that may be shipped in one package by passenger-carrying and/or cargo-only aircraft as appropriate. d. Ensure that completed package meets general packaging requirements. e. Determine special provisions.	 172.101(8A) and reference to sections indicated 172.101(8B) or (8C) and reference to section listed 172.101(9A) and (9B) 173.24, 173.24a, and 173.24b 172.101(7)
4. Mark the package	Subpart D of Part 172 commencing at 172.300
5. Label the package: a. With appropriate table label(s)unless excepted b. With appropriate additions or multiple labeling requirements	 172.101(6) 172.402, 404, and 406
6. Prepare shipping papers with shipper's certification and signature	172.200, 201, 202, 203, 204
7. Provide emergency response information	Subpart G of 172 commencing at 172.600
8. Provide place carding as appropriate	Subpart F of 172 commencing at Section 172.500

7 Recordkeeping and Reporting

7.1 *Introduction*

Generators of hazardous waste must obtain a RCRA identification number (formerly known as U.S. EPA ID) number that is site-specific before transporting wastes off-site for disposal. The Generator ID number must be included on all hazardous waste manifests and land disposal restriction forms.

7.1.1 Calculate Quantities

1. Calculate and insert the quantities of hazardous waste, non-hazardous wastes disposed of/recycled, and quantities of recycled universal wastes in each respective spreadsheet (**Appendix B, Form #1-A, #1-E, and #2**) and file.

7.2 *Hazardous Waste*

7.2.1 RCRA Identification Number for Superior Operations

1. RCM's waste generator identification number is AZD001886654.
2. Refer to **EPA Notification Form 8700-12** to update notification information.

7.2.2 Annual Registration of Hazardous Waste Generators

1. All hazardous waste generators must register annually with the Arizona Department of Environmental Quality (ADEQ).
2. The application for registration shall be accompanied by a registration fee based on the following:
   a. Small Quantity Generators (SQGs) – one hundred dollars ($100)
   b. Large Quantify Generators (LQGs) – three hundred dollars ($300)

7.2.3 Hazardous Waste Fees

1. Generators of hazardous waste that is shipped off-site are required to pay ten dollars ($10) for each ton of waste generated on a quarterly basis to ADEQ.
2. Generators who comply with the pollution prevention planning requirements (submit a written Pollution Prevention Plan) are required to pay five dollars ($5) for each ton of waste generated to ADEQ

7.2.4 Hazardous Waste Recordkeeping

1. The Environmental Department completes a weekly inspection sheet (**Appendix B, Forms #1-A and #1-E**) for the Central Accumulation Area and maintains the completed forms on-site for three (3) years.
2. When wastes are shipped off-site for disposal, retain the completed generator's copy of the hazardous waste manifest and a copy of the waste profile for documentation for at least three (3) years.

3. Within 45 days following the end of a month when hazardous waste was shipped off-site under a manifest send a copy of the returned manifest to the Arizona Department of Environmental Quality (ADEQ).

   Arizona Department of Environmental Quality
   Hazardous Waste, Facilities Assistance Unit (FAU)
   1110 West Washington
   Phoenix, AZ 85007

4. Retain one (1) copy of each signed manifest received from the designated facility which received the waste for three (3) years. This signed copy must be retained for at least three (3) years from the date the waste was accepted by the initial transporter.
5. Calculate and include the quantity of generated or accumulated regulated waste for determining generator and associated waste generation fees. Refer to **Section 7 Recordkeeping and Reporting and Acronyms, Definitions, and Regulations** – Conditionally Exempt Small Quantity Generator, Small Quantity Generator, Large Quantity Generator for guidance and tracking information.
6. If hazardous waste is shipped off-site for disposal, and RCM does not receive the returned copy of the manifest (with the disposal facility's signature – Line Item 20 on the manifest) within the allotted time frame (45 days for LQGs and 60 days for SQGs) of the date waste was accepted by the initial transporter, RCM shall do both of the following:
   a. Contact the transporter or the designated facility to determine the status of the hazardous waste.
   b. Submit an **exception report** that includes the following:
      (1) a legible copy of the manifest of which confirmation of delivery is in question.
      (2) a letter explaining the returned copy was never received. An exemption report for LQGs requires a cover letter signed by the generator explaining the efforts taken to locate the waste and results of those efforts.
7. File the returned manifest, profiles, and analysis and retain for three (3) years. Records of any test results, waste analyses, or other determinations made in accordance with 40 CFR 262.11 must be retained for at least three (3) years from the date that the waste was last sent to off-site treatment, storage, or disposal. The periods of retention are extended automatically during the course of any unresolved enforcement action regarding the regulated activity.
8. Retain land disposal restrictions for five (5) years.
9. Calculate and insert the quantities of hazardous waste and non-hazardous wastes disposed of/recycled in the respective spreadsheet (**Appendix B**) and file.

7.2.5 Waste Analysis Record Requirements

1. Records of any test results, waste analyses, or other determinations made in accordance with 262.11 must be retained for at least three (3) years from the date that the waste was last sent to off-site treatment, storage, or disposal.

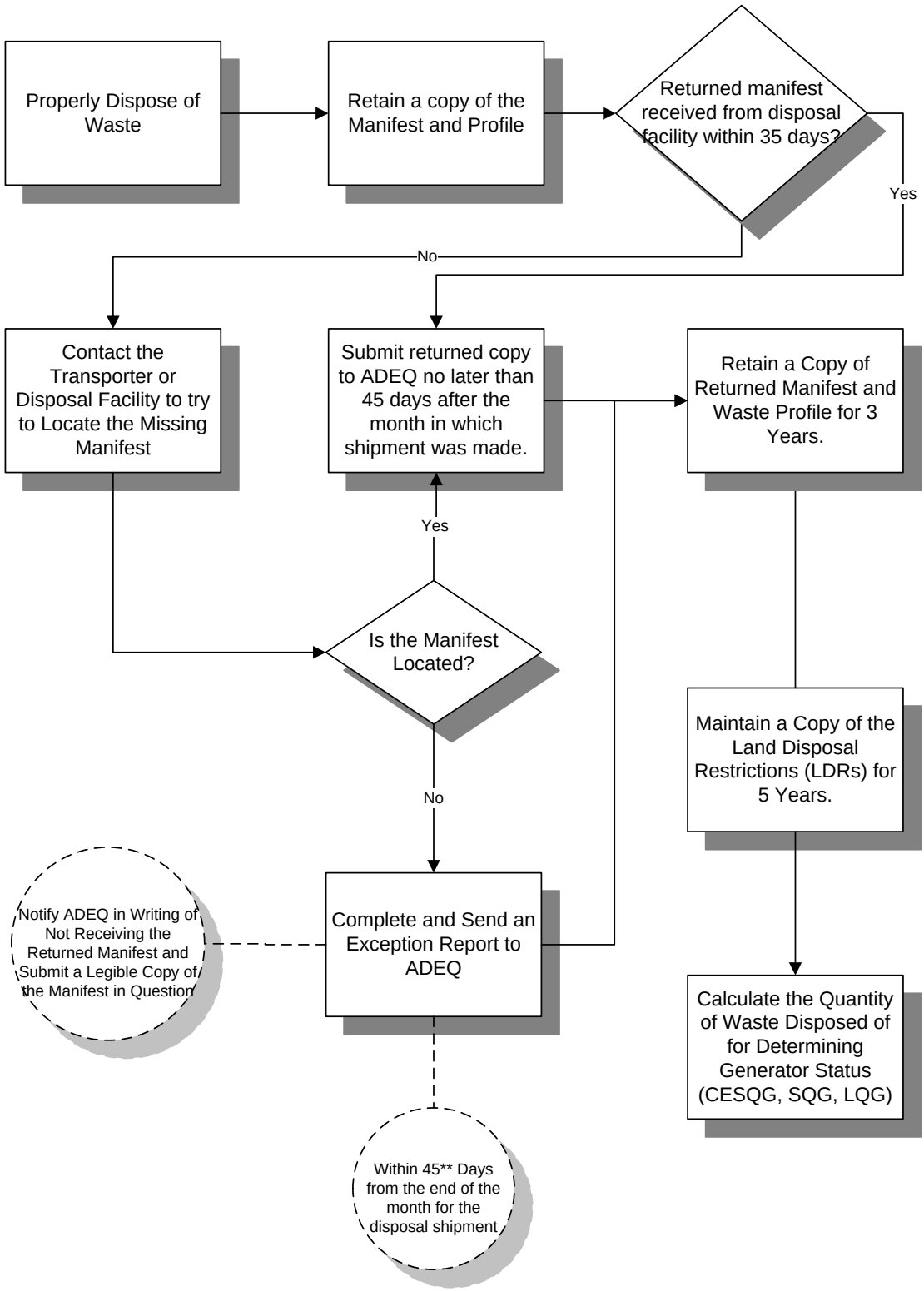
2. Refer to Environmental Files.
3. The periods of retention are extended automatically during the course of any unresolved enforcement action regarding the regulated activity (40 CFR 262.40(d)).

7.2.6 Hazardous Waste Reporting

1. Use only the hazardous waste quantities generated for determining the generator status of the facility:
   a. Large Quantity Generator (LQG) is a facility which generates over 1,000 kg (2,200 lbs.) of hazardous waste in one (1) calendar month.
   b. Small Quantity Generator (SQG) is a facility which generates over 1000 kg (220 lbs.) and up to 1,000 kg (2,200 lbs) of hazardous waste in one (1) calendar month and accumulated at any one time up to 6,000 kg (13,300 lbs.).
   c. Conditionally Exempt Small Quantity Generator (CESQG) is a facility which generates under 1000 kg (220 lbs.) in one (1) calendar month and accumulates at any time on-site up to 1,000 kg (2,200 lbs.) of hazardous waste.
2. Large Quantity Generators (LQGs) must submit, by March 1 each year, the Facility Annual Report (FAR) to ADEQ. This report shall describe generator activities during the previous calendar year and a description of the efforts undertaken to reduce the volume and toxicity of waste generated.
3. Refer to the requirements for each status of hazardous waste generators listed on the Generator Flowchart on the following page.

7.2.7 Exception Reporting

If hazardous waste is shipped off-site for disposal, and RCM does not receive the returned copy of the manifest (with the disposal facility's signature – Line Item 20 on the manifest) within 45 days following the end of the month of shipment, a legible copy of the manifest must be submitted to ADEQ with a note stating the returned manifest was never received.



MANIFEST EXCEPTION REPORTING AND GENERAL RECORDKEEPING PROCEDURES

** 45 days for LQGs
60 days for SQGs

7.3 *Universal Waste*

7.3.1 Universal Waste Recordkeeping

1. Calculate and insert the quantity of Universal Waste recycled. Include all quantities of mercury lamps, mercury thermostats, and spent batteries recycled.
2. File completed forms in the Environmental Department.
3. LQHUW are classified as facilities which accumulate over 5,000 kg (11,000 lbs.) of all types of universal wastes and are subject to notification and tracking requirements.
4. SQHUW may accumulate 5,000 kg (11,000 lbs.) of universal waste (all universal waste categories combined) up to one (1) year.
5. Do not count the universal waste quantities in the hazardous waste generated amounts for determining RCRA generator status.

7.3.2 Universal Waste Reporting

1. LQHUW must notify ADEQ of the LQH status and are subject to tracking requirements. Notification of the LQHUW status is submitted on the Hazardous Waste Generator Notification Form (8700-12) to the Arizona Department of Environmental Quality (ADEQ).
2. SQHUW may accumulate up to 5,000 kg (11,000 lbs.) of universal wastes and are not subject to notification and tracking requirements.

7.4 *Special Waste*

7.4.1 Special Waste Reporting

1. Prepare and submit the Special Waste annual report to ADEQ by March 1 of each year to include the following information for generators:
    a. The volume or weight of each type of special waste treated, stored, or disposed of **on-site** for the preceding year.
    b. The volume or weight of each type of special waste treated, stored, or disposed of **off-site** for the preceding year.
    c. For each type of special waste disposed, a description of the methods and practices used to minimize the amount of toxicity of the waste before disposal or reuse that constitutes disposal.
    d. The volume or weight of waste received pursuant to Section 49-863, subsection G.

7.4.2 PCB Annual Report

1. Refer to **Appendix A, Section 17 Oil-Filled Electrical Devices/PCB Ballasts/ Transformers**.

2. The Electrical Supervisor shall develop and maintain all annual records and the written annual document log of the disposition of PCBs and PCB Items.
3. The written annual document log must be prepared for each facility by July 1 covering the previous calendar year (January through December).
4. The annual document log shall be maintained for three (3) years after the facility ceased using or storing PBCs and PCB Items. Annual records (manifests and certificates of disposal) shall be maintained for the same period.
5. The written annual records shall include the following.
    a. All signed manifests generated by the facility during the calendar year.
    b. All Certificates of Disposal that have been received by the facility during the calendar year.
6. The written annual document log shall include the requirements listed in 40 CFR 761.180(a)(2)).

8 Preparedness and Prevention

1. Hazardous material and waste storage facilities must be equipped with the following:
   a. An internal communications or alarm system capable of providing immediate emergency instruction (voice of signal) to facility personnel;
   b. A device, such as a telephone (immediately available at the scene of operations) or a hand-held two-way radio capable of summoning emergency assistance from local police departments, fire departments, or State or local emergency response teams;
   c. Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment; and
   d. Water at adequate volume and pressure to supply water hose streams or foam producing equipment, automatic sprinklers or water spray systems.
2. All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation at the time of emergency.
3. All personnel involved in the areas where hazardous waste is being “poured, mixed, spread, or otherwise handled” must have immediate access to an internal alarm or emergency communication device. Use of the “Buddy System” (two person team) meets this requirement.
4. Hazardous material and waste storage facilities must maintain required aisle space to allow unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment.
5. Hazardous material and waste storage facilities must arrange for emergency services with appropriate agencies (such as police, fire departments, emergency response teams, and local hospitals) to become familiar with the layout of the site, the materials handled, entrances to roads inside the facility, and evacuation routes. The facility should document into the operating record any incidence of State or local authorities declining to enter into such arrangements.

8.1 *Training*

8.1.1 Introduction

Personnel responsible for handling hazardous wastes must receive specialized training in hazardous waste management within six (6) months after the date of their employment or assignment to a facility and must take part in an annual review of the initial training. As a facility that utilizes hazardous materials and generates hazardous waste, RCM is required to provide training in accordance with OSHA HazWoper regulations, DOT HazMat regulations and RCRA regulations.

8.1.2 Content of Hazardous Materials and Waste Training

RCM is dedicated to provide on-going comprehensive training for required personnel. In addition, all personnel exposed to hazardous materials and wastes as a function of their work detail will take part in periodic spill prevention and response training programs. These programs will address, but are not limited to, the following:

1. Procedures for identifying, handling, packaging, labeling, accumulation, storing, and transporting hazardous wastes, and preparing manifests and other forms.
2. Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment.
3. Procedures for personal protection in handling of hazardous wastes and in responding to spills, fires or explosions.
4. Health effects of exposure to oil and hazardous substances.
5. Spill classification according to Levels 1, 2, and 3 response and RQ allowances.
6. Applicable First Aid procedures to be used following exposure.
7. Personal Protective Equipment (PPE) requirements and procedures for using equipment.
8. Evacuation procedures.
9. Combustibility of materials and hazards associated with controlled releases, including flash back potential along vapor trails.
10. Applicable firefighting and fire-control procedures for dealing with special hazards associated with combustible materials.
11. Reactivity potential and hazards associated with mixed material spills, including water reactivity.
12. Use and maintenance of spill response and control procedures.
13. Initial response and notification procedures.
14. Location of posted site-specific spill response plans.
15. Immediate spill response actions and protocols, including:
    - The location and operation of pump controls and valves used to stop or control releases;
    - The location and use of fire extinguishers, considering the composition of materials released; and
    - The use of absorbents and neutralizing agents, given the composition of released materials.
16. Hazardous material storage protocols, standard good housekeeping practices, and safe handling measures, required for the prevention of substance releases.
17. Understanding of probable flow-path routes in the event of an uncontrolled release. Particular emphasis will be placed on off-base discharge potentials.

RCM has implemented programs that ensure that HazMat employees and local fire departments have familiarity with the general provisions of the hazardous material regulations, are able to recognize and identify hazardous materials on site, and have knowledge of specific requirements of the hazardous material regulations applicable to functions performed by the employee.

8.1.3 Site Specific Training

RCM provides a site-specific training program, designed to provide familiarity with identifying hazards and emergency response procedures RCM personnel, contractors and visitors as well as local fire department personnel per emergency services agreements. This training is conducted as a yearly refresher for personnel and contractors.

8.1.4 Task Training

Task training addresses requirements and methods to properly handle hazardous materials and hazardous wastes. This training includes measures to protect the individual from the hazards associated with the hazardous materials/wastes they utilize in the workplace. Methods and procedures for avoiding accidents are also presented.

8.1.5 First Responder Awareness Level

This training is for individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. The Awareness Level consists of recognizing the emergency situation, securing the scene, identifying the substance, and notifying appropriate personnel. Members of RCM environmental team require the initial 40 hour HazWoper and annual refresher training. The first responders shall have competency in the following areas:

1. Understanding what hazardous substances are and the risks associated with them in an incident.
2. Understanding the potential outcomes associated with an emergency where hazardous substances are present.
3. Ability to recognize the presence of hazardous substances in an emergency and to identify the hazardous substance, if possible.
4. Understanding the first responder's role in the emergency response plan including site security and control and the U.S. DOT Emergency Response Guidebook.
5. Ability to recognize the need for additional resources, and to make appropriate notifications to the communication center.

8.1.6 First Responder/Operations Level

First Responder personnel are individuals who initially respond to releases, or potential releases, of hazardous substances for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a **defensive** fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. The Operations Level personnel

recognize the emergency, secure the scene, identify the hazardous substance, notify appropriate personnel and contain the release (using absorbents, pads, berms, etc.) from a safe distance. RCM provides an annual 8-hour HazWoper First Responder Operations Level course.

Operational Level personnel shall possess the following information:

1. Knowledge of basic hazard and risk assessment techniques.
2. Knowledge of how to select and use proper personal protective equipment (PPE) provided to the first responder and operational level personnel.
3. Understanding of basic hazardous materials terms.
4. Knowledge of how to perform basic control, containment and/or confinement operations within the capabilities of the resources and PPE available within their unit.
5. Knowledge of how to implement basic decontamination procedures.
6. Understanding of the relevant standard operating procedures and termination procedures.

8.1.7 Mine Safety and Health Administration (MSHA)

RCM is considered an underground mining facility and is regulated under the Mine Safety and Health Administration (MSHA). All RCM personnel and contractors as well as emergency responders from local fire departments performing work onsite are required to obtain the initial MSHA training. Those individuals who have already obtained initial MSHA training must complete an 8-hour refresher annually to keep their MSHA certifications current.

8.1.8 Occupational Safety and Health Administration (OSHA)

Some areas of RCM operations are regulated under the Occupational Safety and Health Act (OSHA) (e.g. Core Building). RCM requires the Operations Level personnel to receive the initial 40-Hour OSHA HazWoper training, the 8-Hour OSHA annual refresher training and to have had sufficient experience to objectively demonstrate competency in the preceding areas in addition to those in the awareness level.

8.2 *Transportation Training*

1. Each hazmat employee will be tested by appropriate means on the training subjects covered in 49 CFR 172.704.
2. Training requirements for **hazmat employees** shall include the following:
   a. General Awareness/familiarization training
   b. Function-specific training
   c. Safety Training
3. OSHA or EPA training may be used to satisfy the training requirements listed above to avoid unnecessary duplication of training.
4. Initial and recurring training.

a. Initial training – A new hazmat employee or an employee who changes job functions may perform hazmat functions prior to the completion of training provided:
   (1) The employee is under the direct supervision of a properly trained and knowledgeable hazmat employee; **and**
   (2) The training is completed within 90 days after the employment of a change in job function.
b. Recurrent training – A hazmat employee shall receive the training required at least **once every three years**.
c. Relevant training – Relevant training received from a previous employer or source may be used to satisfy the training requirements provided a current record of training is obtained from hazmat employee's previous employer.
d. Compliance – RCM, as the hazmat employer, is responsible for compliance with the transportation requirements regardless of whether the required training has been completed.

5. Transportation training may be provided onsite or off site.
6. Recordkeeping - RCM will create and retain a record of current training inclusive of the preceding three (3) years, for as long as the employee is employed and for 90 days thereafter. The individual employee retains the original training certificate(s), while the Health & Safety Department and/or Environmental Department retain a copy of the training certificate(s) for documentation.

8.2.1 Training Records

Each generator of hazardous waste is required to keep records of hazardous waste management training for their personnel. Training records on current personnel must be kept until closure of the facility. Training records on former employees must be kept for at least three (3) years from the date the employee last worked at the facility.

Training records must include:

1. Name of employee;
2. Job Title;
3. Written job description (including duties related to hazardous waste handling); and
4. Records (*i.e.*, copies of certificates) or completed training. Retain a copy of the written training agenda with the attendance roster(s) and documentation for implementing the emergency response drill to fires, explosions, or spills.

8.3 *Vendors*

Materials/waste to be purchased/recycled/disposed and the current, associated vendors can be located in SAP

9 Additional Environmental Management Plans & Documents

9.1 *Emergency Response Plan (ERP)*

The ERP is a document maintained and controlled by RCML Environmental Department. The plan provides guidance during environmental emergencies and incidents. These can include spills, dam breaches, reporting requirements, etc. A copy of the ERP can be located on the portal, and should be used as a reference in all environmental incidents.

9.2 *Hazardous Materials and Contaminated Site Map*

RCML maintains an EP and WP map and register to show locations of all open and closed contaminated sites, along with hazardous materials storage locations. A copy of this register can be located on the portal.

9.3 *Refrigeration Management Plant*

The underground cooling system requires the use of hazardous chemicals. A list of chemicals and their SDS can be found in Maxcom as well as in the Refrigeration Management Plan. Also listed in the Refrigeration Management plan is disposal and spill cleanup procedures, inspection/ maintenance schedules and responsibilities, emergency response procedures, and responsible parties. The refrigeration plan is managed by the Operations Team. A copy of this plan can be located on the portal.

9.4 *Wildlife Handling and Avoidance Plan/ Aviation Protection Plan*

RCML has current and historic facilities that have the potential to pose a threat to local wildlife. A Wildlife Handling and Avoidance Plan and an Aviation Protection Plan has been developed to help guide RCM personnel on how to handle wildlife spotted on site. Reporting requirements are outlined in these plans. RCM environmental tracks all wildlife sightings and will report to the necessary agencies if any sick, injured, or deceased wildlife is spotted on site.

10 Additional Environmental Procedures

10.1 *Concrete Washout and Equipment Washbay Areas*

Concrete washouts and washbays are subject to an APP permit. Each washout or washbay needs to be approved through environmental and has items for which it must comply. The compliance table is listed below. All washbays and washout areas are documented on the site Hazardous Materials Map.

Item	Requirement
1	Vegetation at the soil base is cleared & grubbed.
	Base compacted to uniform density not less than 95%.
	Berms compacted to a uniform density not less than 95%
2	Located at least 50 feet from any storm drain inlet
	Located at least 50 feet from open drainage facility or water course
	Located at least 50 feet from any water supply well
3	Designed and operated to maintain adequate freeboard to prevent overflow or discharge of wastewater
4	Wastewater from any wash pad is routed to the impoundment
5	Has an annual average daily flow of wastewater is less than 3,000 gallons per day

10.2 *Pinal County Dust Control*

RCML maintains an air permit through Pinal County Air Quality Control District. Any earthmoving activities have the potential to be regulated by Pinal County under this permit. Dust is the major concern under this activity. Different earthmoving activities include:

- land stripping,
- earthmoving,
- blasting,
- trenching,
- road construction,
- grading,
- landscaping,
- stockpiling/storing/loading excavated materials,
- any other activity associated with land development which results in a disturbed surface area or dust generation operations, equal to or greater than .1 acres.

Any earth moving activities must be reviewed to stay in compliance with the RCML air permit.

10.3 *Radiation Gauges*

During construction activities it may be necessary to do ground compaction testing. The equipment to run this test often times has radioactive material. RCM requires all radioactive gauges to undergo annual testing and inspections. Copies of these records must be given to RCM HSE department before equipment is brought on site. It is also required that copies of training records of the equipment technicians be given to RCM before any work is commenced. Contractors using radiation gauges must have emergency response procedures and provide copies to RCM personnel.

10.4 *RCML Activities Environmental Checklist*

Any activity undertaken at RCM or on behalf of RCM has the potential to create new conditions for which a permit revision or application may need to occur. A checklist has been created that highlights common changes that could occur. This checklist should be reviewed with all new contractors or before the commencement of any new project at RCM or on behalf of RCM. This checklist can be located on the portal under Environmental Documents. A copy can be scene below.

Environmental Activities Checklist			
Activity	**Description**	**Y/N**	**Project Manager comments**
Will there be any digging, removing, or relocating soil/dirt/land?	*Some soil disturbance activities require an addition to our existing Stormwater permits and will require additional storm water BMPs (i.e. berms, waddles, etc.).*		
Will soil or fill material need to be brought on site?	*Certain soils and fill materials have to be approved.*		
Will there be any construction or demolition?	*Certain construction or demolition may require dust, noise, and vibration monitoring and may also require us to notify the surrounding community.*		
Will there be material that needs to be disposed of during construction/demolition?	*Certain construction and demolition waste may be disposed of in RCM's on site landfill and tracked. Other materials may need to be disposed of off site.*		
Will soil or dirt need to be sifted using a mechanical separator?	*This requires a special air permit from Pinal County.*		
Will a concrete washout or washbay area be needed or created?	*Permitting is required for the installation of a washbay or concrete washout area.*		
Will diesel equipment (i.e. stormwater pumps, emergency generators, etc.) be brought on or removed from site?	*Certain activities will require a change to RCM's air permit.*		
Will tanks, equipment, drums storing any hydrocarbons be brought on or removed from site?	*Anything over 50 gallons will require a change to RCM's Spill Prevention Control and Countermeasures Plan/Map and will need secondary containment.*		
Will chemicals be needed for this project?	*All chemicals must be pre-approved before brought on site. Chemical storage areas and containers need to be reviewed.*		
Will any waste be created during this project?	*Waste profiles will need to be created and proper waste storage procedures addressed.*		
Will there be a change to or an installation of a new water line or potable water system?	*This will require Drinking Water Permit approval and specific procedures.*		
Will there be new sewage lines or septic systems installed	*New Aquifer Protection Permits may be needed.*		

Environmental Activities Checklist			
Activity	**Description**	**Y/N**	**Project Manager comments**
during this project?			
Will water lines be installed, removed, or changed?	*Updates to line drawings and flow meters may be needed for site water balance.*		
Will a new drill pad need to be constructed?	*An NOI may need to be filed and an addition to or change to the current SWPPP may be needed.*		
Is there a well being installed or closed?	*An NOI or NOT will be need to be submitted.*		
Will any ground water be discharged from a hydro well?	*A permit may be required.*		

10.5 *Well Abandonment and Installation*

All wells must be registered with Arizona's Department of Water Resources (ADWR). Before the installation of any well, an authorization to drill must be received. To receive authorization a Notice of Intent (NOI) must be completed by RCML and submitted to ADWR. The NOI must include the following information:

- your name, address and telephone number
- county assessor's parcel identification information
- the location of the proposed well by legal description
- a description of the proposed well to include an explanation of how you intend to use the water from the well
- the name, address, and license number of the well drilling firm

Before the abandonment of any well, a Notice of Intention to Abandon a Well (NOIA) must be filed with ADWR. After RCML receives the well abandonment card from ADWR, the abandonment of the well by a licensed well drilling company may commence.

11 Record of Reviews and Revisions

Revision #	Description	Author	Approver	Approved Date	Effective Date
0	EMMP	Westland Resources		2007	
1	EMMP Update	Resolution Copper		2010	
2	EMMP Update	ARCADIS		2011	
3	EMMP Update	Resolution Copper	C. McKeon	6/2012	
4	EMMP Update	Resolution Copper	V. Peacey	9/2014	

12 Additional Information Sources

Arizona Department of Environmental Quality (ADEQ)
http://www.adeq.state.az.us/

Arizona Division of Emergency Management
http://www.dem.azdema.gov/

U.S. Environmental Protection Agency (EPA)
http://www.epa.gov/

U.S. EPA – RCRA Online
http://www.epa.gov/rcraonline

U.S. EPA – Contaminated Site Clean-Up Information (CLU-IN)
http://www.clu-in.com/

U.S. EPA – Office of Air and Radiation
http://www.epa.gov/oar/

U.S. EPA – Office of Ground Water and Drinking Water
http://www.epa.gov/safewater/

U.S. EPA –Wastes
http://www.epa.gov/epawaste/index.htm

Department of Energy, Office of Health, Safety and Security – Environmental Policies
http://www.hss.energy.gov/nuclearsafety/env/policy/

Department of Energy, Office of Health, Safety and Security - Environmental Reports
http://www.hss.energy.gov/nuclearsafety/env/reports/

Department of Energy, Office of Science
http://www.er.doe.gov/

Department of Energy – Office of Environmental Management
http://www.em.doe.gov/Pages/EMHome.aspx

Department of Health – Agency for Toxic Substances and Disease Registry
http://www.atsdr.cdc.gov/

Department of Housing and Urban Development (HUD) – Office of Lead Hazard Control
http://www.hud.gov/offices/lead/

APPENDIX W

Preliminary MSGP-2010
Stormwater Pollution Prevention Plan (SWPPP)

Preliminary MSGP-2010
Stormwater Pollution Prevention Plan (SWPPP)

RESOLUTION COPPER MINING
GENERAL PLAN OF OPERATIONS

Task Schedule

Activity[1]	Phase of Mining Operations	SWPPP Section
	Active	
Routine Facility Inspections	Quarterly	5.1
Visual Assessments[2]	None	5.2
Comprehensive Facility Inspections	Annually	5.3
Monitoring[3]		
General Analytical	None	6.2
Effluent Limitations	None	6.3
Impaired Waters	None	6.4

[1] See ***Attachment* 1** for requirements applicable to the exploration and construction phases of mining.

[2] Visual assessments are not required as the only discharging outfall is covered under an individual AZPDES permit. See ***Section 5.2*** and ***Attachment 11B*** of this SWPPP.

[3] General analytical monitoring for Active Copper Mines (***Table 8.G-8.1***) is not required for discharges to ephemeral waters. See ***Section 6.2.1*** of the SWPPP and MSGP-2010 Part 8.G.8.1.

AZPDES Stormwater Multi-Sector General Permit Number: AZMSG-To Be Determined

September 2014

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TABLES

FIGURES

(*follow text*)

ATTACHMENTS

CERTIFICATIONS

The Multi-Sector General Permit (MSGP-2010) requires the following certifications (identified below with the applicable MSGP-2010 Part) for a discharger to qualify for the permit.

Non-Stormwater Discharges Certification [5.1.3.4; and 8.G.5.3]

An evaluation of the General Plans of Operation activities for the presence of unauthorized non-stormwater (dry weather) discharges to its stormwater conveyance systems was performed in [to be determined]. A visual examination of the outfalls and drainage patterns within the designated stormwater drainage areas was performed to identify any unauthorized non-stormwater discharges. No unauthorized non-stormwater discharges to the Project's stormwater conveyance systems were observed during the evaluation. This evaluation was conducted in accordance with the provisions provided in Parts 5.1.3.4; and 8.G.5.3 of the MSGP-2010. See ***Attachment 7****.*

Stormwater Pollution Prevention Plan Certification [5.1.6]

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature	Title
Name of Authorized Representative	Date

1. INTRODUCTION [5.0; AND 8G]

This preliminary Stormwater Pollution Prevention Plan (SWPPP) was prepared in support of the Resolution Copper Mining, LLC (Resolution Copper) General Plan of Operations (GPO) for construction of the proposed underground mine, ore processing operation, and associated facilities and infrastructure described in the GPO (collectively, the Resolution Project or Project). The Project is located near Superior in Pinal County, Arizona.

The existing East Plant Site (EPS) and West Plant Site (WPS) activities are covered under separate Multi-Sector General Permit (MSGP-2010) SWPPPs. Both EPS and WPS are permitted as active and staffed *Sector G - Metal Mining (Ore Mining and Dressing*) facilities. Additionally, the EPS has an active concrete batch plant which is considered a co-located *Sector E - Cement and Concrete Products* facility for the purposes of the SWPPP. The facilities and activities covered under these existing permits are not considered further in this preliminary plan in support of the GPO permitting effort.

This draft SWPPP has been prepared in accordance with the requirements of the Arizona Pollutant Discharge Elimination System (AZPDES) Stormwater Multi-Sector General Permit (MSGP-2010) for *Sector G - Metal Mining (Ore Mining and Dressing*) as an active and staffed Project. It is organized with bracket references to the corresponding parts of the MSGP-2010 to facilitate compliance verification. Any activities related to exploration and construction, including pollutants, control measures, and inspection and monitoring requirements, are provided separately in ***Attachment 1***. The duration of the overall GPO permitting effort is unknown and the MSGP-2010 will likely have expired prior to Project permitting. As such, the SWPPP will be revised to reflect the current permit prior to beginning construction activities in support of the planned Resolution Project.

Pursuant to Part 1.3 of the MSGP-2010, once the National Environmental Policy Act (NEPA) permitting is complete, a Notice of Intent (NOI) for discharging stormwater will be filed by the Project. That NOI and the corresponding authorization to discharge issued by the Arizona Department of Environmental Quality (ADEQ) stormwater NOI processing center will be provided in ***Attachment 2***. As required in Part 5.4 of the MSGP-2010, a copy of the Mining MSGP-2010 is provided in ***Attachment 3***.

This SWPPP provides anticipated implementation procedures for pollution prevention measures required by the MSGP-2010. The finalized SWPPP will be designed for modification and revision according to the conditions provided within the MSGP-2010. Components subject to change are generally included in the form of attachments to facilitate this process without requiring major SWPPP document changes.

Note that only those areas of the facility that may discharge impacted stormwater to downstream receiving waters or areas not regulated under a different permit are covered under this preliminary SWPPP. Areas that discharge runoff into contained areas, where it is either collected and used as process water or left in the collection area and disposed of through evaporation (i.e., do not discharge to downstream receiving waters) are contained within a hydrologic boundary and are not subject to coverage under the MSGP-2010. Therefore, no further assessment of stormwater collecting in these areas is

provided in this SWPPP. Additionally, areas of the Project which are regulated under other environmental permits are only briefly described here.

2. SITE DESCRIPTION [5.1.2]

2.1 GENERAL

Facility Name and Address:	Resolution Copper Mining, LLC General Plan of Operations Project 102 Magma Heights Road Superior, Arizona 85273
Operator Name and Address:	Resolution Copper Mining, LLC 102 Magma Heights Road Superior, Arizona 85273
MSGP-2010 Authorization Number:	AZMSG-To Be Determined
Primary Standard Industrial Classification:	1021 – Copper Ores

2.2 PLANNED ACTIVITIES AT THE FACILITY [5.1.2.1; AND 8.G.6.1]

Resolution Copper is a joint venture between Rio Tinto and BHP Copper, Inc. (BHP). Rio Tinto took over management of the mining operations in May 2004 at both the EPS and WPS. As noted above, separate SWPPPs have been prepared for Resolution's EPS and WPS facilities.

The Resolution Project is in the planning and environmental review stage. Resolution Copper's administrative headquarters are currently located at Resolution Copper's WPS. These administrative offices are located immediately north of Superior at 102 Magma Heights. The office is accessed from US Highway 60 (US 60) by taking the State Route 177 off ramp and going north to the end of Magma Heights to the guard gate. The office building is known as the Verde Building. The EPS encompasses the proposed underground mine, associated shafts, and surface support facilities. The support facilities, some of which are already in existence, are located in a previously disturbed area and include a mine site where Shaft 9 was constructed in the 1970s. The EPS is located approximately 6 road miles east of the WPS, and is accessed from US 60 by turning south on Magma Mine Road (also known as Forest Road [FR] 469). Magma Mine Road ends at the EPS guard gate. Project facilities and attendant infrastructure components are located in north-central Pinal County and their proposed locations are herein referred to as the General Project Area (GPA) (***Figures 1 through 8***).

Some information relevant to the SWPPP is not yet available as the planning process for the Project has not yet been completed. Current Project-specific plans for proposed activities are summarized in the following paragraphs.

New ore processing facilities (the Concentrator) will be located at the WPS in an area disturbed by legacy mining features (i.e., those related to previous mining activity).

The existing mine site and related surface support facilities at the EPS are currently located on private lands, and during production will largely expand on private lands. The expansion associated with this GPO will be primarily on FS lands, with a smaller portion on state and private lands. Additional area encompassed by the EPS includes the land surface above the ore body, comprised of unpatented mining claims on lands administered by the FS, specifically Tonto National Forest (TNF).

A copper concentrate filtration plant and concentrate loadout facility (the Filter Plant and Loadout Facility) will be constructed near Magma Junction (Magma), proximate to the existing Magma Arizona Railroad Company (MARRCO) right-of-way. The MARRCO right-of-way crosses lands owned by Resolution Copper and the FS, as well as state trust lands administered by the Arizona State Land Department (ASLD) and will be the site of connecting infrastructure, such as water supply pipelines, dewatering pipelines, concentrate pipelines, and power lines; these features and the existing rail line are referred to collectively as the MARRCO Corridor.

A Tailings Storage Facility (TSF) will be situated west of the WPS and north of Queen Station within the TNF. Tailings will be delivered to the TSF from the WPS via a pipeline that traverses the intervening area (along with other infrastructure) along the Tailings Corridor. Linear infrastructure elements of the Project are primarily located within the Tailings Corridor, within the MARRCO Corridor on private land alongside existing infrastructure, or underground, and include ore conveyors, roads, power lines, copper concentrate pipelines, tailings pipelines, the MARRCO Railroad, and water supply pipelines. These elements connect the Project features and traverse multiple jurisdictions, representing several land ownership types, including private, state, and federal lands.

2.3 GENERAL LOCATION MAP [5.1.2.2]

The GPA is located near the Town of Superior, Pinal County, Arizona (in Township 1 South, Range 13 East; Township 2 South, Range 13 East; Township 1 South, Range 12 East; Township 2 South, Range 12 East; Township 1 South, Range 11 East; Township 2 South, Range 11 East; Township 2 South, Range 10 East; Township 2 South, Range 9 East; Township 3 South, Range 9 East; and Township 3 South, Range 8 East of the Gila and Salt River Baseline and Meridian) as depicted on ***Figure 1***.

The primary receiving waters from the proposed construction activities will be unnamed ephemeral tributaries to Queen Creek, Queen Creek, Devils Canyon, and Arnett Creek. Queen Creek from the headwaters to the Superior Wastewater Treatment Plant (WWTP) and from the Superior WWTP to Potts Canyon has been designated by ADEQ as impaired due to elevated levels of copper. A total maximum daily load (TMDL) has not yet been developed for the impaired reaches.

2.4 SITE MAP [5.1.2.3; AND 8.G.6.2]

The following information will be illustrated on ***Figures 1 through 8*** once the final Project design has been determined:

- Size of the property in acres;
- Location of significant structures;
- Directions of stormwater flow (e.g., use arrows);
- Locations of stormwater conveyances (e.g., ditches, pipes, and swales);
- Locations of all existing structural control measures;
- Locations of surface waters receiving the Project's discharges and any impaired waters or Outstanding Arizona Waters (OAWs) within 2.5 miles downstream of the Project;
- Locations where the Project's stormwater discharges to a regulated Municipal Separate Storm Sewer Systems (MS4);
- Locations of potential pollutant sources identified under MSGP-2010 Part 5.1.3.2;
- Locations where significant spills or leaks identified under Part 5.1.3.3 have occurred;
- Locations of all stormwater monitoring points;
- Locations of stormwater outfalls, with a unique identification code for each outfall (e.g., Outfall No. 1, No. 2, etc.), indicating whether one or more outfalls are being treated as "substantially identical" under Parts 4.2.3; 5.1.5.2; and 6.1.1.1 and an approximate outline of the areas draining to each outfall;
- Identification of all outfalls having the potential to contain allowable non-stormwater discharges under Part 1.1.3 and the corresponding type(s) of discharges (see ***Section 3.4.1*** of this SWPPP);
- Location of onsite drywell(s); include a list of the onsite drywells and their registration number(s);
- Locations of the following activities where such activities are exposed to stormwater with potential to discharge from the Project:
    - fueling stations;
    - vehicle and equipment maintenance and/or cleaning areas;

  - loading/unloading areas;
  - locations used for the treatment, storage, or disposal of wastes;
  - liquid storage tanks;
  - processing and storage areas;
  - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the Project;
  - transfer areas for substances in bulk; and
  - machinery;

- Locations and sources of run-on to the Project from adjacent property that contains significant quantities of pollutants; and
- All Sector G specific requirements [8.G.6.2].

3. POTENTIAL POLLUTANT SOURCES [5.1.3; AND 8.G.6.3]

Pollutant sources described in this section relate to active mining activities and features. Any pollutants related to exploration or construction activities at the Project will be documented in ***Attachment 1***.

3.1 INDUSTRIAL ACTIVITIES AND MATERIALS IN AREA [5.1.3.1]

Specific industrial activities or materials that could contribute pollutants to stormwater discharges will be described in this section.

Descriptions of control measures used to control stormwater throughout the GPA will be provided in ***Section 4*** and ***Attachment 9*** of this SWPPP. Potential pollutants and associated sources will be summarized in ***Attachment 4*** of this SWPPP.

3.2 POLLUTANTS [5.1.3.2; AND 8.G.6.3]

Based on the activities described in the previous section, ***Attachment 4*** will provide a table identifying potential pollutants present in discharging areas of the GPA. A summary of potential pollutants will be described in this section.

A summary of any existing ore or waste rock or overburden characterization data and test results for potential generation of acid rock drainage, if applicable, will be provided in ***Attachment 5***. If any new data is acquired due to changes in ore type being mined, the SWPPP will be updated with this information.

3.3 SPILLS AND LEAKS [5.1.3.3]

Spills and leaks within discharging areas of the Project may occur in fueling areas, loading and unloading areas, petroleum storage areas or where vehicles travel along roads or in the active construction area.

A record of any spills and leaks within the GPA which occur within a discharging area of the Project, including spills occurring during the three years prior to SWPPP preparation or amendment, and subsequent events occurring during permit coverage thereafter, will be provided and maintained in ***Attachment 6***.

Significant spills and leaks include, but are not limited to releases of oil or hazardous substances in excess of quantities that are reportable under the Clean Water Act Part 311 (see 40 CFR 110.10 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act. Significant spills may also include releases of oil or hazardous substances that are not in excess of reporting requirements, but could significantly impact stormwater due to the location of the spill and other relevant factors.

3.4 NON-STORMWATER DISCHARGES [1.1.3; 5.1.3.4; AND 8.G.5.3]

3.4.1 Allowable Non-Stormwater Discharges [1.1.3]

Allowable non-stormwater discharges and associated appropriate Best Management Practice (BMP) pursuant to the MSGP-2010 Part 1.1.3 are described in ***Table 1*** below:

Table 1. Allowable Facility Discharges

Source	Discharge Location	Appropriate BMP
Emergency firefighting activities	Activity dependent	Not applicable
Firefighting system testing and maintenance, including hydrant flushings	Not applicable	Not applicable
Discharges related to installation and maintenance of potable water supply systems, including disinfection and flushing activities, discharges resulting from pressure releases or overflows, and discharges from wells approved by ADEQ for drinking water use	Office areas	Erosion control, if necessary
Uncontaminated condensate from air conditioners, evaporative coolers, and other compressors and for the outside storage of refrigerated gases or liquids	Office areas	Erosion control, if necessary
Irrigation drainage and irrigation line flushing	Not applicable	Not applicable
Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling	Not applicable	Not applicable
Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed)	Not applicable	Not applicable
Routine external building wash down which does not use detergents	Not applicable	Not applicable
Water used to control dust, provided effluent or other wastewaters are not used	Throughout, as needed	Erosion control, if necessary
Uncontaminated groundwater or spring water	Along the MARRCO corridor	Erosion control, if necessary
Foundation or footing drains where flows are not contaminated with process materials such as solvents	Not applicable	Not applicable
Incidental windblown mist from cooling towers, but not intentional discharges (e.g. “piped” cooling tower blowdown or drains)	Not applicable	Not applicable
Hydrostatic testing of new pipes, tanks or vessels using potable water, surface water, or uncontaminated groundwater	Along the MARRCO corridor	Erosion control, if necessary
Water used for drilling, rehabilitation and maintenance of water wells and piezometers, or water supply or water quality evaluations	Proposed well field along the MARRCO corridor	Erosion control, if necessary
Non-stormwater discharges subject to an effluent limitation guidelines listed in MSGP-2010 Table 1-2	Not applicable	Not applicable

3.4.2 Unauthorized Non-Stormwater Discharges [5.1.3.4; and 8.G.5.3]

Parts 5.1.3.4 and 8.G.5.3 of MSGP-2010, require dischargers to test or evaluate all outfalls covered under the MSGP-2010 and/or upgradient drainage locations to identify all unauthorized non-stormwater discharges from the Project including for the presence of specific mining-related non-stormwater discharges such as seeps or adit discharges that do not directly result from precipitation events, or discharges subject to effluent limitations guidelines, such as mine drainage or process water. Unauthorized non-stormwater discharges are those not specifically allowed under MSGP-2010 Part 1.1.3 (see ***Section 3.4.1***, above).

Specific information included for this evaluation and determination will be provided in ***Attachment 7***, if applicable. If any future sources are identified, they will be clearly discussed in a modification to this section and mapped on ***Figures 2 through 8***.

3.5 SALT STORAGE [5.1.3.5]

There are no salt storage piles anticipated to be utilized for the Project.

3.6 SAMPLING DATA [5.1.3.6]

A summary of stormwater sampling data collected for the Project during the MSGP-2000 permit term will be provided in ***Attachment 8***, if applicable.

4. CONTROL MEASURES [5.1.4; 2.0; 8.G.5; AND 8.G.6.4]

The following sections generally describe the control measures (including BMPs) that will be selected for each of the activities and potential pollutants identified in ***Section 3*** of this SWPPP. The control measures identified in the following sections will be selected to ensure that stormwater discharges from the Project meet the requirements in MSGP-2010 Part 2.2. Control measures described in this section relate to active or inactive mining areas which are not regulated by a separate permit. Any control measures related to exploration or construction activities at the Project will be documented in ***Attachment 1***, if applicable.

Selection and design of control measures will be based on the following principles, as applicable:

- Preventing stormwater from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from stormwater;
- Using control measures in combination is more effective than using control measures in isolation for minimizing pollutants in the Project's stormwater discharge;
- Attenuating high discharge flows with such control measures as using open vegetated swales and natural depressions to reduce in-stream impacts of erosive flows;
- Conserving and/or restoring of riparian buffers help protect streams from stormwater runoff and improve water quality; and
- Using containment to intercept stormwater flows before they leave the site, such as directing flows to non-discharging areas (pits), or installing runoff containment.

Attachment 9 will provide a summary table of control measure applications, including non-structural, structural and sector-specific control measures. Additional discussion is provided below.

4.1 NON-STRUCTURAL CONTROL MEASURES [2.1.1; AND 5.1.5.1]

4.1.1 Minimizing Exposure [2.1.1.1]

Where applicable, and to the extent practicable, materials will be kept covered or kept in appropriate containers or within containment so as to minimize discharges of stormwater associated with industrial activity.

4.1.2 Good housekeeping [2.1.1.2; and 5.1.5.1]

Good housekeeping is practiced as needed and as scheduled, including but not limited to the following:

- Keeping materials orderly and labeled;
- Storing materials in appropriate containers;

- Cleaning up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;
- Regular waste removal; and
- Using drip pans and absorbents under or around leaky vehicles and equipment, or storing such vehicles and equipment indoors where feasible.

4.1.3 Maintenance [2.1.1.3; 2.2.1; 2.2.2; 2.2.3; and 5.1.5.1]

Vehicles and equipment will be maintained on a routine basis to reduce the potential for leaks or spills in discharging areas of the GPA.

If control measures are not achieving the intended effect of minimizing pollutant discharges (i.e., control measures need repair or replacement), any necessary changes shall be made within **14 calendar days** following discovery, or before the next measurable storm event (see MSGP-2010 Part 6.1.2.2), whichever is sooner. If necessary changes cannot be implemented within the specified timeframe(s), the following information shall be documented with the SWPPP: the reasons for the delay, a schedule for completing the necessary changes, date completed and any back-up control measures in place to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based limitations in Parts 2.2.2 and 2.2.3 of MSGP-2010 should a runoff event occur while a control measure is off-line (either in part or in whole).

4.1.4 Spill Prevention and Response Procedures [2.1.1.4; and 5.1.5.1]

Spill prevention and response procedures are addressed in the Project Spill Prevention Control and Countermeasures (SPCC) plan. This plan will be kept, along with the SWPPP, in the Environmental Offices and is available to the necessary personnel. Spill prevention will be provided through secondary containment of petroleum products and chemicals; overflow sensing devices; spill kit availability; and employee training. Routine inspections and maintenance provide the backbone of spill prevention. The SPCC plan provides the methodology for safely addressing all manner of spill events.

4.1.5 Employee Training [2.1.1.9; 5.1.5.1; and 8.G.6.5]

On an annual basis, employees who work in areas where industrial materials or activities are exposed to stormwater with the potential to discharge, or who are responsible for implementing activities necessary to meet the conditions of the MSGP-2010, including all members of the Stormwater Pollution Prevention Team (see ***Section 9.1*** and ***Attachment 14***), will receive SWPPP training.

The employee training program will cover the specific control measures at the site used to achieve the requirements in MSGP-2010 Part 2.2 and (for those who will be involved in these activities), the monitoring, inspection, planning, reporting, and documentation requirements in the MSGP-2010. The following table (***Table 2***) identifies areas that each annual training session will address.

Table 2. Annual Employee Training Areas

Part	Description	Training Requirements
1	Non-structural control Measures	• Review non-structural control measures • Review procedures for implementing non-structural control measures
2	Facility inspection procedures and maintenance of structural control measures	• Review facility inspection procedures and schedules • Completing BMP inspection forms • Maintenance of control measures
3	Annual Comprehensive Facility Inspection	• What to evaluate • Completing the forms
4	Monitoring and record keeping	• Review monitoring procedures and schedules • Review prior year records and record-keeping procedures
5	Annual Reporting	• Compiling and reporting analytical monitoring data • Filling out Discharge Monitoring Reports (DMRs)

A form for documenting attendance at stormwater management training sessions is provided in ***Attachment 10*** of this SWPPP. The form will be completed and signed by a responsible corporate officer or a duly authorized representative per MSGP-2010, and filed with the SWPPP records.

4.1.6 Non-Stormwater Discharges [2.1.1.10]

Non-stormwater discharges are addressed in ***Section 3.4*** of this SWPPP.

4.2 STRUCTURAL CONTROL MEASURES [2.1.1]

4.2.1 Erosion and Sediment Controls [2.1.1.5]

Where practicable, onsite erosion and sedimentation, and the resulting discharge of pollutants, will be minimized by using methods such as:

- Containing runoff using structural and/or non-structural control measures;
- Placing flow velocity dissipation devices at any discharge locations and within channels where necessary to reduce erosion and/or settle out pollutants;
- Diverting runoff away from roads and other denuded areas by using berms, ditches, and other functionally equivalent diversions;
- Reducing runoff velocities by using energy dissipation devices and minimizing grade, where practical; and/or
- Trapping sediment on site in sediment ponds or other functionally equivalent structural controls.

In addition, wherever possible, structural control planning will be conducted to include the following elements:

- Fit development to terrain when possible;
- minimize the length and grade of slopes;
- time maintenance activities, such as road grading and BMP upkeep to minimize soil exposure to stormwater;
- retain existing vegetation whenever feasible; and
- vegetate and mulch barren areas that are susceptible to erosion.

Structural, vegetative, and/or stabilization control measures will be implemented in areas of the Project that have a potential for soil erosion due to topography, land disturbance or other factors. This includes all property boundaries, wash borders, areas adjacent to discharge outfalls with potential for or that show evidence of erosion.

Routine inspections will evaluate effectiveness of erosion and sediment controls. If control measures are insufficient, improvements will be made and documented in ***Attachment 9***.

4.2.2 Management of Runoff/Stormwater Diversions [2.1.1.6; 2.1.1.8; and 8.G.5.1.1]

Management of runoff will be accomplished at the Project through the use of stormwater diversions and catchments, to be described in ***Attachment 9*** and will be shown on the finalized Site Maps (***Figures 2 through 8***). In general, runoff from unpaved and disturbed areas of the GPA will be directed towards structural control measures as much as possible, to allow solids settling and percolation. Routine inspections will evaluate effectiveness of runoff control BMPs. If BMPs are insufficient, improvements will be made and documented in ***Attachment 9***.

4.2.3 Capping [8.G.5.1.2; and 2.1.1.8]

Capping may be utilized for the GPO Project. If capping of potential pollutant sources is determined to be appropriate, the nature and extent of the capping program will be described here.

4.2.4 Treatment [8.G.5.1.3; and 2.1.1.8]

Given the potential pollutants described in ***Section 3***, treatment may not be an appropriate control measure for the GPO Project. If treatment of potential pollutant sources is determined to be appropriate in the future, the nature and extent of the treatment program will be described here.

4.2.5 Salt Storage Piles or Piles Containing Salt [2.1.1.7]

It is not anticipated there will be any salt storage piles or piles containing salt for the Project.

4.2.6 Litter, Garbage and Floatable Debris [2.1.1.11]

The discharge of litter, garbage, and floatable debris to surface waters will be prevented largely by keeping exposed areas free of such materials, or by intercepting them before they leave the site.

4.2.7 Dust Generation and Vehicle Tracking of Industrial Materials [2.1.1.12]

The generation of dust and offsite tracking of raw, final, or waste materials will be minimized to the extent practicable through the application of dust suppressants or water to unpaved access roads and construction areas.

4.3 SECTOR SPECIFIC CONTROL MEASURES [2.1.1.8; AND 8.G.5]

Part 8 of MSGP-2010 lists additional control measures relevant to Sector G facilities. The potential pollutants identified in ***Section 3.2*** of this plan (per Part 8.G.6.3 of MSGP-2010) shall determine the priority and appropriateness of the control measures selected.

4.3.1 Additional Stormwater Controls [8.G.5.1]

Sector-specific control measures required in MSGP-2010 Part 8.G.5.1 are addressed in ***Section 4.2*** of this SWPPP.

4.3.2 Construction and Exploration Phase Sediment and Erosion Control [8.G.5.2]

Sediment and erosion controls utilized during any exploration or construction phase activities will be addressed in ***Attachment 1*** as necessary.

4.3.3 Certification of Discharge Testing [8.G.5.3]

Discharge testing related to unauthorized non-stormwater discharges is addressed in ***Section 3.4.2*** of this SWPPP.

4.4 DISCHARGES TO IMPAIRED WATERS OR OUTSTANDING ARIZONA WATERS [1.1.4.5 (ONLY APPLIES TO NEW DISCHARGERS); 1.1.4.6 (ONLY APPLIES TO NEW DISCHARGERS); 2.2.3.1; 2.2.3.2; AND 2.2.3.3 (ONLY APPLIES TO NEW DISCHARGERS)]

Resolution Copper is not a new discharger. This section will be expanded to include the requirements of the stormwater permits to reflect discharge to the impaired Queen Creek, as appropriate.

5. INSPECTIONS [2.2.1; 2.2.2; 2.2.3; 4.0; 5.1.5.2; AND 8.G.7]

The MSGP-2010 includes schedules and procedures for three types of inspections: routine facility inspections, visual assessment of stormwater discharges, and comprehensive facility inspections. General requirements apply to all permitted facilities. Additional specific requirements apply for MSGP-2010 Sector G.

Inspection procedures described in this section relate to active and staffed mining activities. Any inspection procedures related to exploration or construction activities at the facility will be documented in ***Attachment 1***, if applicable.

If, during any quarterly routine facility inspection, visual assessment, or comprehensive facility inspection the facility's control measures are found to be inadequate or otherwise not being properly operated and/or maintained, the permittee will review the selection, design, installation, and implementation of the control measures to determine if maintenance and/or modifications are necessary to meet the applicable numeric effluent limitations in MSGP-2010 Part 2.2.1 and water quality-based requirements in MSGP-2010 Parts 2.2.2 and 2.2.3. Such modifications will be documented in the SWPPP and implemented as expeditiously as practicable.

5.1 ROUTINE FACILITY INSPECTIONS [4.1; 5.4; AND 8.G.7]

On a quarterly basis, qualified personnel (including at least one member of the stormwater pollution prevention team) will conduct routine inspections of all areas of the facility where industrial materials or activities are exposed to precipitation and that contribute to stormwater discharges from the site covered under the MSGP-2010, and of all stormwater control measures used to comply with MSGP-2010. Inspections and follow-up actions will be documented on the Routine Inspection Form provided in ***Attachment 11A***. Completed inspection forms will be maintained with the SWPPP, as required in MSGP-2010 Part 5.4.

At a minimum, the documentation for each routine facility inspection will include:

- The inspection date and time;
- The name(s) and signature(s) of the inspector(s);
- Weather information and a description of any discharges occurring at the time of the inspection;
- Evidence demonstrating that previously unidentified discharges of pollutants have occurred from the site;
- Any control measures needing maintenance or repairs;
- Any failed control measures that need replacement;
- Any other evidence of deviations from the permit or SWPPP observed; and
- Any additional control measures needed to comply with the permit requirements.

Inspections will be performed during periods when the Project is in operation. Once per calendar year, a routine facility inspection will be initiated while a stormwater discharge is occurring at one or more outfalls, but in no case later than **24 hours** or the first business day (whichever comes later) following the end of the measurable storm event. If there is no measurable storm event(s) during a calendar year, that fact will be documented on the quarterly inspection form that completes the inspections for that calendar year.

Additional Sector G Inspection Requirements **[8.G.7]**

Unless otherwise approved by ADEQ, active sites which discharge to waters designated as OAWs or waters which are impaired for sediment must be inspected monthly. The permittee may submit a request to ADEQ to reduce the inspection frequency to quarterly at one or more outfalls to an OAW or a water impaired for sediment. The request must be based on the frequencies of discharges and the performance of the control measure(s). This requirement is not applicable to the Project.

5.2 VISUAL ASSESSMENT OF STORMWATER DISCHARGES [4.2]

Two visual assessments will be performed by qualified personnel (including at least one member of the stormwater pollution prevention team) during the summer wet season and two visual assessments during the winter wet season when the Project is discharging.

Wet seasons, for the purposes of visual assessments, are defined as follows:

- Summer wet season: June 1 – October 31
- Winter wet season: November 1 – May 31

The term "wet season" applies statewide and includes areas of the state where freezing conditions exist that prevent runoff from occurring for extended periods. In areas where freezing conditions exist, the four visual assessments may be distributed during seasons when precipitation runoff occurs.

Visual assessment monitoring requirements in MSGP-2010 begin immediately after authorization to discharge is received by the permittee unless authorization is received 90 calendar days or more after a wet season has begun, in which case visual assessment monitoring shall commence with the start of the next wet season.

5.2.1 Visual Assessment Procedures [4.2.1; 6.1.2.2; and 6.1.2.3]

Visual assessment samples are not required to be collected consistent with 40 CFR Part 136 procedures. The visual assessment shall be made:

- Of a sample in a clean, clear glass, or plastic container, and examined in a well-lit area;
- On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be

collected as soon as practicable after the first 30 minutes and the reason why it was not possible to take samples within the first 30 minutes will be documented. In the case of snowmelt, samples shall be taken during a period with a measurable discharge from the Project (see also Part 6.1.2.3); and

- On discharges that occur at least 72 hours (3 calendar days) from a previous discharge (see also Part 6.1.2.2).

The following water quality observations will be documented during visual assessments:

- Color;
- Odor;
- Clarity;
- Floating solids;
- Settled solids;
- Suspended solids;
- Foam;
- Oil sheen; and
- Other obvious indicators of stormwater pollution.

Wet season visual assessments are currently not required for the Project. If they become necessary the representative outfall(s) will be identified in ***Attachment 11B***.

5.2.2 Visual Assessment Documentation [4.2.2; and 5.4]

The results of the visual assessments will be documented and the documentation will be maintained with this SWPPP as required in MSGP-2010 Part 5.4. The visual assessment findings need not be submitted to ADEQ, unless specifically requested.

A Visual Assessment Form is provided in ***Attachment 11C*** and includes the following:

- Sample location(s);
- Sample collection date and time, and visual assessment date and time for each sample;
- Personnel collecting the sample and performing visual assessment, and their signatures;
- Nature of the discharge (i.e., runoff or snowmelt);
- Results of observations of the stormwater discharge;
- Probable sources of any observed stormwater contamination; and

- If applicable, why it was not possible to take samples within the first 30 minutes.

5.2.3 Exceptions to Visual Assessments [4.2.3; and 5.1.5.2]

5.2.3.1 Absence of Discharge

If no storm event results in a discharge from the Project or outfall(s) during a wet season, the reason why an assessment could not be completed during that wet season will be documented and that documentation will be maintained with the SWPPP. In this case, supplementary visual assessment is not required.

5.2.3.2 Adverse Conditions

Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, or electrical storms, or situations that otherwise make sampling unsafe. When adverse conditions prevent the collection of either visual assessment sample in a given wet season, those conditions will be documented and that documentation maintained with the SWPPP. Visual assessment monitoring will then be resumed in the subsequent wet season.

5.2.3.3 Substantially identical outfalls

If the Project has two or more outfalls that discharge substantially identical pollutants, the visual assessment of the discharge at just one of the outfalls may be conducted, and the results applied to the substantially identical outfall(s). The following shall be described when using this visual assessment exception (as well as the exception for the Project's general analytical monitoring requirements, as described in MSGP-2010 Part 6.2.1 and ***Section 6.1.1.1*** of this SWPPP):

- Location of each of the substantially identical outfalls;
- Description of the general industrial activities conducted in the drainage area of each outfall;
- Description of the control measures implemented in the drainage area of each outfall;
- Description of the exposed materials located in the drainage area of each outfall that are likely to be significant contributors of pollutants to stormwater discharges;
- An estimate of the runoff coefficient of the drainage areas (low = under 40%; medium = 40 to 65%; high = above 65%); and
- Why the outfalls are expected to discharge substantially identical effluents.

An analysis of substantially identical outfalls will be documented in ***Attachment 11B***.

If possible, visual assessments of each substantially identical outfall shall be performed on a rotating basis throughout the period of coverage under the MSGP-2010.

If a visual assessment performed on a sample collected at a substantially identical outfall demonstrates that control measures are not functioning as intended, the control measures will be assessed and modified as appropriate for that outfall and, if necessary, other outfalls represented by the monitored outfall.

5.3 COMPREHENSIVE FACILITY INSPECTIONS [4.3; AND 6.2]

On an annual basis, qualified personnel (including at least one member of the stormwater pollution prevention team) will conduct a comprehensive facility inspection (CFI). Annual, as defined in Part 4.3.1 means once per calendar year, but not within 6 months of the previous inspection for the Project throughout the duration of permit coverage.

5.3.1 Scope of Comprehensive Facility Compliance Inspection [4.3; and 6.2]

CFIs must cover all areas of the Project affected by the requirements in MSGP-2010, including areas identified in this SWPPP as potential pollutant sources, any areas where control measures are used to comply with the permit, and areas where significant spills (or spills that would contribute to the discharge of pollutants in stormwater) and leaks have occurred in the past 3 years. CFIs must also include a review of any monitoring data collected in accordance with the MSGP-2010.

Inspectors must evaluate the results of the past year's visual assessments and analytical monitoring when planning and conducting inspections to determine potential areas of concern for stormwater pollution. Inspectors shall look for the following:

- Industrial materials, residue, or trash that may have or could come into contact with stormwater;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the GPA;
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas; and
- Control measures needing replacement, maintenance, or repair.

Inspectors shall examine all stormwater control measures required by MSGP-2010 to ensure that they are functioning correctly. If discharge locations are inaccessible, nearby downstream locations shall be inspected.

The Project's annual CFI may also be used as one of the routine inspections (see ***Section 5.1*** of this SWPPP), provided that all components of both types of inspections are included.

5.3.2 Comprehensive Facility Inspection Documentation [4.3.2; and 7.2]

The findings of each annual CFI will be documented and the documentation maintained with this SWPPP, as required in MSGP-2010 Part 5.4. ***Attachment 11D*** provides a report form for the CFI and includes the following:

- The date of the inspection;
- The name(s) and title(s) of the personnel making the inspection;
- Findings from the examination of areas of the Project identified in ***Section 5.3.1***, above;
- All observations relating to the implementation of the control measures including:
    - Previously unidentified discharges from the site;
    - Previously unidentified pollutants in existing discharges;
    - Evidence of, or the potential for, pollutants entering the drainage system that are not contemplated in the SWPPP;
    - Evidence of pollutants discharging to surface waters from any Project outfall(s) in a manner inconsistent with the SWPPP, and the condition of and around the outfall, including the condition of flow dissipation measures (if present) designed to prevent scouring; and
    - Additional control measures needed to address any conditions requiring corrective action identified during the inspection.
- Any required revisions to the SWPPP resulting from the inspection;
- Any incidents of noncompliance observed or a certification stating the Project is in compliance with this permit (if there is no noncompliance); and
- A statement signed and certified in accordance with Appendix B, Subsection 9 of MSGP-2010.

In addition, permittees that operate facilities that discharge directly to an impaired water or OAW or to an upstream tributary within 2.5 miles of an impaired water or OAW shall submit the CFI findings with the annual report (see ***Section 8.2***, below).

6. MONITORING [5.1.5.2; AND 6]

Several types of monitoring are required under MSGP-2010, including:

- General analytical monitoring [6.2.1];
- Effluent limitations guidelines monitoring [6.2.2];
- Impaired waters monitoring [6.2.3]; and
- Additional monitoring as required by ADEQ [6.2.4].

The procedures and schedules for conducting the types of analytical monitoring specified by MSGP-2010, when and where applicable, are described in the sections below. For the required monitoring, a Sampling and Analysis Plan (SAP) will be incorporated into ***Attachment 12***.

Per MSGP-2010, Parts 6.2.1, and 8.G.8, the requirement for general analytical monitoring is not applicable to a Sector G facility which discharges to an ephemeral water.

6.1 PROCEDURES COMMON TO ALL MONITORING [6.1]

6.1.1 Monitoring Locations [6.1.1]

6.1.1.1 Outfalls [6.1.1.1]

Monitoring of multiple outfalls can be reduced to representative outfalls provided they discharge "substantially identical stormwater and/or allowable non-stormwater." Substantially identical outfalls are addressed in ***Section 5.2.3.3*** and ***Attachment 11B*** of this SWPPP.

The allowance for monitoring only one of the substantially identical outfalls is not applicable to any outfalls with numeric effluent limitations. Each outfall covered by a numeric effluent limitation is required to be monitored.

6.1.1.2 Commingled Discharges [6.1.1.2; and 8.G.6.6]

If discharges authorized by MSGP-2010 commingle with discharges not authorized under the permit, any required sampling of the authorized discharges must be performed at a point before they mix with other unauthorized discharges to the extent practicable.

6.1.1.3 Monitoring for Allowable Non-Stormwater Discharges [6.1.1.3]

Unless otherwise specified by ADEQ, permittees are required to monitor allowable non-stormwater discharges only when they are commingled with stormwater discharges associated with industrial activity. Allowable non-stormwater discharges are addressed in ***Section 3.4.1*** of this SWPPP.

6.1.2 Monitoring Events [6.1.2]

6.1.2.1 Monitoring Periods [6.1.2.1]

Monitoring requirements in MSGP-2010 begin within 90 calendar days of receiving authorization to discharge. The required monitoring events may be distributed during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from the Project.

Wet seasons, for the purposes of analytical monitoring, apply statewide and are defined as follows:

Summer wet season: June 1 – October 31

Winter wet season: November 1 – May 31

6.1.2.2 Measurable Storm Events [6.1.2.2]

All required monitoring must be performed on a storm event that results in a discharge from the Project ("measurable storm event") that follows the preceding measurable storm event by at least 72 hours (3 calendar days). The 72-hour (3-day) storm interval does not apply if the permittee is able to document that less than a 72-hour interval is representative for local storm events during the sampling period. In the case of snowmelt, the monitoring must be performed at a time when a measurable discharge occurs at the site.

For each monitoring event, except snowmelt monitoring, the permittee shall identify the person performing the monitoring, the date and estimated duration (in hours) of the rainfall event, estimated rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event. For snowmelt monitoring, the permittee shall identify the sample as 'snowmelt' and the date of the sampling event.

6.1.2.3 Sample Type [6.1.2.3]

A minimum of one grab sample will be collected from a discharge resulting from a measurable storm event that produces a sufficient volume to allow collection of a sample. With the exception of samples to be analyzed for Suspended Sediment Concentration (SSC), samples must be collected within **the first 30 minutes of a measurable storm event**. If it is not possible to collect the sample within the first 30 minutes of a measurable storm event, the sample must be collected as soon as practicable after the first 30 minutes and documentation must be kept with this SWPPP explaining why it was not possible to take samples within the first 30 minutes.

Samples for SSC shall be collected 48 hours after the storm event that resulted in a measurable discharge. In the case of snowmelt, samples must be taken during a period with a measurable discharge.

6.1.2.4 Adverse Conditions [6.1.2.4]

When adverse conditions (as described in ***Section 5.1.2.3*** of this plan) prevent the collection of the analytical sample(s) required in a given wet season, those conditions will be documented and the

documentation maintained with this SWPPP. Analytical monitoring will resume in the subsequent wet season. Note that adverse conditions do not exempt the permittee from the requirement to file a discharge monitoring report (DMR) in accordance with the Project's sampling schedule. The permittee shall report any failure to monitor as specified in MSGP-2010 Part 7.1, indicating the basis for not sampling during the usual reporting period.

6.1.3 Sampling and Analysis Plan [6.1.3]

The requirements of the SAP will be provided in ***Attachment 12***, if applicable.

6.2 General Analytical Monitoring [6.2.1; and 8.G.8]

This section will describe general analytical monitoring requirements, as applicable.

6.3 Effluent Limitations Monitoring [6.2.2]

This section will describe effluent limitation requirements, as applicable.

6.4 Impaired Waters Monitoring [6.2.3]

This section will describe impaired waters requirements, as applicable.

6.5 Additional Monitoring Required by ADEQ [6.2.4; and 8.G.8.2.3]

This section will describe additional monitoring required by ADEQ, as appropriate. The Project has not been directed by the ADEQ to conduct additional monitoring; therefore, it is not required to conduct additional monitoring.

6.6 Outfall Monitoring Summary

This section will summarize outfall monitoring requirements once a final Project has been permitted.

6.7 Follow-up Actions if a Numeric Effluent Limit or a Water Quality Standard is Exceeded [6.3]

If a numeric effluent limit is exceeded during a stormwater discharge, or if there is information that a stormwater discharge is causing or contributing to an exceedance of an applicable water quality standard, follow-up monitoring will be conducted within 30 calendar days (or during the next qualifying runoff event, should none occur within the 30 days) of implementing corrective action(s) taken in accordance with Part 3. Monitoring must be performed for any pollutant(s) that exceeds the numeric effluent limit or for which there has been an exceedance of an applicable water quality standard.

If this follow-up monitoring exceeds the applicable numeric effluent limit or demonstrates that the stormwater discharges are causing or contributing to an exceedance of an applicable water quality standard, the following requirements apply:

- Submit an Exceedance Report to ADEQ (see ***Section 8.3*** of this SWPPP).

- Continue to monitor, at least twice per wet season, until the discharge is in compliance with the numeric effluent limit or is no longer causing or contributing to an exceedance of an applicable water quality standard or until ADEQ waives the requirement for additional monitoring.

7. CORRECTIVE ACTIONS [3]

7.1 CORRECTIVE ACTION TRIGGERS [3.1]

7.1.1 Conditions Requiring Review and Revision of Control Measures to Eliminate a Problem [3.1.1; 2.1; and 2.2.]

If any of the following conditions occur resulting in or from a failure of a control measure, the selection, design, installation, and implementation of the Project's control measures shall be reviewed and revised as necessary to ensure that the condition is eliminated:

- An unauthorized discharge (e.g., discharge of non-stormwater not authorized by this or another AZPDES permit) to a water of the U.S. or to a regulated MS4 occurs at the facility (MSGP-2010 Part 2.1);
- A discharge violates a numeric effluent limitation guideline (MSGP-2010, Table 6-1);
- The permittee becomes aware, or ADEQ determines, that the Project's discharge causes or contributes to an exceedance of applicable water quality standard(s) (MSGP-2010 Part 2.2.2) or an adopted waste load allocation (WLA) (Part 2.2.3); and/or
- ADEQ, or an operator of a regulated MS4, determines that modifications to the control measures are necessary to meet the requirements of MSGP-2010 Part 2.2.

7.1.2 Substantially Identical Outfalls [3.1.2]

If the event triggering corrective action is linked to an outfall that represents other substantially identical outfalls, the above review must assess the need for corrective action for each outfall represented by the outfall that triggered the review.

7.2 CORRECTIVE ACTION DEADLINES [3.2]

The discovery of any of the conditions listed in ***Section 6.1.1*** will be documented within 72 hours of making such discovery. Within 14 calendar days of such discovery, any corrective action(s) taken or to be taken to eliminate or further investigate the condition will be documented, or if no corrective action is needed, the basis for that determination. The specific documentation required within 72 hours and 14 calendar days is detailed in ***Section 7.3***, below.

When actions are determined necessary, any necessary changes will be made within 14 calendar days following discovery, or before the next measurable storm event (see MSGP-2010 Part 6.1.2.2), whichever is sooner. If necessary changes cannot be implemented within the specified timeframe(s), the following shall be documented with the SWPPP: the reasons for the delay, a schedule for completing the necessary changes, date completed and any back-up practices in place to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based requirements in Parts 2.2.2 and 2.2.3 of this permit should a runoff event occur while a control measure is off-line.

7.3 CORRECTIVE ACTION REPORT [3.3; AND 7.2]

Within 72 hours of discovery of any condition listed in ***Section 7.1.1***, the following information shall be documented and maintained with the SWPPP:

a. Identification of the condition triggering the need for corrective action review;

b. Description of the problem identified; and

c. Date the problem was identified.

Within 14 calendar days of discovery of any condition listed in Section 6.1.1, the following information shall be documented and maintained with the SWPPP:

a. Summary of corrective action taken or to be taken;

b. Whether SWPPP modifications are required as a result of this discovery or corrective action;

c. Date corrective action initiated or will be initiated; and

d. Date corrective action completed or expected to be completed.

When any condition listed in ***Section 7.1.1*** occurs, a permittee that operates a facility that discharges to an impaired water or OAW shall submit this documentation in an annual report (see ***Section 8.2***, below) as required in MSGP-2010 Part 7.2 and retain a copy of the corrective action report onsite with the SWPPP as required in Part 5.4.

8. REPORTING AND RECORDKEEPING

8.1 REPORTING MONITORING DATA TO ADEQ [7.1]

All analytical monitoring data (see ***Section 6*** of this SWPPP) shall be submitted to ADEQ at the address in ***Section 8.6***, using the MSGP DMR form available at http://www.azdeq.gov/environ/water/permits/download/2010/dmr.pdf and in ***Attachment 13A***.

All sampling results for the previous two wet seasons will be compiled onto the DMR form(s) and, except as provided in ***Section 8.2*** below, submitted to ADEQ not later than July 15 of each year of permit coverage. The first DMR form must be submitted to ADEQ by no later than July 15th of each permit year.

8.2 ANNUAL REPORT [7.2]

All facilities shall prepare an Annual Report on the form provided in ***Attachment 13B*** and retain a copy of the report with this SWPPP. The Annual Report for the reporting period June 1 to May 31 shall be completed by July 15 (the first report must be completed by July 15th of each permit year) and include, at a minimum:

- The findings from the Project's comprehensive facility inspection (***Section 5.3***);
- Any corrective action documentation (***Section 7.3***);
- The DMR form(s) for the preceding two wet seasons; and
- The results of any monitoring required in MSGP-2010 Part 6.2 for those facilities that discharge to a water (or within 2.5 miles of a water if required by ADEQ) or portion thereof, classified as an OAW or an impaired water; or
- The results of any monitoring required in MSGP-2010 Part 6.2 if notified by ADEQ in accordance with MSGP-2010 Part 1.3.1(2)(c).

For facilities that discharge to a water (or within 2.5 miles of a water if required by ADEQ, or is otherwise referenced within an approved TMDL) or portion thereof, classified as an OAW or an impaired water, the annual report shall be submitted to ADEQ on or before July 15 (postmark date).

8.3 EXCEEDANCE REPORT FOR NUMERIC EFFLUENT LIMITS OR WATER QUALITY STANDARDS [7.3]

If follow-up monitoring pursuant to Part 6.3 exceeds a numeric effluent limit or demonstrates that a stormwater discharge is causing or contributing to an exceedance of an applicable water quality standard, an Exceedance Report shall be submitted to ADEQ no later than 30 calendar days after receiving the Project's lab results. The Project's Exceedance Report shall include the following:

- Facility name, physical address and location;
- AZPDES permit tracking number;
- Name of receiving water;
- Monitoring data from this and the preceding monitoring event(s);
- An explanation of the situation, including what actions the permittee has completed or intends to complete (if corrective actions are not yet complete) to correct the exceedance; and
- Contact person name, title, and phone number.

8.4 OTHER REPORTING [7.4]

The permittee is subject to the reporting requirements stipulated in MSGP-2010 Part 7, in addition to the standard permit reporting provisions of MSGP-2010 Appendix B, Subsection 12.

- 24-hour reporting (see MSGP-2010 Appendix B, Subsection 12.d);
- 5-day follow-up reporting to the 24 hour reporting (see Appendix B, Subsection 12.d.(ii)];
- Reportable quantity spills (verbal report only; see Part 2.1.1.4);
- Planned changes (see Appendix B, Subsection 12.a);
- Anticipated noncompliance (see Appendix B, Subsection 12.c);
- Transfer of ownership and/or operation (see MSGP-2010 Table 1-3);
- Other noncompliance (see Appendix B, Subsection 12.e); and
- Other information (see Appendix B, Subsection 12.f).

Where a written report is required, these reports shall be submitted to ADEQ's address listed in ***Section 8.6*** of this plan. If the facility discharges to a regulated MS4, these reports shall also be submitted to the MS4 operator (in accordance with MSGP-2010 Part 5.1.2).

8.5 RECORDKEEPING [7.5]

The following shall be retained for a period of at least three (3) years from the date the Project's coverage under MSGP-2010 expires or is terminated:

- Copies of the SWPPP (including any modifications made during the term of MSGP-2010);
- Additional documentation requirements pursuant to MSGP-2010 Part 5.4 (including documentation related to corrective actions taken pursuant to Part 3);
- All reports and certifications required by this permit;
- Monitoring data; and

- Records of all data used to complete the NOI to be covered by the MSGP-2010.

8.6 ADDRESSES FOR REPORTS [7.6]

Signed copies of monitoring data and any other reports required, shall be submitted to the address below. Other options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet or by public notice. Notices of Intent and Notices of Termination (or a photocopy/reproduction) shall be signed and dated in accordance with Appendix B, Subsection 9 of MSGP-2010 and submitted to ADEQ at the address below. DMR forms and paper copies of any reports required in ***Sections 5, 6 and 7*** shall be sent to the address below. All other written correspondence concerning discharges covered under this permit shall likewise be sent to the address listed below:

Arizona Department of Environmental Quality
Surface Water Section, Stormwater Permits Unit—MSGP Monitoring
1110 West Washington Street, Mail Code 5415 A-1
Phoenix, Arizona 85007
Office: (602) 771-4508

Reports of non-compliance shall be reported to:

Arizona Department of Environmental Quality
Water Quality Compliance Section
1110 West Washington Street, Mail Code 5515 B-1
Phoenix, Arizona 85007
Office: (602) 771–4513

9. ADMINISTRATIVE

9.1 POLLUTION PREVENTION TEAM [5.1.1]

The Project will identify and train a Stormwater Pollution Prevention Team that will ensure effective SWPPP implementation. The team will include personnel who are responsible for development and implementation of the SWPPP as well as maintaining control measures and taking corrective actions where required. Components of the preventive maintenance and inspection program will be supervised and/or carried out by the team. Members and their assigned tasks and responsibilities will be specifically identified in ***Attachment 14***.

9.2 SIGNATURE, PLAN REVIEW, AND PLAN AVAILABILITY [5.1.6; 5.3; AND B.9]

This SWPPP will be certified in accordance with MSGP-2010 Appendix B, Subsection 9 and retained at the facility available for regulatory review at the time of inspections, or upon request. It will also be available to the public upon written request. Certification will be provided in the front of this document.

9.3 REQUIRED SWPPP MODIFICATIONS [5.2]

This SWPPP shall be modified whenever necessary to address any of the triggering conditions for corrective action in MSGP-2010 Part 3.1 (see ***Section 7*** of this SWPPP). Changes to the SWPPP to reflect corrective actions shall be made in accordance with the corrective action deadlines in Parts 3.2 and 3.3, and signed and dated in accordance with MSGP-2010 Appendix B, Subsection 9.

In addition, the SWPPP shall be modified to reflect new or modified control measures (see MSGP-2010 Parts 2.1 and 4.0), including measures implemented at active mining operations as mining activities expand into previously undisturbed areas (see MSGP-2010 Part 8.G.5.2).

9.4 DOCUMENTATION REQUIREMENTS [5.4]

The following inspection, monitoring, and certification records shall be kept complete and up-to-date. Retaining these records with the SWPPP (unless otherwise specified below) is necessary to demonstrate compliance with the conditions of this permit.

- A copy of the NOI submitted to ADEQ, including: any correspondence exchanged between the operator and ADEQ specific to coverage under this permit and the permit authorization number assigned by ADEQ - see ***Attachment 2***;
- A copy of this permit (an electronic copy easily available to SWPPP personnel is also acceptable) – see ***Attachment 3***;
- Descriptions and dates of any incidences of significant spills, leaks, or other releases that resulted in discharges of pollutants in stormwater to a regulated MS4 or to waters of the U.S., the circumstances leading to the release and actions taken in response to the release, and measures

taken to prevent the recurrence of such releases [2.1.1.4; and 5.1.3.3] – see SWPPP ***Section 3.3*** and ***Attachment 6***;

- Records of employee training, including date training received. Training records need not be maintained with the SWPPP but shall be made available to ADEQ, EPA, or another federal, state or local agency upon request [2.1.1.9] – see SWPPP ***Section 4.1.5*** and ***Attachment 10***;
- Documentation of repairs of structural control measures, including the date(s) of discovery of areas in need of repair/replacement, date(s) that the structural control measure(s) returned to full function, and the justification for any extended repair schedules [2.1.1.3] – see SWPPP ***Section 4.1.3***;
- Documentation of maintenance of industrial equipment and systems in accordance with part 2.1.1.3 need not be maintained with the SWPPP but shall be made available to ADEQ, EPA, or another Federal, State or local agency upon request. The maintenance records shall include the date(s) of regular maintenance. However, the justification for any extended maintenance schedules shall be maintained with the SWPPP [2.1.1.3] – see SWPPP ***Section 4.1.3***;
- All inspection reports, including the Routine Facility Inspection Reports [4.1] – see SWPPP ***Section 5.1***, the Visual Assessment Reports [4.2] – see SWPPP ***Section 5.2***, and the Comprehensive Facility Inspection Reports [4.3] – see SWPPP ***Section 5.3***;
- Description of and rationale for any deviations from the schedule for visual assessments and/or monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 30 minutes of a measurable storm event) [4.1.1; 4.2.1; 6.1.2.3; and 6.2.1] – see SWPPP ***Section 5.2***;
- Description of any corrective action taken at the site, including triggering event and dates when problems were discovered and modifications occurred– see SWPPP ***Section 7.3***; and
- Documentation to support a claim that the Project has changed its status from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections [4.1.3], visual assessments [4.2.3], and/or general analytical monitoring [6.2.1.4].

9.5 DEFINITIONS [APPENDIX A; AND 8.G.3]

Refer to MSGP-2010 Parts 8.G.3 and Appendix A in ***Attachment 3*** of this SWPPP for applicable definitions.

9.6 STANDARD PERMIT CONDITIONS [APPENDIX B]

A discussion of standard permit conditions is not included in the SWPPP. Refer to MSGP-2010 Appendix B in ***Attachment 3*** for additional information.

9.7 TERMINATION OR TRANSFER OF COVERAGE [1.4; 8.G.9; AND B.19]

9.7.1 Termination of Permit Coverage [1.4]

To terminate permit coverage, a complete and accurate Notice of Termination (NOT) form shall be submitted to the address listed in ***Section 7.6***. Other NOT options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet or by public notice. The Project's authorization to discharge under the MSGP-2010 terminates at midnight of the day that a complete NOT form is received by ADEQ. An NOT shall be submitted within 30 calendar days after a new owner or operator assumes ownership of or has taken over responsibility for the Project.

An NOT shall also be submitted when there are not or no longer will be discharges of stormwater associated with industrial activity from the Project.

The permittee is responsible for meeting the terms and conditions of this permit until the Project's authorization is terminated.

9.7.1.1 Termination of Permit Coverage for Sites Reclaimed After December 17, 1990 [8.G.9.1]

A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is not required to maintain coverage under MSGP-2010.

If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is not required to maintain coverage under MSGP-2010 if the site or portion of the site has been reclaimed as defined in ***Section 9.9.1.2***, below.

9.7.1.2 Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990 [8.G.9.2]

A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under MSGP-2010 if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if:

1) Stormwater runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state water quality standards;
2) Soil disturbing activities related to mining at the sites or portion of the site have been completed;
3) The site or portion of the site has been stabilized as necessary to minimize soil erosion; and

4) As appropriate depending on location, size, and the potential to contribute pollutants to stormwater discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

9.7.2 Transfer of Permit Coverage [1.3.1; and B.19]

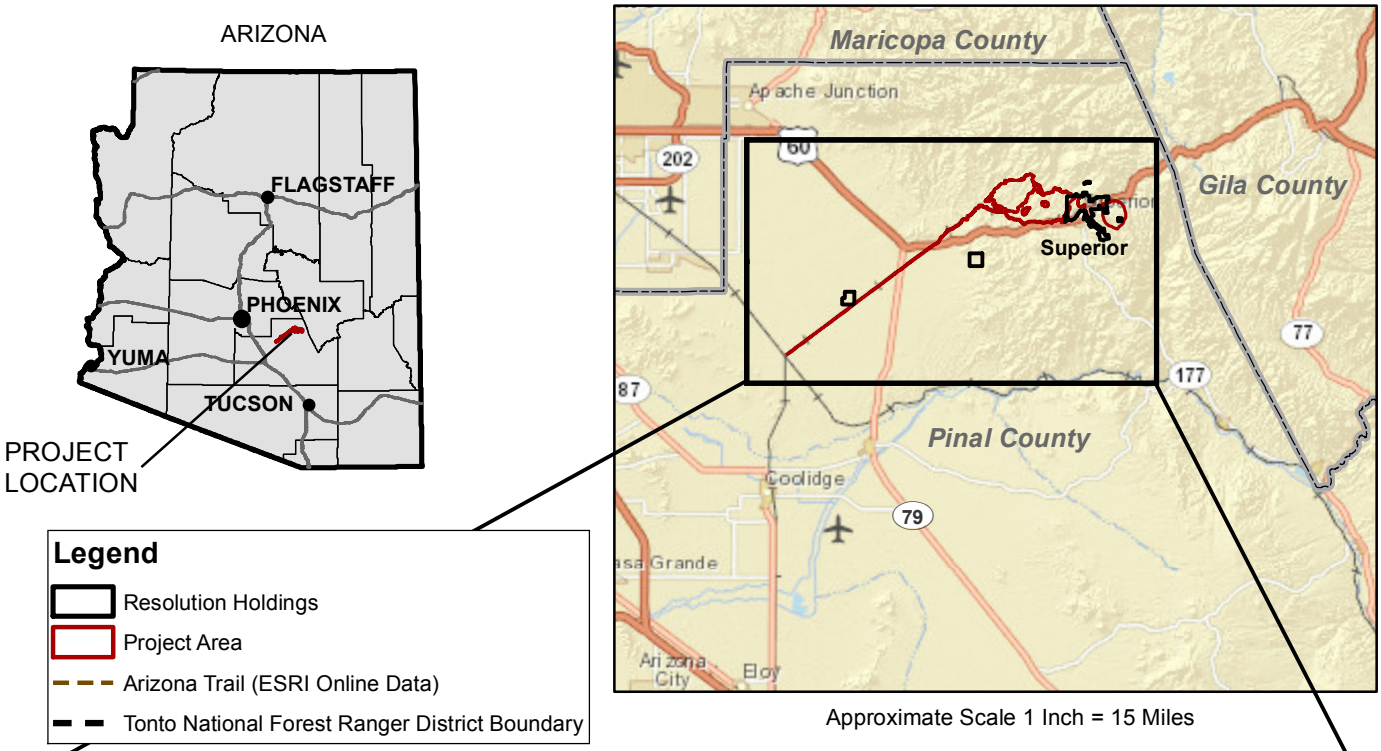
Transfer of coverage from one operator to another under the MSGP-2010 is not permitted. If the Project changes owner/operator, an NOI must be completed and filed by the *new* company at least seven (7) days prior to taking over operational control of the Project. A NOT must be submitted by the *old* owner/operator within 30 days after the new owner/operator has assumed responsibility for the Project. Blank NOI and NOT forms are provided in ***Attachment 15***. If such a change occurs, copies of the completed NOI and NOT forms will be maintained in ***Attachment 2***.

Simple name changes of the permittee (e.g., Company "A" changes name to "ABC, Inc.") may be done by filing an amended Notice of Intent referencing the Project's assigned permit number and requesting a simple name change.

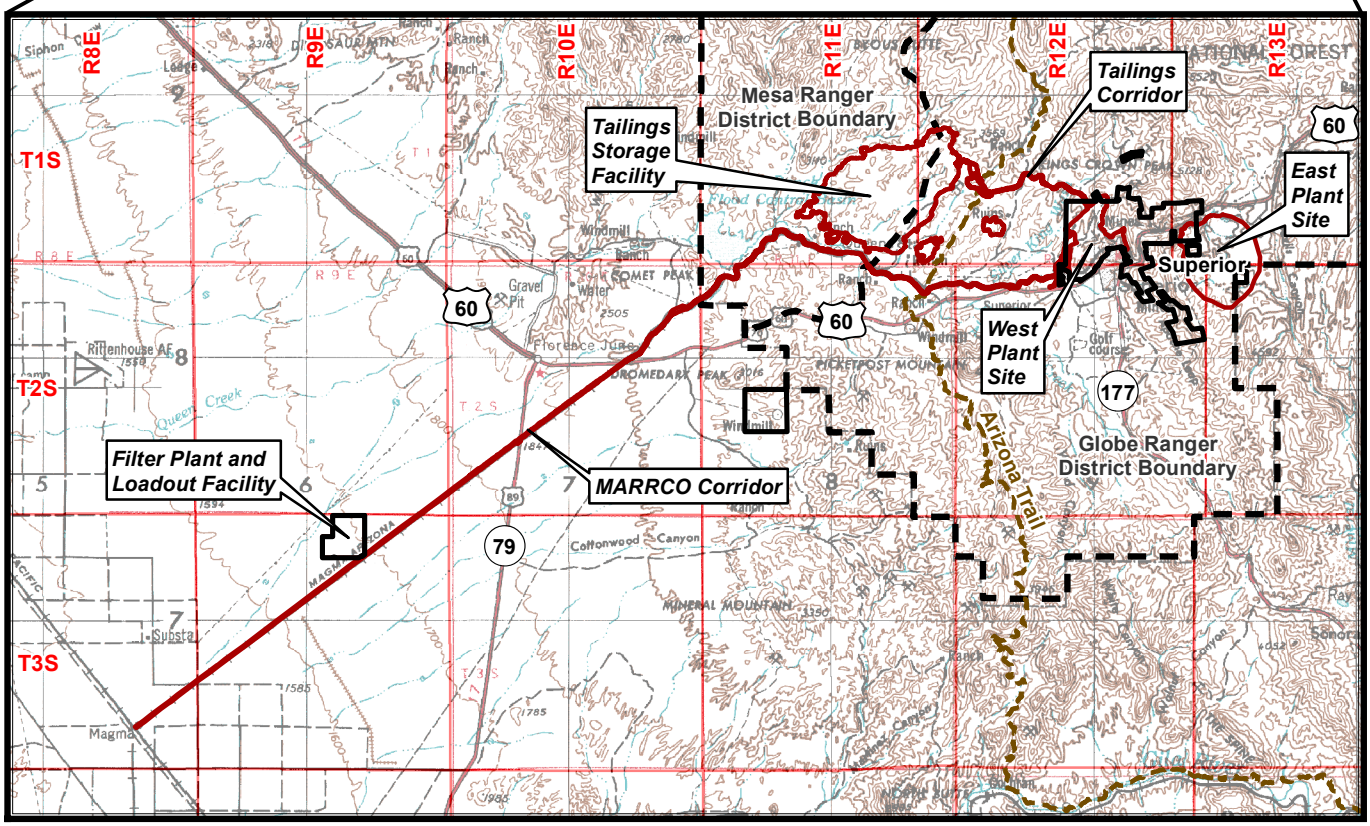
10. SECTOR-SPECIFIC REQUIREMENTS FOR INDUSTRIAL ACTIVITY [8]

Requirements of Sector G – Metal Mining (Ore Mining and Dressing) [8.G] are incorporated into previous applicable sections of this document. Corresponding permit section numbers are included to facilitate compliance verification (i.e., 8.G.X).

FIGURES



Approximate Scale 1 Inch = 15 Miles



GPO found within the following Township & Ranges:
T1S, R13E & T2S, R13E, T1S, R12E & T2S, R12E,
T1S, R11E & T2S, R11E, T2S, R10E & T2S, R9E,
T3S, R9E & T3S, R8E, Portions of Pinal County, Arizona.
Mesa 1:250,000 USGS Quadrangle.

N

0 2.5 5 Miles

0 4 8 Kilometers

PRELIMINARY

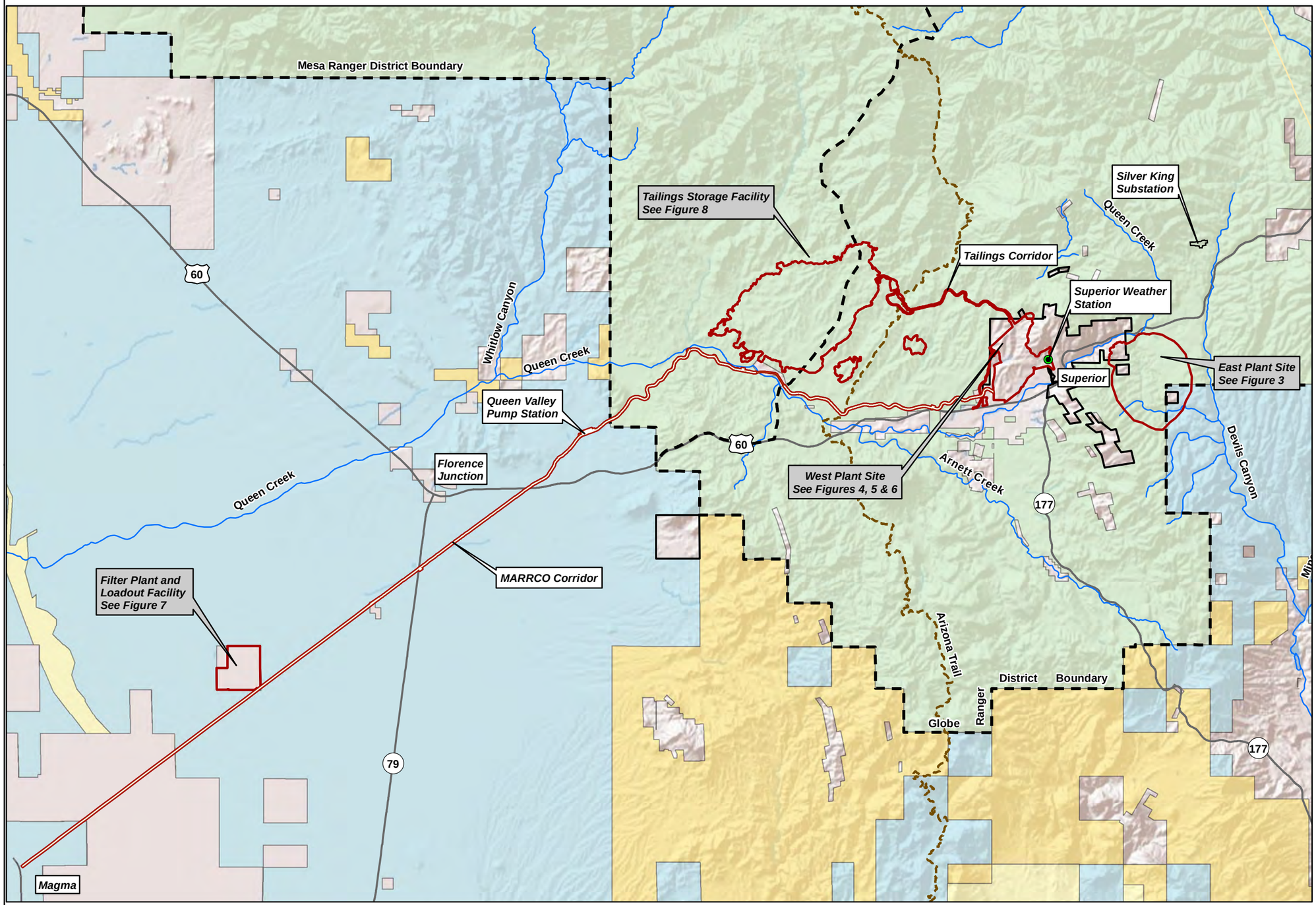
RESOLUTION COPPER

General Plan of Operations
Stormwater Pollution Prevention Plan

VICINITY MAP

Figure 1

Path: M:\Jobs\800's\807.94\ENV\SWPPP&SpillPlan\SWPPP\Figures_07_03_2014\MXD_Figures\Fig2_SWPPP_Overview.mxd



Legend

- Resolution Holdings
- Project Area
- Arizona Trail (ESRI Online Data)
- Tonto National Forest Ranger District Boundary

Surface Management (Source: BLM 2011)

- Bureau of Land Management (BLM)
- Bureau of Reclamation
- Private Land (No Color)
- State Trust Land
- US Forest Service (USFS)

GPO found within the following Township & Ranges:
T1S, R13E & T2S, R13E, T1S, R12E & T2S, R12E,
T1S, R11E & T2S, R11E, T2S, R10E & T2S, R9E,
T3S, R9E & T3S, R8E, Portions of Pinal County, Arizona.
Mesa 1:250,000 USGS Quadrangle.

Image Source: ESRI Online World Shaded Relief

N

0 6,000 12,000 Feet

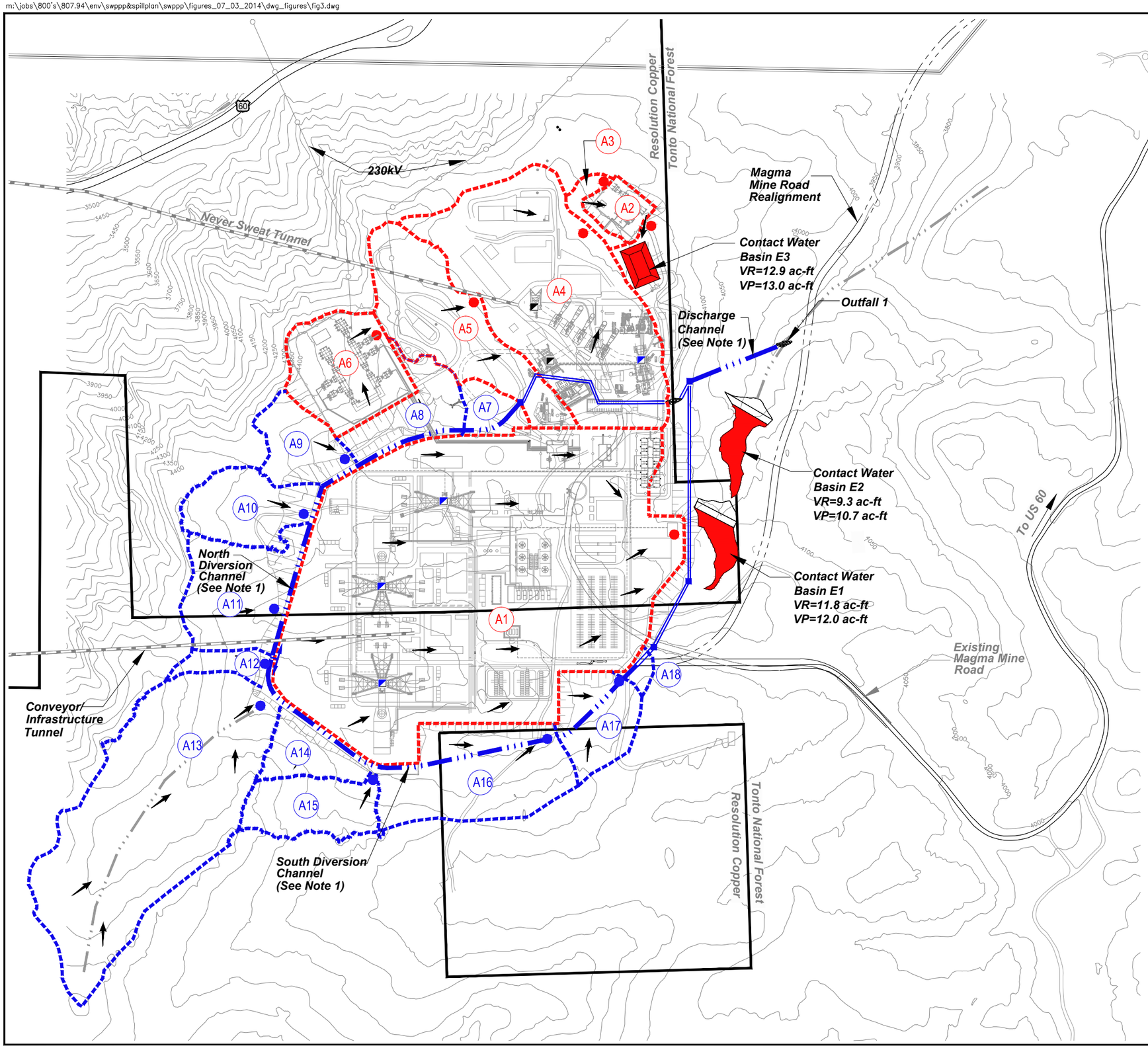
PRELIMINARY

RESOLUTION COPPER

General Plan of Operations
Stormwater Pollution Prevention Plan

OVERVIEW MAP
Figure 2

m:\jobs\800's\807.94\env\swppp&spillplan\swppp\figures_07_03_2014\dwg_figures\fig3.dwg



Legend

- Resolution Holdings
- Existing Mine Shaft
- Mine Shaft
- Onsite Concentration Point
- Offsite Concentration Point
- A2 — Onsite Catchment
- A2 — Offsite Catchment
- Onsite Watershed Boundary
- Offsite Watershed Boundary
- Non-Contact Buried Culvert
- Non-Contact Water Channel/Drainage
- Existing Drainage
- Drainage Vault
- VR = Volume Required
- VP= Volume Provided
- Direction of Surface Flow

N

0 250 500 Feet

0 100 200 Meters

Data Source: East Plant Facilities Provided by AMEC 2012

Note 1: Route Non-Contat Water to Existing Drainage Downstream of Contact Water Basin E1 & E2

Note: These preliminary SWPPP figures were created using the draft Stormwater Drainage Design Memorandum. Once a final alternative is selected, a map will be generated that complies with the industrial general permit at that time. The map is anticipated to identify, at a minimum, potential pollutant sources, Best Management Practices, and discharge outfalls as required by the current MSGP.

PRELIMINARY

RESOLUTION COPPER

General Plan of Operations

Stormwater Pollution Prevention Plan

EAST PLANT SITE

Figure 3

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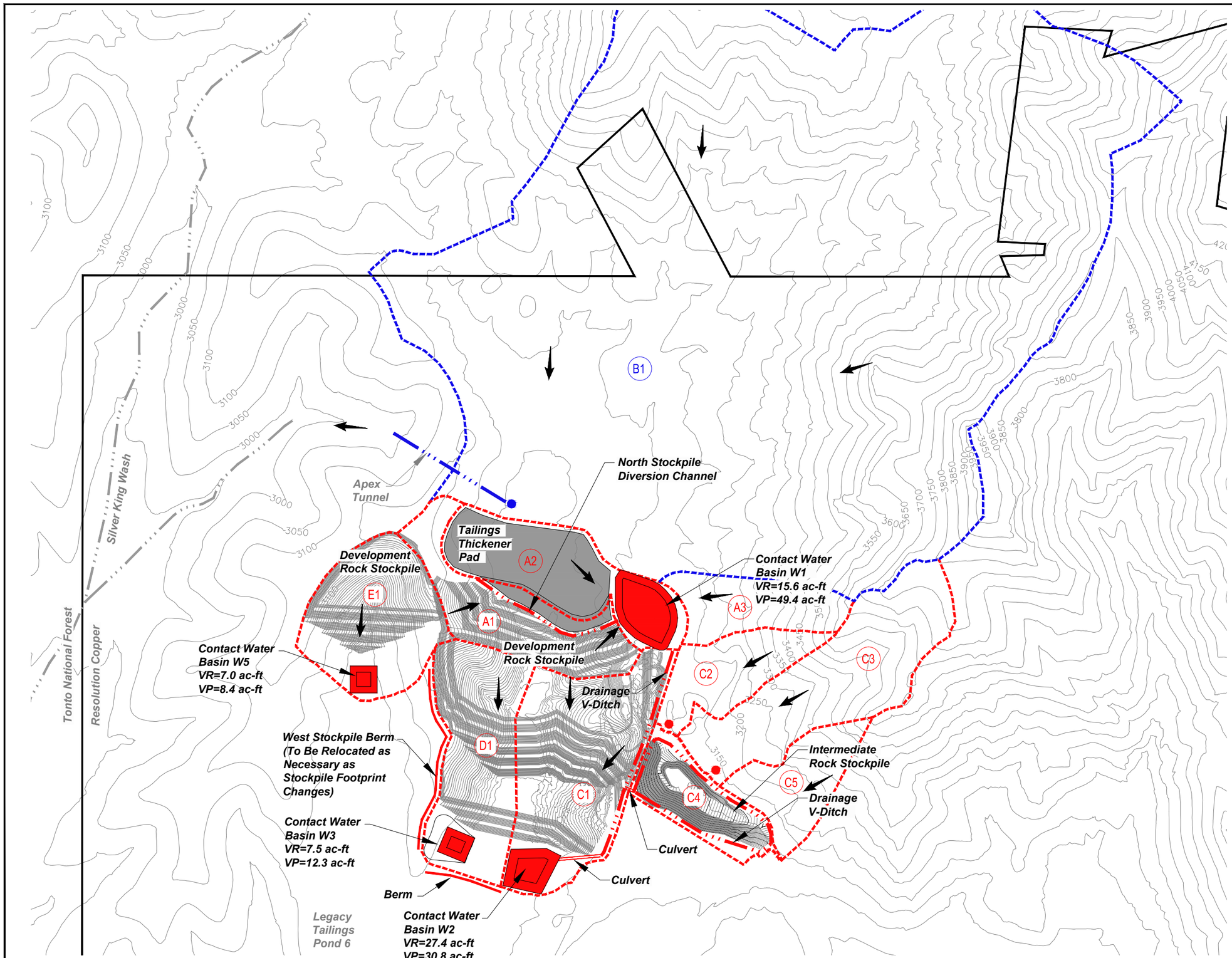

Legend

- Resolution Holdings
- Onsite Concentration Point
- Offsite Concentration Point
- A2 — Onsite Catchment
- A2 — Offsite Catchment
- Onsite Watershed Boundary
- Offsite Watershed Boundary
- Contact Water Buried Culvert
- Non-Contact Water Channel/Drainage
- Contact Water Channel/Drainage
- Contact Water Berm
- Existing Drainage
- VR = Volume Required
- VP= Volume Provided
- Direction of Surface Flow

N

0 300 600 Feet

0 100 200 Meters

Data Source: West Plant Facilities
Provided by M3 Engineering
July 10, 2013

Development Rock Stockpile
Provided by Resolution Copper 2013

Intermediate Rock Stockpile
Provided by Golder Associates 2012

Note: These preliminary SWPPP figures were created using the draft Stormwater Drainage Design Memorandum. Once a final alternative is selected, a map will be generated that complies with the industrial general permit at that time. The map is anticipated to identify, at a minimum, potential pollutant sources, Best Management Practices, and discharge outfalls as required by the current MSGP.

PRELIMINARY

RESOLUTION COPPER
General Plan of Operations
Stormwater Pollution Prevention Plan

WEST PLANT SITE
STOCKPILES
Figure 4

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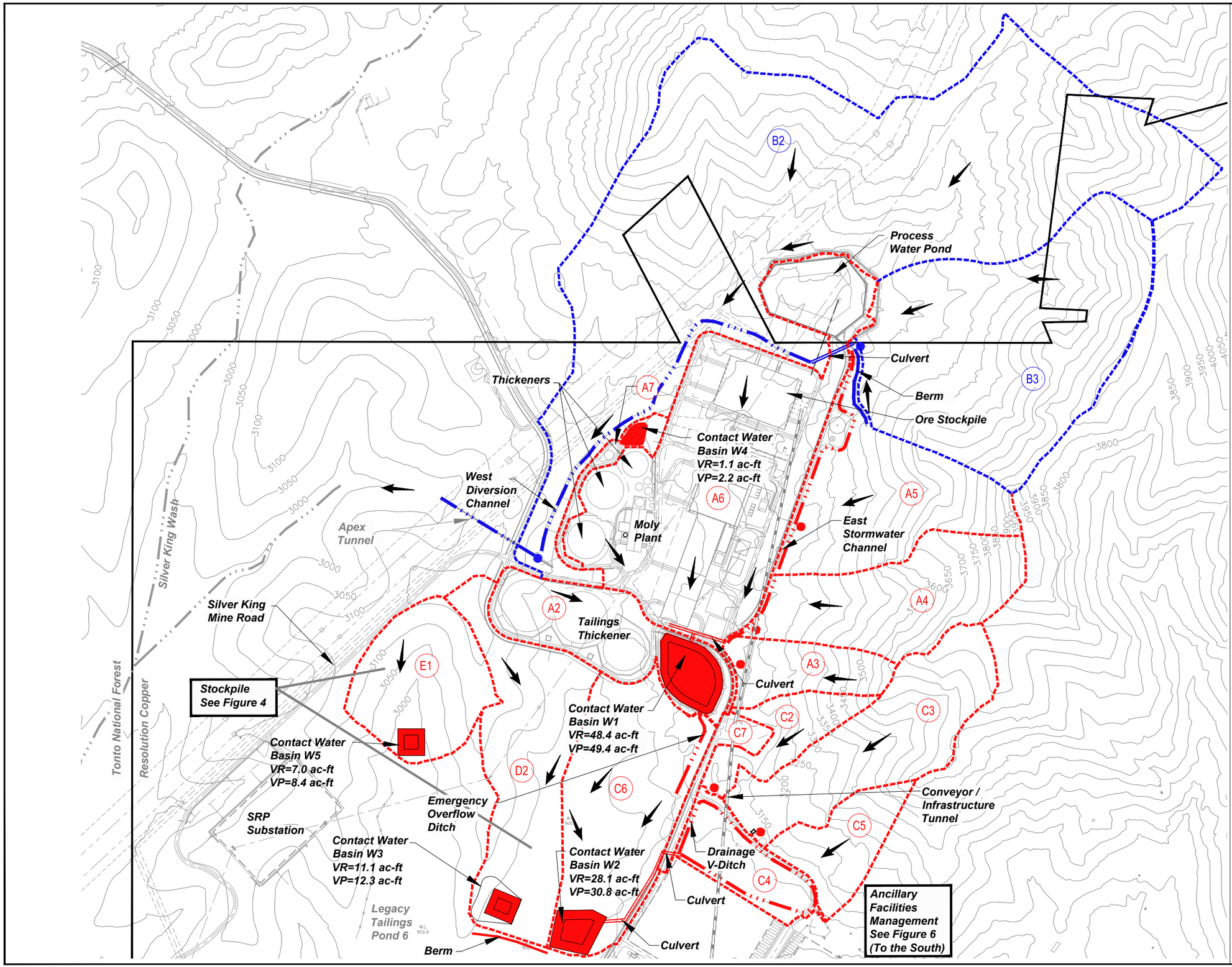

Legend

- Resolution Holdings
- Onsite Concentration Point
- Offsite Concentration Point
- A2 — Onsite Catchment
- A2 — Offsite Catchment
- Onsite Watershed Boundary
- Offsite Watershed Boundary
- Non-Contact Buried Culvert
- Contact Water Buried Culvert
- Non-Contact Water Channel/Drainage
- Contact Water Channel/Drainage
- Non-Contact Water Berm
- Contact Water Berm
- Existing Drainage
- VR = Volume Required
- VP= Volume Provided
- Direction of Surface Flow

N

0 300 600 Feet

0 100 200 Meters

Data Source:
West Plant Site Facilities
Provided by M3 Engineering
July 10, 2013

Note: These preliminary SWPPP figures were created using the draft Stormwater Drainage Design Memorandum. Once a final alternative is selected, a map will be generated that complies with the industrial general permit at that time. The map is anticipated to identify, at a minimum, potential pollutant sources, Best Management Practices, and discharge outfalls as required by the current MSGP.

PRELIMINARY

RESOLUTION COPPER
General Plan of Operations
Stormwater Pollution Prevention Plan

WEST PLANT SITE
CONCENTRATOR COMPLEX
Figure 5

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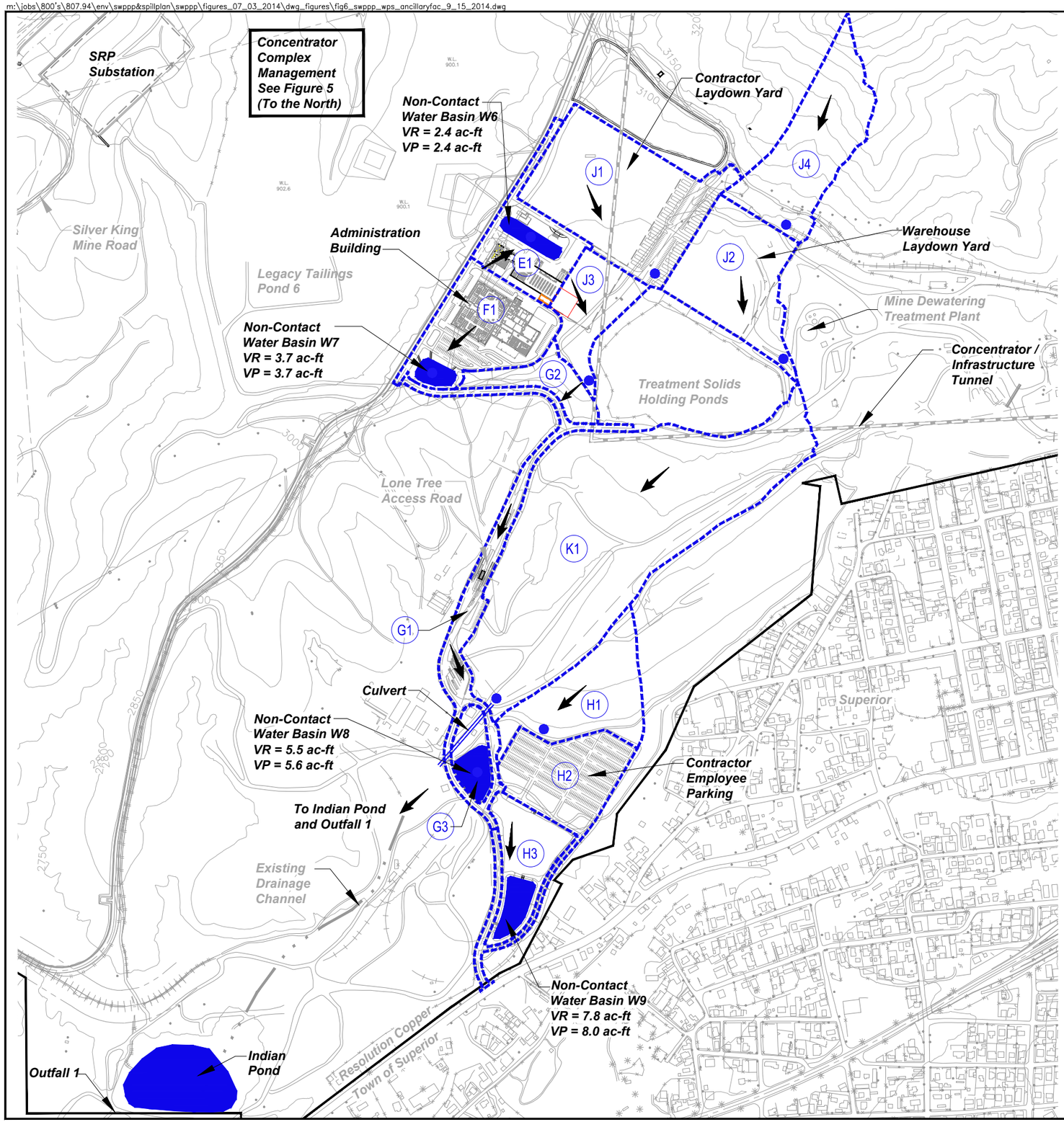

Legend

- Resolution Holdings
- Offsite Concentration Point
- A2 — Offsite Catchment
- Offsite Watershed Boundary
- Non-Contact Buried Culvert
- Existing Drainage
- VR = Volume Required
- VP= Volume Provided
- Direction of Surface Flow

N

0 300 600 Feet

0 100 200 Meters

Data Source:
West Plant Site Ancillary Facilities
Provided by M3 Engineering
July 10, 2013

Note: These preliminary SWPPP figures were created using the draft Stormwater Drainage Design Memorandum. Once a final alternative is selected, a map will be generated that complies with the industrial general permit at that time. The map is anticipated to identify, at a minimum, potential pollutant sources, Best Management Practices, and discharge outfalls as required by the current MSGP.

PRELIMINARY

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General Plan of Operations
Stormwater Pollution Prevention Plan

WEST PLANT SITE
ANCILLARY FACILITIES

Figure 6

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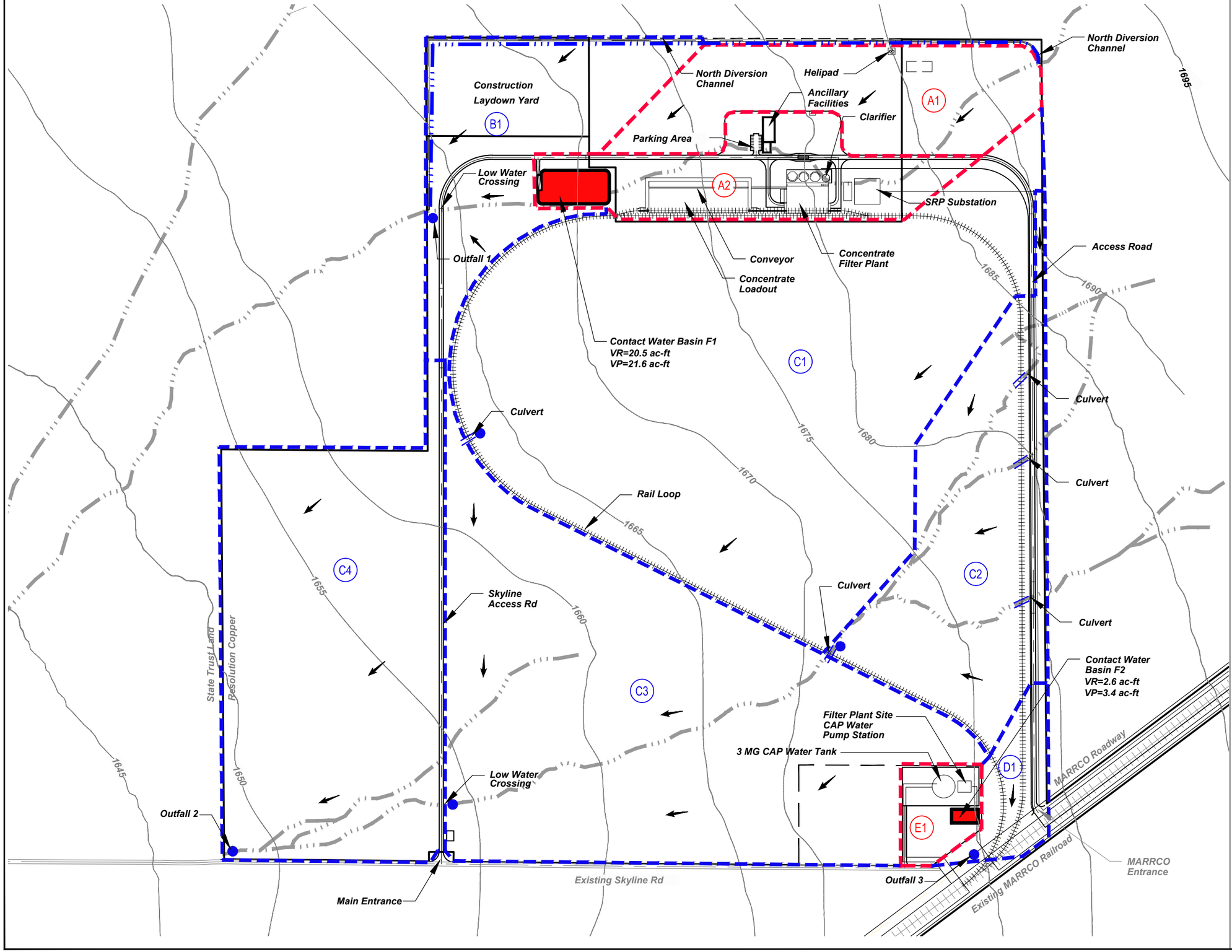


Legend

- Resolution Holdings
- Offsite Concentration Point
- A2 — Onsite Catchment
- A2 — Offsite Catchment
- Onsite Watershed Boundary
- Offsite Watershed Boundary
- Non-Contact Buried Culvert
- Non-Contact Water Channel/Drainage
- Existing Drainage
- VR = Volume Required
- VP= Volume Provided
- Direction of Surface Flow

N

0 300 600 Feet

0 100 200 Meters

Note:
Existing topography to be verified by current survey. All grades shown are subject to change.

Data Source:
Filter Plant and Loadout Facility
Provided by M3 Engineering
April, 2012

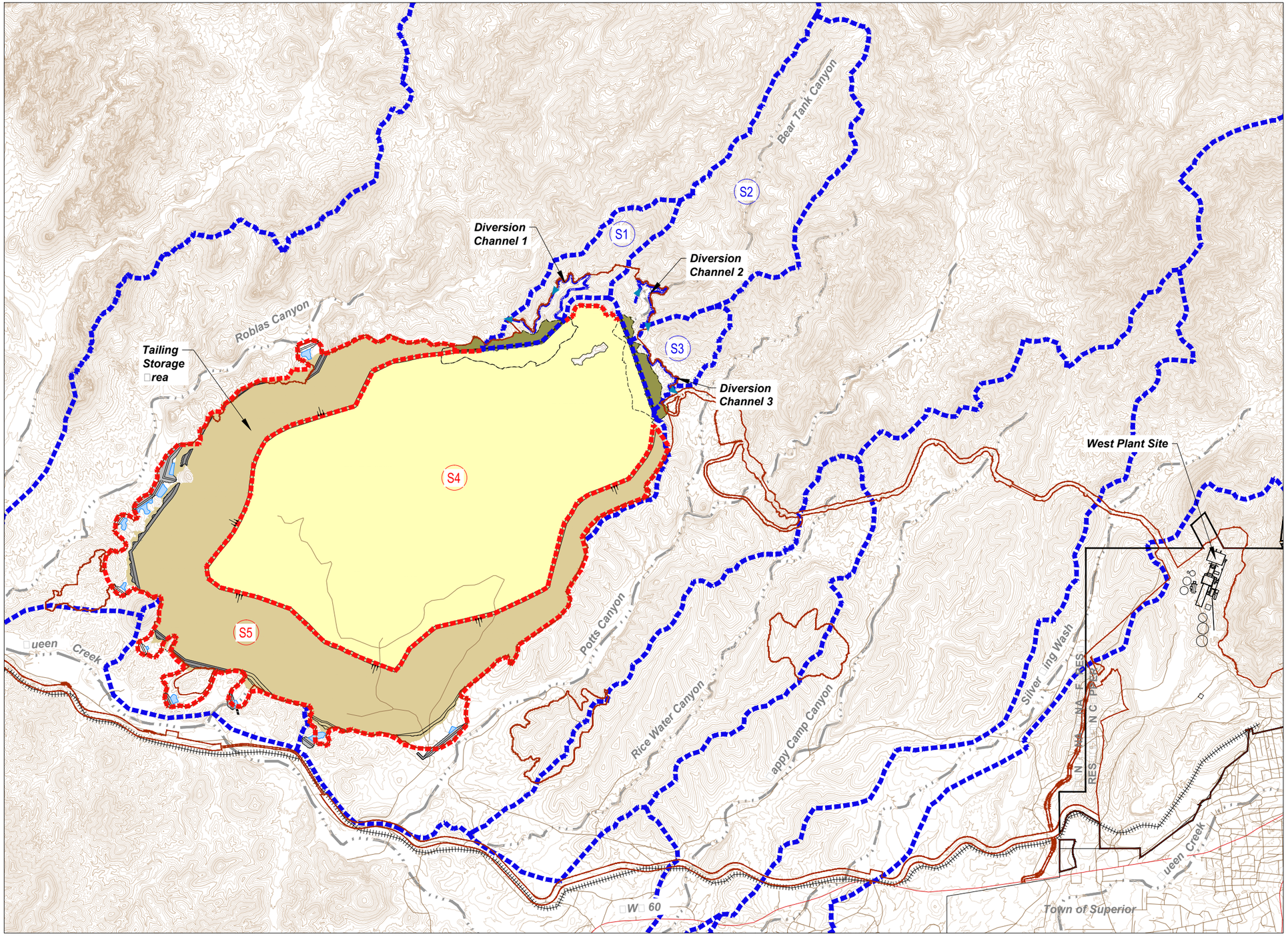
Note: These preliminary SWPPP figures were created using the draft Stormwater Drainage Design Memorandum. Once a final alternative is selected, a map will be generated that complies with the industrial general permit at that time. The map is anticipated to identify, at a minimum, potential pollutant sources, Best Management Practices, and discharge outfalls as required by the current MSGP.

PRELIMINARY

RESOLUTION COPPER
General Plan of Operations
Stormwater Pollution Prevention Plan

FILTER PLANT AND LOADOUT FACILITY

Figure 7



Legend

- Resolution Holdings
- Project Area
- A2 Onsite Catchment
- A2 Offsite Catchment
- Onsite Watershed Boundary
- Offsite Watershed Boundary
- Existing Drainage
- Upstream Embankment Raise Fill
- Starter Dam
- Thickened Scavenger Tailings
- North Dams
- Seepage Collection Dam Pond

Topography Based on 1 Meter (3.3 Foot) Interval Contours Received From Resolution January, 2013.

N

0 1,500 3,000 Feet

0 500 1,000 Meters

Note: These preliminary SWPPP figures were created using the draft Stormwater Drainage Design Memorandum. Once a final alternative is selected, a map will be generated that complies with the industrial general permit at that time. The map is anticipated to identify, at a minimum, potential pollutant sources, Best Management Practices, and discharge outfalls as required by the current MSGP.

Klohn Crippen Berger

201□

PRELIMINARY

RESOLUTION COPPER

General Plan of Operations

Stormwater Pollution Prevention Plan

TAILINGS STORAGE FACILITY

Figure 8

ATTACHMENTS

Attachment 1:
Exploration and Construction Phase Activities [8.G.4]

Note: ADEQ recommends that requirements associated with exploration and construction phases of mining be kept as a separate chapter or appendix in the facility's SWPPP to distinguish from other mining operations.

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phases at mining sites are covered under MSGP-2010 (or may be covered under an alternate AZPDES stormwater permit such as the AZPDES General Permit for Discharge from Construction Activities (AZG2008-001)) if they disturb **one acre or more**. Clearing, grading, and excavation activities being conducted as part of the exploration and construction phases at mining sites and disturbing less than one acre do not require permit coverage unless they are integrally related to other exploration or construction activities that collectively disturb one acre or more.

The exploration phase "entails exploration and land disturbance activities to delineate the dimensions and financial viability of a metal mining site." The construction phase includes (1) the *initial* building of site access roads and *initial* removal of overburden and waste rock to expose mineable materials at a mining site and (2) any subsequent construction activity on undisturbed areas of an existing mine property if stormwater discharges from such activity are not managed by pre-existing or permanent control measures.

Once the areas subject to clearing, grading, and excavation activities being conducted as part of the exploration and construction phases at a mining site are stabilized or the area(s) become part of the mining operation, the control measures, inspections, monitoring, and other requirements in MSGP-2010 Part 8.G.4 is no longer required; however, the facility remains subject to Parts 1 through 7, Parts 8.G.5 through 8.G.9, and all other applicable provisions of this permit.

There are no portions of the Resolution Project that are currently in the construction or exploration phase and that discharge stormwater to downstream receiving waters. As such, this provision of the MSGP-2010 does not currently apply at the Resolution Project.

Permit No. AZMSG2010-003

ADEQ Arizona Department of Environmental Quality

STATE OF ARIZONA
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY DIVISION
PHOENIX, ARIZONA 85007

ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY – MINERAL INDUSTRY TO WATERS OF THE UNITED STATES

This permit provides authorization to discharge under the Arizona Pollutant Discharge Elimination System (AZPDES) program, in compliance with the provisions of the Arizona Revised Statutes, Title 49, Chapter 2, Article 3.1, the Arizona Administrative Code (A.C.C.), Title 18, Chapter 9, Articles 9 and Chapter 11, Article 1, and the Clean Water Act as amended (33 U.S.C. 1251 et seq.).

This general permit specifically authorizes stormwater discharges associated with category iii, Mineral Industry sites, pursuant to 40CFR 122.26(b)(14) in Arizona. All discharges authorized by this general permit shall be consistent with the terms and conditions of this general permit.

This general permit becomes effective on February 1, 2011.

This general permit and the authorization to discharge expire at midnight, January 31, 2016.

Signed this 20th day of December, 2010.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Michael A Fulton, Director
Water Quality Division

AZPDES MULTI-SECTOR GENERAL PERMITS FOR STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY – MINERAL INDUSTRY

TABLE OF CONTENTS

Appendixes

1.0 Coverage under this Permit

1.1 Eligibility.

1.1.1 Facilities Covered

This general permit authorizes stormwater discharges associated with "industrial activities" as defined in Appendix A from facilities having primary industrial activities included in Table 1-1. This permit is not authorized for use by facilities with stormwater discharges associated with industrial activities on any Indian Country lands in Arizona. USEPA Region 9 is the permitting authority for Indian lands in Arizona.

Permit eligibility is limited to discharges from facilities of industrial activity in Sectors G and J (i.e., the "mining sectors"), summarized in Table 1-1. These sector descriptions are based on Standard Industrial Classification (SIC) Codes and Industrial Activity Codes. References to "sectors" in this permit (e.g., sector-specific monitoring requirements) refer to these groupings.

Table 1-1. Mining Sectors of Industrial Activity Covered by This Permit Derived from Category (iii) of 40 CFR 122.26(b)(14)

Subsector (May be subject to more than one sector/subsector)	SIC Code or Activity Code[1]	Activity Represented
SECTOR G: METAL MINING (ORE MINING AND DRESSING)		
G1	1021	Copper Ore and Mining Dressing Facilities
G2	1011	Iron Ores
	1021	Copper Ores
	1031	Lead and Zinc Ores
	1041, 1044	Gold and Silver Ores
	1061	Ferroalloy Ores, Except Vanadium
	1081	Metal Mining Services
	1094, 1099	Miscellaneous Metal Ores
SECTOR H: RESERVED (COAL MINES AND COAL MINING-RELATED FACILITIES)		
SECTOR I: RESERVED (OIL AND GAS EXTRACTION)		
SECTOR J: NON-METALLIC MINERAL MINING AND DRESSING		
J1	1442	Construction Sand and Gravel
	1446	Industrial Sand
J2	1411	Dimension Stone
	1422-1429	Crushed and Broken Stone, Including Rip Rap
	1481	Non-metallic Minerals Services, Except Fuels
	1499	Miscellaneous Non-metallic Minerals, Except Fuels
J3	1455, 1459	Clay, Ceramic, and Refractory Materials
	1474-1479	Chemical and Fertilizer Mineral Mining

[1] A complete list of SIC Codes (and conversions from the newer North American Industry Classification System" (NAICS) can be obtained from the Internet at **http://www.osha.gov/pls/imis/sicsearch.html** or in paper form from various locations in the document titled *Handbook of Standard Industrial Classifications*, Office of Management and Budget, 1987. Much of the information in the 1987 *Handbook* can be obtained from the Internet at **http://www.osha.gov/pls/imis/sic_manual.html**. Conversions from the NAICS can be obtained from the Internet at **www.census.gov/epcd/www/naics.html**

1.1.2 Allowable Stormwater Discharges.

Unless otherwise ineligible under Part 1.1.4, the following are eligible for discharge under this permit:

1. Stormwater discharges associated with industrial activity for any primary industrial activities and co-located industrial activities authorized under this permit, as defined in Appendix A;
2. Discharges designated by ADEQ as needing a stormwater permit as provided in Sector AD;
3. Discharges that are not otherwise required to obtain AZPDES permit authorization but are commingled with discharges that are authorized under this permit; and
4. Discharges subject to any of the effluent limitations guidelines listed in Table 1-2.

Table 1-2. Stormwater Specific Effluent Limitations Guidelines

Regulated Discharge	40 CFR Section	MSGP Sector
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	Part 436, Subparts B, C, and D	J

1.1.3 Allowable Non-Stormwater Discharges.

Discharges from emergency fire-fighting activities are an allowable non-stormwater discharge activity without regard to the receiving water. The following non-stormwater discharges are allowed under this permit provided they are ancillary to the permitted use:

1. Fire fighting system testing and maintenance, including hydrant flushings;
2. Discharges related to installation and maintenance of potable water supply systems, including disinfection and flushing activities, discharges resulting from pressure releases or overflows, and discharges from wells approved by ADEQ for drinking water use;
3. Uncontaminated condensate from air conditioners, evaporative coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
4. Irrigation drainage and irrigation line flushing;
5. Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;
6. Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed);
7. Routine external building washdown that does not use detergents;
8. Water used to control dust, provided effluent or other wastewaters are not used;
9. Uncontaminated groundwater or spring water;
10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
11. Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains);

12. Hydrostatic testing of new pipes, tanks or vessels using potable water, surface water, or uncontaminated groundwater;
13. Discharges of water associated with drilling, rehabilitation and maintenance of potable or non-potable water wells and piezometers, or water supply or water quality evaluations including:
    a. Discharges from any borehole not fully developed;
    b. Well purging;
    c. Well/aquifer pump tests not associated with groundwater remediation activities;
    d. Backflushing of injection wells provided the discharge meets applicable water quality standards; and
14. Non-stormwater discharges subject to an effluent limitation guideline listed in Table 1-2.

1.1.4 Limitations on Coverage.

1.1.4.1 Discharges Mixed with Non-Stormwater. Stormwater discharges that are mixed with non-stormwater, other than allowable non-stormwater discharges listed in Part 1.1.3 are not eligible for coverage under this permit.

1.1.4.2 Stormwater Discharges Associated with Construction Activity. Stormwater discharges associated with construction activity are eligible for coverage under this permit, as specified in Sectors G and J of Part 8 of this permit.

1.1.4.3 Discharges Currently or Previously Covered by another Permit. Unless the permittee receives written notification from ADEQ specifically allowing these discharges to be covered under this permit, the following are not eligible for coverage under this general permit:

1. Stormwater or non-stormwater discharges associated with industrial activity that is currently covered under an individual AZPDES permit or an alternative AZPDES general permit and has established numeric water quality-based limitations developed for the stormwater component of the discharge; or
2. Discharges for which any AZPDES permit has been or is in the process of being denied, terminated, or revoked by ADEQ (this does not apply to the routine reissuance of permits every five years).

1.1.4.4 Stormwater Discharges Subject to Effluent Limitations Guidelines. For stormwater discharges subject to effluent limitation guidelines under 40 CFR, Subchapter N, only those discharges identified in Table 1-2 are eligible for coverage under this permit.

1.1.4.5 New Dischargers to Water Quality Impaired Waters. A new discharger to an impaired water, as defined in Appendix A, is not automatically eligible for coverage under this permit.

1. To receive authorization under this permit, the applicant shall make one of the following demonstrations and retain such data and other technical information onsite with the stormwater pollution prevention plan (SWPPP):
    a. That the facility will employ measures to prevent all exposure to stormwater of the pollutant(s) for which the waterbody is impaired; or
    b. That the discharge from the site has no potential to contain the pollutants causing impairment; or
    c. That the discharge is not expected to cause or contribute to an exceedance of an applicable water quality standard. The applicant shall demonstrate either:
        i. The discharges are subject to stormwater control measures such that the discharges meet the applicable water quality standard, for the parameter causing the impairment, at the point of discharge into the waterbody; or

ii. The discharges are consistent with the provisions of the TMDL, including established TMDL allocations and implementation plans.

Note: Pursuant to A.A.C. R18-11-109(D)(2), if a receiving water is impaired for suspended solids, turbidity or sediment/ sedimentation, a operator seeking authorization to discharge under this permit may satisfy the requirement of Part 1.1.4.5(1)(c)(i) either by discharging only within the first 48 hours after a local storm event, or by demonstrating that any discharge after that time satisfies the requirements of Part 1.1.4.5(1)(c)(i).

2. The applicant shall submit:
   a. The NOI in accordance with Part 1.3.1;
   b. A copy of the SWPPP. The SWPPP shall describe how the permittee will monitor for pollutants of concern in the discharge in accordance with Part 6.2.3; and
   c. The necessary information or documentation related to the demonstration selected above.
3. If the proposed discharge is to an upstream tributary within 2.5 miles of a water or portion thereof classified as impaired, the applicant shall submit a copy of the SWPPP.
4. Within 32 business days of receipt of information required in Part 1.1.4.5 (2) or (3), ADEQ will notify the applicant in writing that:
   a. It is acceptable to proceed under the general permit;
   b. The SWPPP is incomplete or otherwise deficient and must be revised. The applicant shall submit to ADEQ for review the revised SWPPP that addresses the deficiencies as identified in the notification; or
   c. It is not eligible for coverage under this permit and must apply for an individual permit under Part 1.6.
5. A new discharger to an upstream tributary within 2.5 miles of an impaired water is not required to meet the eligibility requirements set forth above, but must submit a copy of the SWPPP with the NOI and is subject to the additional evaluation requirements set forth in Part 1.3.1(2)(c).

1.1.4.6 Discharges to Outstanding Arizona Waters.

1. No new or expanded discharges directly to a water or portion thereof classified as an outstanding Arizona water (OAW) (see A.A.C. R18-11-112) are authorized under this permit.
2. New or expanded discharges to tributaries upstream of a water or portion thereof classified as an OAW are not automatically eligible for coverage under this permit. To receive authorization for a new or expanded discharge to a tributary upstream of a water or portion thereof classified as an OAW, the applicant shall:
   a. Submit the NOI in accordance with Part 1.3.1;
   b. Prepare a SWPPP that demonstrates the discharge will not degrade existing water quality in the downstream OAW and retain documentation supporting this demonstration onsite with the SWPPP. Information relevant to this demonstration may include, but is not limited to, some or all of the following: (1) the distance between the discharge and the water or portion thereof that is OAW; (2) the estimated size (volume) and duration of the discharge; (3) the expected frequency of the discharge; (4) the expected characteristics of the discharge; and (5) the known or expected water quality of the water or portion thereof that is the OAW during storm events; and
   c. If the proposed discharge is to an upstream tributary within 2.5 miles of a water or portion thereof classified as an OAW, submit a copy of the SWPPP that includes a sampling and analysis plan to collect data appropriate to verify the demonstration in subsection b, above.

3. Within 32 business days of receipt of information required in Part 1.1.4.6 (2), ADEQ will notify the applicant in writing that:
   a. It is acceptable to proceed under the general permit;
   b. The SWPPP is incomplete or otherwise deficient and must be revised. The applicant shall submit to ADEQ for review the revised SWPPP, including any additional parameter identified in accordance with Part 6.2.4, that addresses the deficiencies as identified in the notification; or
   c. It is not eligible for coverage under this permit and must apply for an individual permit under Part 1.6.

1.2 Permit Compliance.

Any noncompliance with any of the requirements of this permit constitutes a violation of the Clean Water Act and A.R.S. Title 49, Chapter 2, Article 3.1.

1.3 Authorization under this Permit.

1.3.1 Obtaining Authorization to Discharge.

1. Before obtaining authorization under this permit, the applicant shall:
   a. Ensure the facility is located in Arizona on land that is outside of Indian Country;
   b. Ensure that the facility meets the Part 1.1 eligibility requirements;
   c. Select, design, install, and implement control measures in accordance with Part 2.1;
   d. Develop a SWPPP according to the requirements in Part 5 of this permit. An applicant seeking authorization for a new discharge to or within 2.5 miles of an impaired water (see Part 1.1.4.5) or for a new or expanded discharge within 2.5 miles of an Outstanding Arizona Water (see Part 1.1.4.6) is required to submit a copy of the SWPPP, to the Department for review, along with the NOI in subsection (e);
   e. Submit to the Department a complete and accurate Notice of Intent (NOI) Form (either an original, or a photocopy/reproduction) in accordance with A.A.C. R18-9-C901(D) to the address listed in Part 7.6. Other NOI options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet or by public notice.

      If the facility has the potential to discharge to a regulated municipal separate storm sewer system (MS4), the applicant must provide:
      - The name of the MS4 operator in Section E of the NOI; and
      - Name of closest surface water receiving the discharge.

      The NOI form is available at http://www.azdeq.gov/environ/water/permits/stormwater.html

2. Authorization to Discharge

   a. Routine Authorizations

      Unless otherwise notified, the applicant is authorized to discharge stormwater from an eligible facility upon either: receipt of the Authorization to Discharge; or 7 calendar days after a complete and accurate NOI is received by the Department, whichever is earlier. However, in order to rely on this 7 calendar day provision, the operator must submit the NOI in a manner that documents the date of ADEQ's receipt (i.e., certified mail, hand delivery, fax, etc.).

   b. Authorizations to Discharge for New Dischargers to Impaired Waters and New or Expanded Discharges to Tributaries of OAWs

      Unless otherwise notified, an applicant subject to Part 1.1.4.5 or 1.1.4.6 is authorized to discharge stormwater from an eligible facility upon receipt of the Authorization to

Discharge or 32 business days after a complete and accurate NOI is received by the Department, whichever is earlier.

c. NOIs Requiring Additional Evaluation.

ADEQ may inform an applicant that authorization to discharge will not occur for up to 32 business days in the event that screening of the NOI provides information requiring further evaluation. ADEQ's notification may be made either in writing, electronically, by fax or phone. The notification typically will be made within 7 calendar days after receipt of the NOI. Applicants who receive notice of a delay in coverage may discharge 32 business days after the date the NOI is received unless further notice is received from ADEQ during this timeframe. Such notice may confirm authorization to discharge, or request additional information to comply with the requirements of this permit.

d. Requirement to Obtain Alternate Coverage.

ADEQ may require the operator to submit an application for an individual AZPDES permit, as detailed in Part 1.6.1. In these instances, ADEQ will notify the operator in writing of: 1) the delay; or 2) the request for submission of an individual AZPDES permit application.

e. Discharges to a regulated MS4.

Permittees with discharges to a regulated MS4 shall submit to the MS4 operator a copy of the Department's Authorization to Discharge.

3. Incomplete NOI Submitted. If ADEQ notifies the applicant that an NOI is incomplete or incorrect, the applicant must resubmit an amended NOI if the applicant still intends to obtain (or retain) coverage under this permit.

4. The time frames for discharge authorization are presented in Table 1-3, below.

Table 1-3. NOI Submittal Deadlines

Category	NOI Submission Deadline	Discharge Authorization Status
Existing Dischargers – authorized for coverage under MSGP 2000.	The operator shall revise SWPPP documents to conform with this permit and apply for coverage no later than *May 31, 2011.*	Coverage under the MSGP 2000 is administratively continued until ADEQ: • Grants the applicant coverage under this permit (in accordance with Part 1.3.1(2)); or • Issues or denies an alternative permit in accordance with Part 1.6.1.
Other Eligible Dischargers – in operation prior to the effective date of this permit, but did not obtain coverage under the MSGP 2000 or another AZPDES permit.	The operator shall develop SWPPP documents to conform with this permit and apply for coverage no later than *May 31, 2011.*	Coverage will begin upon ADEQ issuance of an Authorization to Discharge (in accordance with Part 1.3.1(2)).
New Dischargers – will commence discharging after the effective date of this permit	As soon as possible, and at least 32 business days before discharge is anticipated.	Coverage begins upon ADEQ's issuance of an Authorization to Discharge (in accordance with Part 1.3.1(2)).

Table 1-3. NOI Submittal Deadlines		
Category	**NOI Submission Deadline**	**Discharge Authorization Status**
Change of ownership and/ or operation to a new owner/operator of an existing facility (discharger) whose discharge is authorized under this permit.	Permitted owner/ operator shall submit a NOT to ADEQ within 30 calendar days after the new owner/ operator assumes responsibility for the facility. New owner/ operator shall submit a NOI to ADEQ 7 calendar days before taking over operational control or initiating activities at the facility.	New owner/ operator obtains coverage.

1.3.2 Continuation of this Permit.

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with A.A.C. R18-9-C903(A) and remain in force and effect. If the operator is authorized to discharge under this permit prior to the expiration date, any discharges authorized under this permit will automatically remain covered by this permit until the earliest of:

1. The operator submits a timely, complete, and accurate NOI requesting authorization to discharge under a renewal or revision of this permit and ADEQ issues an Authorization to Discharge; or
2. The operator submits a Notice of Termination; or
3. ADEQ denies coverage under this general permit or denies or issues coverage under an individual permit or other alternative permit for the facility's discharges; or
4. A formal permit decision is made by ADEQ not to reissue this general permit, at which time ADEQ will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease at the end of this time period.

1.4 Terminating Coverage.

To terminate permit coverage, the permittee shall submit a complete and accurate Notice of Termination (NOT) form to the address listed in Part 7.6. Other NOT options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet of by public notice. The facility's authorization to discharge under this permit terminates at midnight of the day that a complete NOT form is received by the department. The permittee shall submit an NOT within 30 calendar days after a new owner or operator assumes ownership of or has taken over responsibility for the facility.

The permittee shall also submit an NOT when there are not or no longer will be discharges of stormwater associated with industrial activity from the facility.

The permittee is responsible for meeting the terms and conditions of this permit until the facility's authorization is terminated.

1.5 Inactive and Unstaffed Sites – Conditional Exemption from No Exposure Requirements.

Permit holders of inactive and unstaffed mining facilities may qualify for reduced inspections and monitoring provisions of the no exposure provisions of Parts 4.4 and 6.2.1.3, without certifying "there are no industrial materials or activities exposed to stormwater". This exemption is predicated on the following:

- To the extent practicable, the permittee shall implement the following control measures:
  - Industrial materials used in the operations will be removed, covered or kept in appropriate containers or within containment if applicable so as to minimize discharges of stormwater associated with industrial activity as outlined in the facility's SWPPP; and
  - Stockpiles, waste rock, tailings and other spoil or waste piles shall be protected from erosion and/ or downstream catchments shall be installed and maintained.
- If circumstances change and the facility becomes active and/or staffed, this exemption no longer applies and the permittee shall immediately begin complying with the inspection requirements as if the facility were in the first year of permit coverage, including the requirements for the routine quarterly inspections (Part 4.1), wet season visual assessments (Part 4.2), the annual comprehensive facility inspections (Part 4.3) and applicable general analytical monitoring requirements (Part 6.2.1).
- ADEQ retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potential to cause, or contribute to an exceedance of an applicable water quality standard, including designated uses.

To invoke the exemption for an inactive, unstaffed site, the permittee shall do the following:

- Maintain a statement in the SWPPP as required in Part 5.1.5.3 indicating that the site is inactive and unstaffed, in accordance with the substantive requirements of this section. The statement must be signed and certified in accordance with Appendix B, Subsection 9.
- If, during the period of coverage under this permit, the facility becomes qualified for the inactive and unstaffed exemption, the permittee shall include the same signed and certified statement as above and retain it with the facility's records pursuant to Part 5.4.

Subject to the requirements above, if the facility is inactive and unstaffed, the permittee is waived from the requirement to conduct routine facility inspections, wet season visual assessments and general analytical monitoring. The permittee shall conduct one comprehensive facility inspection (CFI) each calendar year in accordance with Part 4.3. The permittee shall also inspect the site whenever there is a reasonable expectation that severe weather or other events may have damaged control measures or increased discharges.

1.6 Alternative Permits.

1.6.1 ADEQ Requiring Coverage under an Alternative AZPDES Permit.

ADEQ may require an operator to obtain authorization to discharge under either an individual AZPDES permit or an alternative AZPDES general permit in accordance with A.A.C. R18-9-C902(A). If ADEQ requires an operator to apply for an individual permit, any applications shall be submitted within 120 calendar days, unless ADEQ provides an extended deadline. In addition, a discharger already authorized under this permit, will be notified of a deadline to file a permit application. Coverage under this permit will terminate immediately if the facility fails to submit an individual AZPDES permit application by the specified deadline. ADEQ may take appropriate enforcement action for any unpermitted discharge.

1.6.2 Permittee Requesting Coverage under an Alternative Permit.

An applicant may elect to forego coverage under this general permit by applying for an individual permit. In such a case, the applicant must submit an individual permit application in accordance with the requirements of A.A.C. R18-9-B901(B)(2) to the Department at the address listed in Part 7.6 and include reasons supporting the request. The request may be granted by issuance of an individual permit or authorization of coverage under an alternative general permit if the Department finds that the reasons are adequate to support the request.

When an individual AZPDES permit is issued to the applicant or the applicant is authorized to discharge under an alternative AZPDES general permit, the authorization to discharge under this permit is terminated on the effective date of the individual permit or the date of authorization of coverage under

the alternative general permit.

2.0 Control Measures, Numeric Effluent Limitations and Water Quality Standards.

In Part 2.1 (Control Measures) and in Part 8 (Sector-Specific Requirements for Industrial Activity), the term "minimize" means reduce and/or eliminate to the extent achievable using control measures that are technologically available, economically practicable and achievable in consideration of best industry practice to meet any applicable numeric effluent limitations in Part 2.2.1 and the water-quality based requirements in Parts 2.2.2 and 2.2.3.

The requirement to implement control measures in accordance with Part 2.1 applies to all facilities. Part 8 contains additional control measures imposed on a sector-specific basis. In some cases, sector-specific provisions in Part 8 modify the terms of the general control measures set forth in Part 2.1.

2.1 Control Measures.

The permittee shall select, design, install, and implement control measures (including best management practices), as appropriate, to ensure the discharge meets the requirements of Part 2.2. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. If construction or a change in design, operation, or maintenance at the facility significantly changes the nature of pollutants discharged in stormwater, or significantly increases the quantity of pollutants discharged, the permittee shall review the selection, design, installation, and implementation of the facility's control measures to determine if modifications are necessary to meet the requirements of this permit. If the facility's control measures are not achieving their intended effect of minimizing pollutant discharges, the permittee shall modify these and/or add additional control measures to meet requirements of this permit. Regulated stormwater discharges from the facility include stormwater run-on that commingles with stormwater discharges associated with industrial activity at the facility.

The permittee shall consider all of the control measures listed below for implementation at the facility and select those that the permittee determines are appropriate, given the nature of the site, to meet the requirements set forth in Parts 2.1.1 and 2.2. The control measures listed below are not intended to be an exclusive list of acceptable control measures. In preparing the SWPPP in accordance with the requirements in Part 5 of this permit, the permittee shall explain the basis for the selection of the control measures to be utilized at the facility.

2.1.1 Control Measure Selection and Design Considerations.

The permittee shall assess the type and quantity of pollutants likely to discharge in stormwater or allowable non-stormwater from the site when designing and implementing control measures. The permittee shall select and design control measures incorporating one or more of the following principles:

- Preventing stormwater from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from stormwater;
- Using control measures in combination is more effective than using control measures in isolation for minimizing pollutants in the facility's stormwater discharge;
- Attenuating high discharge flows with such control measures as using open vegetated swales and natural depressions to reduce in-stream impacts of erosive flows;
- Conserving and/or restoring of riparian buffers help protect streams from stormwater runoff and improve water quality; and
- Using containment to intercept stormwater flows before they leave the site, such as directing flows to non-discharging areas (pits), or installing runoff containment.

2.1.1.1 Minimize Exposure. The permittee shall minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff by implementing measures such as the following:

- Locating industrial materials and activities inside or protect them with storm resistant coverings (although significant enlargement of impervious surface area is not recommended)
- Covering fueling area(s) or minimize stormwater run-on/runoff to fueling area(s);
- Using grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas;
- Locating materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas);
- Using spill/overflow protection and cleanup equipment;
- Draining fluids from equipment and vehicles prior to on-site storage or disposal;
- Performing all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray; and
- Ensuring that all washwater drains to a proper collection system (i.e., not the stormwater drainage system).

The discharge of vehicle and equipment washwater, including tank cleaning operations, is not authorized by this permit. These wastewaters must be covered under a separate AZPDES permit, discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements, or disposed of otherwise in accordance with applicable law.

2.1.1.2 Good Housekeeping. The permittee shall implement good housekeeping measures for all exposed areas that are potential sources of pollutants. Such measures may include:

- Sweeping at regular intervals;
- Keeping materials orderly and labeled;
- Storing materials in appropriate containers;
- Cleaning up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;
- Using drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible.

2.1.1.3 Maintenance. The permittee shall regularly inspect, test, maintain, and repair all industrial equipment and systems that have the potential for exposure to stormwater to avoid situations that may result in leaks, spills, and other releases of pollutants to stormwater discharged from the site. The permittee shall maintain all control measures and equipment in effective operating condition. Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If the permittee discovers control measures are not achieving the intended effect of minimizing pollutant discharges (i.e., control measures need repair or replacement), the permittee shall make any necessary changes within 14 calendar days following discovery, or before the next measurable storm event (see Part 6.1.2.2), whichever is sooner, to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based limitations in Parts 2.2.2 and 2.2.3 of this permit. If necessary changes cannot be implemented within the specified timeframe(s), the permittee shall document with the SWPPP the reasons for the delay, a schedule for completing the necessary changes, date completed and any back-up control measures in place to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based limitations in Parts 2.2.2 and 2.2.3 of this permit should a runoff event occur while a control measure is off-line (either in part or in whole).

2.1.1.4 Spill Prevention and Response Procedures. The permittee shall minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for timely and effective clean-up of spills if or when they occur by implementing measures such as:

- Procedures for plainly labeling containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides," etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
- Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;
- Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause or detect a spill or leak should be knowledgeable in the proper reporting procedures established by their facility. Employees who are responsible for spill response and/or cleanup, must be properly trained and have necessary spill response equipment available; and
- Procedures for notification of appropriate facility personnel and emergency response. Where a leak, spill, or other release occurs that contains a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, the permittee shall notify ADEQ Emergency Response Duty Office at (602) 771-2330 or, toll free, at (800) 234-5677. Contact information must be in locations that are readily accessible and available.

2.1.1.5 Erosion and Sediment Controls. The permittee shall minimize on-site erosion and sedimentation, and the resulting discharge of pollutants by using methods such as:

- Stabilizing exposed areas;
- Containing runoff using structural and/or non-structural control measures;
- Placing flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants.

[*Note*: In selecting, designing, installing, and implementing appropriate control measures, permittees are encouraged to consult EPA's internet-based resources relating to BMPs for erosion and sedimentation, including the sector-specific Industrial Stormwater Fact Sheet Series, (www.epa.gov/npdes/stormwater/msgp), National Menu of Stormwater BMPs (www.epa.gov/npdes/stormwater/menuofbmps), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (www.epa.gov/owow/nps/urbanmm/index.html).]

2.1.1.6 Management of Runoff. The permittee shall reduce stormwater runoff to minimize the discharge of pollutants from the facility by implementing control measures such as:

- Diverting, infiltrating, reusing, containing runoff, or
- Treating and/or recycling stormwater runoff collected.

[*Note*: In selecting, designing, installing, and implementing appropriate control measures, permittees are encouraged to consult EPA's internet-based resources relating to runoff management, including the sector-specific Industrial Stormwater Fact Sheet Series, (www.epa.gov/npdes/stormwater/msgp), National Menu of Stormwater BMPs (www.epa.gov/npdes/stormwater/menuofbmps), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (www.epa.gov/owow/nps/urbanmm/index.html).]

2.1.1.7 Salt Storage Piles or Piles Containing Salt. The permittee shall enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. The permittee shall implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if stormwater runoff from the piles is not discharged or if discharges from the piles are authorized under another AZPDES permit.

2.1.1.8 Sector Specific Control Measures. The permittee shall implement any additional control measures in the relevant sector-specific section(s) of Part 8, as appropriate.

2.1.1.9 Employee Training. The permittee shall train all employees who work in areas where

industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of the facility's stormwater pollution prevention team (see Part 5.1.1). Training must cover both the specific control measures used to achieve the requirements in Part 2.2 and (for those who will be involved in these activities) the monitoring, inspection, planning, reporting, and documentation requirements in other parts of this permit. Training shall be conducted at least annually (or more often if circumstances warrant, such as high employee turnover).

2.1.1.10 Non-Stormwater Discharges. The permittee shall not allow any non-stormwater discharges from the facility unless they are specifically authorized in Part 1.1.3.

2.1.1.11 Litter, Garbage and Floatable Debris. The permittee shall ensure that litter, garbage, and floatable debris are not discharged to surface waters by keeping exposed areas free of such materials or by intercepting them before they leave the site.

2.1.1.12 Dust Generation and Vehicle Tracking of Industrial Materials. The permittee shall minimize generation of dust and off-site tracking of raw, final, or waste materials.

2.2 Numeric Effluent Limitations and Water Quality Standards.

2.2.1 Numeric Effluent Limitations Based on Effluent Limitations Guidelines.

Table 2-1 below identifies specific regulated activities with effluent limitations guidelines and the locations of effluent limitations guidelines in this permit. Discharges from such activities must meet the specified effluent limitations guidelines. Compliance with these effluent limits is to be determined based on discharges from these regulated activities independent of commingling with any other discharges allowed under this permit.

Table 2-1. Applicable Effluent Limitations Guidelines

Regulated Activity	40 CFR Part/Subpart	Effluent Limit
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	Part 436, Subparts B, C, or D	See Part 8.J.9

2.2.2 Water Quality Standards.

The permittee shall control discharge from the facility as necessary to not cause or contribute to an exceedance of an applicable water quality standard. ADEQ expects that compliance with other conditions in this permit will control discharges as necessary to not cause or contribute to an exceedance of an applicable water quality standard (A.A.C.R18-11, Article 1). However, if at any time the permittee becomes aware, or ADEQ determines, that the facility's discharge causes or contributes to an exceedance of an applicable water quality standard, the permittee shall take corrective action as required in Part 3.1, document the corrective actions as required in Parts 3.3 and 5.4, and report the corrective actions to ADEQ as required in Part 7.2.

Additionally, ADEQ may impose additional water quality-based requirements on a site-specific basis, or require the operator to obtain coverage under an individual permit in accordance with Part 1.6.1, if information in the Notice of Intent (NOI), required reports, or from other sources indicates the discharges are not controlled as necessary to not cause or contribute to an exceedance of an applicable water quality standard.

2.2.3 Discharges to Water Quality Impaired Waters.

2.2.3.1 Existing Discharges to an Impaired Water with an Approved TMDL. If the discharge is to an impaired water with or is otherwise referenced in an approved TMDL, the Department may require, as a condition of authorization, additional limits, controls, or monitoring necessary to be consistent with the assumptions of any available wasteload allocation in the TMDL. Alternatively, ADEQ will advise the permittee if coverage under an individual permit is necessary in accordance with Part 1.6.

2.2.3.2 Existing Discharges to an Impaired Water without an Approved TMDL. If the discharge is to an impaired water without an approved TMDL, the permittee shall comply with Part 2.2.2 and the monitoring requirements of Part 6.2.3. This subsection applies to discharges directly to impaired waters as well as to situations where ADEQ determines that the facility's discharge is not controlled as necessary to meet water quality standards in a downstream water segment, even if the discharge is to a receiving water that is not specifically identified on a Section 303(d) list.

2.2.3.3 New Discharges to an Impaired Water. If the permittee's authorization to discharge under this permit relied on Part 1.1.4.5 for a discharge to an impaired water, the permittee shall implement and maintain any control measures or conditions on the facility that enabled it to become eligible under Part 1.1.4.5. The permittee shall modify such measures or conditions as necessary in accordance with any Part 3 corrective actions. In addition, the permittee shall comply with Part 2.2.2 and the monitoring requirements of Part 6.2.3.

3.0 Corrective Actions.

3.1 Corrective Action Triggers.

3.1.1 Conditions Requiring Review and Revision of Control Measures to Eliminate a Problem.

If any of the following conditions occur resulting in or from a failure of a control measure, the permittee shall review the selection, design, installation, and implementation of the facility's control measures and revise as necessary to ensure that the condition is eliminated:

- An unauthorized discharge (e.g., discharge of non-stormwater not authorized by this or another AZPDES permit) to a water of the U.S. or to a regulated MS4 occurs at the facility (Part 2.1);
- A discharge violates a numeric effluent limitation guideline (Table 2-1);
- The permittee becomes aware, or ADEQ determines, that the facility's discharge causes or contributes to an exceedance of applicable water quality standard(s) (Part 2.2.2) or an adopted waste load allocation (WLA) (Part 2.2.3); or
- ADEQ, or an operator of a regulated MS4, determines that modifications to the control measures are necessary to meet the requirements of Part 2.2.

3.1.2 Substantially Identical Outfalls.

If the event triggering corrective action is linked to an outfall that represents other substantially identical outfalls, the facility's review must assess the need for corrective action for each outfall represented by the outfall that triggered the review.

3.2 Corrective Action Deadlines.

The permittee shall document the discovery of any of the conditions listed in Part 3.1 within 72 hours of making such discovery. Within 14 calendar days of such discovery, the permittee shall document any corrective action(s) taken or to be taken to eliminate or further investigate the condition, or if no corrective action is needed, the basis for that determination. The specific documentation required within 72 hours and 14 calendar days is detailed in Part 3.3. When actions are determined necessary, the permittee shall make any necessary changes within 14 calendar days following discovery, or before the

next measurable storm event (see Part 6.1.2.2), whichever is sooner, to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based requirements in Parts 2.2.2 and 2.2.3 of this permit. If necessary changes cannot be implemented within the specified timeframe(s), the permittee shall document with the SWPPP the reasons for the delay, a schedule for completing the necessary changes, date completed and any back-up practices in place to ensure compliance with the applicable numeric effluent limitations in Part 2.2.1 and water quality-based requirements in Parts 2.2.2 and 2.2.3 of this permit should a runoff event occur while a control measure is off-line.

3.3 Corrective Action Report.

1. Within 72 hours of discovery of any condition listed in Part 3.1, the permittee shall document the following information, which shall be maintained with the SWPPP:
   a. Identification of the condition triggering the need for corrective action review;
   b. Description of the problem identified; and
   c. Date the problem was identified.
2. Within 14 calendar days of discovery of any condition listed in Part 3.1, the permittee shall document and maintain with the SWPPP the following information:
   a. Summary of corrective action taken or to be taken;
   b. Whether SWPPP modifications are required as a result of this discovery or corrective action;
   c. Date corrective action initiated or will be initiated; and
   d. Date corrective action completed or expected to be completed.
3. When any condition listed in Part 3.1 occurs, a permittee that operates a facility that discharges to an impaired water or OAW shall submit this documentation in an annual report as required in Part 7.2 and retain a copy of the corrective action report onsite with the SWPPP as required in Part 5.4.

4.0 Inspections.

The permittee shall conduct inspections in accordance with Parts 4.1, 4.2, and 4.3 of this permit at the facility. If, during any quarterly routine facility inspection, visual assessment, or comprehensive facility inspection, or any other time, the facility's control measures are found to be inadequate or otherwise not be properly operated and / or maintained, the permittee shall review the selection, design, installation, and implementation of the control measures to determine if maintenance and/or modifications are necessary to meet the applicable numeric effluent limitations in Part 2.2.1 and water quality-based requirements in Parts 2.2.2 and 2.2.3 of this permit, in accordance with the requirements of Part 2.1.1.3. Such modifications shall be documented in the SWPPP and implemented as expeditiously as practicable.

Additional sector-specific inspection requirements may be described in Part 8 of this permit. If a conflict exists between the two, the requirements of Part 8 shall prevail.

4.1 Routine Facility Inspections.

4.1.1 Routine Facility Inspection Procedures.

The permittee shall conduct routine inspections of all areas of the facility where industrial materials or activities are exposed to stormwater with the potential to discharge from the facility, and of all stormwater control measures used to comply with this permit. Such routine inspections shall be conducted at least once each calendar quarter beginning with the first full calendar quarter after the facility becomes covered under this permit (see Part 1.3.1(2) and Table 1-3). More frequent inspections (e.g., monthly) may be appropriate for some types of equipment, processes, and control measures or areas of the facility with significant activities and materials exposed to stormwater. The permittee shall specify the relevant inspection schedules in the SWPPP document as required in Part 5.1.5.

A qualified person or persons (see definition in Appendix A) shall conduct routine facility

inspections. A member of the stormwater pollution prevention team (see Part 5.1.1) shall conduct or participate in the inspections. Inspections shall be performed during periods when the facility is in operation (i.e., is not inactive and unstaffed in accordance with the requirements of Part 1.5). The permittee shall initiate at least one of the routine facility inspections each calendar year while a stormwater discharge is occurring at one or more outfalls, but in no case later than 24 hours or the first business day (whichever comes later) following the end of the measurable storm event.

If there is no measurable storm event(s) during a calendar year, the permittee shall document the inability to perform an inspection during a measurable storm event as described in Part 5.4. In any case, the permittee must still complete routine quarterly inspections.

4.1.2 Routine Facility Inspection Documentation.

The permittee shall document the findings of each routine facility inspection performed and maintain this documentation with the SWPPP as required in Part 5.4. Inspection findings do not need to be submitted to ADEQ, unless specifically requested. At a minimum, the documentation for each routine facility inspection must include:

- The inspection date and time;
- The name(s) and signature(s) of the inspector(s);
- Weather information and a description of any discharges occurring at the time of the inspection;
- Evidence demonstrating that previously unidentified discharges of pollutants have occurred from the site;
- Any control measures needing maintenance or repairs;
- Any failed control measures that need replacement;
- Any other evidence of deviations from the permit or SWPPP observed; and
- Any additional control measures needed to comply with the permit requirements.

4.2 Visual Assessment of Stormwater Discharges.

The permittee shall perform two visual assessments during the summer wet season and two visual assessments during the winter wet season when the facility is discharging.

Wet seasons, for the purposes of visual assessments, are defined as follows:

- Summer wet season: June 1 – October 31
- Winter wet season: November 1 – May 31

The term ‘wet season’ applies statewide and includes areas of the state where freezing conditions exist that prevent runoff from occurring for extended periods. In areas where freezing conditions exist, the four visual assessments may be distributed during seasons when precipitation runoff occurs.

Visual assessment monitoring requirements in this permit begin immediately after authorization to discharge is received by the permittee unless authorization is received 90 calendar days or more after a wet season has begun, in which case visual assessment monitoring shall commence with the start of the next wet season.

4.2.1 Visual Assessment Procedures.

Visual assessment samples are not required to be collected consistent with 40 CFR Part 136 procedures.

The visual assessment shall be made:

- Of a sample in a clean, clear glass, or plastic container, and examined in a well-lit area;

- On samples collected within the first 30 minutes of an actual discharge from a storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and the permittee shall document why it was not possible to take samples within the first 30 minutes. In the case of snowmelt, samples shall be taken during a period with a measurable discharge from the facility (see also Part 6.1.2.3); and
- On discharges that occur at least 72 hours (3 calendar days) from a previous discharge (see also Part 6.1.2.2).

The permittee shall visually inspect the sample for the following water quality characteristics:

- Color;
- Odor;
- Clarity;
- Floating solids;
- Settled solids;
- Suspended solids;
- Foam;
- Oil sheen; and
- Other obvious indicators of stormwater pollution.

4.2.2 Visual Assessment Documentation.

The permittee shall document the results of the visual assessments and maintain this documentation with the SWPPP as required in Part 5.4. The visual assessment findings need not be submitted to ADEQ, unless specifically requested by the Department. At a minimum, the documentation of the visual assessment shall include:

- Sample location(s);
- Sample collection date and time, and visual assessment date and time for each sample;
- Personnel collecting the sample and performing visual assessment, and their signatures;
- Nature of the discharge (i.e., runoff or snowmelt);
- Results of observations of the stormwater discharge;
- Probable sources of any observed stormwater contamination; and
- If applicable, why it was not possible to take samples within the first 30 minutes.

4.2.3 Exceptions to Visual Assessments.

Absence of Discharge: If no storm event results in a discharge from the facility or outfall(s) during a wet season, the permittee is excused from visual assessment for the facility or outfall(s) for that season provided the permittee documents in the monitoring records and retains with the SWPPP why a sample could not be collected.

Adverse Conditions: Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, or electrical storms, or situations that otherwise make sampling unsafe.

When adverse conditions prevent the collection of either visual assessment sample in a given wet season, the permittee shall document those conditions with the SWPPP and resume visual assessment monitoring in the subsequent wet season.

Substantially identical outfalls: If the facility has two or more outfalls that discharge substantially identical pollutants, as documented in Part 5.1.5.2, the permittee may conduct visual assessments of the discharge at just one of the outfalls and report that the results also apply to the substantially identical outfall(s). If possible, visual assessments of each substantially identical outfall shall be performed on a rotating basis throughout the period of coverage under this permit.

If a visual assessment performed on a sample collected at a substantially identical outfall demonstrates that control measures are not functioning as intended, the permittee shall assess and modify the control measures as appropriate for that outfall and, if necessary, other outfalls represented by the monitored outfall.

4.3 Comprehensive Facility Inspections.

4.3.1 Comprehensive Facility Inspection Procedures.

The permittee shall conduct annual comprehensive facility inspections while covered under this permit. Annual, as defined in this Part, means once per calendar year, but not within 6 months of the previous inspection for the facility throughout the duration of permit coverage.

If the facility's coverage is administratively continued after the expiration date of this permit, the permittee shall continue to perform inspections annually until no longer covered by this permit.

A qualified person or persons shall conduct comprehensive facility inspections (CFI). A member of the facility's stormwater pollution prevention team shall conduct or participate in the inspection. CFIs must cover all areas of the facility affected by the requirements in this permit, including areas identified in the SWPPP as potential pollutant sources (see Part 5.1.3) where industrial materials or activities are exposed to stormwater with the potential to discharge from the facility, any areas where control measures are used to comply with the permit, and areas where significant spills (or spills that would contribute to the discharge of pollutants in stormwater) and leaks have occurred in the past 3 years. CFIs must also include a review of monitoring data collected in accordance with Part 6.2.

Inspectors must evaluate the results of the past year's visual assessments and analytical monitoring when planning and conducting inspections to determine potential areas of concern for stormwater pollution. Inspectors shall look for the following:

- Industrial materials, residue, or trash that may have or could come into contact with stormwater;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas; and
- Control measures needing replacement, maintenance, or repair.

Inspectors shall examine all stormwater control measures required by this permit to ensure that they are functioning correctly. If discharge locations are inaccessible, nearby downstream locations shall be inspected.

The facility's annual CFI may also be used as one of the routine inspections required by Part 4.1, provided that all components of both types of inspections are included.

4.3.2 Comprehensive Facility Inspection Documentation.

All permittees shall document the findings of each CFI and maintain this documentation with the SWPPP. At a minimum, the following information shall be included:

- The date of the inspection;
- The name(s) and title(s) of the personnel making the inspection;
- Findings from the examination of areas of the facility identified in Part 4.3.1;
- All observations relating to the implementation of the control measures including:
  - Previously unidentified discharges from the site,
  - Previously unidentified pollutants in existing discharges,
  - Evidence of, or the potential for, pollutants entering the drainage system that are not contemplated in the SWPPP;

  - Evidence of pollutants discharging to surface waters from any facility outfall(s) in a manner inconsistent with the SWPPP, and the condition of and around the outfall, including the condition of flow dissipation measures (if present) designed to prevent scouring, and
  - Additional control measures needed to address any conditions requiring corrective action identified during the inspection.
- Any required revisions to the SWPPP resulting from the inspection;
- Any incidents of noncompliance observed or a certification stating the facility is in compliance with this permit (if there is no noncompliance); and
- A statement signed and certified in accordance with Appendix B, Subsection 9 of this permit.

In addition, permittees that operate facilities that discharge directly to an impaired water or OAW or to an upstream tributary within 2.5 miles of an impaired water or OAW shall submit the CFI findings with the annual report as required in Part 7.2.

4.4 Exceptions for Inspection Requirements for Inactive and Unstaffed Mining Sites

Each calendar year, a permit holder of an inactive and unstaffed mining facility shall conduct one comprehensive facility inspection in accordance with the requirements of Part 4.3. The permittee shall also inspect the site whenever there is a reasonable expectation that severe weather or other events may have damaged control measures or increased discharges. The permittee is waived from general analytical monitoring, routine facility inspections and visual assessments inspection requirements in accordance with Part 1.5.

Although stormwater monitoring is not waived for inactive and unstaffed mining sites that discharge to impaired waters, the monitoring frequency is reduced in accordance with Part 6.2.3.3.

5.0 Stormwater Pollution Prevention Plan (SWPPP)

The permittee shall prepare a SWPPP for the facility, or review and update an existing one, as appropriate, before submitting the Notice of Intent (NOI) for permit coverage. The SWPPP shall document the basis for selection, design, and installation of control measures utilized at the facility. The additional documentation requirements (see Part 5.4) are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements. Additional sector-specific SWPPP requirements may be described in Part 8 of this permit. If a conflict exists between the two, the requirements of Part 8 shall prevail.

5.1 Contents of the SWPPP.

The SWPPP shall contain all of the following elements:

- Identification of the stormwater pollution prevention team (see Part 5.1.1);
- Site description (see Part 5.1.2);
- Summary of potential pollutant sources (see Part 5.1.3);
- Description of control measures (see Part 5.1.4);
- Schedules and procedures (see Part 5.1.5);
- Signature requirements (see Part 5.1.6);
- Identify each outfall authorized by this permit and describe the rationale for any substantially identical outfall determinations; and
- Sampling and analysis plan (SAP) (see Part 6.1.3).

Where the SWPPP refers to procedures in other facility documents, such as other environmental permits, a Spill Prevention, Control and Countermeasure (SPCC) Plan or an Environmental Management System (EMS) developed for an Environmental Performance Track facility, copies of the relevant portions of those documents must be kept with the SWPPP.

5.1.1 Stormwater Pollution Prevention Team.

The permittee shall identify the members (by name or title) that comprise the facility's stormwater pollution prevention team as well as their individual responsibilities. The team may include members who are not employed by the facility (such as third party consultants). The stormwater pollution prevention team is responsible for assisting the facility manager in developing and revising the SWPPP as well as maintaining control measures and taking corrective actions where required. Each member of the stormwater pollution prevention team must have access to either an electronic or paper copy of applicable portions of this permit and the SWPPP.

5.1.2 Site Description.

The SWPPP shall include all of the following:

1. *Activities at the Facility*. Provide a description of the nature of the industrial activities at the facility.
2. *General location map*. Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to identify the location of the facility and surface waters receiving stormwater discharges from the facility.
3. *Site map*. Provide a legible site map (or maps) completed to scale, that identifies at a minimum the:
   - Size of the property in acres;
   - Location of significant structures;
   - Directions of stormwater flow (e.g., use arrows);
   - Locations of stormwater conveyances (e.g., ditches, pipes, and swales);
   - Locations of all existing structural control measures;
   - Locations of surface waters receiving the facility's discharges and any impaired waters or OAWs within 2.5 miles downstream of the facility;
   - Locations where the facility's stormwater discharges to a regulated MS4 (where applicable);
   - Locations of potential pollutant sources identified under Part 5.1.3.2;
   - Locations where significant spills or leaks identified under Part 5.1.3.3 have occurred;
   - Locations of all stormwater monitoring points;
   - Locations of stormwater outfalls, with a unique identification code for each outfall (e.g., Outfall No. 1, No. 2, etc), indicating whether one or more outfalls are being treated as "substantially identical" under Parts 4.2.3, 5.1.5.2, and 6.1.1.1 and an approximate outline of the areas draining to each outfall;
   - Identification of all outfalls having the potential to contain allowable non-stormwater discharges under Part 1.1.3 and the corresponding type(s) of discharges;
   - Location of on-site drywell(s); include a list of the on-site drywells and their registration number(s);
   - Locations of the following activities where such activities are exposed to stormwater with potential to discharge from the facility:
     - fueling stations;
     - vehicle and equipment maintenance and/or cleaning areas;
     - loading/unloading areas;
     - locations used for the treatment, storage, or disposal of wastes;
     - liquid storage tanks;
     - processing and storage areas;
     - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
     - transfer areas for substances in bulk; and

o machinery; and

- Locations and sources of run-on to the facility from adjacent property that contains significant quantities of pollutants.

5.1.3 Summary of Potential Pollutant Sources.

The permittee shall describe in the SWPPP areas at the facility where industrial materials or activities are exposed to stormwater with the potential to discharge and from which allowable non-stormwater discharges are released. Industrial materials or activities include, but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. Material handling activities include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For each area identified, the description must include:

5.1.3.1 Activities in the area A list of the industrial activities exposed to stormwater (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams).

5.1.3.2 Pollutants A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity. The pollutant list must include all significant materials that are handled, treated, stored, or disposed, and that have been exposed to stormwater including any past activities or incidents that may impact present stormwater discharges (see Note in Part 5.1.3.3).

5.1.3.3 Spills and Leaks The permittee shall document where significant spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfall(s) that would be impacted by stormwater in contact with such spills and leaks. The permittee shall also document all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the 3 years prior to the date that the SWPPP was prepared or amended.

Note: Significant spills and leaks include, but are not limited to, releases of oil or hazardous substances in excess of quantities that are reportable under CWA Section 311 (see 40 CFR 110.6 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC §9602. This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 relating to spills or other releases of oils or hazardous substances.

5.1.3.4 Unauthorized Non-Stormwater Discharges Unauthorized non-stormwater discharges are those not specifically allowed under Part 1.1.3. The permittee shall identify and evaluate all unauthorized non-stormwater discharges. Documentation of this evaluation shall include:

- The date of the evaluation;
- A description of the evaluation criteria used;
- A list of the outfalls and/ or upgradient drainage locations that were directly observed during the evaluation;
- The different types of unauthorized non-stormwater discharge(s) and source locations; and
- The action(s) taken, such as a list of control measures used to eliminate unauthorized non-stormwater discharge(s), if any were identified or obtaining an AZPDES permit for the discharge. For example, a floor drain was sealed, a sink drain was re-routed to the sanitary sewer, or an AZPDES permit application was submitted for an unauthorized cooling water discharge.

5.1.3.5 Salt Storage The permittee shall document the location of any storage piles containing salt used for deicing or other commercial or industrial purposes.

5.1.3.6 Sampling Data The permittee shall summarize all stormwater discharge sampling data collected at the facility during the previous permit term.

5.1.4 Description of Control Measures.

The permittee shall describe in the SWPPP the location and type of control measures installed and implemented at the site to comply with Parts 2 and 8 of this permit. This documentation must describe how the control measures at the site address both the pollutant sources identified in Part 5.1.3 and any stormwater run-on that commingles with any discharges covered under this permit.

5.1.5 Schedules and Procedures.

5.1.5.1 Control Measures.

The following must be described in the SWPPP:

- Good Housekeeping measures, procedures and related schedules (See Part 2.1.1.2);
- Maintenance measures, procedures and related schedules (See Part 2.1.1.3) – Preventative maintenance procedures, including regular inspections, testing, maintenance, and repair of all industrial equipment and systems exposed to stormwater with the potential to discharge, and associated control measures, to avoid situations that may result in leaks, spills, and other releases that affect the quality of stormwater discharges; and
- Spill Prevention and Response Procedures (See Part 2.1.1.4) – Procedures for preventing and responding to spills and leaks. The permittee may reference the existence of other plans, such as the Spill Prevention Control and Countermeasure (SPCC) plan developed for the facility under Section 311 of the CWA or BMP programs otherwise required by an AZPDES permit or an aquifer protection permit for the facility, provided that a copy of that other plan is kept with the SWPPP consistent with Part 5.3; and
- Employee Training (Part 2.1.1.9) – A schedule for all types of necessary training in accordance with the sector-specific requirements described in Part 8.

5.1.5.2 Monitoring and Inspection

Monitoring: The permittee shall describe in the SWPPP the procedures for conducting the four types of analytical monitoring specified by this permit, when and where applicable. The four types of analytical monitoring are:

- General analytical monitoring (see Part 6.2.1);
- Effluent limitations guidelines monitoring (see Part 6.2.2);
- Impaired waters monitoring (see Part 6.2.3); and
- Additional monitoring as required by ADEQ (see Part 6.2.4).

For the required monitoring, the SWPPP shall contain a SAP either as a separate section or as an appendix to the SWPPP. The contents of the SAP are outlined in Part 6.1.3.

Inspection: The permittee shall describe in the SWPPP the procedures for performing, as appropriate, the three types of inspections specified by this permit, including:

- Routine facility inspections (see Part 4.1);
- Visual assessment of stormwater discharges (see Part 4.2); and
- Comprehensive facility inspections (see Part 4.3).

For each type of inspection performed, the SWPPP shall identify:

- Person(s) or positions of person(s) responsible for inspection;
- Schedules for conducting inspections; and

- Specific items to be covered by the inspection.

Substantially Identical Outfalls: The permittee shall describe the following in the SWPPP when using the substantially identical outfall exception for the visual assessment requirements in Part 4.2 or the facility's general analytical monitoring requirements in Part 6.2.1:

- Location of each of the substantially identical outfalls;
- Description of the general industrial activities conducted in the drainage area of each outfall;
- Description of the control measures implemented in the drainage area of each outfall;
- Description of the exposed materials located in the drainage area of each outfall that are likely to be significant contributors of pollutants to stormwater discharges;
- An estimate of the runoff coefficient of the drainage areas (low = under 40%; medium = 40 to 65%; high = above 65%); and
- Why the outfalls are expected to discharge substantially identical effluents.

5.1.5.3 Inactive and Unstaffed Sites. When the permittee declares that the site has become inactive and unstaffed, the SWPPP shall include the information that supports this claim as required by Parts 1.5 and 6.2.1.4.

5.1.6 Signature Requirements.

The permittee shall sign the SWPPP in accordance with Appendix B, Subsection 9, including the date of signature.

5.2 Required SWPPP Modifications.

The permittee shall modify the SWPPP whenever necessary to address any of the triggering conditions for corrective action in Part 3.1. Changes to the SWPPP to reflect corrective actions shall be made in accordance with the corrective action deadlines in Parts 3.2 and 3.3, and signed and dated in accordance with Appendix B, Subsection 9.

In addition, the permittee shall modify the SWPPP to reflect new or modified control measures (see Parts 2.1 and 4.0), including measures implemented at active mining operations as mining activities expand into previously undisturbed areas (see Part 8.G.5.2).

5.3 SWPPP Availability.

The permittee shall retain a copy of the current SWPPP at the facility, and it shall be made immediately available to ADEQ, EPA, or another Federal, State or local agency having stormwater program authority, or the operator of a regulated MS4 receiving discharges from the facility (where applicable) at the time of an onsite inspection or upon request. If otherwise requested by ADEQ, the permittee shall submit copies of the SWPPP documents within 14 calendar days of request.

Inactive and Unstaffed Sites: Permittees with facilities that meet the requirements for inactive and unstaffed are not required to maintain the SWPPP on-site. However, the SWPPP must be locally available (i.e., in Arizona) and must be on-site when conducting the inspections required by Part 4. For the purpose of a regulatory inspection, the SWPPP shall be made available to ADEQ, EPA, or other Federal, State or local authority having stormwater program authority, within 48 hours of request. If otherwise requested by ADEQ, the permittee shall submit copies of these documents within 14 calendar days of request.

5.4 Documentation Requirements.

The permittee shall keep the following inspection, monitoring, and certification records complete and up-to-date. Retaining these records with the SWPPP (unless otherwise specified below) is necessary to demonstrate compliance with the conditions of this permit.

- A copy of the NOI submitted to ADEQ, including: any correspondence exchanged between the operator and ADEQ specific to coverage under this permit and the permit authorization number assigned by ADEQ;
- A copy of this permit (an electronic copy easily available to SWPPP personnel is also acceptable);
- Descriptions and dates of any incidences of significant spills, leaks, or other releases that resulted in discharges of pollutants in stormwater to a regulated MS4 or to waters of the U.S., the circumstances leading to the release and actions taken in response to the release and measures taken to prevent the recurrence of such releases (see Part 2.1.1.4 and 5.1.3.3);
- Records of employee training, including date training received. Training records need not be maintained with the SWPPP but shall be made available to ADEQ, EPA, or another Federal, State or local agency upon request (see Part 2.1.1.9);
- Documentation of repairs of structural control measures, including the date(s) of discovery of areas in need of repair/replacement, date(s) that the structural control measure(s) returned to full function, and the justification for any extended repair schedules (see Part 2.1.1.3). Documentation of maintenance of industrial equipment and systems in accordance with part 2.1.1.3 need not be maintained with the SWPPP but shall be made available to ADEQ, EPA, or another Federal, State or local agency upon request. The maintenance records shall include the date(s) of regular maintenance. However, the justification for any extended maintenance schedules shall be maintained with the SWPPP (see Part 2.1.1.3);
- All inspection reports, including the Routine Facility Inspection Reports (see Part 4.1), the Visual Assessment Reports (see Part 4.2), and the Comprehensive Facility Inspection Reports (see Part 4.3);
- Description of and rationale for any deviations from the schedule for visual assessments and/or monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 30 minutes of a measurable storm event) (see Parts 4.1.1, 4.2.1, 6.1.2.3, and 6.2.1);
- Description of any corrective action taken at the site, including triggering event and dates when problems were discovered and modifications occurred; and
- Documentation to support the permittee's claim that the facility has changed its status from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections (see Part 4.1.3), visual assessments (see Part 4.2.3), and/or general analytical monitoring (see Part 6.2.1.4).

6.0 Analytical Monitoring Program.

In addition to visual assessments required in Part 4 of this permit, the permittee shall collect and analyze stormwater samples and document monitoring activities consistent with the procedures described in Part 6 and Appendix B, Subsections 9, 11 and 12 and any sector-specific requirements in Part 8. Refer to Part 7 for additional reporting and recordkeeping requirements.

6.1 Analytical Monitoring Procedures.

6.1.1 Analytical Monitoring Locations.

6.1.1.1 Monitored Outfalls.

Applicable monitoring requirements apply to each outfall authorized by this permit. If the facility has two or more outfalls believed to discharge substantially identical stormwater and/or allowable non-stormwater, based on the similarities of the general industrial activities and control measures, exposed materials that may significantly contribute pollutants to stormwater, and runoff coefficients of their drainage areas, the permittee may monitor the discharge at just one of the outfalls and report that the results also apply to the substantially identical outfall(s). The allowance for monitoring only one of the

substantially identical outfalls is not applicable to any outfalls with numeric effluent limitations set forth in Part 2.2.1. The permittee is required to monitor each outfall covered by a numeric effluent limitation as identified in Part 6.2.2.

6.1.1.2 Commingled Discharges.

If discharges authorized by this permit commingle with discharges not authorized under this permit, any required sampling of the authorized discharges must be performed at a point before they mix with other unauthorized discharges to the extent practicable.

6.1.1.3 Monitoring for Allowable Non-Stormwater Discharges

Unless otherwise specified by ADEQ, permittees are required to monitor allowable non-stormwater discharges (as delineated in Part 1.1.3) only when they are commingled with stormwater discharges associated with industrial activity.

6.1.2 Monitoring Events.

6.1.2.1 Monitoring Periods.

Monitoring requirements in this permit begin within 90 calendar days of receiving the Department's authorization to discharge. The required monitoring events may be distributed during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from the site.

Wet seasons, for the purposes of analytical monitoring, apply statewide and are defined as follows:

Summer wet season: June 1 – October 31

Winter wet season: November 1 – May 31

The term 'wet season' includes areas of the state where freezing conditions exist that prevent runoff from occurring for extended periods. In areas where freezing conditions exist, the required monitoring and sample collection may be distributed during seasons when precipitation runoff, either as melting snow or rain mixed with melting snow, occurs.

6.1.2.2 Measurable Storm Events.

All required monitoring must be performed on a storm event that results in a discharge from the facility ("measurable storm event") that follows the preceding measurable storm event by at least 72 hours (3 calendar days). The 72 hour (3 day) storm interval does not apply if the permittee is able to document that less than a 72 hour interval is representative for local storm events during the sampling period. In the case of snowmelt, the monitoring must be performed at a time when a measurable discharge occurs at the site.

For each monitoring event, except snowmelt monitoring, the permittee shall identify the person performing the monitoring, the date and estimated duration (in hours) of the rainfall event, estimated rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event. For snowmelt monitoring, the permittee shall identify the sample as 'snowmelt' and the date of the sampling event.

6.1.2.3 Sample Type.

The permittee shall take a minimum of one grab sample from a discharge resulting from a measurable storm event that produces a sufficient volume to allow collection of a sample. With the exception of samples to be analyzed for Suspended Sediment Concentration (SSC), samples must be collected within the first 30 minutes of a measurable storm event. If it is not possible to collect the sample within the first 30 minutes of a measurable storm event, the sample must be collected as soon as practicable after the first 30 minutes and documentation must be kept with the SWPPP explaining why it was not possible to take samples within the first 30 minutes. Samples for SSC shall be collected 48 hours

after the storm event that resulted in a measureable discharge. In the case of snowmelt, samples must be taken during a period with a measurable discharge.

6.1.2.4 Adverse Conditions.

When adverse conditions as described in Part 4.2.3 prevent the collection of the analytical sample(s) required in a given wet season, the permittee shall document those conditions with the SWPPP and resume analytical monitoring in the subsequent wet season. Adverse conditions do not exempt the permittee from the requirement to file a discharge monitoring report (DMR) in accordance with the facility's sampling schedule. The permittee shall report any failure to monitor as specified in Part 7.1 indicating the basis for not sampling during the usual reporting period.

6.1.3 Sampling and Analysis Plan.

The permittee shall develop a written SAP covering all analytical monitoring required by this permit. The SAP shall be a part of the SWPPP as either an appendix or a separate SWPPP section. The SAP shall include the following:

6.1.3.1 Sample Collection, Preservation, Tracking, and Handling Information

- Designate and train personnel to collect, maintain, and handle samples in accordance with the appropriate sample protocols.
- Identify water quality parameters/pollutants to be sampled including any pollutant(s) of concern in accordance with Parts 6.2.3 and 6.2.4;
- Identify the required sample analyses and associated analytical methods (analytical laboratory and field analyses).
- Written procedures for:
  - Sample collection (equipment and containers, calibration procedures, document site conditions during sampling, field notes and conditions under which the sample was taken),
  - Preservation (sample preparation to meet holding times),
  - Tracking (including chain-of-custody procedures), and
  - Handling (packing, transporting and shipping procedures to maximize sample integrity).

6.1.3.2 Calibration and Maintenance of Monitoring Equipment.

All monitoring instruments and equipment (including permittee's field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturer's recommendations.

6.1.3.3 Analytical Methods and Laboratories.

Other than parameters required to be sampled at the time of sample collection (e.g., field parameters), all samples shall be analyzed by a laboratory that is licensed by the Arizona Department of Health Service (ADHS) Office of Laboratory Licensure and Certification. Identification of the analytical methods and related limits of detection (if applicable) for each parameter is required. The samples shall be analyzed using analytical methods with a limit of quantitation (LOQ) that is at or below the applicable surface water quality standards, ELGs or other criteria specified in this permit. If all methods have LOQs higher than the specific criteria, the samples shall be analyzed using the analytical method with the lowest LOQ.

All laboratory analyses shall be conducted according to test procedures specified in 40 CFR 136, unless other test procedures have been specified in this general permit. This requirement does not apply to parameters that require analysis at the time of sample collection as long as the testing methods used are approved by ADHS. The permittee may conduct field analysis of turbidity if the permittee has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to properly perform the field analysis.

6.1.3.4 Records.

The permittee shall retain records of all stormwater monitoring information and reports with the SWPPP in accordance with Part 7.5 and any additional requirements in Appendix B, Subsection 11 of this permit.

6.2 Required Monitoring.

This permit includes four types of required analytical monitoring, one or more of which may apply to the facility's discharge:

- General analytical monitoring (see Part 6.2.1)
- Effluent limitations monitoring (see Part 6.2.2);
- Impaired waters monitoring (see Part 6.2.3); and
- Additional monitoring as required by ADEQ (see Part 6.2.4).

When more than one type of monitoring for the same parameter at the same outfall applies (e.g., total suspended solids once per year for an effluent limitation and twice per wet season for general analytical monitoring at a given outfall), a single sample may be used to satisfy both monitoring requirements.

6.2.1 General Analytical Monitoring.

This permit requires mining Sectors G and J to conduct general analytical monitoring as outlined in Part 8.

6.2.1.1 Applicability of General Analytical Monitoring.

The permittee shall monitor stormwater discharges for parameters specified in Part 8 for the primary industrial activity, and any co-located industrial activities authorized under this permit. If any of the parameters are hardness-dependent, the permittee must also characterize for hardness. The results of the general analytical monitoring, including hardness, shall be submitted to ADEQ in accordance with Part 7. For discharges to:

- Perennial or intermittent waters, the hardness shall be of the surface water receiving the discharge.
- Ephemeral waters, the hardness shall be of the discharge leaving the facility.

6.2.1.2 Exception for Stormwater Discharges to Ephemeral Waters.

Facilities that discharge to ephemeral surface waters are not required to monitor for Total Suspended Solids (TSS) and turbidity as part of the general analytical monitoring requirements specified in Part 8.

6.2.1.3 Exception for Inactive and Unstaffed Sites.

The requirement for general analytical monitoring does not apply at a facility that is inactive and unstaffed if the requirements of Part 1.5 are met.

6.2.2 Effluent Limitations Monitoring.

6.2.2.1 Monitoring Based on Effluent Limitations Guidelines.

Table 6-1 identifies the stormwater discharges subject to effluent limitation guidelines that are authorized for coverage under this permit. Commencing with the first wet season of permit coverage (in accordance with Section 6.1.2.1), the permittee shall monitor once per year at each outfall containing the discharges identified in Table 6-1 for the parameters specified in the sector-specific section of Part 8.

Table 6-1. Required Monitoring for Effluent Limitations Based on Effluent Limitations Guidelines			
Regulated Activity	**Effluent Limit**	**Monitoring Frequency**	**Sample Type**
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	See Part 8.J.9	1/year	Grab

6.2.2.2 Substantially Identical Outfalls.

The permittee shall monitor each outfall discharging runoff from any regulated activity identified in Table 6-1. The substantially identical outfall monitoring provisions are not available for numeric effluent limitations monitoring.

6.2.3 Impaired Waters Monitoring.

6.2.3.1 Permittees Required to Monitor Discharges to Impaired Waters.

If a facility discharges to an impaired water, the permittee shall develop a monitoring program in accordance with Part 6.1.3 and monitor for all pollutants for which the waterbody is impaired (except as provided in Part 6.2.3.2) and for which a standard analytical method exists (see 40 CFR Part 136).

If the waterbody is impaired for suspended solids, turbidity or sediment/ sedimentation and the discharge occurs for more than 48 hours after the storm event, the permittee shall monitor for SSC. If the pollutant for which the waterbody is impaired is expressed in the form of an indicator or surrogate pollutant, the permittee shall monitor for that indicator or surrogate pollutant. No monitoring is required when a waterbody's biological communities are impaired but no pollutant, including indicator or surrogate pollutants, is specified as causing the impairment, or when a waterbody's impairment is related to hydrologic modifications, impaired hydrology, or temperature.

6.2.3.2 Impaired Waters Monitoring Schedule.

***Discharges to impaired waters without an approved TMDL*.**

Beginning in the first wet season following the permittee's discharge authorization, the permittee shall monitor twice per wet season at each outfall discharging stormwater to an impaired water without an approved TMDL. Once the four (4) samples have been collected, if the pollutant for which the water is impaired is not detected above applicable water quality standards, the permittee may discontinue further monitoring for that pollutant, under this section. The permittee shall keep records of this finding with the SWPPP. If the pollutant for which the water is impaired is found in the discharge above applicable water quality standards for any of the samples collected in the first year of sampling, the permittee shall continue monitoring twice during each wet season.

Further, this monitoring requirement does not apply after one year if the pollutant for which the waterbody is impaired is not detected above natural background levels in the discharge, and the permittee documents, as required in Part 5.4, that this pollutant is not expected to be present above natural background levels in the discharge.

If the pollutant for which the water is impaired is not present and not expected to be present in the facility's discharge, or it is present but it has been determined using a methodology approved by ADEQ that the presence is caused solely by natural background sources, the permittee shall include a notification to this effect in the first monitoring report, after which annual monitoring under this subsection may be discontinued. To support this determination, the following documentation must be submitted with the first monitoring report and kept with the SWPPP records:

- An explanation of why the presence of the pollutant causing the impairment in your discharge is not related to the activities at the facility; and
- Data and/or studies that tie the presence of the pollutant causing the impairment in the discharge to natural background sources in the watershed.

***Discharges to impaired waters with an ADEQ approved TMDL*.**

For stormwater discharges assigned a WLA in an approved TMDL, the facility shall monitor for the pollutant for which the TMDL was written. Beginning in the first wet season following the facility's date of discharge authorization, the permittee shall monitor twice per wet season at each outfall discharging stormwater to the impaired water with an approved TMDL. ADEQ's authorization to discharge will include specifications on any additional pollutant(s) to monitor.

If the pollutant for which the water is impaired is not detected above the applicable WLA in the TMDL after the four samples have been collected, the permittee may discontinue further monitoring, under this section. The permittee shall keep records of this finding onsite with the SWPPP.

If the pollutant for which the water is impaired is found above the applicable WLA in the TMDL in the discharge for any of the samples collected in the first year of sampling, the permittee shall continue monitoring twice during each wet season. Attainment of the WLA for SSC will be based on the median of four samples collected from four different measureable storm events.

6.2.3.3 Exception for Inactive and Unstaffed Mine Sites.

The requirement for impaired waters monitoring at a facility that is inactive and unstaffed is reduced to once per year, if the requirements of Part 1.5 are met.

6.2.4 Additional Monitoring Required by ADEQ.

ADEQ may notify the permittee, in writing, of additional discharge monitoring required to ensure protection of receiving water quality in cases where there is evidence that a pollutant is being discharged that is not being monitored for by the permittee and that the pollutant may be causing or contributing to exceedances of a water quality standard. Any such notice will provide an explanation of the reasons for the monitoring, locations, and parameters to be monitored, frequency and period of monitoring, sample types, and reporting requirements.

6.3 Follow-up Actions if Discharge Exceeds a Numeric Effluent Limit or a Water Quality Standard.

The permittee shall conduct follow-up monitoring within 30 calendar days (or during the next qualifying runoff event, should none occur within the 30 days) of implementing corrective action(s) taken in accordance with Part 3 in response to an exceedance of a numeric effluent limit or water quality standard contained in this permit as described in Part 2.2.1 and 2.2.2. Monitoring must be performed for any pollutant(s) that exceeds the effluent limit or water quality standard. If this follow-up monitoring exceeds the applicable effluent limit or water quality standard, the permittee shall comply with both Parts 6.3.1 and 6.3.2.

6.3.1 Submit an Exceedance Report.

The permittee shall submit an Exceedance Report consistent with Part 7.3.

6.3.2 Continue to Monitor.

The permittee shall continue to monitor, at least twice per wet season, until the discharge is in compliance with the effluent limit or water quality standard or until ADEQ waives the requirement for additional monitoring.

7.0 Reporting and Recordkeeping.

7.1 Reporting Monitoring Data to ADEQ.

7.1.1 The permittee shall submit monitoring data collected in accordance with Parts 4.2, 6.2, 6.3, and 6.4 to ADEQ at the address in Part 7.6.

7.1.2 Permittees shall use the MSGP discharge monitoring report (DMR) form available at http://www.azdeq.gov/environ/water/permits/stormwater.html .

7.1.3 The permittee shall compile all sampling results for the previous two wet seasons onto DMR form(s). Except as provided in Part 7.2 below, the permittee shall submit the DMRs to ADEQ not later than July 15 of each year of permit coverage.

7.2 Annual Report.

All facilities shall prepare an Annual Report on a form provided by the Department and retain a copy of the report with the SWPPP. The Annual Report for the reporting period June 1 to May 31 shall be completed by July 15 and include, at a minimum:

- The findings from the facility's Part 4.3 comprehensive facility inspection;
- Any corrective action documentation as required in Part 3.3;
- The DMR form(s) as required in Part 7.1 for the preceding two wet seasons; and
- The results of any monitoring required in Part 6.2 for those facilities that discharge to a water (or within 2.5 miles of a water if required by ADEQ) or portion thereof, classified as an OAW or an impaired water, or
- The results of any monitoring required in Part 6.2 if notified by the Department in accordance with Part 1.3.1(2)(c).

Permittees with facilities that discharge to a water (or within 2.5 miles of a water if required by ADEQ, or is otherwise referenced within an approved TMDL) or portion thereof, classified as an OAW or an impaired water shall submit the annual report to ADEQ on or before July 15 (postmark date).

7.3 Exceedance Report for Numeric Effluent Limitations or Water Quality Standards.

If follow-up monitoring pursuant to Part 6.3 exceeds a numeric effluent limit or water quality standard, the permittee shall submit an Exceedance Report to ADEQ no later than 30 calendar days after receiving the facility's lab results. The facility's Exceedance Report shall include the following:

- Facility name, physical address and location;
- AZPDES permit tracking number;
- Name of receiving water;
- Monitoring data from this and the preceding monitoring event(s);
- An explanation of the situation; including what actions the permittee has completed or intends to complete (if corrective actions are not yet complete) to correct the violation; and
- Contact person name, title, and phone number.

7.4 Other Reporting.

The permittee is subject to the reporting requirements stipulated in Part 7, in addition to the standard permit reporting provisions of Appendix B, Subsection 12.

- 24-hour reporting (see Appendix B, Subsection 12.d);
- 5-day follow-up reporting to the 24 hour reporting (see Appendix B, Subsection 12.d.(ii));

- Reportable quantity spills (verbal report only; see Part 2.1.1.4).
- Planned changes (see Appendix B, Subsection 12.a);
- Anticipated noncompliance (see Appendix B, Subsection 12.c);
- Transfer of ownership and/or operation – (see Table 1-2);
- Other noncompliance (see Appendix B, Subsection 12.e); and
- Other information (see Appendix B, Subsection 12.f).

Where a written report is required, the permittee shall submit these reports to the Department's address listed in Part 7.6. If the facility discharges to a regulated MS4, the permittee shall also submit these reports to the MS4 operator (in accordance with Part 5.1.2).

7.5 Recordkeeping.

The permittee shall retain copies of the SWPPP (including any modifications made during the term of this permit), additional documentation requirements pursuant to Part 5.4 (including documentation related to corrective actions taken pursuant to Part 3), all reports and certifications required by this permit, monitoring data, and records of all data used to complete the NOI to be covered by this permit, for a period of at least 3 years from the date that the facility's coverage under this permit expires or is terminated.

7.6 Addresses for Reports.

Signed copies of monitoring data and any other reports required, shall be submitted to the address below. Other options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet or by public notice. Notices of Intent and Notices of Termination (or a photocopy/reproduction) shall be signed and dated in accordance with Appendix B, Subsection 9 of this permit and submitted to ADEQ at the address below. DMR forms and paper copies of any reports required in Parts 6 and 7 shall be sent to the address below. All other written correspondence concerning discharges covered under this permit shall likewise be sent to the address listed below:

Arizona Department of Environmental Quality
Surface Water Section, Stormwater Permits Unit—MSGP Monitoring
1110 W. Washington Street, Mail Code 5415 A-1
Phoenix, AZ 85007
Fax: 602/ 771 – 4528

Reports of non-compliance shall be reported to:

Arizona Department of Environmental Quality
Water Quality Compliance Section
1110 W. Washington Street, Mail Code 5515 B-1
Phoenix, AZ 85007
Office: 602-771 – 2330; Fax 602/ 771 – 4505

Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart G – Sector G – Metal Mining.

The permittee shall comply with Part 8 sector-specific requirements associated with the facility's primary industrial activity and any co-located industrial activities authorized under this permit, as defined in Appendix A. The sector-specific requirements apply to those areas of the facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit. In some cases, these sector-specific requirements modify more general requirements set forth in Parts 1-7 of this permit (e.g., Part 8.G.9. below).

8.G.1 Covered Stormwater Discharges.

The requirements in Subpart G apply to stormwater discharges associated with industrial activity from Metal Mining facilities, including mines abandoned on Federal lands, as identified by the SIC Codes specified under Sector G in Table 1-1 of this permit. Coverage is required only for mining operations that discharge stormwater contaminated by contact with, or that has come into contact with, any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the operation.

8.G.1.1 *Covered Discharges from Active Facilities*. Only the stormwater discharges from the areas described in Table 8.G.1.1 and the allowable non-stormwater discharges identified in Part 1.1.3 are covered:

TABLE 8.G.1.1—APPLICABILITY OF THE AZPDES MULTI-SECTOR GENERAL PERMIT TO STORMWATER RUNOFF FROM ACTIVE ORE (METAL) MINING AND DRESSING SITES

Discharge/source of discharge	AZPDES General Permit Applicability
Piles	
Waste rock/overburden Topsoil piles	Discharge under GP must be composed entirely of stormwater and not combined with mine drainage. See Note below.
Roads constructed of waste rock or spent ore	
Onsite haul roads and haul/access roads used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility.	Discharge under the GP must be composed entirely of stormwater and not combined with mine drainage. See Note below.
Roads not constructed of waste rock or spent ore	
Onsite haul roads and haul/access roads used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility.	Discharge acceptable under GP except if ''mine drainage'' is used for dust control.
Milling/concentrating	
Runoff from tailings dams/dikes when constructed of waste rock/tailings.....	Discharges must be composed entirely of stormwater and not combined with mine drainage; not applicable if process fluids are present. See Note below.
Runoff from tailings dams/dikes when not constructed of waste rock/tailings.....	Discharge acceptable under GP except if process fluids are present.
Concentration building.....	Discharge acceptable under GP if discharge is stormwater only and there is no contact with concentrate piles.
Mill site.....	Discharge acceptable under GP if discharge is stormwater only and there is no contact with concentrate piles.

Discharge/source of discharge	AZPDES General Permit Applicability
Ancillary areas	
Office/administrative building and housing.....	Discharge acceptable under GP if mixed with stormwater from the industrial area. (*Note:* coverage is unnecessary if drainage from these areas is not mixed with stormwater from industrial areas.)
Chemical storage area & Docking facility.....	Discharge under GP must be composed entirely of stormwater and not combined with mine drainage.
Explosive storage Fuel storage (oil tanks/coal piles) Vehicle/equipment maintenance area/building Parking areas……	Discharge acceptable under GP (*Note:* coverage is unnecessary for drainage exclusively from employee and visitor-type parking areas.)
Power plant Truck wash area….....	Discharge under GP must be composed entirely of stormwater and not combined with mine drainage.
Reclamation-related areas	
Any disturbed area (unreclaimed)..... Reclaimed areas released from reclamation bonds prior to Dec. 17 1990. ..... Partially/inadequately reclaimed areas or areas not released from reclamation bond.	Discharge acceptable under GP only if not in active mining area.

Note: Stormwater runoff from these sources is subject to the AZPDES program for stormwater unless mixed with discharges subject to 40 CFR Part 440 that are regulated by another permit prior to mixing. Non-stormwater discharges from these sources are subject to AZPDES permitting and may be subject to the effluent limitation guidelines under 40 CFR Part 440.

Discharges from overburden/waste rock and overburden/waste rock-related areas are not subject to 40 CFR Part 440 unless they: (1) drain naturally (or are intentionally diverted) to a point source; and (2) combine with "mine drainage" that is otherwise regulated under the Part 440 regulations. For such sources, coverage under this permit is available if the discharge composed entirely of stormwater does not combine with other sources of mine drainage that are subject to 40 CFR Part 440, and that meets other eligibility criteria contained in Part 1.1 of this permit. Permit applicants bear the initial responsibility for determining the applicable technology-based standard for such discharges.

8.G.1.2 *Covered Discharges from Inactive Facilities.* All stormwater discharges.

8.G.1.3 *Covered Discharges from Exploration and Construction of Metal Mining and/or Ore Dressing Facilities.* All stormwater discharges.

8.G.1.4 *Covered Discharges from Facilities Undergoing Reclamation.* All stormwater discharges.

8.G.2 Limitations on Coverage.

8.G.2.1 *Prohibition of Stormwater Discharges.* Stormwater discharges not authorized by this permit: discharges from active metal mining facilities that are subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

8.G.2.2 *Prohibition of Non-Stormwater Discharges*. The following discharges are not authorized by this permit: adit drainage, and contaminated springs or seeps discharging from waste rock dumps that do not directly result from precipitation events (see also the standard Limitations on Coverage in Part 1.1.4).

8.G.3 Definitions.

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

8.G.3.1 *Mining operation* - Consists of active, inactive, reclamation phases and the exploration and construction phases.

8.G.3.2 *Exploration phase* - Entails exploration and land disturbance activities to delineate the dimensions and financial viability of a metal mining site.

8.G.3.3 *Construction phase* - Includes the initial building of site access roads and initial removal of overburden and waste rock to expose mineable minerals at a mining site. In addition, any subsequent construction activity on undisturbed areas of an existing mine property is also considered part of the construction phase if stormwater discharges are not managed by pre-existing or permanent control measures.

8.G.3.4 *Active phase* - Activities including the extraction, removal or recovery of metal ore. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a). The active phase is considered part of "mining operations."

Note: The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

8.G.3.5 *Active metal mining facility* - A place where work or other activity related to the extraction, removal, or recovery of metal ore is being conducted. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a).

8.G.3.6 *Inactive metal mining facility* - A site or portion of a site where metal mining and/or milling occurred in the past but is not an active facility as defined above. An inactive metal mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an AZPDES industrial stormwater permit.

8.G.3.7 *Reclamation phase* - Activities undertaken following the cessation of the "exploration phase" or the "active phase" at a site or a portion of a site, intended to return the land to an appropriate post-mining land use in order to meet applicable Federal and State reclamation requirements or the requirements of Part 8.G.9.1 at a site or portion of a site not subject to Federal and State reclamation requirements. The reclamation phase is considered part of "mining operations."

8.G.3.8 *Stabilization* - A site or portion of a site is "stabilized" when it has implemented all applicable Federal and State reclamation requirements.

8.G.4 Stormwater Discharges Associated with the Exploration and Construction Phases of Mining (Clearing, Grading, and Excavation Activities).

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phases at mining sites are covered under this permit (or may be covered under an alternate AZPDES stormwater permit such as the AZPDES General Permit for Discharge from Construction Activities (AZG2008-001)) if they disturb one acre or more. Exploration and construction activities disturbing less than one acre do not require permit coverage unless they are integrally related to other exploration or construction activities that collectively disturb one acre or more.

For all areas affected by exploration and construction activities that will occur at an active site or previously mined site, the permittee shall select, design, install, and implement the following control measures or their equivalents, as necessary to minimize the discharge of pollutants to stormwater. The control measures selected shall be documented in the SWPPP.

Once the areas subject to construction and exploration activities are stabilized or the area(s) become part of the mining operation, the control measures, inspections, monitoring, and other requirements in Parts 8.G.4 are no longer required; however, the facility remains subject to Parts 1 through 7, Parts 8.G.5 through 8.G.9, and all other applicable provisions of this permit.

8.G.4.1 *Additional Control Measures*.

The permittee shall implement, as applicable, control measures for erosion control, sediment control, perimeter control, good housekeeping, material storage, fueling and maintenance, concrete washouts, and non-stormwater discharges. In the SWPPP, identify and describe all temporary and/or permanent control measures to be implemented during the exploration and construction phases.

8.G.4.1.1 *Erosion and Sediment Controls.* Design and implement a combination of erosion and/ or sediment control BMPs to keep sediment in place and/ or to capture sediment to the extent practicable before it leaves the site. At a minimum, such controls must be designed, installed and maintained to:

a. Control stormwater volume and velocity within the site to minimize soil erosion;
b. Control stormwater discharges by minimizing both peak flow rates and total stormwater volume, to minimize erosion;
c. Phase or sequence exploration and construction activities, as practicable, to minimize the area of disturbance at any one time;
d. Minimize sediment discharges from the site;
e. Where practicable, increase sediment removal and maximize stormwater infiltration and / or reuse; and
f. Where practicable, minimize soil compaction and preserve topsoil.

8.G.4.1.2 *Maintenance of control measures*. The permittee shall maintain all control measures identified in the SWPPP in effective operating condition. Repairs or modifications of control measures shall be accomplished in accordance with Part 2.1.1.3.

8.G.4.1.3 *Dewatering*. The permittee shall ensure all discharges from dewatering or basin draining activities, including discharges from dewatering of trenches and excavations, are discharged in a manner that do not cause nuisance conditions, including erosion in receiving channels or on surrounding properties.

8.G.4.1.4 *Pollution Prevention Measures*. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
b. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
c. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

8.G.4.1.5 *Prohibited Discharges*. The following discharges are prohibited:

a. Wastewater from washout of concrete, unless managed by an appropriate control;

b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials. If concrete washout is conducted at the facility, appropriate control measures must be implemented to prevent discharge of pollutants;

c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

d. Soaps or solvents used in vehicle and equipment washing.

8.G.4.1.6 *Surface Outlets*. When culverts or other surface outlets are present on the site, the permittee shall include measures to sufficiently minimize the threat of erosion at surface outlet locations that prevent the formation of rills and gullies.

8.G.4.1.7 *Good Housekeeping.* (See also Part 2.1.1.2) The permittee shall implement practices to ensure litter, debris, and chemicals are prevented from contact with stormwater discharges. These procedures shall include storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices.

8.G.4.1.8 *Soil Stabilization.* After construction has ceased and until stabilization is achieved or active mining commences at the site, the permittee shall maintain the control measures, in accordance with Part 8.G.4.2, and conduct site inspections at least quarterly.

8.G.4.2 *Additional SWPPP Requirements.*

The requirements in Part 8.G.4.2 are applicable to exploration and construction activities.

Note: ADEQ recommends activities associated with the exploration and construction activities be kept as a separate chapter or appendix in the facility's SWPPP to distinguish from other mining operations.

8.G.4.2.1 *Nature of Exploration and Construction Activities.* (See also Part 5.1.2) Document in the facility's SWPPP the exploration and construction activities that can potentially affect the stormwater discharges covered by this permit.

8.G.4.2.2 The SWPPP shall describe the nature of the construction and exploration activities, including: a description of the exploration and construction phases on the mining property; and an estimate of the total area of the site (in acres) to be disturbed.

8.G.4.3 *Inspections*. (See also Part 4) Except as provided in Part 8.G.4.1.8, the permittee shall conduct inspections as indicated below to ensure BMPs are functional and that the SWPPP is being properly implemented.

8.G.4.3.1 Inspection Schedule.

a. Inspections shall be conducted once every 30 calendar days and within 24 hours of the end of each measurable storm event.

b. *Inspection Schedule for Sites within 2.5 miles of an Impaired or Outstanding Arizona Water.* If any discharge point from the construction site is within 2.5 miles of an impaired or outstanding Arizona water, the permittee shall inspect the site at least once every 7 calendar days.

Note: If the inspection day falls on a Saturday or holiday, the inspection may be conducted on the preceding workday. If the inspection day falls on a Sunday, the inspection shall be conducted on the following Monday.

8.G.4.3.2 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials

that are exposed to precipitation. Sedimentation and erosion control measures implemented must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of significant off-site sediment tracking.

8.G.4.3.3 Inspection Reports. (See also Part 4.1) For each inspection required above, the permittee shall document the findings of the inspections in accordance with Part 4.1, and maintain this documentation with the SWPPP. In addition to the information required in Part 4.1, the inspection report shall include:

a. Location(s) of discharges of sediment or other pollutants from the site;

b. For inspections occurring during or after a measurable storm event, a description of stormwater that is discharging from the site (presence of suspended sediment, turbid water, discoloration, and/or oil sheen, as applicable), when present;

c. Identification of all sources of non-stormwater discharges occurring at the site and associated BMPs in place;

d. Identification of material storage areas and, evidence of or potential for, pollutant discharge from such areas.

8.G.4.4 *Monitoring and Reporting Requirements for Discharges to Impaired and Outstanding Arizona Waters.* The permittee shall conduct monitoring and reporting as required in Part 8.G.4.3.1.b for stormwater discharges resulting from exploration and construction activities that are within 2.5 miles of an impaired water or outstanding Arizona water. The visual assessment and analytical monitoring requirements in this subpart are in addition to those required in Part 4.2, Part 6, Part 8.G.8 and Part 8.G.9, but may be combined where appropriate.

In accordance with Part 4.2.3 and Part 6.1.2.4, the permittee is not required to conduct visual assessments or analytical monitoring during adverse conditions.

8.G.5 Additional Control Measures for the Active and Inactive Mining Phases.

8.G.5.1 *Additional Stormwater Controls to be Evaluated.* The permittee shall evaluate whether some or all of the following control measures are necessary in order to meet the requirements of Part 2.2 and implement if necessary. These control measures must be evaluated in addition to those measures identified in Part 2.1.1. The potential pollutants identified in Part 8.G.6.3 shall determine the priority and appropriateness of the control measures selected.

8.G.5.1.1 *Stormwater Diversions*: Consider diversion of stormwater away from potential pollutant sources using one or more of the following measures: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

8.G.5.1.2 *Capping*: Consider capping potential pollutant sources. When capping is utilized to minimize pollutant discharges in stormwater, identify the source being capped and the material used to construct the cap.

8.G.5.1.3 *Treatment*: If treatment of stormwater (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is determined to be necessary to meet the requirements of Part 2.2, describe the type and location of stormwater runoff is encouraged where practicable. Treated runoff may be discharged as a stormwater source regulated under this permit provided the discharge is not combined with

discharges subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

8.G.5.2 *Sediment and Erosion Control*. At sites where the active phase has commenced, in addition to measures evaluated pursuant to Part 2.1.1.5, the permittee shall implement appropriate erosion and/ or sediment controls, in accordance with Part 8.G.4, when clearing, grading or excavation activities occur in previously undisturbed areas where discharges are not controlled by pre-existing or permanent control measures. The purpose of these sediment and/or control measures is to minimize the discharge of sediment from the newly disturbed areas. Where structural control measures are used for sediment control, such measures shall be installed prior to major land disturbance activities commencing.

8.G.5.3 *Certification of Discharge Testing.* (See also Part 5.1.3.4) Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-stormwater discharges such as seeps or adit discharges, or discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 440), such as mine drainage or process water. The certification may be kept with the facility's SWPPP consistent with Part 8.G.6.6.

8.G.6 Additional SWPPP Requirements for Mining Operations.

The requirements in Part 8.G.6 are applicable to all mining operations, except inactive and unstaffed sites.

8.G.6.1 *Nature of Industrial Activities*. (See also Part 5.1.2) Briefly document in the facility's SWPPP the mining and associated activities that can potentially affect the stormwater discharges covered by this permit.

8.G.6.2 *Site Map.* (See also Part 5.1.2) Document the following in the SWPPP (as appropriate):

- Location of the site relative to major transportation routes and communities;
- Site boundaries of co-located facilities;
- Temporary control measures that may be utilized during the exploration or construction phase.
- Access and haul roads;
- Outline of the drainage areas of each stormwater outfall within the facility with indications of the types of discharges from the drainage areas;
- Location(s) of all permitted discharges covered under an individual AZPDES permit,
- The locations of the following, if they are located such that they will contribute to discharge from a stormwater outfall covered by this permit:
  - Mining or milling site boundaries; immediate access roads and haul roads;
  - Overburden, materials, soils, or waste storage areas;
  - Outdoor equipment storage, fueling, and maintenance areas;
  - Materials handling areas;
  - Outdoor manufacturing, outdoor storage, and material disposal areas;
  - Outdoor chemicals and explosives storage areas;
  - Reclaimed areas;
- Location of mine drainage, dewatering or other process water;
- Off-site points of discharge for mine dewatering and process water; and
- Boundary of areas that contribute discharges subject to effluent limitations guidelines.

8.G.6.3 *Potential Pollutant Sources.* (See also Part 5.1.3) For each area of the mine or mill site where stormwater discharges associated with industrial activities occur, document in the SWPPP the types of pollutants (e.g., heavy metals, sediment) likely to be present in significant amounts. To identify potential pollutants, evaluate these factors: the mineralogy of the ore and waste rock

(e.g., acid generating); toxicity and quantity of chemicals used, produced, or discharged; the likelihood of contact with stormwater; vegetation of site (if any); and history of significant leaks or spills of toxic or hazardous pollutants. Also include a summary of any existing ore or waste rock or overburden characterization data and test results for potential generation of acid rock drainage. If any new data is acquired due to changes in ore type being mined, update the SWPPP with this information.

8.G.6.4 *Documentation of Control Measures.* All control measures implemented at the site shall be documented in the SWPPP, in accordance with Part 8.G.5.1 and Part 5.1.4. If control measures are implemented or planned but are not listed in Part 8.G.5.1 (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in the SWPPP.

8.G.6.5 *Employee Training.* All employee training conducted in accordance with Part 2.1.1.9 shall be documented with the SWPPP.

8.G.6.6 *Certification of Permit Coverage for Commingled Non-Stormwater Discharges:* If the permittee is able to certify, consistent with Part 8.G.5.2 above, that a particular discharge composed of commingled stormwater and non-stormwater is covered under a separate AZPDES permit, and that permit subjects the non-stormwater portion to effluent limitations prior to any commingling, such certification shall be retained with the SWPPP. This certification must identify the non-stormwater discharges, the applicable AZPDES permit(s), the effluent limitations placed on the non-stormwater discharge by the permit(s), and the points at which the limitations are applied.

8.G.7 Additional Inspection Requirements for the Active Mining Phase. (See also Part 4.1)

As required by Part 4.1, the permittee shall conduct routine facility inspections at active mine sites at least quarterly unless adverse weather conditions make the site inaccessible. Inspections are only required to cover areas where industrial activities occur that are exposed to precipitation and that contribute to stormwater discharges from the site covered under this permit.

Unless otherwise approved by ADEQ, active sites which discharge to waters designated as OAWs or waters which are impaired for sediment must be inspected monthly. The permittee may submit a request to the Department to reduce the inspection frequency to quarterly at one or more outfalls to an OAW or a water impaired for sediment. The request must be based on the frequencies of discharges and the performance of the control measure(s).

8.G.8 Monitoring and Reporting Requirements. (See also Part 6.)

Note: There are no Part 8.G.8 monitoring and reporting requirements for inactive and unstaffed sites.

8.G.8.1 *General Analytical Monitoring for Active Copper Ore Mining and Dressing Facilities.* Active copper ore mining and dressing facilities shall sample and analyze stormwater discharges for the pollutants listed in Table 8.G-8.1. Permittees discharging to perennial or intermittent waters must sample and analyze stormwater discharges, on an annual basis, alternating wet seasons each year, beginning in year one of permit coverage. Permittees discharging to ephemeral waters are not required to sample under this subsection.

Table 8.G-8.1

Subsector (Facility discharges may be subject to requirements for more than one sector/subsector)	Parameter
Subsector G1. Active Copper Ore Mining and Dressing Facilities (SIC 1021)	Total Suspended Solids (TSS)
	Chemical Oxygen Demand (COD)

8.G.8.2 *Monitoring Requirements for Discharges from Waste Rock and Overburden Piles at Active Metal Mining Facilities*

8.G.8.2.1 *General Analytical Monitoring.*

For discharges from waste rock and overburden piles, the permittee shall sample and analyze stormwater discharges for the parameters listed in Table 8.G-8.2. The permittee shall retain all report, monitoring data and methodologies in accordance with Part 7.5 of the permit.

Permittees discharging to perennial or intermittent waters: the permittee shall sample and analyze, on a semi-annual basis, once each wet season, beginning in year one of permit coverage. In addition to analyzing the stormwater discharge for hardness, the permittee shall characterize the hardness of the receiving water. Such characterization may include analysis of samples from the surface water receiving the discharge or surface water data collected by a third party provided the data is credible, scientifically defensible and is representative of current conditions. The data and the methodology for determining the hardness values must be submitted to ADEQ in the first year of permit coverage.

For permittees discharging to ephemeral waters: the permittee shall sample and analyze, on an annual basis in alternating wet seasons, beginning in year one of permit coverage. Permittees discharging to ephemeral waters are not required to sample TSS or turbidity, in accordance with Part 6.2.1.2.

Table 8.G-8.2

Subsector (Discharges may be subject to requirements for more than one sector/subsector)	**Parameter**
Subsector G2. Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores, Except Vanadium; and Miscellaneous Metal Ores (SIC Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099)	Total Suspended Solids (TSS)
	Turbidity
	pH
	Hardness (as $CaCO_3$; calc. from Ca, Mg)[1]
	Antimony
	Arsenic
	Beryllium
	Cadmium, total & dissolved[1]
	Copper, total & dissolved [1]
	Iron, total & dissolved
	Lead, total & dissolved [1]
	Mercury, total & dissolved
	Nickel, total & dissolved [1]
	Selenium
	Silver, total & dissolved [1]
	Zinc, total & dissolved [1]

[1] These metals are hardness-dependent and require sampling for water hardness. Note: when analyzing hardness for a suite of metals, it is more cost effective to add analysis of calcium and magnesium, and have hardness calculated than to require separate hardness analysis.

8.G.8.2.2 *Additional Analytical Monitoring For Uranium, Vanadium or Radium Ores Mining Facilities.* These permittees shall also conduct additional monitoring for the parameters in Table 8.G-8.3 at the same frequencies required in Part 8.G.8.2.1.

Table 8.G-8.3

Subsector (Discharges may be subject to requirements for more than one sector/subsector)	Parameter
Subsector G2: Uranium-Vanadium-Radium Ore Mining (SIC Code 1094)	Radium, total and dissolved
	Uranium
	Chemical Oxygen Demand (COD)

8.G.8.2.3 *Additional Monitoring.* The Director may require the permittee to perform additional monitoring to accurately characterize the quality and quantity of pollutants discharged from waste rock and overburden piles in accordance with Part 6.2.4.

8.G.9 Termination of Permit Coverage

8.G.9.1 *Termination of Permit Coverage for Sites Reclaimed After December 17, 1990.* A site (or a portion of a site) that was released from applicable state or federal reclamation requirements after December 17, 1990, is not required to maintain coverage under this permit.

If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is not required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 8.G.9.2.

8.G.9.2 *Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990.* A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if:

(1) Stormwater runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state water quality standards,

(2) Soil disturbing activities related to mining at the sites or portion of the site have been completed;

(3) The site or portion of the site has been stabilized as necessary to minimize soil erosion; and

(4) As appropriate depending on location, size, and the potential to contribute pollutants to stormwater discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart H – Sector H – Coal Mines and Coal Mining-Related Facilities.
RESERVED

Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart I – Sector I – Oil and Gas Extraction.
RESERVED

Part 8 – Sector-Specific Requirements for Industrial Activity

Subpart J – Sector J – Non-Metallic Mineral Mining and Dressing.

The permittee shall comply with Part 8 sector-specific requirements associated with the facility's primary industrial activity and any co-located industrial activities authorized under this permit, as defined in Appendix A. The sector-specific requirements apply to those areas of the facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

8.J.1 Covered Stormwater Discharges.

The requirements in Subpart J apply to stormwater discharges associated with industrial activity from Active and Inactive Non-Metallic Mineral Mining and Dressing facilities as identified by the SIC Codes specified under Sector J in Table 1-1 of this permit.

8.J.1.1 *Covered Discharges from Active Non-Metallic Mineral Mining Facilities.* All stormwater discharges, except for most stormwater discharges subject to the existing effluent limitation guideline at 40 CFR Part 436. Mine dewatering discharges composed entirely of stormwater or uncontaminated groundwater seepage from: construction sand and gravel, industrial sand, and crushed stone mining facilities are covered by this permit.

8.J.1.2 *Covered Discharges from Inactive Facilities.* All stormwater discharges.

8.J.1.3 *Covered Discharges from Exploration and Construction of Non-Metallic Mineral Mining Facilities.* All stormwater discharges.

8.J.1.4 *Covered Discharges from Sites Undergoing Reclamation.* All stormwater discharges.

8.J.2 Limitations on Coverage.

Most stormwater discharges subject to an existing effluent limitation guideline at 40 CFR Part 436 are not authorized by this permit. An exception to this is mine dewatering discharges composed entirely of stormwater or uncontaminated groundwater seepage from construction sand and gravel, industrial sand, and crushed stone mining facilities, which are covered under this permit.

8.J.3 Definitions.

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

8.J.3.1 *Mining operation* - Consists of active, inactive, reclamation phases and the exploration and construction phases.

8.J.3.2 *Explo ration phase* - Entails exploration and land disturbance activities to delineate the dimensions and financial viability of a non-metallic mineral mining site.

8.J.3.3 *Construction phase* - Includes the initial building of site access roads and initial removal of overburden and waste rock to expose mineable minerals at a mining site. In addition, any subsequent construction activity on undisturbed areas of an existing mine property is also considered part of the construction phase if stormwater discharges are not managed by pre-existing or permanent control measures.

8.J.3.4 *Active phase* - Activities including the extraction, removal or recovery of minerals. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of

"active mining area" found at 40 CFR 440.132(a). The active phase is considered part of "mining operations."

Note: The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

8.J.3.5 *Active Mineral Mining Facility* - A site or portion of a site where work or other activity related to the extraction, removal, or recovery of non-metallic minerals is being conducted. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a).

8.J.3.6 *Inactive Mineral Mining Facility* - A site or portion of a site where non-metallic mineral mining and/or milling occurred in the past but is not an active facility as defined above. An inactive mineral mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials, and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an AZPDES industrial stormwater permit.

8.J.3.7 *Reclamation phase* - Activities undertaken, following the cessation of the exploration phase or the "active phase" at a site or a portion of a site, intended to return the land to an appropriate post-mining land use in order to meet applicable Federal and State reclamation requirements or the requirements of Part 8.J.10.1 at a site or portion of a site not subject to Federal and State reclamation requirements. The reclamation phase is considered part of "mining operations".

8.J.3.8 *Stabilization* - a site or portion of a site is "stabilized" when it has implemented all applicable Federal and State reclamation requirements.

8.J.3.9 *Uncontaminated* - Free from the presence of pollutants attributable to industrial activity.

8.J.4 Stormwater Discharges Associated with the Exploration and Construction Phases of Mining (Clearing, Grading, and Excavation Activities).

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phases at mining sites are covered under this permit (or may be covered under an alternate AZPDES stormwater permit such as the AZPDES General Permit for Discharge from Construction Activities (AZG2008-001)) if they disturb one acre or more. Exploration and construction activities disturbing less than one acre do not require permit coverage unless they are integrally related to other exploration or construction activities that collectively disturb one acre or more.

For all areas affected by exploration and construction activities that will occur at an active site or previously mined site, the permittee shall select, design, install, and implement the following control measures or their equivalents, as necessary to minimize the discharge of pollutants to stormwater. The control measures selected shall be documented in the SWPPP.

Once the areas subject to construction and exploration activities are stabilized or the area(s) become part of the mining operation, the control measures, inspections, monitoring, and other requirements in Parts 8.J.4 are no longer required; however, the facility is still subject to Parts 1 through 7 and all other applicable provisions of this permit.

8.J.4.1 *Additional control measures.* The permittee shall implement, as applicable, control measures for erosion control, sediment control, perimeter control, good housekeeping, material storage, fueling and maintenance, concrete washouts, and non-stormwater discharges. In the SWPPP, identify and describe all temporary and/or permanent control measures to be implemented during the exploration and construction phases.

8.J.4.1.1 *Erosion and Sediment Controls.* The permittee shall design and implement a combination of erosion and/ or sediment control BMPs to keep sediment in place and/ or to capture sediment to the extent practicable before it leaves the site. At a minimum, such controls must be designed, installed and maintained to:

a. Control stormwater volume and velocity within the site to minimize soil erosion;

b. Control stormwater discharges by minimizing both peak flow rates and total stormwater volume to control erosion;

c. Phase or sequence exploration and construction activities, as practicable, to minimize the area of disturbance at any one time;

d. Minimize sediment discharges from the site;

e. Where practicable, increase sediment removal and maximize stormwater infiltration and / or reuse; and

f. Where practicable, minimize soil compaction and preserve topsoil.

8.J.4.1.2 *Maintenance of control measures*. The permittee shall maintain all control measures identified in the SWPPP in effective operating condition. Repairs or modifications of control measures shall be accomplished in accordance with Part 2.1.1.3.

8.J.4.1.3 *Dewatering*. The permittee shall ensure all discharges from dewatering or basin draining activities, including discharges from dewatering of trenches and excavations, are discharged in a manner that do not cause nuisance conditions, including erosion in receiving channels or on surrounding properties.

8.J.4.1.4 *Pollution Prevention Measures*. The permittee shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

b. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

c. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

8.J.4.1.5 *Prohibited Discharges*. The following discharges are prohibited:

a. Wastewater from washout of concrete, unless managed by an appropriate control;

b. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials. If concrete washout is conducted at the facility, appropriate control measures must be implemented to prevent discharge of pollutants;

c. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

d. Soaps or solvents used in vehicle and equipment washing.

8.J.4.1.6 *Surface Outlets*. When culverts or other surface outlets are present on the site, the permittee shall include measures to sufficiently minimize the threat of erosion at surface outlet locations that prevent the formation of rills and gullies.

8.J.4.1.7 *Good Housekeeping.* (See also Part 2.1.1.2) The permittee shall implement practices to ensure litter, debris, and chemicals are prevented from contact with stormwater discharges. These procedures shall include storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices.

8.J.4.1.8 *Soil Stabilization.* After construction has ceased and until stabilization is achieved or active mining commences at the site, the permittee shall maintain the control measures, in accordance with Part 8.J.4.2, and conduct site inspections at least quarterly.

8.J.4.2 *Additional SWPPP Requirements.*

The requirements in Part 8.J.4.2 are applicable to exploration and construction activities.

Note: ADEQ recommends activities associated with the exploration and construction activities be kept as a separate chapter or appendix in the facility's SWPPP to distinguish from mining operations.

8.J.4.2.1 *Nature of Exploration and Construction Activities.* (See also Part 5.1.2) Document in the facility's SWPPP the exploration and construction activities that can potentially affect the stormwater discharges covered by this permit.

8.J.4.2.2 The SWPPP shall describe the nature of the construction and exploration activities, including: a description of the exploration and construction phases on the mining property; and an estimate of the total area of the site (in acres) to be disturbed.

8.J.4.3 *Inspections*. (See also Part 4) Except as provided in Part 8.J.4.1.8, the permittee shall conduct inspections as indicated below to ensure BMPs are functional and that the SWPPP is being properly implemented.

8.J.4.3.1 Inspection Schedule.

a. Inspections shall be conducted once every 30 calendar days and within 24 hours of the end of each measurable storm event.

b. *Inspection Schedule for Sites within 2.5 miles of an Impaired or Outstanding Arizona Water.* If any discharge point from the construction site is within 2.5 miles of an impaired or outstanding Arizona water, the permittee shall inspect the site at least once every 7 calendar days.

Note: If the inspection day falls on a Saturday or holiday, the inspection may be conducted on the preceding workday. If the inspection day falls on a Sunday, the inspection shall be conducted on the following Monday.

8.J.4.3.2 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control measures implemented must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of significant off-site sediment tracking.

8.J.4.3.3 Inspection Reports. (See also Part 4.1) For each inspection required above, the permittee shall document the findings of the inspections in accordance with Part 4.1, and maintain this documentation with the SWPPP. In addition to the information required in Part 4.1, the inspection report shall include:

a. Location(s) of discharges of sediment or other pollutants from the site;

b. For inspections occurring during or after a measurable storm event, a description of stormwater that is discharging from the site (presence of suspended sediment, turbid water, discoloration, and/or oil sheen, as applicable), when present;

c. Identification of all sources of non-stormwater discharges occurring at the site and associated BMPs in place;

d. Identification of material storage areas and, evidence of or potential for, pollutant discharge from such areas.

8.J.4.4 *Monitoring and Reporting Requirements for Discharges to Impaired and Outstanding Arizona Waters.* The permittee shall conduct monitoring and reporting as required in Part 8.J.4.3.1.b for stormwater discharges resulting from exploration and construction activities that are within 2.5 miles of an impaired water or outstanding Arizona water. The visual assessment and analytical monitoring requirements in this subpart are in addition to those required in Part 4.2, Part 6, Part 8.J.8 and Part 8.J.9, but may be combined where appropriate.

In accordance with Parts 4.2.3 and 6.1.2.4, the permittee is not required to conduct visual assessments or analytical monitoring during adverse conditions.

8.J.5 Additional Control Measures for Active and Inactive Mining Phases.

8.J.5.1 *Additional Stormwater Controls.* The permittee shall evaluate whether some or all of the following control measures are necessary, and implement as appropriate, in order to meet the requirements of Part 2. These control measures are apart from, or in addition to, the control measures implemented by the permittee to meet the Part 2 effluent limits. The potential pollutants identified in Part 8.J.6.3 shall determine the priority and appropriateness of the control measures selected.

8.J.5.1.1 *Stormwater Diversions*: As necessary, divert stormwater away from potential pollutant sources using one or more of the following measures: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

8.J.5.1.2 *Treatment:* If treatment of stormwater (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is determined to be necessary to meet the requirements of Part 2.2, describe the type and location of treatment used. Passive and/or active treatment of stormwater runoff is encouraged. Treated runoff may be discharged as a stormwater source regulated under this permit provided the discharge is not combined with discharges subject to effluent limitation guidelines for the Mineral Mining and Processing Point Source Category (40 CFR Part 436), except as those subparts identified in Table 2-1 of this permit.

8.J.5.2 *Sediment and Erosion Control*. At sites where the active phase has commenced, in addition to measures evaluated pursuant to Part 2.1.1.5, the permittee shall implement appropriate erosion and/ or sediment controls, in accordance with Part 8.J.4, when clearing, grading or excavation activities occur in previously undisturbed areas where discharges are not controlled by pre-existing or permanent control measures. The purpose of these sediment and/or control measures is to minimize the discharge of sediment from the newly disturbed areas. Where structural control measures are used for sediment control, such measures shall be installed prior to major land disturbance activities commencing.

8.J.5.3 *Certification of Discharge Testing:* (See also Part 5.1.4.4) Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-stormwater discharges such as

discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 436). The certification may be kept with the facility's SWPPP consistent with Part 8.J.6.6.

8.J.6 Additional SWPPP Requirements for Mining Operations.

The requirements in Part 8.J.6 are applicable to all mining operations, except inactive and unstaffed sites.

8.J.6.1 *Nature of Industrial Activities*. (See also Part 5.1.2) Document in the facility's SWPPP the mining and associated activities that can potentially affect the stormwater discharges covered by this permit.

8.J.6.2 *Site Map.* (See also Part 5.1.2) Document the following in the SWPPP (as appropriate):

- Location of the site relative to major transportation routes and communities;
- Site boundaries of co-located facilities;
- Temporary control measures that may be utilized during the exploration or construction phase.
- Access and haul roads;
- Outline of the drainage areas of each stormwater outfall within the facility with indications of the types of discharges from the drainage areas;
- Location(s) of all permitted discharges covered under an individual AZPDES permit,
- The locations of the following, if they are located such that they will contribute to discharge from a stormwater outfall covered by this permit:
  - Mining or milling site boundaries; immediate access roads and haul roads;
  - Overburden, materials, soils, or waste storage areas;
  - Outdoor equipment storage, fueling, and maintenance areas;
  - Materials handling areas;
  - Outdoor manufacturing, outdoor storage, and material disposal areas;
  - Outdoor chemicals and explosives storage areas;
  - Re claimed areas;
- Location of mine drainage, dewatering or other process water;
- Off-site points of discharge for mine dewatering and process water; and
- Boundary of areas that contribute discharges subject to effluent limitations guidelines.

8.J.6.3 *Potential Pollutant Sources.* (See also Part 5.1.3) For each area of the mine site where stormwater discharges associated with industrial activities occur, document in the SWPPP the types of pollutants (e.g., oil, sediment) likely to be present in significant amounts. To identify potential pollutants, evaluate these factors: toxicity and quantity of chemicals used, produced, or discharged; the likelihood of contact with stormwater; vegetation of site (if any); and history of significant leaks or spills of toxic or hazardous pollutants. If applicable include in the SWPPP a summary of any existing waste rock or overburden characterization data and test results for potential generation of acid rock drainage.

8.J.6.4 *Documentation of Control Measures.* To the extent that any of the control measures in Part 8.J.5.1 are used, the permittee shall document them in the facility's SWPPP pursuant to Part 5.1.4. If control measures are implemented or planned but are not listed in Part 8.J.5.1 (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in the SWPPP.

8.J.6.5 *Employee Training.* All employee training conducted in accordance with Part 2.1.1.9 shall be documented with the SWPPP.

8.J.6.5 *Certification of Permit Coverage for Commingled Non-Stormwater Discharges.* If the permittee is able to certify, consistent with Part 8.J.5.2 above, that a particular discharge composed of commingled stormwater and non-stormwater is covered under a separate AZPDES permit, and that permit subjects the non-stormwater portion to effluent limitations prior to any commingling, such certification shall be retained with the SWPPP. This certification must identify the non-stormwater discharges, the applicable AZDPES permit(s), the effluent limitations placed on the non-stormwater discharge by the permit(s), and the points at which the limitations are applied.

8.J.7 Additional Inspection Requirements for the Active Mining Phase. (See also Part 4.1)

As required by Part 4.1, the permittee shall conduct routine facility inspections at active mining sites at least quarterly unless adverse weather conditions make the site inaccessible. Inspections are only required to cover areas where industrial activities occur that are exposed to precipitation and that contribute to stormwater discharges from the site covered under this permit.

Unless otherwise approved by ADEQ, active sites which discharge to waters designated as OAWs or waters which are impaired for sediment must be inspected monthly. The permittee may submit a request to the Department to reduce the inspection frequency to quarterly at one or more outfalls to an OAW or a water impaired for sediment. The request must be based on the frequencies of discharges and the performance of the control measure(s).

8.J.8 Monitoring and Reporting Requirements. (See also Part 6)

Note: There are no Part 8.J.8 monitoring and reporting requirements for inactive and unstaffed sites.

Table 8.J-1 identifies general analytical monitoring that applies to the specific subsectors of Sector J. These monitoring requirements apply to both the facility's primary industrial activity and any co-located industrial activities authorized under this permit, which describe the site's activities. Permittees discharging to perennial or intermittent waters must sample and analyze stormwater discharges for the pollutants listed in Table 8.J-8.1, on a semi-annual basis, once each wet season, beginning in year one of permit coverage. Permittees discharging to ephemeral waters are not required to sample TSS, in accordance with Part 6.2.1.2.

Table 8.J-8.1

Subsector (Facility discharges may be subject to requirements for more than one sector/subsector)	Parameter
Subsector J1. Sand and Gravel Mining (SIC 1442, 1446)	Total Suspended Solids (TSS)
Subsector J2. Dimension and Crushed Stone and Non-metallic Minerals (except fuels) (SIC 1411, 1422-1429, 1481, 1499)	Total Suspended Solids (TSS)

8.J.9 Effluent Limitations Based on Effluent Limitations Guidelines (See also Part 6.2.2.1.)

Table 8.J-2 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other discharges that may be allowed under this permit.

Table 8.J-2		
Industrial Activity	**Parameter**	**Effluent Limitation[1]**
Mine dewatering discharges at crushed stone mining facilities (SIC 1422 - 1429)	pH	6.0 – 9.0 s.u.
Mine dewatering discharges at construction sand and gravel mining facilities (SIC 1442)	pH	6.0 – 9.0 s.u.
Mine dewatering discharges at industrial sand mining facilities (SIC 1446)	Total Suspended Solids (TSS)	25 mg/L, monthly avg.
		45 mg/L, daily maximum
	pH	6.0 – 9.0 s.u.

[1]Monitor annually.

8.J.10 Termination of Permit Coverage

8.J.10.1 *Termination of Permit Coverage for Sites Reclaimed After December 17, 1990.* A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is not required to maintain coverage under this permit.

If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is not required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 8.J.10.2.

8.J.10.2 *Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990.* A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if:

(1) Stormwater runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state water quality standards;

(2) Soil disturbing activities related to mining at the sites or portion of the site have been completed;

(3) The site or portion of the site has been stabilized as necessary to minimize soil erosion; and

(4) As appropriate depending on location, size, and the potential to contribute pollutants to stormwater discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

Appendix A

Definitions, Abbreviations and Acronyms

Appendix A. Definitions, Abbreviations, and Acronyms (for the purposes of this permit).

Approved Total Maximum Daily Loads (TMDLs) –Approved TMDLs are those that are developed by the Arizona Department of Environmental Quality and approved by EPA.

Best Management Practices (BMPs) – schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. See 40 CFR 122.2.

Co-located Industrial Activities – Any industrial activities, excluding primary industrial activity(ies), located on-site that are defined by the stormwater regulations at 122.26(b)(14)(i)-(ix) and (xi). An activity at a facility is not considered co-located if the activity, when considered separately, does not meet the description of a category of industrial activity covered by the stormwater regulations or identified by the SIC code list in Appendix D.

Control Measure – refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

Director – a means the Director of the Arizona Department of Environmental Quality or an authorized representative.

Discharge – when used without qualification, means the "discharge of a pollutant." See 40 CFR 122.2.

Discharge of a pollutant – any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

Existing Discharger – an operator applying for coverage under this permit for discharges authorized previously under an AZPDES general or individual permit.

Facility or Activity – any AZPDES “point source” (including land or appurtenances thereto) that is subject to regulation under the AZPDES program. See 40 CFR 122.2.

Federal Facility – any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

Impaired water – waters that have been assessed by ADEQ, under the CWA, Section 303(d), as not attaining a water quality standard for at least one designated use, and are listed in Arizona’s 2006 – 2008 §303(d) and Other Impaired Waters List.

Indian Country – (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; (b) all dependent Indian communities within the borders of the United States, whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a State, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe. (18 U.S.C. 1151)

Industrial Activity – the 10 categories of industrial activities included in the definition of “stormwater discharges associated with industrial activity” as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

Industrial Stormwater – stormwater runoff from industrial activity.

Municipal Separate Storm Sewer – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

(ii) Designed or used for collecting or conveying stormwater;

(iii) Which is not a combined sewer; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2. See 40 CFR 122.26(b)(4) and (b)(7).

New Discharger – a facility from which there is a discharge, that did not commence the discharge at a particular site prior to August 13, 1979, which is not a new source, and which has never received a finally effective AZPDES permit for discharges at that site. See 40 CFR 122.2.

New Source – any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

- After promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or
- After proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal. See 40 CFR 122.2.

New Source Performance Standards (NSPS) – technology-based standards for facilities that qualify as new sources under 40 CFR 122.2 and 40 CFR 122.29.

No exposure – all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. See 40 CFR 122.26(g).

Operator – any entity with a stormwater discharge associated with industrial activity that meets either of the following two criteria:

(i) The entity has operational control over industrial activities, including the ability to modify those activities; or

(ii) The entity has day-to-day operational control of activities at a facility necessary to ensure compliance with the permit (e.g., the entity is authorized to direct workers at a facility to carry out activities required by the permit).

Outstanding Arizona Water – a surface water that has been designated by ADEQ as an outstanding state resource under A.A.C. R18-11-112.

Person – an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof. See 40 CFR 122.2.

Point source – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or

may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff. See 40 CFR 122.2.

Pollutant – dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water. See 40 CFR 122.2.

Pollutant of concern – A pollutant which causes or contributes to a violation of a water quality standard, including a pollutant which is identified as causing an impairment in a state's 303(d) list.

Primary industrial activity – includes any activities performed on-site which are (1) identified by the facility's primary SIC code; or (2) included in the narrative descriptions of 122.26(b)(14)(i), (iv), (v), or (vii), and (ix). [For co-located activities covered by multiple SIC codes, it is recommended that the primary industrial determination be based on the value of receipts or revenues or, if such information is not available for a particular facility, the number of employees or production rate for each process may be compared. The operation that generates the most revenue or employs the most personnel is the operation in which the facility is primarily engaged. In situations where the vast majority of on-site activity falls within one SIC code, that activity may be the primary industrial activity.] Narrative descriptions in 40 CFR 122.26(b)(14) identified above include: (i) activities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards; (iv) hazardous waste treatment storage, or disposal facilities including those that are operating under interim status or a permit under subtitle C of the Resource Conservation and Recovery Act (RCRA); (v) landfills, land application sites and open dumps that receive or have received industrial wastes; (vii) steam electric power generating facilities; and (ix) sewage treatment works with a design flow of 1.0 mgd or more.

Qualified Personnel – Qualified personnel are those (either the permittee's employees or outside consultants) who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and who can also evaluate the effectiveness of control measures.

Reportable Quantity Release – a release of a hazardous substance at or above the established legal threshold that requires emergency notification. Refer to 40 CFR Parts 110, 117, and 302 for complete definitions and reportable quantities for which notification is required.

Runoff coefficient – the fraction of total rainfall that will appear at the conveyance as runoff. See 40 CFR 122.26(b)(11).

Significant materials – includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges. See 40 CFR 122.26(b)(12).

Stormwater – stormwater runoff, snow melt runoff, and surface runoff and drainage. See 40 CFR 122.26(b)(13).

Stormwater Discharges Associated with Construction Activity – a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

Stormwater Discharges Associated with Industrial Activity – the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities

or activities excluded from the AZPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in 40 CFR 122.26(b)(14). The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v). See 40 CFR 122.26(b)(14).

Total Maximum Daily Loads (TMDLs) – A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges; load allocations for nonpoint sources and/or natural background, and must include a margin of safety (MOS) and account for seasonal variations. (See section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

Water Quality Standards – A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and EPA adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)). Water quality standards also include an antidegradation policy. See P.U.D. o. 1 of Jefferson County et al v. Wash Dept of Ecology et al, 511 US 701, 705 (1994).

A.2. ABBREVIATIONS AND ACRONYMS

ADHS – Arizona Department of Health Service

BOD_5 – Biochemical Oxygen Demand (5-day test)

BMP – Best Management Practice

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

COD – Chemical Oxygen Demand

CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 *et seq*)

DMR – Discharge Monitoring Report

EPA – Environmental Protection Agency

MDMR – MSGP Discharge Monitoring Report

MS4 – Municipal Separate Storm Sewer System

MSGP – Multi-Sector General Permit

NAICS – North American Industry Classification System

NOI – Notice of Intent

NOT – Notice of Termination

OAW – outstanding Arizona water

SIC – Standard Industrial Classification

SPCC – Spill Prevention, Control, and Countermeasures

SSC – Suspended Sediment Concentration

SWPPP – Stormwater Pollution Prevention Plan

TMDL – Total Maximum Daily Load

TSS – Total Suspended Solids

WLA – Wasteload Allocation

WQS – Water Quality Standard

Appendix B
Standard Permit Conditions

Appendix B. Standard Permit Conditions.

Standard permit conditions in Appendix B are consistent with the general permit provisions required under 40 CFR 122.41 and A.A.C. R-18-9-A905(A)(3).

1. **Duty to Comply.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(a)(1) and A.R.S. §§ 49-261, 262, 263.01, and 263.02.]

   a. The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act; A.R.S. Title 49, Chapter 2, Article 3.1; and A.A.C. Title 18, Chapter 9, Articles 9 and 10, and is grounds for enforcement action, permit termination, revocation and reissuance, or modification, or denial of a permit renewal application.
   b. The issuance of this permit does not waive any federal, state, county, or local regulations or permit requirements with which a person discharging under this permit is required to comply.

2. **Duty to Reapply / Continuation of the Expired General Permit.** [A.A.C. R18-9-A905 which incorporates 40 CFR 122.41(b)]

   a. Upon reissuance of the general permit, the permittee shall file an NOI, within the timeframe specified in the new general permit, and shall obtain new written authorization to discharge from the Director.
   b. If the Director does not reissue the general permit before the expiration date, the current general permit will be administratively continued and remain in force and effect until the general permit is reissued.
   c. Any permittee granted authorization to discharge under the general permit before the expiration date automatically remains covered by the continued general permit until the earlier of:

      i. Reissuance or replacement of the general permit, at which time the permittee shall comply with the NOI conditions of the new general permit to maintain authorization to discharge; or
      ii. The date the permittee has submitted a Notice of Termination; or
      iii. The date the Director has issued an individual permit for the discharge; or
      iv. The date the Director has issued a formal permit decision not to reissue the general permit, at which time the permittee shall seek coverage under an alternative general permit or an individual permit, or cease discharge.

3. **Need To Halt or Reduce Activity Not a Defense.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(c)]

   It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. **Duty to Mitigate.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(d)]
   The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

5. **Proper Operation and Maintenance.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(e)]
   The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are

installed by a permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

6. **Permit Actions.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(f)]
This permit may be modified, revoked and reissued, or terminated for cause. Filing a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. **Property Rights.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(g)]
This permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, nor any infringement of federal, state, Indian tribe, or local laws or regulations.

8. **Duty to Provide Information.** [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(h)]
The permittee must furnish to ADEQ, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to ADEQ upon request, copies of records required to be kept by this permit.

9. **Signatory Requirements.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(k) and (l); A.A.C. R18-9-A905(A)(1)(c), which incorporates 40 CFR 122.22]
All Notices of Intent (NOI) and Notices of Termination (NOT), must be signed as follows:

   a. NOIs and NOTs:

      i. For a corporation*:* By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

      ii. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

      iii. For a municipality, State, Federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal (or state) agency includes: (1) The chief executive officer (or director) of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

   b. All reports required by this permit and other information requested by ADEQ as follows:

      i. A person described in Section 9.a or by a duly authorized representative of that person. A person is a duly authorized representative only if the authorization is made in writing by a person described in Section 9.a and contained in the SWPPP.

      ii. The authorization must specify either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

c. All reports, including SWPPPs, inspection reports, annual reports, monitoring reports, reports on training and other information required by this permit must be signed by a person described in Appendix B, Subsection 9.a above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

i. The authorization is made in writing by a person described in Part 9.a;

ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may be either a named individual or any individual occupying a named position); and

iii. The signed and dated written authorization is included in the SWPPP. A copy must be submitted to ADEQ, upon request.

d. Changes to Authorization. If the information on the NOI filed for permit coverage is no longer accurate because a different owner / operator has responsibility for the overall operation of the facility, a new NOI satisfying the requirements of Part 1.3.1 must be submitted to ADEQ prior to or together with any reports, information, or applications to be signed in accordance with Appendix B, Subsection 9.c above. The change in authorization must be submitted within the time frame specified in Table A.3, and sent to the address specified in Part 7.6.

e. Certification. Any person signing documents under the terms of this permit must make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

10. Inspection and Entry. [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(i)]

a. The permittee must allow ADEQ or an authorized representative to:

i. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records are kept under the conditions of this permit;

ii. Have access to and copy at reasonable times, any records that are kept under the conditions of this general permit; and

iii. Inspect at reasonable times any facility or equipment (including monitoring and control equipment), practices or operations regulated or required under this permit;

iv. Sample or monitor at reasonable times any substances or parameters at any location, for the purposes of assuring permit compliance or as otherwise authorized by A.R.S. Title 49, Chapter 2, Article 3.1, and 18 A.A.C. 9, Articles 9 and 10; and

b. If the facility discharges to an MS4, the permittee must allow representatives of the municipal operator or the separate storm sewer receiving the discharge to inspect the site and obtain copy of records pertaining to the discharge or the conditions of this permit.

11. Monitoring and Records.

a. Representative Samples/Measurements. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

b. Retention of Records. The permittee must retain records of all monitoring information,

including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for at least three (3) years from the date this permit expires This period may be extended by request of the Director at any time. Permittees must submit any such records to ADEQ upon request. The permittee must retain the SWPPP developed in accordance with Part 5 of this permit, for at least three (3) years after the last modification or amendment is made to the plan.

c. Records Contents. Records of monitoring information must include:

i. The date, exact place, and time of sampling or measurements;
ii. The initials or name(s) of the individual(s) who performed the sampling or measurements;
iii. The date(s) analyses were performed;
iv. The time(s) analyses were initiated;
v. The initials or name(s) of the individual(s) who performed the analyses;
vi. References and written procedures, when available, for the analytical techniques or methods used;
vii. The analytical techniques or methods used; and
viii. The results of such analyses.

d. Approved Monitoring Methods. Monitoring must be conducted according to test procedures approved under 40 CFR 136, unless specific test procedures have been otherwise specified in this permit.

e. Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained in this permit is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article 4, which includes the possibility of fines and/or imprisonment.

12. Reporting Requirements. [A.A.C. R18-9-A905(A)(3)(a) which incorporates 40 CFR 122.41(l)]

a. Planned changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b) (incorporated by reference at A.A.C. R18-9-A905(A)(1)(e)); or
ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1) (incorporated by reference at A.A.C. R18-9-A905(A)(3)(b)).

b. Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

i. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms (paper or electronic) provided or specified by ADEQ. Pursuant to Part 7.1, all monitoring data collected pursuant to Part 6.2 and 6.3 must be submitted to the Department using the MSGP Discharge Monitoring Report (MDMR) form, available at http://www.azdeq.gov/environ/water/permits/stormwater.html .
ii. If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
iii. Calculations for all limitations which require averaging of measurements must use an arithmetic mean and non-detected results must be incorporated in calculations as the

limit of quantitation for the analysis.

c. Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

d. Twenty-four hour reporting.

i. The permittee shall report to ADEQ any noncompliance with this permit which may endanger human health or the environment. The permittee shall orally notify the office listed below within 24 hours:

Arizona Department of Environmental Quality – Water Quality Compliance
1110 W. Washington Street, Mail Code 5515 B-1
Phoenix, AZ 85007
Office: 602-771 – 2330; Fax 602-771 – 4505

ii. A written submission shall also be provided to the office identified above within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

iii. The following shall be included as information which must be reported within 24 hours under this paragraph.

1) Any upset which exceeds any effluent limitation in the permit.

2) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. (See 40 CFR 122.44(g) which is incorporated by reference at A.A.C. R18-9-A905(A)(3)(d)).

iv. ADEQ may waive the written report on a case-by-case basis for reports under this subsection if the oral report has been received within 24 hours.

e. Other noncompliance. The permittee shall report all instances of noncompliance not otherwise required to be reported under this subsection, at the time monitoring reports are submitted. The reports shall contain the information listed in subsection 12(d).

f. Other information. When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Department, the permittee shall promptly submit the facts or information to ADEQ at the address listed in Part 7.6.

13. Reopener Clause. [A.A.C. R18-9-A905(A)(3)(d) which incorporates 40 CFR 122.44(c)] The Department may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines, which may be promulgated in the course of the current permit cycle.

14. Other Environmental Laws. No condition of this general permit releases the permittee from any responsibility or requirements under other environmental statutes or regulations. For example, this permit does not authorize the "taking" of endangered or threatened species as prohibited by Section 9 of the Endangered Species Act, 16 U.S.C. 1538. Information regarding the location of endangered and threatened species and guidance on what activities constitute a "taking" are available from the U.S. Fish and Wildlife Service. The permittee must also comply with applicable State and Federal laws, including Spill Prevention Control and Countermeasures (SPCC).

15. State or Tribal Law. [Pursuant to A.A.C. R18-9-A904(C)] Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State or Tribal law or regulation under authority preserved by Section 510 of the Clean Water Act.

16. **Severability.** The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstance, is held invalid, the application of the provision to other circumstances, and the remainder of this general permit shall not be affected.

17. **Requiring Coverage under an Individual Permit or an Alternative General Permit.**

a. The Director may require a person authorized by this permit to apply for and/or obtain either an individual AZPDES permit or an alternative AZPDES general permit. Any interested person may petition the Department to take action under this section. The Department may require a permittee authorized to discharge under this permit to apply for an individual permit in any of the following cases:

i. A change occurs in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;

ii. Effluent limitation guidelines are promulgated for point sources covered by the general permit;

iii. An Arizona Water Quality Management Plan containing requirements applicable to the point sources is approved;

iv. Circumstances change after the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary;

v. If the Director determines that the discharge is a significant contributor of pollutants. When making this determination, the Director shall consider:

1) The location of the discharge with respect to waters of the United States,

2) The size of the discharge,

3) The quantity and nature of the pollutants discharged to waters of the U.S., and

4) Any other relevant factor.

b. If an individual permit is required, the Director shall notify the discharger in writing of the decision. The notice shall include:

i. A brief statement of the reasons for the decision;

ii. An application form;

iii. A statement setting a deadline to file the application;

iv. A statement that on the effective date of issuance or denial of the individual permit, coverage under the general permit will automatically terminate;

v. The applicant's right to appeal the individual permit requirement with the Water Quality Appeals Board under A.R.S. § 49-323, the number of days the applicant has to file a protest challenging the individual permit requirement, and the name and telephone number of the Department contact person who can answer questions regarding the appeals process; and

vi. The applicant's right to request an informal settlement conference under A.R.S. 41-1092.03(A) and 41-1092.06.

c. The discharger shall apply for an individual permit within 90 days of receipt of the notice, unless the Director grants a later date. In no case shall the deadline be more than 180 days after the date of the notice.

d. If the discharger fails to submit the individual permit application within the time period established in Appendix B.17.c the applicability of the general permit to the discharger is automatically terminated at the end of the day specified by the Director for application submittal.

e. Coverage under the general permit shall continue until an individual permit is issued or denied unless the general permit coverage is terminated under Appendix B. Subsection 17.d.

18. Request for an Individual Permit.

a. A permittee may request an exclusion from coverage of a general permit by applying for an individual permit.

i. The permittee shall submit an individual permit application under R18-9-B901(B) and include the reasons supporting the request no later than 90 days after publication of the general permit.

ii. The Director shall grant the request if the reasons cited by the permittee are adequate to support the request.

b. If an individual permit is issued to a person otherwise subject to a general permit, the applicability of the general permit to the discharge is automatically terminated on the effective date of the individual permit.

19. Transfer of Coverage

a. Transfer of coverage from one operator to a different operator (*e.g.,* facility sold to a new company): the new owner/ operator must complete and file a Notice of Intent in accordance with Part 1.3.1 at least 5 days prior to taking over operational control of the facility. The old owner/ operator must file a Notice of Termination within thirty (30) days after the new owner/ operator has assumed responsibility for the facility.

b. Simple name changes of the permittee (*e.g.,* Company "A" changes name to "ABC, Inc.") may be done by filing an amended Notice of Intent referencing the facility's assigned permit number and requesting a simple name change.

20. Bypass

a. Definitions.

1 Bypass means the intentional diversion of waste streams from any portion of a treatment facility

2 Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations. The permittee may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions Appendix B, Subsections 20.c and 20.d.

c. Notice

1 Anticipated bypass. If the permittee knows in advance of the need for a bypass, prior notice shall be submitted at least ten days before the date of the bypass.

2 Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Appendix B, Subsection 12.d.

d. Prohibition of bypass.

1. Bypass is prohibited, and ADEQ may take enforcement action against the permittee for bypass, unless:

i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering

judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

iii. The permittee submitted notices as required under Appendix B, Subsection 20.c.

2. ADEQ may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three conditions listed above in this Appendix B, Subsection 20.d.

21. Upset

a. Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix B, Subsection 21.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1 An upset occurred and that the permittee can identify the cause(s) of the upset;

2 The permitted facility was at the time being properly operated;

3 The permittee submitted notice of the upset as required in Appendix B, Subsection 12.d (iii); and

4 The permittee complied with any remedial measures required under Appendix B, Subsection 4.

d. Burden of proof. In any enforcement proceeding, the permittee, who is seeking to establish the occurrence of an upset, has the burden of proof.

G. Penalties for Violations of Permit Conditions.

Any permit noncompliance constitutes a violation and is grounds for an enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

1. **Civil Penalties.** A.R.S. § 49-262 provides that any person who violates any provision of A.R.S. Title 49, Chapter 2, Article 2, 3 or 3.1 or a rule, permit, discharge limitation or order issued or adopted under A.R.S. Title 49, Chapter 2, Article 3.1 is subject to a civil penalty not to exceed $25,000 per day per violation.

2. **Criminal Penalties.** Any a person who violates a condition of this general permit, or violates a provision under A.R.S. Title 49, Chapter 2, Article 3.1, or A.A.C. Title 18, Chapter 2, Articles 9 and 10 is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article 4, which may include the possibility of fines and/or imprisonment.

Attachment 4. Potential Pollutants

Pollutant Source (Material or Activity)	Potential Pollutant	Outfall Location

Attachment 6. Summary of Significant Leaks and Spills

Date and Time	Location	Description	Quantity Released	Measures to Prevent Recurrence	Agency Contact	Reporting Party
None at this time						

Attachment 7: Non-Stormwater Discharge Certification Evaluation Data

Inspector's Name: _____

Date of Evaluation: _____

Weather Conditions: _____

Testing Method/Evaluation Criteria: Visual observation of outfalls for signs of dry weather discharge

Outfalls observed (check all that apply):

Were non-stormwater discharges observed (check one)? ☐ Yes ☐ No

If yes, describe (outfall, source of discharge, etc.):

Outfall	Source of discharge	Allowable non-stormwater? (Y or N)

What actions were taken to eliminate the non-stormwater discharge?

Outfall	Actions taken

File completed form in appropriate environmental file. **Retain for life of permit plus three (3) years.**

Attachment 7: Non-Stormwater Discharge Certification Evaluation Data

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature	Title
Name of Authorized Representative	Date

Attachment 9. Control Measures (including Best Management Practices)

Pollutant Source (Material or Activity)	Potential Pollutant	Control Measures	
		Type	Description

Attachment 10: Training Record

TRAINING DATE & TIME:

INSTRUCTOR(S):

NOTES:

PRINT NAME	TITLE	SIGNATURE

File completed forms in Attachment 10. **Retain for life of permit plus three (3) years.**

Attachment 10: Training Record

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature	Title
Name of Authorized Representative	Date

Attachment 11A: Routine Facility Inspection Report

Date and Time of Inspection: _____

Weather Conditions: _____

Inspector Names: _____

Description of Discharge (if any): _____

Inspector Signatures: _____

Observation	Y	N	Comments/Actions to be Taken	Date When Action Was Completed
Are industrial materials and control measures consistent with those described in the SWPPP?				
Is there any evidence demonstrating that previously unidentified discharges of pollutants have occurred from the facility?				
Do any control measures need maintenance or repairs?				
Do any control measures need replacement?				
Are any additional control measures needed to comply with the permit requirements?				
Was there any evidence of deviations from the permit or SWPPP observed during the inspection?				

Comments:

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature

Title

Name of Authorized Representative

Date

File completed forms in appropriate environmental file. **Retain for life of permit plus three (3) years.**

Attachment 11B: Representative Outfall Evaluation

Outfall & Location	Industrial Activity	Significant/ Industrial Material (Attachment 4)	Control Measures (Attachment 9)	Drainage Area (feet^2)	Runoff Coefficient *	Representative Outfall

* Values are estimated runoff coefficients of the drainage areas (Low: under 40 percent; Medium: 40 to 65 percent; High: above 65 percent)

Attachment 11C: Visual Assessment Monitoring Form

Sampler/Assessor Names:		Assessment Time and Date	
Sampler/Assessor Signatures		Nature of Discharge (i.e., runoff or snowmelt)	
Sampling Time and Date			
Estimated Discharge Start Time		Time Since Previous Measurable Discharge	(days)

Outfall locations for sample and assessment (complete one form for each):

Observation Results	Yes	No	Comments
Color			
Odor			
Clarity			
Floating solids			
Settled solids			
Suspended solids			
Foam			
Oil sheen			
Other obvious indicators of stormwater pollution			

Other Pertinent Data (i.e., probable sources of any observed stormwater contamination)**:**

Note: Monitoring must occur within the first 30 minutes (or as soon thereafter as practicable) of when runoff begins discharging **and** occurs at least 72 hours from the previously measurable event. If not practicable, describe above (i.e., because the preceding storm did not yield discharge, or less than a 72-hour interval is representative during the sample period). If a visual assessment is not conducted for a given wet season, document the reason above.

Attachment 11C: Visual Assessment Monitoring Form

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature	Title
Name of Authorized Representative	Date

File completed forms in appropriate files. **Retain for life of permit plus three (3) years.**

This attachment is currently not applicable to the Resolution Project.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

MSGP INDUSTRIAL DISCHARGE MONITORING REPORT (DMR)

Reason(s) for Submitting DMR (Check all that apply):

- ☐ Reporting monitoring data (Fill in all Sections).
- ☐ Reporting no discharge for all outfalls for this monitoring period (Fill in Sections A, B, C.1, D, and F).
- ☐ Reporting that your site status has changed to inactive and unstaffed (Fill in Sections A, B, F and include date of status change in comment field in Section E.4).
- ☐ Reporting that your site status has changed to active (Fill in all Sections and include date of status change in comment field in Section E.4).
- ☐ **Non-mining MSGP only:** Reporting that no further pollutant reductions are achievable for all outfalls and for all pollutants in accordance with Part 6.2.1.3 of the permit (Fill in Sections A, B and F).

A. Permit Authorization Number: AZMSG – _____ **Note: Read instructions before completing this Form.**

B. Facility Information

1. Facility Name:

2. Facility Location:

a. Street:

b. City: c. State: d. Zip Code: -

3. Additional Facility Information:

Contact Name: E-mail:

Phone: - - Ext.

4. DMR Preparer (Complete if DMR was prepared by someone other than the person signing the certification in Section F)

Prepared by:

Organization:

E-mail:

Phone: - - Ext. Date of inactive / unstaffed status change (if applicable): _____

C. Discharge Information

1. Identify monitoring period (two samples per winter wet season and two samples per summer wet season): ☐ Check here if discharging to an ephemeral water

☐ 1 Winter (November 1 – May 31)	☐ Winter 1:	From	/	To	/
☐ 2 Winter (November 1 – May 31)	☐ Winter 2:	From	/	To	/
☐ 3 Summer (June 1 – October 31)	☐ Summer 3:	From	/	To	/
☐ 4 Summer (June 1 – October 31)	☐ Summer 4:	From	/	To	/

2. Are you required to monitor for cadmium, copper, chromium, lead, nickel, silver, or zinc? ☐ Yes (Complete line item 3) ☐ No (Skip to Section D)

3. What is the hardness level of the receiving water? mg/L

D. Outfall Information

1. How many outfall(s) are identified in your SWPPP? List name of outfall(s) required to be monitored in table below.

2. Do any of your outfalls discharge substantially identical effluents? YES NO

3. If yes, for each monitored outfall, indicate outfall names that are substantially identical in table below.

4.A. Monitored Outfall Name*	4.B. Substantially Identical Outfalls [List name(s) of outfall(s) substantially identical to outfall in 4.A. (if applicable)]	4.C. No Discharge?
		☐
		☐
		☐
		☐
		☐

*Reference attachment if additional space is needed to complete the table.

ADEQ Arizona Department of Environmental Quality

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

MSGP INDUSTRIAL DISCHARGE MONITORING REPORT (DMR)

E. Monitoring Information **Note: Make additional copies of this form as necessary.**

1. Permit Authorization Number: ☐☐☐☐☐☐☐☐☐☐

2. Nature of Discharge: ☐ Rainfall (Complete line items 2.a., 2.b., & 2.c.) ☐ Snowmelt

2.a. Duration of the rainfall event (hours): ☐☐ 2.b. Rainfall amount (inches): ☐☐ . ☐ 2.c. Time since previous measurable storm event (days): ☐☐☐

3.a. Outfall Name	3.b. Monitoring Type (BM, ELG, I, O)*	3.c. Parameter	3.d. Quality or Concentration	3.e. Units	3.f. Results Description	3.g. Collection Date	3.h. Exceedance due to natural background pollutant levels	3.i. No further pollutant reductions achievable?
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐
							☐	☐

* (BM) - Benchmark monitoring; (ELG) - Annual effluent limitations guidelines monitoring; (I) - Impaired waters monitoring; (O) - Other monitoring as required by ADEQ

4. Comment and/or Explanation of Any Violations (Reference all attachments here)

F. Certification

	I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.		
Typed or Printed Name/Title of Principal Executive Officer or Authorized Agent		Signature of Principal Executive Officer or Authorized Agent	Date

E-mail of Principal Executive Officer or Authorized Agent: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Instructions for Completing the MSGP Industrial Discharge Monitoring Report (DMR)

Who Must Submit A Discharge Monitoring Report to ADEQ?

Facilities covered under the Multi-Sector General Permit (MSGP or permit) that are required to monitor pursuant to Parts 6.2, 6.3, and 8 of the permit must submit the MSGP Discharge Monitoring Report (DMR) consistent with the reporting requirements specified in Part 7.1 of the permit.

Where to File the DMR Form

Monitoring data collected pursuant to Parts 6.2, 6.3, and 8 of the permit must be submitted on the paper DMR form and sent to the following address:

Notice of Intent forms sent by regular or overnight / express mail:

Arizona Department of Environmental Quality
Surface Water Section / Stormwater Program
1110 West Washington, 5415A-1
Phoenix, Arizona 85007

Phone number: 602– 771– 4508

Completing the DMR Form

To complete this form, type or print in uppercase letters in the appropriate areas only. Be sure that you complete all applicable questions. Photocopy your DMR form for your records before you send the completed original form to the address above. Use ink when you sign and mail the original document – ADEQ will not accept photocopies.

Reasons for Submitting DMR form

Indicate your reason(s) for submitting this DMR by checking all boxes that apply. The reasons for submitting are defined as follows:

- *Submitting monitoring data*: For each storm event sampled, submit one DMR form with data for all outfalls sampled. Select this reason even if you only have monitoring data for some of your outfalls (i.e., some outfalls did not discharge). If you select this reason you are required to complete all Sections of the form.
- *Reporting no discharge for all outfalls for this monitoring period*: Indicates that there were no discharges from all outfalls during this monitoring period. If you select this reason you are only required to complete Sections A, B, C.1, D, and F.
- *Reporting that your site status has changed to inactive and unstaffed*: Indicates that your facility is currently inactive and unstaffed (See Part 6.2.1.4 of the Non-mining MSGP and Part 6.2.1.3 of the Mining MSGP and for more information). If you select this reason you are only required to complete Sections A, B, and F and include date of status change in the comment field in Section E.4.
- *Reporting that your site status has changed from inactive to active*: Indicates that your facility is currently active. If you select this reason you are required to complete all Sections of the form and include date of status change in the comment field in Section E.4.
- **Non-mining MSGP only:** *Reporting that no further reductions are achievable for all outfalls and for all pollutants*: Indicates that your facility has determined that no further pollutant reductions are technologically and economically practicable in consideration of best industry practice to meet the water-quality-based effluent limitations in Part 2 of the permit (See Part 6.2.1.3 for more information). If you select this reason you are required to complete Sections A, B and F. However, if you can make this finding for some outfalls and pollutants, but not for others, you cannot select this reason; instead you must identify which outfalls and which pollutants you can make this finding for in Section E.

Section A. Permit Authorization Number

Enter ADEQ's Authorization Number. The Authorization Number begins with "AZMSG – " and was sent to you in ADEQ's Authorization to Discharge letter.

Section B. Facility Information

1. Enter the facility's name as required in box C of the NOI. Unless the name of your facility has changed, please use the same name provided on your NOI.

2.a-d. Enter the street address, including city, state, and zip code of the actual physical location of the facility. Do not use a P.O. Box.

3. Identify the name, telephone number, and e-mail address of the person who will serve as a contact for ADEQ on issues related to monitoring at your facility. This person should be able to answer questions related to stormwater discharges and monitoring or have immediate access to individuals with that knowledge. This person does not have to be the facility operator, but should have intimate knowledge of monitoring activities at the facility.

4. If the form was prepared by someone other than the person who is signing the certification statement in Section F (for example, if the DMR was prepared by a member of the facility's stormwater pollution prevention team or a consultant for the certifier's signature), include the name, organization, phone number and e-mail address of the DMR preparer.

Section C. Discharge Information

1. Indicate the appropriate monitoring period (summer or winter wet season) covered by the DMR. The dates should be displayed as month (Mo) / day (Day). See Part 6.1.2.1 of either permit for more information.

Facilities that discharge to an ephemeral water:

2. If you are submitting benchmark monitoring data, identify if your facility is required to collect benchmark samples for one or more hardness-dependent metals (i.e., cadmium, copper, lead, nickel, silver, and zinc). If "yes" to this question, you must also complete Question 3. If "no" to this question, skip to Section D.

3 If "yes" to Question 2 under Section C, then you are required to submit to ADEQ with your first benchmark report a hardness level, established consistent with the procedures in Appendix D of the Non-mining MSGP, which is representative of your receiving water. Mining MSGP permit holders are also required to report hardness; refer to the Stormwater Monitoring Guidance Document for the Mineral Industry for instructions. If the facility's outfalls discharge to more than one receiving water, as reported in your NOI form, you should report hardness for the receiving water with the lowest hardness values. Hardness values must be reported in milligrams per liter (mg/L).

Section D. Outfall Information

1. Enter the total number of outfalls identified in your stormwater pollution prevention plan (SWPPP). Outfalls are locations where stormwater exits the facility, including pipes, ditches, swales, and other structures used to remove stormwater from the facility.

2. Indicate if your facility has two or more outfalls that you believe discharge substantially identical effluents (i.e., stormwater), based on the similarities of the general industrial activities and control measures, exposed materials that may significantly contribute pollutants to stormwater, and runoff coefficients of their drainage areas. See Parts 5.1.5.2 and 6.1.1.1 of either permit for more information on substantially identical outfalls.

3. If "yes" to Question 2 under Section D, then you must list the outfall name(s) in Column 4.B. that you expect to be substantially identical to the corresponding outfall in Column 4.A.

4.A. *Monitored Outfall Name:* List name(s) of outfall(s) you are required to monitor in Column 4.A.

4.B. *Substantially Identical Outfalls:* List name(s) of outfall(s) substantially identical to "*Monitored Outfall*" in Column 4.A. (if applicable)].

4.C *No Discharge:* Check box if you are reporting "No Discharge" for the monitored outfall for the reporting period identified in Section C.1.

Example:

4.A Monitored Outfall Name	4.B Substantially Identical Outfall	4.C No Discharge
Outfall A	Outfall B; Outfall C	☐
Outfall D		☒

Reference attachment if additional space is needed to complete the Table Section D.

Section E. Monitoring Information

1. Enter ADEQ's Authorization Number for the facility reported in Section A.

2. For the reported monitoring event indicate whether the discharge was from a rainfall or snowmelt event. If you select "rainfall" then indicate the duration (in hours) of the rainfall event, rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event in line items 2.a-c. For both rainfall and snowmelt monitoring, you must identify the date of collection for the monitoring event in column 3.g. of the table. If the discharge occurs during a period of both rainfall and snowmelt, check both the rainfall and snowmelt boxes and report the appropriate rainfall information in item 2.a-c. To report multiple monitoring events in the same reporting period, copy Page 2 of

this Form and enter each monitoring event separately with data for all outfalls sampled.

For each pollutant monitored at an outfall, you must complete one row in the Table as follows:

3.a. *Outfall Name*: Provide the outfall name for which you monitored (e.g., Outfall 1, Outfall 2, Outfall 3).

3.b. *Monitoring Type*: Provide the type of monitoring using the specified codes, in parentheses, below:
- (BM) –benchmark monitoring
- (ELG) – Annual effluent limitations guidelines monitoring;
- (OAW) – Outstanding Arizona Water;
- (I) – Impaired waters monitoring; or
- (O) – Other monitoring as required by ADEQ.

3.c. *Parameter(s)*: Enter each "Parameter" (or "pollutant") monitored. For BM and ELG monitoring, use the same parameter name as in Part 8 of the permit.

3.d. *Quality or Concentration*: Enter sample measurement value for each parameter analyzed and required to be reported. Enter "ND" (i.e., not detected) for any sample results below the method detection limit or "BQL" (i.e., below quantitation limit) for sample results above the detection limit but below the quantitation limit.

3.e. *Units*: Enter the units for sample measurement values (i.e., "mg/L" for milligrams per liter) for each parameter analyzed and required to be reported. For monitoring results reported as ND or BQL this space will be left blank and the units will be reported in Column 3.f.

3.f. *Results Description*: This section must be completed for any monitoring results reported as ND or BQL in the "Quality or Concentration" column. For ND, report the laboratory detection level and units in this column. For BQL, report the laboratory quantitation limit and units in this column.

3.g. *Collection Date*: Identify the sampling date for each parameter monitoring result reported on this form.

3.h. **Non-mining MSGP only:** *Exceedance due to natural background pollutant levels:* Check box if following the first 4 quarters of benchmark monitoring (or sooner if the exceedance is triggered by less than 4 quarters of data) you have determined that the exceedance of the benchmark is attributable solely to the presence of that pollutant in the natural background for that outfall and any substantially identical outfalls. See Part 6.2.1.3 of the permit for more information. Attach supporting rationale for your determination to the submitted DMR and reference attachment in Section E.4. Mining MSGP permit holders are advised to refer to the Stormwater Monitoring Guidance Document for the Mineral Industry for instructions.

3.i. **Non-mining MSGP only:** *No further pollutant reductions achievable:* Check box if after collection of 4 quarterly samples (or sooner if the exceedance is triggered by less than 4 quarters of data), the average of the 4 monitoring values for any parameter exceeds the benchmark and you have made the determination that no further pollutant reductions are technologically available and economically practicable and achievable in consideration of best industry practice to meet the technology-based effluent limits or are necessary to meet the water-quality-based effluent limitations in Part 2 of the permit (See Part 6.2.1.3 of the permit for more information) for that outfall and any substantially identical outfalls. Attach supporting rationale for your determination to the submitted DMR and reference attachment in Section E.4. Mining MSGP permit holders are advised to refer to the Stormwater Monitoring Guidance Document for the Mineral Industry for instructions.

4. Where violations of the permit requirements are reported, include an explanation to describe the cause and corrective actions taken, and reference each violation by date. Also, this section should include any additional comments such as are required when changing site status from inactive and unstaffed to active or vice versa. Attach additional pages if you need more space.

Attach additional copies of Section E as necessary to address all outfalls and parameters.

Section F. Certification

Enter "*Name/Title of Principal Executive Officer or Authorized Agent*" with "*Signature of Principal Executive Officer or Authorized Agent,*" "*Date*" form was signed and e-mail of the "*Principal Executive Officer or Authorized Agent*." If you submit multiple pages of Section E monitoring data, each page must be appropriately signed and certified as described below.

Certification statement and signature (see Appendix B, Subsection 9 of the MSGP for more information). State statutes provide for severe penalties for submitting false information on this application form. This form must be signed by one of the following individuals, or a duly authorized representative of that person, as follows:

For a corporation: by a responsible corporate officer, which means:

(i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or

(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or
For a municipal, State, Federal, or other public facility: by either a principal executive or ranking elected official.

ANNUAL REPORT FORM

for the Non-mining and Mining Multi-Sector General Permits

Use this form for documenting results from the annual Comprehensive Facility Inspection, in accordance with Part 4.3 and Part 7.2 of both permits. All permittees must complete an annual report form and file it with the SWPPP. Permittees with facilities that discharge to an impaired or outstanding Arizona water shall submit an annual report on or before July 15 (postmark date) during each year until coverage is terminated (*not* when the permit expires) to the following address:

Arizona Department of Environmental Quality; Surface Water Section / Stormwater Program
1110 West Washington, 5415A-1; Phoenix, Arizona 85007
Faxed forms are not acceptable.

A. GENERAL INFORMATION

1. AZPDES Authorization Number: AZMSG – _____

2. Facility Name: _____

3. Facility Physical Address:

   Street: _____

   City: _____ State: |___|___| Zip Code: _____

4. Lead Inspector's Name: _____ Title _____

   Additional Inspector's Name(s): _____ _____

5. Contact Person: _____ Title: _____

   Telephone: _____ Ext. _____ E-mail: _____

6. Inspection Date: |___|___| / |___|___| / |___|___|___|___|

B. GENERAL INSPECTION FINDINGS

1. As part of this comprehensive facility inspection, did you inspect all potential pollutant sources, including areas where industrial activity may be exposed to stormwater?

   ☐ YES ☐ NO

   If NO, explain why not:

Note: *Complete Section C of this form for each industrial activity area inspected and included in your SWPPP or as newly identified in B.2 or B.3 below where pollutants may be exposed to stormwater.*

2. Did this inspection identify any stormwater or non-stormwater outfalls not previously identified in your SWPPP: ☐ YES ☐ NO

   If YES, for each location, describe the sources of those stormwater and non-stormwater discharges and any associated control measures in place.

3. Did this inspection identify any sources of stormwater or non-stormwater discharges not previously identified in your SWPPP?

☐ YES ☐ NO

If YES, describe these sources of stormwater or non-stormwater pollutants expected to be present in these discharges and any control measures in place.

4. Did you review stormwater monitoring data as part of this inspection to identify potential areas of concern for stormwater pollution?

☐ YES ☐ NO ☐ N/A, no monitoring performed

If YES, summarize the findings of that review and describe any additional inspection activities resulting from this review::

5. Describe any evidence of pollutants entering the drainage system or discharging to surface waters and the condition of and around outfalls, including flow dissipation measures to prevent scouring:

6. Have you taken or do you plan to take any corrective actions, as specified in Part 3 of the permit, since your last annual report submission (or since you received authorization to discharge under this permit if this is your first annual report), including any corrective actions identified as a result of this annual comprehensive facility inspection?

☐ YES ☐ NO

NOTE: *Complete the attached Corrective Action Form (Section D) for each condition identified, including any conditions identified as a result of this comprehensive stormwater inspection.*

C. INDUSTRIAL ACTIVITY AREA-SPECIFIC FINDINGS

Complete one block for each industrial activity area where pollutants may be exposed to stormwater.

In reviewing each area, you must look for:

- ► Industrial materials, residue or trash that may have or could come into contact with stormwater;
- ► Leaks or spills from industrial equipment, drums, tanks and other containers;
- ► Offsite tracking of industrial or waste materials from areas of no exposure to exposed areas; and
- ► Tracking or blowing or raw, final, or waste materials from areas of no exposure to exposed areas.

INDUSTRIAL ACTIVITY AREA _____

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form – Section D.)

INDUSTRIAL ACTIVITY AREA _____

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form.)

INDUSTRIAL ACTIVITY AREA _____

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional / revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form.)

Copy this page for additional industrial activity areas and attach additional pages as necessary

INDUSTRIAL ACTIVITY AREA _____

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional / revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form.)

INDUSTRIAL ACTIVITY AREA _____

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional/revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form.)

INDUSTRIAL ACTIVITY AREA _____

1. Brief Description:

2. Are any control measures in need of maintenance or repair? ☐ YES ☐ NO
3. Have any control measures failed and require replacement? ☐ YES ☐ NO
4. Are any additional / revised control measures necessary in this area? ☐ YES ☐ NO

If YES to any of these three questions, provide a description of the problem: (Any necessary corrective actions should be described on the attached Corrective Action Form.)

D. CORRECTIVE ACTIONS

Complete this page for each specific condition requiring a corrective action. Copy this page for additional corrective actions.

1. Corrective Action # |___|___| of |___|___| for this reporting period.

2. Is this correction action:

   ____ An update on a corrective action from a previous annual report, or

   ____ A new corrective action?

3. Identify the conditions(s) triggering the need for this review.

   ____ Unauthorized release or discharge

   ____ Violation of a numeric effluent limitation guideline

   ____ Control measures inadequate to meet applicable water quality standards

   ____ Control measures inadequate to meet an adopted Waste Load Allocation

   ____ Control measures not properly operated or maintained

   ____ Change in facility operations necessitated change in control measures

   ____ Other (describe): _____

4. Briefly describe the nature of the problem identified.

5. Date problem identified: |__|__| / |__|__| / |__|__|__|__|

6. How problem was identified:

   ____ Comprehensive facility inspection

   ____ Visual assessment

   ____ Quarterly routine facility inspection

   ____ Benchmark, numeric Effluent Limitation Guideline or other analytical monitoring

   ____ Notification by ADEQ, EPA or another Federal, State or local agency having stormwater program authority, or the operator of a regulated MS4 receiving discharges from the facility (where applicable)

   ____ Other (describe): _____

7. Description of corrective action(s) taken or to be taken to eliminate the problem (e.g., describe modifications or repairs to control measures, analyses to be conducted, etc.) or if no modifications are needed, basis for that determination.

8. Did / will this corrective action require modification to your SWPPP? ☐ YES ☐ NO

9. Date corrective action initiated: |___|___| / |___|___| / |___|___|___|___|

10. Date corrective action completed: |___|___| / |___|___| / |___|___|___|___| or expected to be completed: |___|___| / |___|___| / |___|___|___|___|

11. If corrective action not yet completed, provide the status of corrective action at the time of the comprehensive facility inspection and describe any remaining steps (including timeframes associated with each step) necessary to complete corrective action.

E. ANNUAL REPORT CERTIFICATION

1. Compliance Certification.

   Do you certify that your annual comprehensive facility inspection has met the requirements of Part 4.3 of the permit, and that, based upon the results of this inspection, to the best of your knowledge; you are in compliance with the permit?

   ☐ YES ☐ NO

   If NO, explain why you are not in compliance with the permit:

2. Annual Report Certification

   I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

   Printed Name: _____ Title: _____

   Signature: _____ Date: _____

Attachment 14: Stormwater Pollution Prevention Team

Team Assignment	Member Name	Responsibility
Plan Manager	To Be Determined	Oversee implementation of the stormwater program
Facility Inspector	To Be Determined	Perform inspections and assist in implementation of the stormwater program
Records-keeper	To Be Determined	Maintain all inspection records and plan updates
Spill Prevention and Reporting Manager	To Be Determined	Notify appropriate regulatory agencies of reportable spills
Trainer	To Be Determined	Perform SWPPP training

ADEQ Arizona Department of Environmental Quality

AZMSG2010-002 ● AZMSG2010-003

NOTICE OF INTENT (NOI)

for Stormwater Discharges Associated with

INDUSTRIAL ACTIVITY

under the AZPDES 2010 Multi-Sector Permits

FOR COVERAGE, A COMPLETE AND ACCURATE NOI MUST BE SUBMITTED TO:
Arizona Department of Environmental Quality; Surface Water Section/Stormwater Program
1110 West Washington, 5415A-1; Phoenix, Arizona 85007
FAX: (602) 771-4528

Submitting this completed Notice of Intent (NOI) constitutes notice that the operator identified in Section B of this form requests authorization to discharge pollutants to waters of the United States from the facility identified in Section C under the AZPDES Multi-Sector General Permit(s) (MSGP) for industrial stormwater. Submitting this NOI constitutes your notice to ADEQ that the facility identified in Section C of this form meets the eligibility conditions of Part 1.1 of the MSGP. Please read and make sure you comply with all eligibility requirements, including the requirement to prepare a Stormwater Pollution Prevention Plan. Refer to the instructions at the end of this form to complete your NOI.

A. NOI REVISION (Follow instructions carefully.)

2010 Authorization #
(ADEQ Use Only)

► Is this NOI a revision for a facility previously filed under the AZPDES 2010 Multi-Sector General Permit?
_____ YES _____ NO If "yes," complete the following:

1. Provide your current authorization #: AZMSG-_____
2. Provide the name of the facility listed in Part C.1 and only the specific information being revised.
3. Complete the certification section (Part F) and have this document signed by the authorized signatory.

B. FACILITY OPERATOR INFORMATION

- Contact Name: _____ Phone: _____ Ext: _____
- E-mail: _____ Fax: _____
- Operator Business Name: _____
- Mailing Address: _____
- City: _____ State: |_____| Zip Code: _____

C. FACILITY INFORMATION

1. Facility Name: _____
2. Facility physical location (include the address, if applicable, otherwise provide directions from the nearest municipality):
   - Street: _____
     _____
     _____
   - City: _____ State: |_____| Zip Code: _____
   - County: _____ Phone: _____ Ext: _____
3. Provide the latitude and longitude of the outfall (discharge location) of the facility in degrees/minutes/seconds:

   Latitude: |___ı___|° |___ı___|' |___ı___| . |_____|" (Degrees, minutes, seconds)
   Longitude: |___ı___ı___|° |___ı___|' |___ı___| . |_____|" (Degrees, minutes, seconds)

4. Have stormwater discharges from the facility been covered previously under an EPA or AZPDES permit? _____ YES _____ NO
   If yes, provide one of the following:
   - ► The EPA tracking number: AZR05_____ OR
   - ► The AZPDES MSGP authorization number: AZMSG-_____ OR
   - ► The AZPDES Individual Permit number: _____
5. Is the facility located on Indian Country land? _____ YES _____ NO
   - ► ► If you answered yes, DO NOT submit this NOI to ADEQ. The Department does not have permitting authority on Indian Country land. You must coordinate with the U.S. EPA for permit coverage on Indian Country Land within Arizona..

6. PRIMARY INDUSTRIAL ACTIVITY: Identify the sector, subsector, and 4-digit Standard industrial Classification (SIC) or Activity Code (AC) that best represents the products produced or services rendered for which your facility is primarily engaged, as defined in the MSGP.

Sector |__|__| Subsector |__|__|__| SIC or AC |__|__|__|__|

► Area of industrial activity at the primary site that is exposed to stormwater: _______________ acres

7. CO-LOCATED INDUSTRIAL ACTIVITY: Identify the applicable sector(s), subsector(s) of co-located industrial activity, and 4-digit Standard Industrial Classification (SIC) or Activity Code (AC) for which you are requesting permit coverage.

Sector |__|__| Subsector |__|__|__| SIC or AC |__|__|__|__| ► Area of industrial activity exposed to stormwater: ___________ acre(s)

Sector |__|__| Subsector |__|__|__| SIC or AC |__|__|__|__| ► Area of industrial activity exposed to stormwater: ___________ acre(s)

Sector |__|__| Subsector |__|__|__| SIC or AC |__|__|__|__| ► Area of industrial activity exposed to stormwater: ___________ acre(s)

Sector |__|__| Subsector |__|__|__| SIC or AC |__|__|__|__| ► Area of industrial activity exposed to stormwater: ___________ acre(s)

Sector |__|__| Subsector |__|__|__| SIC or AC |__|__|__|__| ► Area of industrial activity exposed to stormwater: ___________ acre(s)

Sector |__|__| Subsector |__|__|__| SIC or AC |__|__|__|__| ► Area of industrial activity exposed to stormwater: ___________ acre(s)

8. Is the facility expected to be inactive and unstaffed at any time during the permit term? ☐ YES ☐ NO

► If yes, indicate the estimated starting and ending dates that you expect the facility to be inactive and unstaffed:

From _________________________ to _________________________

D. DISCHARGE INFORMATION

1. Does the facility discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ YES ☐ NO

► If yes, name the MS4 operator: ____

2. Receiving Waters.

a. List the closest water that receives stormwater directly and/or through an MS4 or other conveyance.	b. Check, as appropriate, if there are any of the discharges within 2.5 miles of any segment of an impaired or outstanding Arizona water (OAW.)	If the facility discharges within 2.5 miles of an impaired water, answer the following three questions		
		c.1. What pollutant(s) are causing the impairment?	c.2. Are the pollutant(s) causing the impairment present in the discharge?	c.3. Has a TMDL been completed for the pollutant(s) causing the impairment?
	☐ OAW ☐ Impaired		☐ Yes ☐ No	☐ Yes ☐ No

3. Water Quality Standards. (***Answer only if the facility has not been covered under the previous EPA or AZPDES permit.***)

   a. Are any of the new discharges into any portion of a receiving water designated by ADEQ as an impaired water? ☐ YES ☐ NO

   b. Has the receiving water(s) been designated as an outstanding Arizona water (OAW)? ☐ YES ☐ NO

4. Effluent Limitation Guidelines and Sector-Specific Requirements.

   a. Are you requesting permit coverage for any stormwater discharges subject to effluent limitation guidelines? ☐ YES ☐ NO

   ► If yes, which effluent limitation guidelines apply to the stormwater discharges? (see page 3)

Effluent Limitation Guidelines (40 CFR Part/Subpart)	Eligible Discharges	Affected MSGP Sector	Check if Applicable
Part 429, Subpart I	Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	A	
Part 418, Subpart A	Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	C	
Part 443, Subpart A	Runoff from asphalt emulsion facilities	D	
Part 411, Subpart C	Runoff from material storage piles at cement manufacturing facilities	E	
Part 436, Subpart B, C, or D	Mine dewatering discharges at crushed stone mines, construction sand and gravel mines, or industrial sand mines	J	
Part 445, Subparts A & B	Runoff from hazardous waste and non-hazardous waste landfills	K, L	
Part 423	Coal pile runoff at steam electric generating facilities	O	

b If you are a Sector S (Air Transportation) facility, do you anticipate using more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis? ____ YES ____ NO

E. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

1. I confirm that a SWPPP meeting the requirements of the general permit has been developed and will be implemented prior to discharging stormwater from this facility. ____ YES ____ NO
2. Name of the person to contact to view the SWPPP: _____
3. Telephone number of the SWPPP contact: _____ Ext: _____ Fax: _____
4. E-mail: _____
5. If the facility is located within 2.5 miles of an OAW or impaired water, have you enclosed a copy of the SWPPP with this NOI? ____ YES ____ NO

   (The SWPPP will be reviewed and approved by ADEQ before permit authorization is issued.)

F. CERTIFICATION

I certify under penalty of law that I have met the eligibility conditions of this permit and that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Print Name: _____ Title: _____

Signature: _____ Date: _____

Business Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

E-Mail: _____ Phone: _____ Ext: _____

AZMSG2010-002 ●AZMSG2010-003
NOTICE OF INTENT INSTRUCTIONS
for Stormwater Discharges Associated with
INDUSTRIAL ACTIVITY
under the AZPDES 2010 Multi-Sector Permits

Who Must File A Notice Of Intent (NOI)

Under section 402(p) of the Clean Water Act (CWA) and regulations in 40 CFR 122, stormwater discharges associated with industrial activity are prohibited to waters of the United States unless covered under an authorizing permit. In Arizona, such discharges are covered by Arizona Pollutant Discharge Elimination System (AZPDES) permits. Coverage may be obtained under one, or both, Multi-Sector General Permits (MSGPs) by submitting a completed NOI if you operate a facility that:

- Discharges stormwater associated with industrial activities, identified in Appendix C of the MSGP;
- Meets the eligibility requirements in Part 1.1 of the permit;
- Develops a stormwater pollution prevention plan (SWPPP) in accordance with Part 5 of the MSGP; and
- Installs and implements control measures in accordance with Parts 2 and 8 of the MSGP to meet numeric and non-numeric effluent limits.

If you are unsure if you need an AZPDES stormwater permit for discharges associated with industrial activity, contact ADEQ's storm-water permitting program at (602) 771-4508.

One NOI must be submitted for each facility for which you are seeking permit coverage. However, you do not need to submit a separate NOI for each type of industrial activity present at your facility, provided your SWPPP covers all industrial activities.

When to File the NOI Form

Do not file your NOI until you have obtained and thoroughly read the AZPDES 2010 MSGPs, which are located at:

Mining: http://azdeq.gov/environ/water/permits/download/2010/122010g.pdf.

Non-Mining: http://azdeq.gov/environ/water/permits/download/2010/122010f.pdf.

The MSGPs describe procedures to ensure your eligibility, prepare your SWPPP, install and implement appropriate stormwater control measures, and complete the NOI form questions – all of which must be done before you sign the NOI certification statement attesting to the accuracy and completeness of your NOI. You will also need a copy of the appropriate MSGP once you have obtained coverage so that you can comply with the implementation requirements of the permit.

Where to File the NOI Form

Notice of Intent forms sent by regular or overnight/express mail:

Arizona Department of Environmental Quality
Surface Water Section / Stormwater Program
1110 West Washington, 5415A-1
Phoenix, Arizona 85007

Notice of Intent forms sent by facsimile:

(602) 771-4528

The SWPPP does not need to be submitted to ADEQ for review unless the facility is within 2.5 miles of an impaired or outstanding Arizona water (OAW) or ADEQ specifically requests a copy of the SWPPP.

Completing the NOI Form

Be certain that you complete all fields. Make a photocopy for your records before you send or fax the completed form to the location listed above.

Section A. NOI Revision

This section does not apply to a permit renewal.

Complete this section ONLY if your facility is permitted under one, or both, of the 2010 MSGPs and information has changed that requires you to update your NOI.

Section B. Facility Operator Information

Provide the name of the person who will serve as the primary contact for the facility.

Provide the legal name of the firm, public organization or other public entity that operates the facility described in this NOI. An operator is a legal entity that controls the operation of the facility.

Provide the operator's mailing address, telephone number, fax number (optional), and email address. All correspondence will be sent to this address.

Section C. Facility Information

1. Provide the facility's official or legal name. Unless the name of your facility has changed, please use the same name provided on prior NOIs.
2. Provide the street address, city, state, zip code, and county of the actual physical location of the facility. If the facility does not have an address, provide driving directions from the nearest municipality. Do not use a PO Box number.
3. Provide the latitude and longitude of the facility in degrees, minutes, and seconds. You can obtain these coordinates through geographic information system tools, topographic maps, or ADEQ's web-based GIS mapping system at: http://gisweb.azdeq.gov/arcgis/emaps/?topic=impaired.

   For consistency, take the coordinates from the location of your facility's stormwater outfall. Outfalls are locations where the stormwater exits the facility, including pipes, ditches, swales, and other structures that transport stormwater. If there is more than one outfall present, provide the coordinates of the primary outfall (i.e., the outfall with the largest volume of stormwater discharge associated with industrial activity).
4. Indicate if industrial stormwater discharges from your facility were previously covered by a NPDES or AZPDES permit.

   If the facility was covered by the 2000 MSGP, include the EPA tracking number or the ADEQ authorization number, whichever is applicable. If the facility was covered under an AZPDES individual permit, include that permit number.
5. Indicate whether the facility is located on Indian Country Lands. If you answered yes, DO NOT submit this NOI to ADEQ. The Department does not have permitting authority on Indian County Lands. You must coordinate with the U.S. EPA for permit coverage on Indian Country Land within Arizona.
6. Provide the sector and subsector codes, and SIC or Activity Codes that best describes the primary industrial activities performed by your facility. Your primary industrial activity includes any activities performed onsite that are (1) identified by the facility's SIC code for which the facility is primarily engaged; and (2) included in the narrative descriptions of 40 CFR 122.26(b)(14)(i), (iv), (v), or (vii) and (ix). See Appendix C of the MSGP for a complete list of SIC codes and Activity Codes. See the footnote in Appendix C, or Table 1, for how to determine the SIC code.

   Enter the area (in acres) of industrial activity at your facility that is exposed to stormwater.
7. If your facility has co-located industrial activities that are not identified as your primary industrial activity, identify the sector and subsector codes, SIC or Activity Codes, and area (in acres) that describe these other industrial activities. For a complete list of sector and subsector codes, see Appendix C of the MSGP.

   Enter the area of industrial activity (by SIC or AC code) of all co-located sites exposed to stormwater.
8. Indicate whether the facility is expected to be inactive and unstaffed at any time during the permit term. If yes, specify the

term (with approximate dates) in which the facility will be inactive and unstaffed.

Section D. Discharge Information

1. Indicate whether stormwater from your facility will be discharged into a municipal separate storm sewer system (MS4). An MS4 is a conveyance or system of conveyances, including roads with drainage systems, municipal streets, catch basins, storm drains, curbs and gutters, ditches and man-made channels, owned or operated by a state, city, town, county, district, association or other public body, used to collect or convey stormwater.

   If you checked "yes," identify the name of the MS4 operator. A list of MS4 operators can be found at: http://www.azdeq.gov/environ/water/permits/stormwater.html#ms4.

2. Receiving Water.
   a. Indicate the name(s) of the receiving water(s) into which stormwater from your facility will discharge. The receiving water may be a lake, stream, river, dry wash, wetland, or other waterbody, and may or may not be located adjacent to your facility.

      Stormwater from the facility may discharge directly to a receiving water or indirectly via a storm sewer system, an open drain or ditch, or other conveyance structure. DO NOT list a man-made conveyance, such as a storm sewer system, as your receiving water. Indicate the first receiving water your stormwater discharge enters. For example, if the discharge enters a storm sewer system that empties into Trout Creek, which flows into Pine River, the receiving water is Trout Creek because it is the first waterbody the discharge will reach. Similarly, a discharge into a ditch that feeds Spring Creek should be identified as "Spring Creek" since the ditch is a manmade conveyance.

      If the facility discharges into a municipal separate storm sewer system (MS4) you must identify the waterbody into which that portion of the storm sewer discharges. That information should be readily available from the operator of the MS4.

   b. Indicate whether the facility discharges within 2.5 miles of a lake, river, stream segment, wash, etc. that is classified as an impaired or outstanding Arizona water (OAW) under the "2006/2008 303(d) List of Impaired and Not Attaining Waters" (http://www.azdeq.gov/environ/water/assessment/download/2008/2006_2008.pdf).

   c. Answer the following questions only if you answered "yes" to Item D.2.b.
      i. Provide the pollutants listed as causing the impairment in the water identified in Item D.2.b.
      ii. Out of the pollutant(s) that you identified in Item D.2.c.1, indicate which pollutants you believe will be present in the discharge. If you do not expect any of these pollutants to be in the discharge, then enter "none."
      iii. Indicate the pollutants that have a Total Maximum Daily Load (TMDL) for the impaired stream segment that you identified in Item D.2.c.2. (See the 2006/2008 list of impaired waters at: http://www.azdeq.gov/environ/water/assessment/download/2008/2006_2008.pdf.)

3. Water Quality Standards

   If you selected "yes" in Item C.4 you are considered an existing discharger and may skip this question.

   If you selected "no" in Item C.4 indicating that stormwater discharges from your facility have not been previously covered under an NPDES or AZPDES permit, you are considered a new discharger and must answer this question.

   a. If you are a new discharger, any discharge into an impaired water is not automatically eligible for coverage under the MSGP. (See Part 1.1.4.5 of the permit.)

   b. If you selected "yes" in Item D.3.b indicating that the receiving water has been designated as an outstanding Arizona water (OAW) under A.A.C. R18-11-112 you are not eligible for coverage under the MSGP. (See Part 1.1.4.6 of the permit.)

4. Effluent Limitation Guidelines and Sector-Specific Requirements
   a. Depending on your industrial activities, your facility may be subject to effluent limitation guidelines that include additional effluent limits and monitoring requirements for your facility. Review the requirements, described in Part 2.2.1 of the MSGP, and check any appropriate boxes on the NOI form.
   b. For Sector S facilities (Air Transportation), indicate whether you anticipate that the entire airport facility will use more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis. If so, additional effluent limits and monitoring conditions apply to your discharge (See Part 8, Sector S of the MSGP).

Section E. Stormwater Pollution Prevention Plan (SWPPP)

Identify the name, telephone number and e-mail address of the person who will serve as a contact for ADEQ on issues associated with stormwater management at your facility. This person should be able to answer questions related to stormwater discharges, the SWPPP, and other matters related to stormwater permit coverage, or have immediate access to individuals with that knowledge. This person does not have to be the facility operator, but should have intimate knowledge of stormwater management activities at the facility.

You must keep a copy of your SWPPP onsite or otherwise make it available to facility personnel responsible for implementing provisions of the permit.

Section F. Certification

Certification statement and signature (See Appendix B.9 of the MSGP for more information). Enter the certifier's (authorized signatory) printed name, title, and e-mail address.

Sign and date the form. (CAUTION: An unsigned or undated NOI form will prevent the granting of permit coverage.) This NOI must be signed as follows:

For a corporation: by a responsible corporate officer, this means:

1. President, secretary, treasurer, or vice-president of the corporation in charge of the principal business function, or any other person who performs similar policy or decision making functions, or
2. The manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit NOI requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality state, federal, or other facility: by either a principal executive or ranking elected official.

Notes: Operators cannot delegate the responsibility for signature on a Notice of Intent (NOI) form to a consultant, agent, or any other third party.

State statutes provide for severe penalties for submitting false information on this NOI form.

NOTICE OF TERMINATION (NOT)

of Coverage under an AZPDES General Permit for Stormwater Discharges Associated with Industrial Activity

FOR TERMINATION OF COVERAGE, A COMPLETE AND ACCURATE NOT MUST BE SUBMITTED TO:
Arizona Department of Environmental Quality / Stormwater Program
1110 West Washington, 5415A-1; Phoenix, Arizona 85007
FAX: (602) 771-4528

Submitting this Notice of Termination (NOT) constitutes notice that the party identified in Section B below is no longer authorized to discharge stormwater associated with industrial activity under the AZPDES program for the facility identified in Section C below. All necessary information must be included on this form. Refer to the instructions.

A. PERMIT INFORMATION

MSGP Authorization Number: **AZMSG–**_____

Reason for Termination (check one):

_____ Operational control has been transferred to another operator.

_____ Operations have ceased at the facility, there are not or no longer will be stormwater discharges associated with industrial activity from the facility, and the necessary sediment and erosion controls as required by Part 2.1.1.5 have already been implemented.

_____ The facility is classified as a Sector G or J facility and has met the applicable termination requirements.

_____ Coverage has been obtained under an alternative AZPDES permit.

_____ No Exposure Certification received. (List No Exposure # _____)

B. FACILITY OPERATOR INFORMATION

Operator Name: _____ Phone: _____

E-mail: _____ Fax: _____

Business Name: _____

Mailing Address: _____

_____

City: _____ State: |___|___| Zip Code: _____

C. FACILITY LOCATION INFORMATION

Facility Name: _____

Facility Address or Site Physical Location: _____

_____

_____

City: _____ State: |___|___| Zip Code: _____

County: _____

D. CERTIFIER INFORMATION

I certify under penalty of law that I have met at least one of the reasons for terminating permit coverage listed in Section A above. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge stormwater associated with industrial activity under this general permit, and that discharging pollutants in stormwater associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by an AZPDES permit. I also understand that the submittal of this Notice of Termination does not release me from liability for any violations of this permit or the Clean Water Act.

Printed Name: _____ Title: _____

Signature: _____ Date: _____

E-mail Address: _____ Phone: _____

Address **(Complete ONLY if different from Section B)**: _____

_____

City: _____ State: |___|___| Zip Code: _____

NOTICE OF TERMINATION INSTRUCTIONS

for Stormwater Discharges Associated with INDUSTRIAL ACTIVITY under the Multi-Sector General Permit (MSGP)

Who May File Notice of Termination (NOT) Form

Permittees currently covered by the AZPDES stormwater Multi-Sector General Permit (MSGP) must submit a Notice of Termination (NOT) form within 30 days after one or more of the following conditions have been met:

- A new owner or operator has assumed responsibility for the facility; or
- Operations have ceased at the facility, there are not or no longer will be stormwater discharges associated with industrial activity from the facility, and the necessary sediment and erosion controls as required by Part 2.1.1.5 have been implemented; or
- The facility is categorized in Sector G or J and has met the applicable termination requirements; or
- Coverage under an individual or alternative general permit has been obtained for all discharges required to be covered by an AZPDES permit.

See Part 1.4 of the MSGP for more information.

Where to File NOT form

Notice of Termination forms sent by regular mail:

Arizona Department of Environmental Quality
Surface Water Section / Stormwater Program
1110 West Washington, 5415A-1
Phoenix, Arizona 85007

Notice of Termination forms sent by facsimile:

(602) 771-4528

Completing the Form

To complete this form, type or print in uppercase letters in the appropriate areas only. Please complete all questions. Make sure you make a photocopy for your records before you send the completed original form to the address above.

Please use ink when you sign the original document. If you have any questions about this form, you may call (602) 771-4632.

Section A. Permit Information

1. Enter either the EPA NPDES tracking number or ADEQ's Authorization Number if you received coverage after Dec. 5, 2002.
2. Indicate your reason for submitting this Notice of Termination by checking the appropriate box (see Part 1.4 of the MSGP for more information).

Section B. Facility Operator Information

1. Provide the legal name of the firm, public organization, or any other entity that operates the facility described in this application. The operator of the facility is the legal entity that controls the facility's operation, *not* the plant or site manager. Do not use a colloquial name.
2. Enter the complete mailing address, email address, telephone number, and fax number of the operator. This address will be used for any future correspondence between ADEQ and the facility operator.

Section C. Facility Information

1-2. Enter the facility's official or legal name and complete address, including city, county, or similar government subdivision, state, and zip code.

Section D. Certification

Certification statement and signature (see Appendix B, Section B.9 of the MSGP for more information). Enter the certifier's (authorized signatory) printed name, title, and email address. Sign and date the form.

Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, this means:

(i) President, secretary, treasurer, or vice-president of the corporation in charge of the principal business function, or any other person who performs similar policy or decision making functions, or

(ii) The manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality state, federal, or other facility: by either a principal executive office or ranking elected official.

State statutes provide for severe penalties for submitting false information on this application form.

APPENDIX X

Wildlife Management Plan

General Plan of Operations

Wildlife Management Plan

September 2014

TABLE OF CONTENTS

1. INTRODUCTION

Resolution Copper Mining, LLC (Resolution Copper) submitted a General Plan of Operations (Plan), dated November 2013, to the Tonto National Forest (TNF) for authorization to construct an underground mine, ore processing operation, and associated facilities and infrastructure near Superior, Pinal County, Arizona. These components are collectively identified as the Resolution Copper Project (Project). The proposed location for the Project is referred to as the General Project Area (GPA) as defined in the submitted Plan.

The main sites and associated primary project elements within the GPA include:

- East Plant Site (EPS) – Underground mine and attendant shafts and surface support facilities;
- West Plant Site (WPS) – Ore and development rock stockpiles, Concentrator (ore processing facilities), and administrative facilities;
- Tailings Storage Facility (TSF) – Tailings storage area and associated Tailings Corridor (distribution pipeline and access roads);
- The Magma Arizona Railroad Company (MARRCO) Corridor (existing and future pipelines); and
- Filter Plant and Loadout Facility

Resolution Copper would implement a Wildlife Management Plan to discourage wildlife from entering active mining areas at the East Plant Site (EPS), West Plant Site (WPS), Tailings Storage Facility (TSF) and Filter Plant and Loadout Facility. The plan would provide guidance to Resolution Copper personnel on the management of wildlife that may be attracted to the tailings decant pond, non-contact and contact water catchments, and process water ponds. Resolution Copper would employ the application of the least aggressive management practices to deter and prevent wildlife from gaining access to these areas.

The goal of the Wildlife Management Plan would be to reduce the potential for wildlife injury and mortality at active mining facilities. The plan would continue to evolve and would be periodically modified within an adaptive management framework aimed at improving the efficacy of wildlife protection measures. A final Wildlife Management Plan would be developed as the Project advances through National Environmental Policy Act (NEPA).

The following sections provide a brief description of the facilities and areas that would require implementation of wildlife protection measures (***Section 2***) and the types of wildlife protection measures and protocols that would be implemented by Resolution Copper for the Project (***Section 3***).

2. FACILITY DESCRIPTIONS

This section describes the process water ponds and the non- contact and contact water basins at the EPS, WPS, TSF and Filter Plant and Loadout Facility that would require monitoring and implementation of protection measures to prevent wildlife from gaining access to these areas. Details on facility design

and existing site conditions for the proposed facility locations (e.g. existing facilities, infrastructure, and environmental setting) are contained within the submitted Plan.

2.1. EAST PLANT SITE

The EPS is approximately 68 miles east of Phoenix and 2 miles east of Superior. The EPS encompasses the proposed underground mine, associated shafts and ore handling systems, and surface support facilities. The existing mine and related surface support facilities are on private lands, and during mine operations, would largely expand onto private lands. The support facilities, some of which already exist, are in a previously disturbed area and include a mine site where Shaft 9 was constructed in the 1970s. Additional area encompassed by the EPS includes the land surface above the ore body, comprised of unpatented mining claims on the Tonto National Forest and Arizona State Trust lands administered by the Arizona State Land Department (ASLD).

Facilities that would be monitored for wildlife at EPS include three contact water basins (E1, E2, and E3). Contact Water Basins E1 and E2 would be constructed at the eastern edge of the EPS. The basins would be sited at low points in an existing drainage to capture the majority of the stormwater flows from the newly developed mine area. These basins would be emptied after each storm event, and contact water would be reused in the process water supply or the underground mine operations. Contact Water Basin E3 would contain flows from the existing and new mine facilities. This basin would be in the area of an existing sump, which would be deepened and widened to catch all contact flow from these areas. This basin would be lined to prevent surface water infiltration.

2.2. WEST PLANT SITE

The WPS is approximately 65 miles east of Phoenix and 1 mile north of Superior on Resolution Copper private property and the Tonto National Forest. The WPS encompasses facilities associated with past mining activity and facilities that are currently in operation either to support new development or for closure of legacy facilities. New features at WPS would include rail facilities, development rock stockpiles, new ore processing facilities (the Concentrator Complex), conveyor systems, and associated surface infrastructure (including administration buildings) to support the underground development and mining occurring at the EPS.

Facilities at WPS that would be monitored for wildlife include a process water pond and contact water basins. Process water for WPS use would be stored in the 50-million-gallon (190,000-m^3) Process Water Pond. This pond would receive water from the CAP well field and CAP canal, filtrate from the Filter Plant, reclaim water from the TSF and contact water pumped from the local contact water ponds. Overflow water from the tailings, copper, and pyrite thickeners would drain or be pumped to the Tailings Thickener Overflow Tank for pumping back to the Process Water Pond where it would be recycled.

Contact water basins (W1, W2, W3, W4, and W5) would be built to act as storage facilities for contact stormwater from the WPS. These basins would provide stormwater management for the following facilities:

- Development Rock and Intermediate Rock stockpiles;
- The Concentrator Complex, which includes the process water pond, ore stockpile facility, tailings thickeners, copper molybdenum and copper concentrator thickeners, and the molybdenum plant;

Non-Contact water basins (W6, W7, W8, and W9) would be built to act as storage facilities for stormwater that falls in the Ancillary Facilities catchment areas. Ancillary Facilities include the administration building, contractor and warehouse laydown yards, and construction and employee parking. No mining activity would occur within the Ancillary Facilities area.

2.3. TAILINGS STORAGE FACILITY

The TSF would be situated west of the WPS and north of Queen Station, within the TNF. The TSF would consist of the tailings storage area and associated Tailings Corridor (distribution pipeline and access roads). Tailings would arrive at the TSF from the WPS via a pipeline that traverses the intervening area (along with other infrastructure) along the Tailings Corridor.

Facilities at the TSF that would be monitored for wildlife include the tailings decant pond, seepage collection ponds, and stormwater catchment basins. The stormwater that falls directly on the TSF, or downstream of the diversion channels in early stages of tailings construction, would be contained within the TSF. This water would directly offset supply water needs for tailings void fill and water lost to evaporation. The stormwater that seeps through the tailings would be collected in a series of rockfill underdrains to report to one of 11 seepage collection dams.

2.4. FILTER PLANT AND LOADOUT FACILITY

The Filter Plant and Loadout Facility would be constructed near Magma adjacent to the existing Magma Arizona Railroad Company (MARRCO) right-of-way. The Filter Plant and Loadout Facility would consist of a copper concentrate filtration plant and facility to load concentrate onto trains for shipment.

Contact water from the Filter Plant and Loadout Facility would be contained on site in contact water basins (F1 and F2) and recycled back into the process water circuit. Drainage from the Concentrate Filter Plant, Conveyor, Concentrate Loadout, Clarifier, Ancillary Facilities, an SRP Substation, a helipad, and a parking area would flow to Contact Water Basin F1. The runoff from the Filter Plant Site, CAP Water Pump Station, and CAP Water Tank would flow to Contact Water Basin F2.

3. WILDLIFE PROTECTION MEASURES

3.1. MONITORING

3.1.1. AVIAN SPECIES

Monitoring for wildlife would generally include daily, routine inspections at the EPS, WPS, TSF and Filter Plant and Load out Facility for avian species. Inspections would occur at the tailings decant pond,

non-contact and contact stormwater catchments, and process water ponds and would likely be conducted from a designated vehicle inspection route and/or pedestrian inspection walkway. During these inspections, a trained staff member would use binoculars to scan the ponds and vicinity looking for birds or bird sign. Any observations of birds made during these inspections would be documented in a field log. If a bird is encountered, the trained staff member would employ the appropriate deterrence method in accordance with the bird hazing program to be developed for the Project as described in ***Section 3.5***. An inspection frequency and schedule would be determined for the final Plan.

3.1.1. SONORAN DESERT TORTOISE

The Sonoran desert tortoise, a US Forest Service Sensitive Species and Candidate for listing under the ESA has the potential to occur in the vicinity of the proposed TSF. In general, a biological monitor would: 1) pre-survey the activity areas that include the known elevation range and habitat requirements of the Sonoran desert tortoise before ground disturbing activities start, 2) investigate the area for Sonoran desert tortoise shelter sites and, 3) monitor the excavation of any shelter sites. Any individuals encountered would be avoided and allowed to move out of the way prior to ground disturbing activities. If encountered near an activity area, work would stop at the area until the tortoise vacates to a safe distance. Guidelines for handling desert tortoise[1] published by Arizona Game and Fish Department (AGFD) would be used if absolutely necessary to move individual tortoises. A biological monitoring report would be submitted to the TNF.

3.2. DETERRENT METHODS

Non-lethal harassment techniques would start with implementation of the least invasive techniques (preventative measures and vegetation management). Effectiveness would be observed for a period of time by site staff during routine non-formal daily observations of the tailings storage facility, process water ponds, and contact and non-contact stormwater ponds and would ramp up to harassment, scare measures, floating covers or balls, and lastly the use of netting until wildlife use is diminished. Non-lethal harassment techniques listed in the plan would be adjusted or discontinued based on the observations in order to maximize effectiveness.

Ongoing deterrent efforts are being conducted by Resolution Copper and can be used to help determine the most effective deterrence strategies for the Project which would be incorporated into the final Wildlife Management Plan.

[1] Arizona Game and Fish Department (AGFD) 2007. Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects. Phoenix, Arizona. http://www.azgfd.gov/hgis/pdfs/Tortoisehandlingguidelines.pdf

3.3. PREVENTATIVE MEASURES

Fencing, where possible due to topographic constraints, would be installed around the perimeter of each site. The fence would act to prevent and block mammals from entering the sites. Additional barriers that may be used include floating balls, strategically mounted artificial predatory birds and decoys, or cover and netting on the tailings impoundment and process water ponds.

3.4. VEGETATION MANAGEMENT

Vegetation growth within the contact and non-contact stormwater catchment basins and process water ponds would be monitored and periodically removed as often as necessary to further discourage the presence of wading birds.

3.5. HAZING PROGRAM

Some additional non-lethal harassment and scare devices to deter and disperse wildlife from the tailings decant pond, non-contact and contact stormwater catchment basins and process water ponds may also be considered and could include: plastic ball covers, vehicle lights and horns, motion sensor lights, flags, perch deterrents, shell crackers, bird bangers, screamers, distress cries/electronic noise systems, bird scare balloons, propane cannons, and mylar scare tape.

A bird hazing protocol would be developed for Resolution Copper employees and would include a combination of harassment techniques. Additional hazing techniques may be adjusted or added as necessary based on field observations and ongoing research efforts. The protocol would include an inspection schedule, acceptable harassment techniques, a field log procedure, and incident reporting procedures. Resolution Copper staff responsible for implementing the bird hazing program would be trained on the protocol prior to its initiation.

3.6. PREVENTATIVE MAINTENANCE

During operations, the tailings decant pond, non-contact and contact stormwater catchment basins, and process water ponds would be routinely inspected as part of an operational and preventative maintenance program. Additionally, maintenance and/or operations personnel would be present on a daily basis to ensure prompt repair of the site fencing and other preventative or harassment/scare devices to discourage wildlife from the facility.

3.7. REPORTING

Resolution Copper documents all wildlife sightings and would report to the necessary agencies if any sick, injured, or deceased wildlife are observed on site. If a bird injury or mortality is observed during inspections, Resolution Copper staff would report the incident to the Environmental Manager who would then notify a wildlife rehabilitation expert in the case of an injury or U.S. Fish and Wildlife Law Enforcement or AGFD authorities in the case of mortality. A final reporting procedure would be developed for the final General Plan of Operations.

APPENDIX Y

Post-Closure Grading Plan

POST CLOSURE GRADING PLAN FOR THE RESOLUTION COPPER PROJECT IN PINAL COUNTY, ARIZONA

Prepared for: Resolution Copper Mining LLC

Prepared by: WestLand Resources, Inc.

Date: September 18, 2014

Project No.: 807.94

TABLE OF CONTENTS

FIGURES

(*follow text*)

1. INTRODUCTION

Resolution Copper Mining, LLC (Resolution Copper) submitted a General Plan of Operations (Plan), dated November 2013, to the Tonto National Forest (TNF) for authorization to construct an underground mine, ore processing operation, and associated facilities and infrastructure near Superior in Pinal County, Arizona. These components are collectively identified as the Resolution Copper Project (Resolution Project or Project).

The main sites and associated primary project elements include:

- East Plant Site (EPS) – Underground mine and attendant shafts and surface support facilities;
- West Plant Site (WPS) – Ore and development rock stockpiles, Concentrator (ore processing facilities), and administrative facilities;
- Tailings Storage Facility (TSF) – Tailings storage area and associated Tailings Corridor (distribution pipeline and access roads);
- Filter Plant and Loadout Facility (proximate to the existing Magma Arizona Railroad Company [MARRCO] right-of-way); and
- Connecting Infrastructure – Including the MARRCO Corridor.

The Resolution Project will have a total operational life of approximately 40 years, not including initial site construction and final reclamation work. Initial site construction could take up to ten years, while reclamation is projected to take between 5 and 10 years, although that time frame will be refined through National Environmental Policy Act (NEPA). WestLand Resources, Inc. (WestLand) has prepared this technical memorandum to describe the conceptual post closure grading plan for the EPS, WPS, and the Filter Plant Loadout Facility as shown in ***Figures 1-5***. The post-closure grading plan for the TSF (***Figure 6***) was developed by Klohn Crippen Berger and is not described in this technical memorandum.

2. POST CLOSURE GRADING PLAN

Resolution Copper facility areas (EPS surface facilities and WPS, TSF and Tailings Corridor, Filter Plant and Loadout Facility, and pipeline corridors) will be cross ripped along the contour, re-graded and contoured to blend into the surrounding topography and terrain as well as provide for erosion control and water collection for seed and seedlings. Compacted areas such as roads, parking and storage areas, building and structure sites will be cross ripped or disked along the contour or otherwise left in a roughened condition prior to growth medium material replacement. Closure of potentially discharging facilities will be completed in accordance with Aquifer Protection Permit (APP), Arizona Pollutant Discharge Elimination System, Pinal Air Quality Control District, Mine Land Reclamation Plan, and other applicable requirements. ***Figures 1-5*** show the main facility areas after re-grading as well as the water management structures (e.g., surface water diversions) that will either remain or be relocated after reclamation.

2.1. EAST PLANT SITE

The EPS facilities (shafts, hoist houses, etc.) will be decommissioned and the land surfaces will be cross-ripped along the contour, contoured and re-graded to blend into the surrounding topography and terrain, and reclaimed with appropriate local species seed mixes. The EPS post closure-grading plan is shown in ***Figures 1 and 2*** and includes the following:

- A berm and/or a fence will be constructed, monitored, and maintained along the entire perimeter of the Block Cave Subsidence Zone to prevent access. No additional reclamation activities are planned for this area. However, to the extent practicable, surface water diversions may be constructed to move storm water away from the subsidence zone and into natural drainages.
- All fill slopes shall be laid back to a maximum of 2.5:1.
- Shaft collars and subcollars will be permanently sealed. Shafts will be decommissioned or salvaged as necessary.
- The North and South Diversion Channels will be relocated as necessary to route flow to existing drainages.
- Contact Water Basins E1, E2 and E3 will be closed per permit requirements.

2.2. WEST PLANT SITE

WPS facilities will be decommissioned and the land surfaces will be contoured and graded as necessary to blend into the surrounding topography and terrain, and reclaimed with appropriate local species seed mixes. Onsite drainages will remain in place and be used to direct flow to the natural drainages. The post closure-grading plans for the northern and southern portions of WPS are shown in ***Figures 3 and 4***, respectively. The plan includes the following:

- All fill slopes shall be laid back to a maximum of 2.5:1.
- The West Diversion Channel, the East Stormwater Channel, and an onsite channel will remain in place to route flow through a new diversion channel to the Apex Tunnel to existing drainages (e.g. Silver King Wash)
- The Process Water pond located at the northern portion of WPS will be closed per APP requirements (e.g., pond will be drained, the liner removed, area will be backfilled, regraded and contoured to match as close as possible the pre-mining topography).
- Contact Water Basins W1 through W5 will be closed per APP requirements (e.g., pond will be drained, the liner removed, area will be backfilled, regraded and contoured to match as close as possible the pre-mining topography).
- The emergency overflow ditch from Contact Water Basin W1 will remain in place.
- Non-Contact Water Basins W6 through W9 will be graded to drain.
- Indian Pond, located at the southern portion of WPS, will be graded to drain.

2.3. FILTER PLANT AND LOADOUT FACILITY

Facilities at the Filter Plant and Loadout Facility that are not designated for salvage and/or that won't have a post-mining use will be demolished and the land reclaimed. For those areas that are regraded and reseeded, local species seed mixes will be used. The Filter Plant and Loadout Facility post closure-grading plan is shown in ***Figure 5*** and includes the following:

- The North Diversion Channel will remain in place and route flows to existing drainages.
- Contact Water Basins F1 and F2 will be closed per APP requirements (e.g., pond will be drained, the liner removed, area will be backfilled, regraded and contoured to match as close as possible the pre-mining topography).

FIGURES

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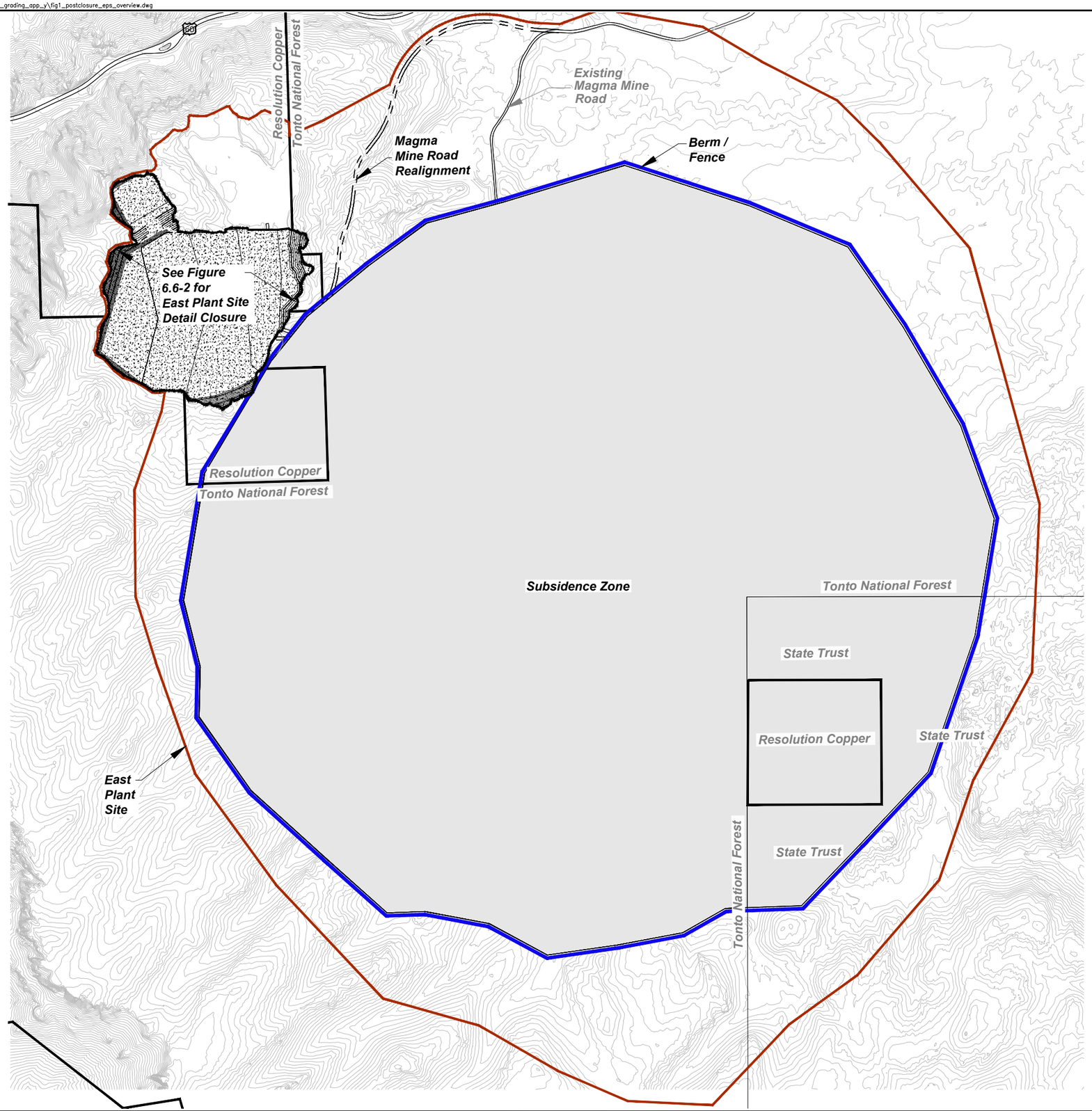

Legend

- Resolution Holdings
- Project Area
- Seeded Area
- Berm / Fence

N

0 500 1,000 Feet

0 150 300 Meters

RESOLUTION COPPER
General Plan of Operations

EAST PLANT SITE OVERVIEW
POST CLOSURE GRADING PLAN

Figure 1

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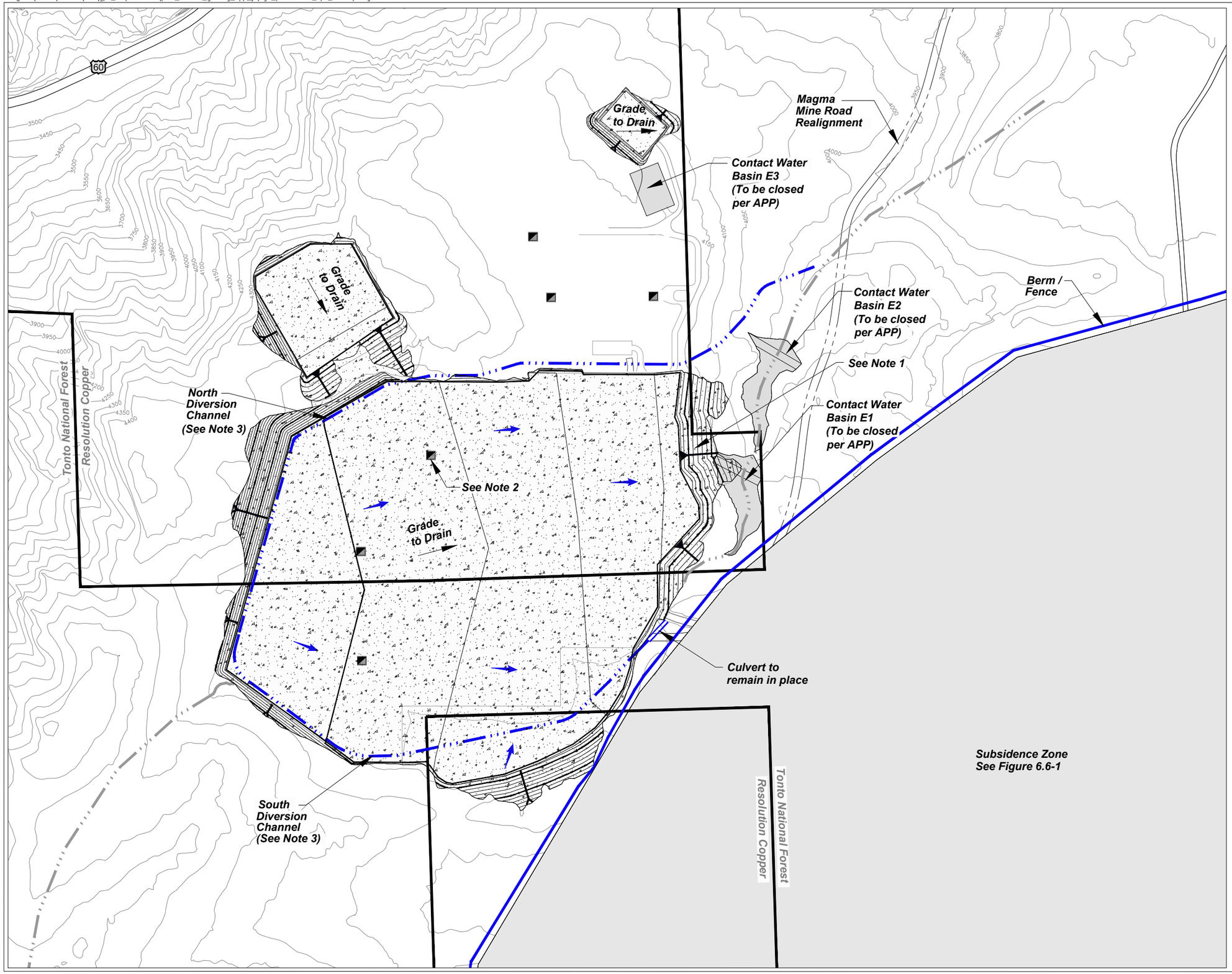

Legend

- Resolution Holdings
- Seeded Area
- Shaft
- Cut
- Fill
- Direction of Flow
- Existing Drainage
- Channel/Drainage
- Berm / Fence
- Buried Culvert

Notes:
1. All fill slopes shall be laid back to a maximum of 2.5:1.
2. Shaft collars and subcollars will be permanently sealed. Shafts will be decommissioned or salvaged as necessary.
3. Relocate North and South Diversion Channels as necessary to route flow to existing drainage.

APP = Aquifer Protection Permit

N

0 200 400 Feet

0 50 100 Meters

RESOLUTION COPPER
General Plan of Operations

EAST PLANT SITE DETAIL
POST CLOSURE GRADING PLAN
Figure 2

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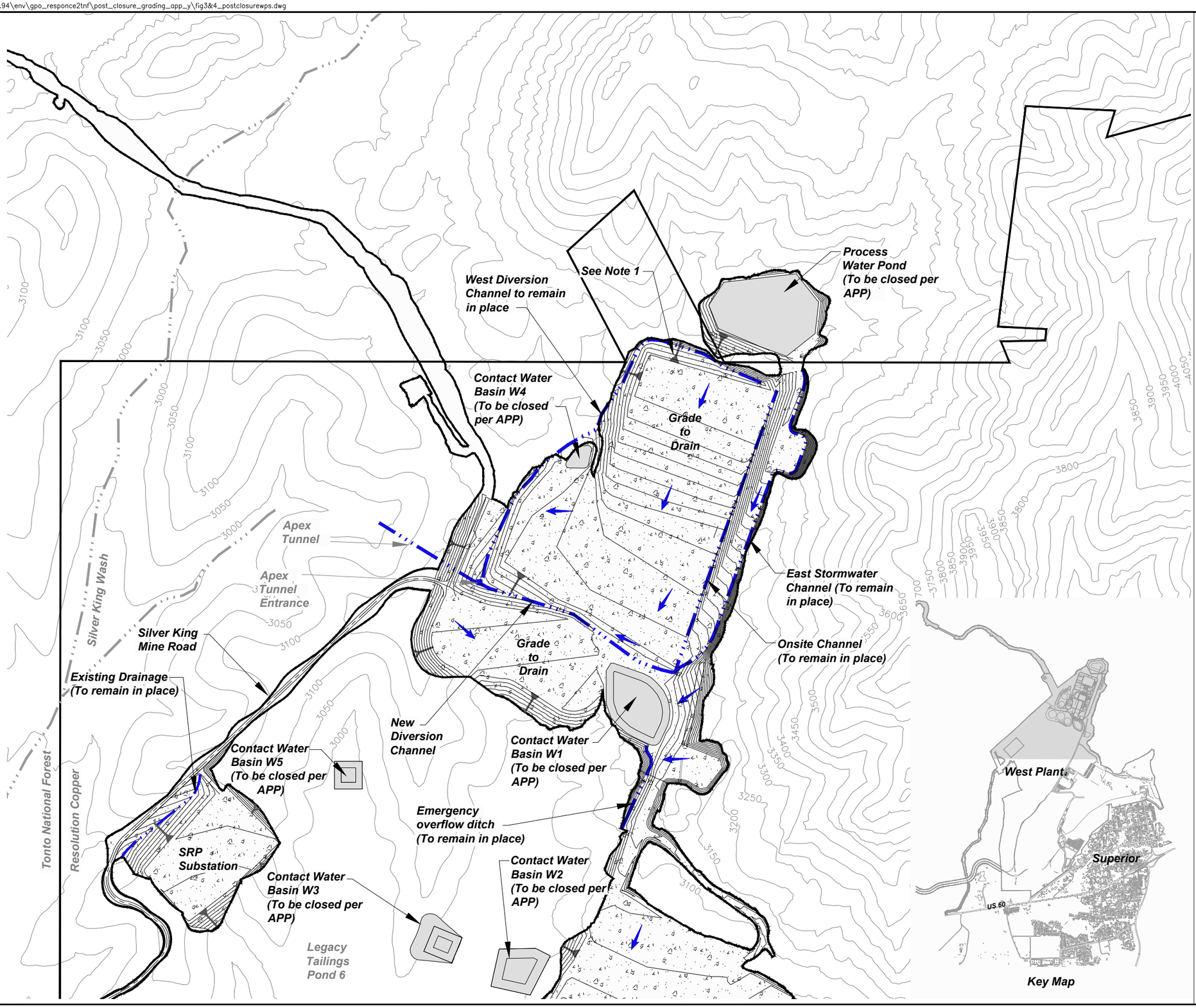

Key Map

Legend

- Resolution Holdings
- Seeded Area
- Cut
- Fill
- Direction of Flow
- Existing Drainage
- Channel/Drainage

Notes:
1. All fill slopes shall be laid back to a maximum of 2.5:1.

APP = Aquifer Protection Permit

N

0 325 650 Feet

0 100 200 Meters

RESOLUTION COPPER
General Plan of Operations

WEST PLANT SITE NORTH
POST CLOSURE GRADING PLAN
Figure 3

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Contact Water Basin W3 (To be closed per APP)

Contact Water Basin W2 (To be closed per APP)

Non-Contact Water Basin W7 (Grade to Drain)

Non-Contact Water Basin W6 (Grade to Drain)

Grade to Drain

Grade to Drain

Non-Contact Water Basin W8 (Grade to Drain)

Grade to Drain

Non-Contact Water Basin W9 (Grade to Drain)

Indian Pond (Grade to Drain)

Tonto National Forest

Resolution Copper

2750

2800

2850

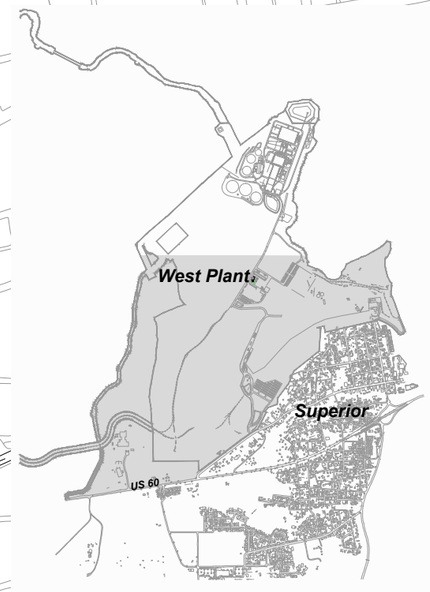
3000

Legend

- Resolution Holdings
- Seeded Area
- Cut
- Fill
- Direction of Flow
- Existing Drainage

Notes:
1. All fill slopes shall be laid back to a maximum of 2.5:1.

APP = Aquifer Protection Permit



Key Map

N

0 325 650 Feet

0 100 200 Meters

RESOLUTION COPPER
General Plan of Operations

WEST PLANT SITE SOUTH
POST CLOSURE GRADING PLAN

Figure 4

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North Diversion Channel

Grade to Drain

Grade to Drain

Contact Water Basin F1
(To be closed per APP)

Contact Water Basin F2
(To be closed per APP)

Grade to Drain

1695
1690
1685
1680
1675
1670
1665
1660
1655
1650
1645

State Trust Land

Resolution Copper

Existing Skyline Rd

MARRCO Roadway

Existing MARRCO Railroad

Legend

- Resolution Holdings
- Seeded Area
- Direction of Flow
- Existing Drainage
- Channel/Drainage

APP= Aquifer Protection Permit

N

0 300 600 Feet

0 100 200 Meters

Note:
Existing topography to be verified by current survey. All grades shown are subject to change.

RESOLUTION COPPER
General Plan of Operations

FILTER PLANT AND LOADOUT FACILITY
POST CLOSURE GRADING PLAN
Figure 5

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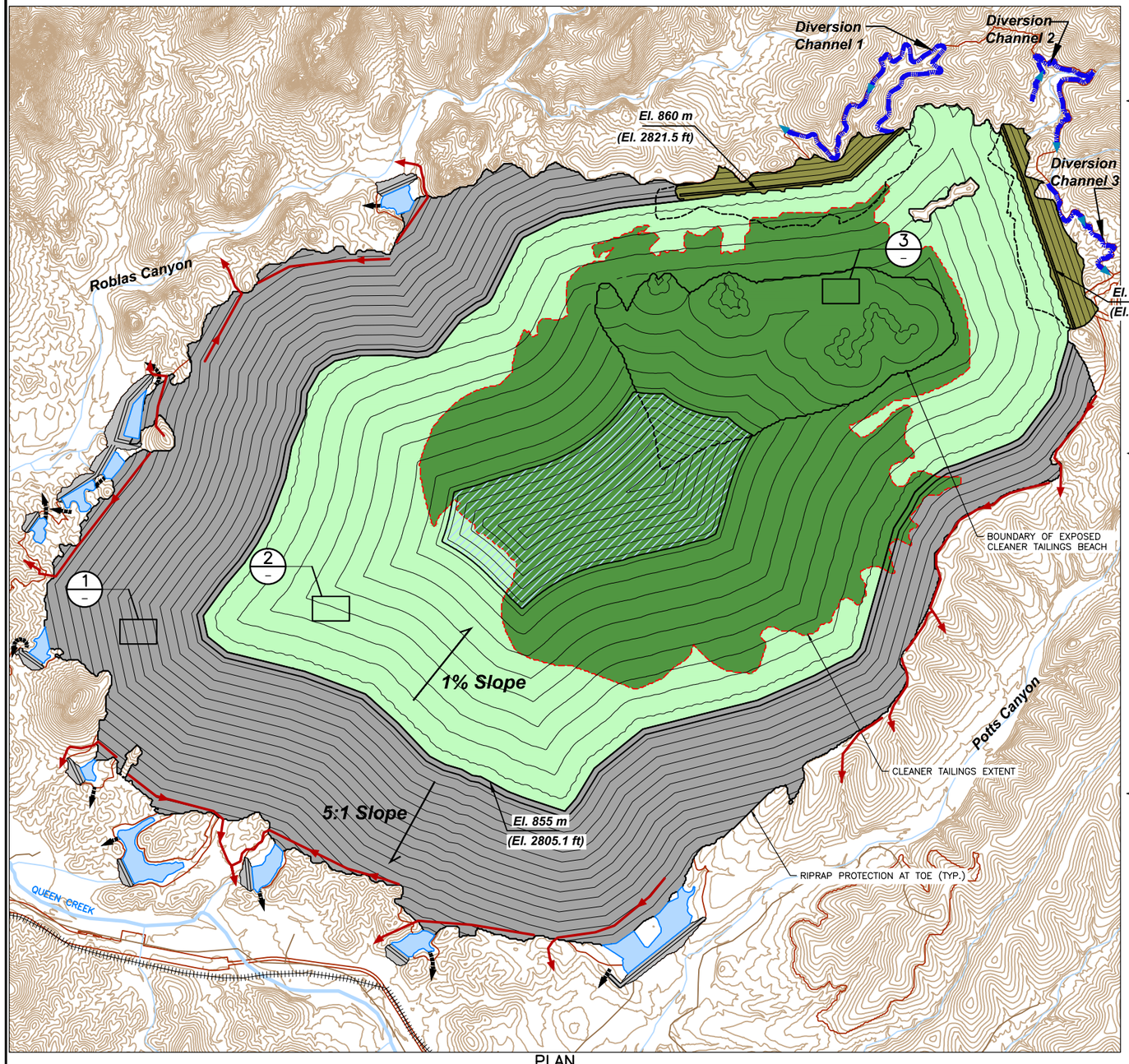
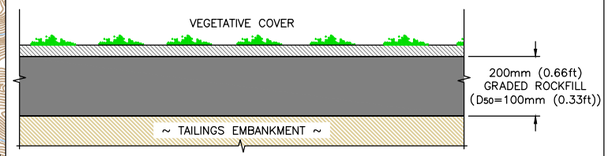
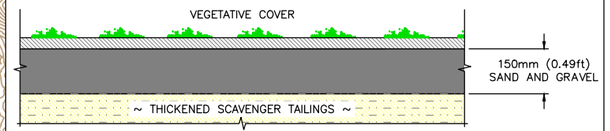


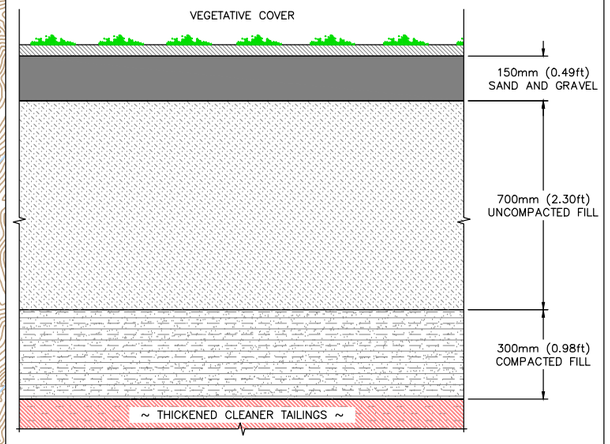
PLAN



DETAIL 1 – EMBANKMENT CLOSURE COVER DETAIL
Not To Scale



DETAIL 2 – SCAVENGER TAILINGS CLOSURE COVER DETAIL
Not To Scale



DETAIL 3 – CLEANER TAILINGS CLOSURE COVER DETAIL
Not To Scale

Legend

- Project Area
- Diversion Channel
- Slope Runoff Diversion Channel
- Spillway
- Railway
- Existing Road
- Stream
- Seepage Collection Dam (SCD)
- Reclaimed Upstream Embankment Raise Fill
- Reclaimed Scavenger Tailings
- Reclaimed Cleaner Tailings
- North Dams
- TSF Reclaim Pond
- Seepage Collection Dam Pond

Topography Based on 1 m (3.3 ft) Interval Contours Received From Resolution January, 2013.

N

0 1,000 2,000 Feet

0 500 Meters

Klohn Crippen Berger
2013

RESOLUTION COPPER
General Plan of Operations

TAILINGS STORAGE FACILITY
POST CLOSURE GRADING PLAN
Figure 6

APPENDIX Z

Section I Tables and Figures
Project Disturbance with
Land Exchange

APPENDIX Z

Section 1 Tables and Figures

Project Disturbance with Land Exchange

Table A1.5-1. Description of Project Disturbance

General Project Area	Description of Project Disturbance
West Plant Site (***Figures 1.5-2a through 1.5-2e***)	Project disturbance would be the same as described in Table 1.5-1 except that a portion of the Silver King Mine Road would be widened on previously disturbed other private lands rather than on Tonto National Forest lands (***Figures A1.5-2a and A1.5-2d)***.
Ore Conveyor/ Infrastructure Corridor (***Figure 1.5-2f***)	Project disturbance would be the same as described in Table 1.5-1 except that the majority of the corridor would be located beneath private lands with a small section located beneath Tonto National Forest lands (***Figure A1.5-2f***).
East Plant Site (***Figures 1.5-3a and 1.5-3b***)	New facilities, such as shafts, hoists, and attendant features, would be located on a combination of previously disturbed and minimally disturbed areas on private lands. Subsidence is predicted above the underground mine on private and state trust lands. This area is all identified as new disturbance (***Figure A1.5-3a***).
Tailings Storage Facility and Tailings Pipeline Corridor (***Figures 1.5-4a and 1.5-4b***)	Project disturbance would be the same as described in Table 1.5-1.
MARRCO Corridor, Filter Plant, and Loadout Facility (***Figures 1.5-5a and 1.5-5b***)	Project disturbance is the same as described in Table 1.5-1.

Table A1.5-2. Summary of Proposed Project Disturbance

Surface Ownership	Minimally Disturbed or Undisturbed[1] (ac)	Previously Disturbed (ac)	Total (ac)
Tonto National Forest	4,439	26	4,465
Resolution Copper	1,628	648	2,276
State Trust Lands	152	39	191
Other Private Lands	0	19	19
TOTALS	**6,219**	**732**	**6,951**

[1] Includes lands that have not been disturbed and lands that are largely undisturbed but may contain areas of minimal disturbance, such as small roads or road segments.

APPENDIX Z

Section 1 Tables and Figures

Project Disturbance with Land Exchange

Table A1.5-3. Proposed Project Disturbance Detail

Project Feature	Tonto National Forest			Resolution Copper			State Trust Lands			Other Private		
	Minimally Disturbed or Undisturbed (ac)	Previously Disturbed (ac)	Total (ac)	Minimally Disturbed or Undisturbed (ac)	Previously Disturbed (ac)	Total (ac)	Minimally Disturbed or Undisturbed (ac)	Previously Disturbed (ac)	Total (ac)	Minimally Disturbed or Undisturbed (ac)	Previously Disturbed (ac)	Total (ac)
Tailings and Tailings Corridor												
Tailings Storage Facility	4,016	0	4,016	0	0	0	0	0	0	0	0	0
Borrow Areas/Soil Salvage Stockpile	202	0	202	0	0	0	0	0	0	0	0	0
Tailings Corridor	114	0	114	0	0	0	0	0	0	0	0	0
Roads/Infrastructure	49	0	49	2	0	2	0	0	0	0	0	0
Subtotal	**4,381**	**0**	**4,381**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
East Plant Site and Mine Area												
Plant Area	0	0	0	88	39	127	0	0	0	0	0	0
Magma Mine Road	0	0	0	16	0	16	0	0	0	0	0	0
Subsidence	9	0	9	1,130	0	1,130	93	0	93	0	0	0
Subtotal	**9**	**0**	**9**	**1,234**	**39**	**1,273**	**93**	**0**	**93**	**0**	**0**	**0**
West Plant Site												
Stockpiles	0	0	0	0	98	98	0	0	0	0	0	0
Concentrator Complex/ Yards/Lay-down Areas[1]	13	0	13	8	197	205	0	0	0	0	0	0
Administration/Offices	0	0	0	0	22	22	0	0	0	0	0	0
Roads/Infrastructure	0	7	7	10	93	103	0	0	0	0	5	5
Subtotal	**13**	**7**	**20**	**18**	**410**	**428**	**0**	**0**	**0**	**0**	**5**	**5**
Filter Plant and Concentrate Loadout Facility												
Plant Area	0	0	0	363	190	553	0	0	0	0	0	0
Subtotal	0	0	0	363	190	553	0	0	0	0	0	0
MARRCO Corridor[1]												
Pipelines, Booster Stations, Roads/Infrastructure	32	19	51	11	9	20	45	39	84	0	14	14
Laydown Areas	4	0	4	0	0	0	14	0	14	0	0	0
Subtotal	**36**	**19**	**55**	**11**	**9**	**20**	**59**	**39**	**98**	**0**	**14**	**14**
TOTALS	**4,439**	**26**	**4,465**	**1,628**	**648**	**2,276**	**152**	**39**	**191**	**0**	**19**	**19**

[1] Includes areas inside and outside of MARRCO right of way.

FIGURES

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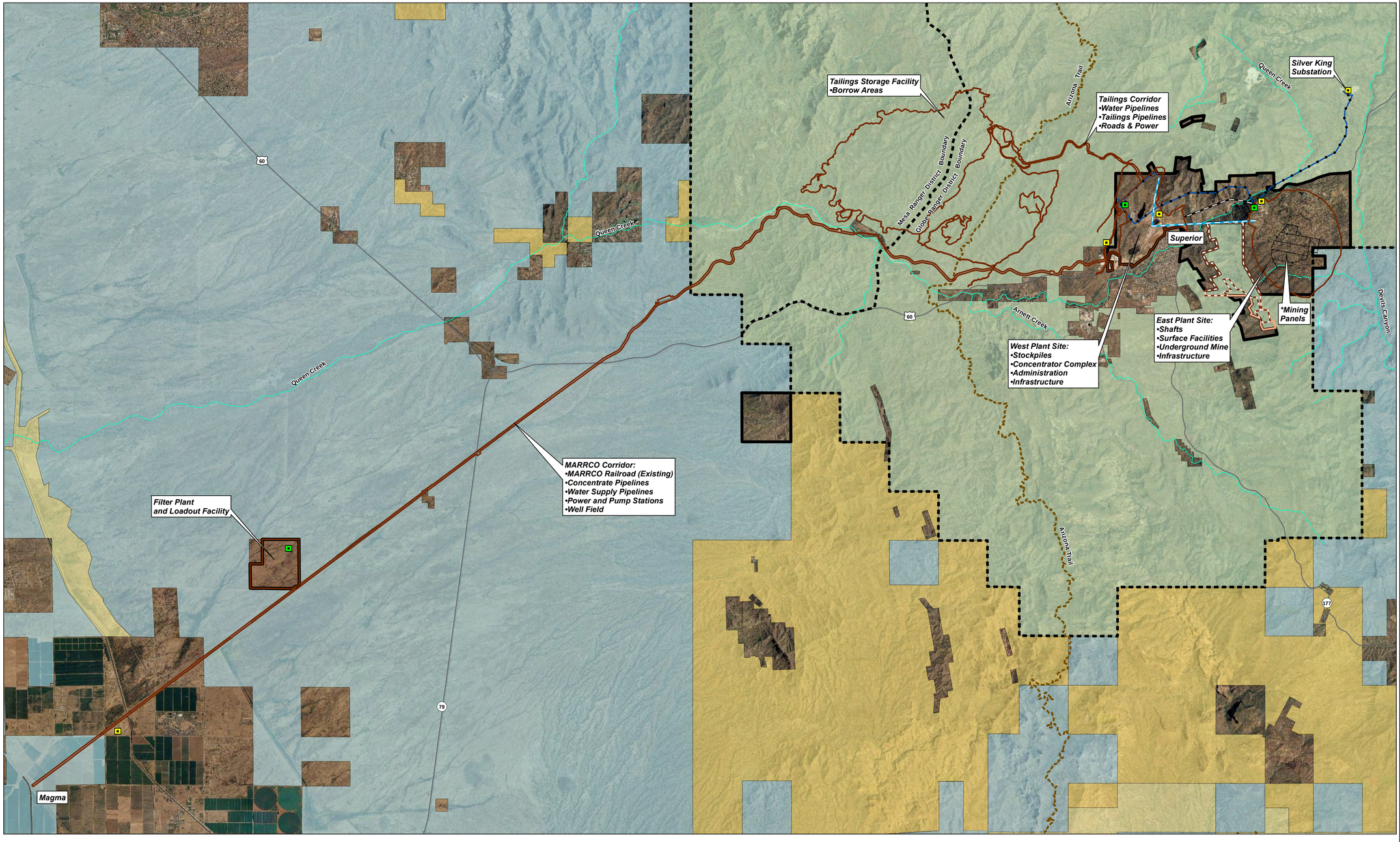

Legend

- Resolution Holdings
- Project Area
- Apache Leap Special Management Area
- Withdrawal Boundary
- Substation
- Existing Substation
- Power Line
- Conveyor/Infrastructure Tunnel
- Existing Never Sweat Tunnel
- Arizona Trail (ESRI Online Data)
- Tonto National Forest Ranger District Boundary

* Note: Mine Panel Configuration Subject to Change.

Post Land Exchange Surface Management

- Bureau of Land Management (BLM)
- Bureau of Reclamation
- Private Land (No Color)
- State Trust Land
- US Forest Service (USFS)

Image Source: ESRI Online Microsoft November 2010
Data Source: BLM Surface Management modified 5-2015 to reflect post land exchange status.

N

0 1 2 Miles

0 2 4 Kilometers

Note: This figure is designed to be plotted at 24" x 36". All map elements may not be legible at other plot sizes.

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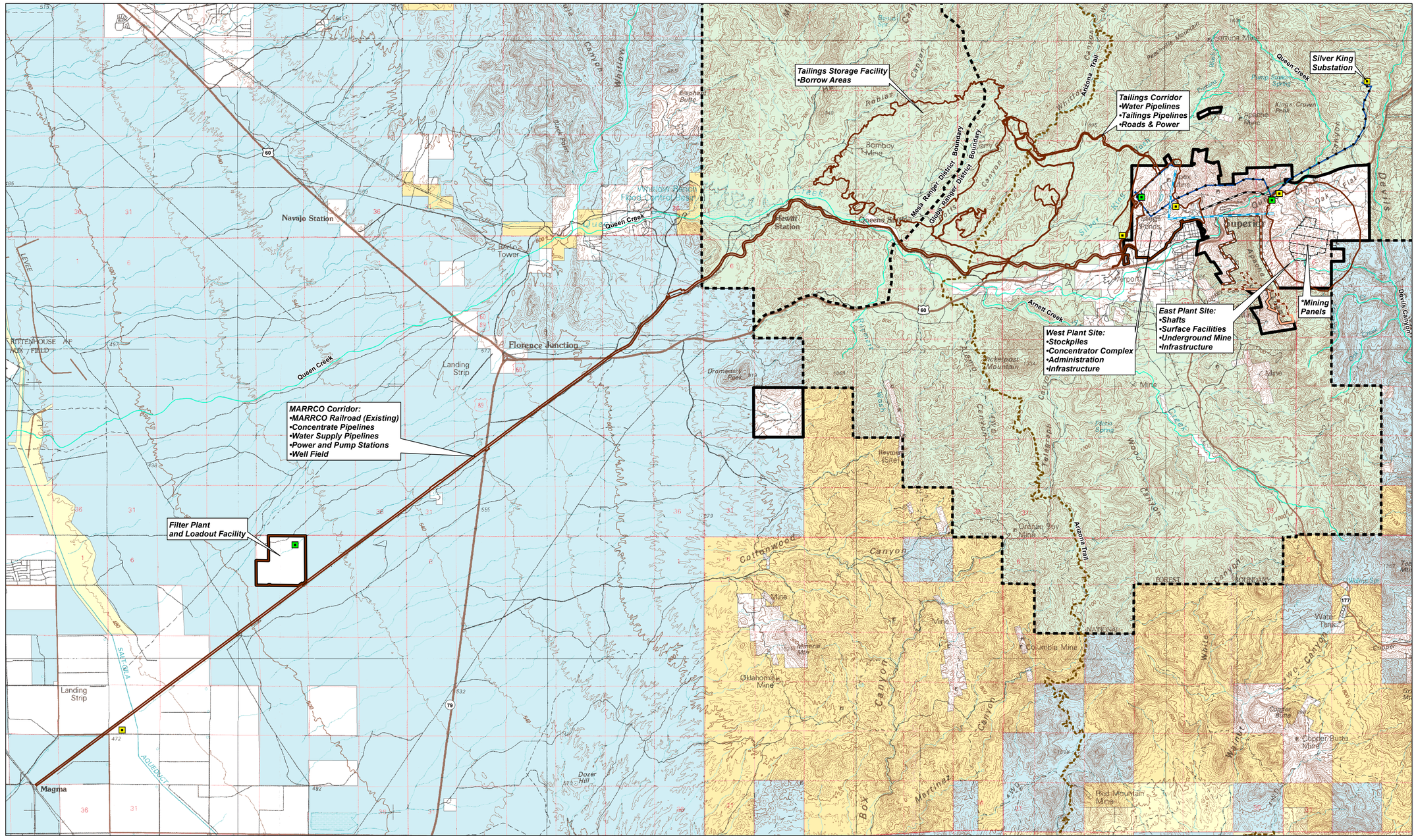
GENERAL ARRANGEMENT

Figure 1.2-2

Path: M:\obs\800\v807.98\ENV\LandExchangeMaps\MXD\Figures from GPO\GPO_Addendum_8_13_2015\AFig1.3.1_Surface_Man.mxd



Legend

- Resolution Holdings
- Project Area
- Apache Leap Special Management Area
- Withdrawal Boundary
- Substation
- Existing Substation
- Power Line
- Conveyor/Infrastructure Tunnel
- Existing Never Sweat Tunnel
- Arizona Trail (ESRI Online Data)
- Tonto National Forest Ranger District Boundary

* Note: Mine Panel Configuration Subject to Change.

Post Land Exchange Surface Management

- Bureau of Land Management (BLM)
- Bureau of Reclamation
- Private Land (No Color)
- State Trust Land
- US Forest Service (USFS)

Image Source: ESRI Online Microsoft November 2010
Data Source: BLM Surface Management modified 5-2015 to reflect post land exchange status.

N

0 1 2 Miles

0 2 4 Kilometers

Note: This figure is designed to be plotted at 24" x 36". All map elements may not be legible at other plot sizes.

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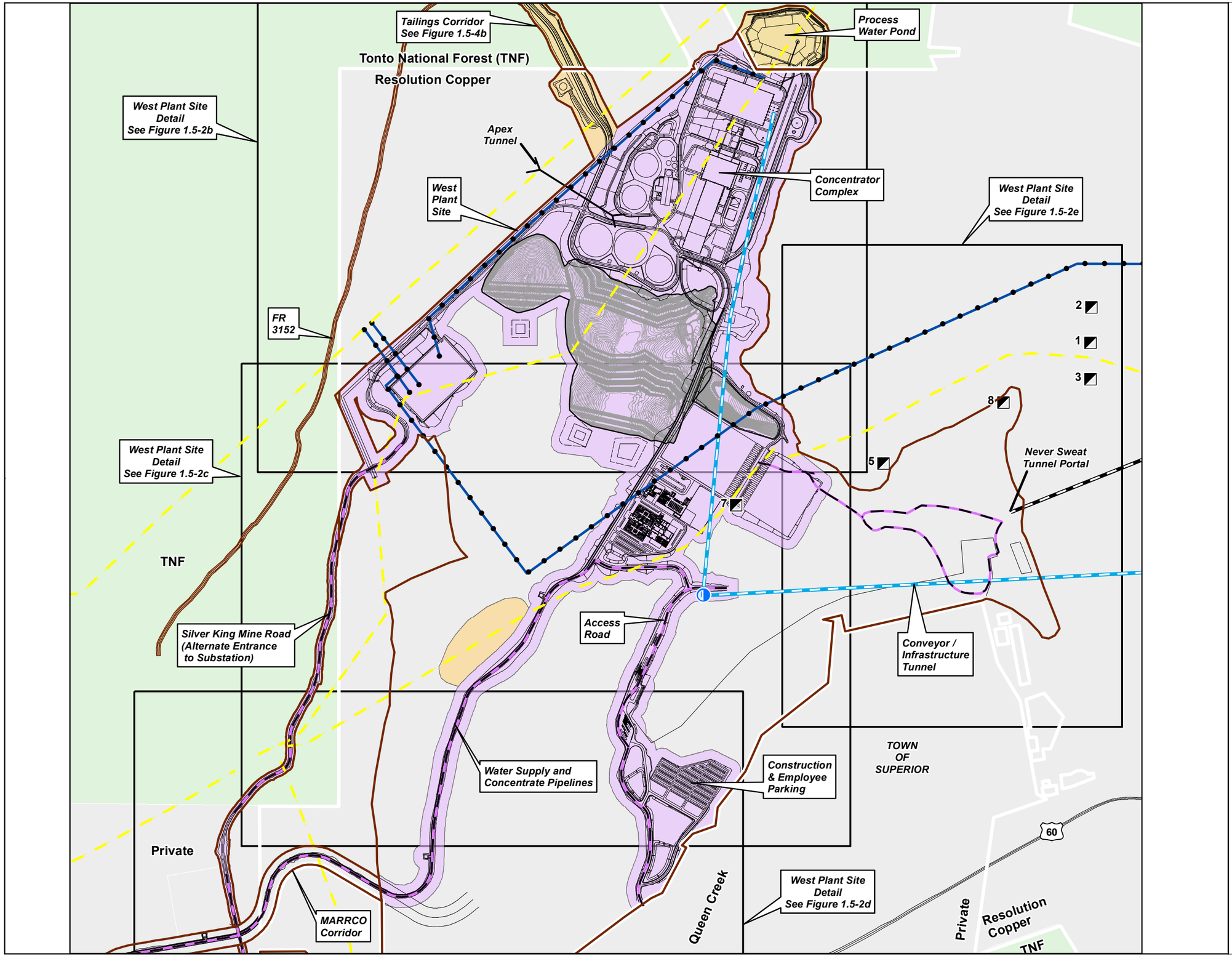
SURFACE OWNERSHIP

Figure A1.3-1

Path: M:\Jobs\800's\807.98\ENV\LandExchangeMaps\MXD\Figures from GPO\GPO_Addendum_8_13_2015\AFig1.5-2a_WPS_Surface_Disturb.mxd



Legend

- Resolution Holdings
- Project Area
- Feature Located on Minimally Disturbed or Undisturbed Area
- Feature Located on Disturbed Area / Legacy Mine Area
- Linear Disturbance Feature Located Within Disturbed Area
- Existing SRP 115kV Power Line
- Power Line
- Existing Never Sweat Tunnel
- Conveyor / Infrastructure Tunnel
- Existing Mine Shaft
- Exhaust Raise
- Text for existing features
- Text for proposed features

Note: Portions of some underground features, such as the existing Never Sweat Tunnel and the proposed Conveyor / Infrastructure Tunnel, are not considered part of the Project Area because they lack surface expression.

Data Source:
West Plant Facilities
Provided by M3 Engineering
July 10, 2013

Development Rock Stockpile
Provided by Resolution Copper 2013

Intermediate Rock Stockpile
Provided by Golder Associates 2012

Image Source: Cooper Aerial Surveys Co. 2010
Data Source: BLM Surface Management modified 5-2015 to reflect post land exchange status.

N

0 500 1,000 Feet

0 200 400 Meters

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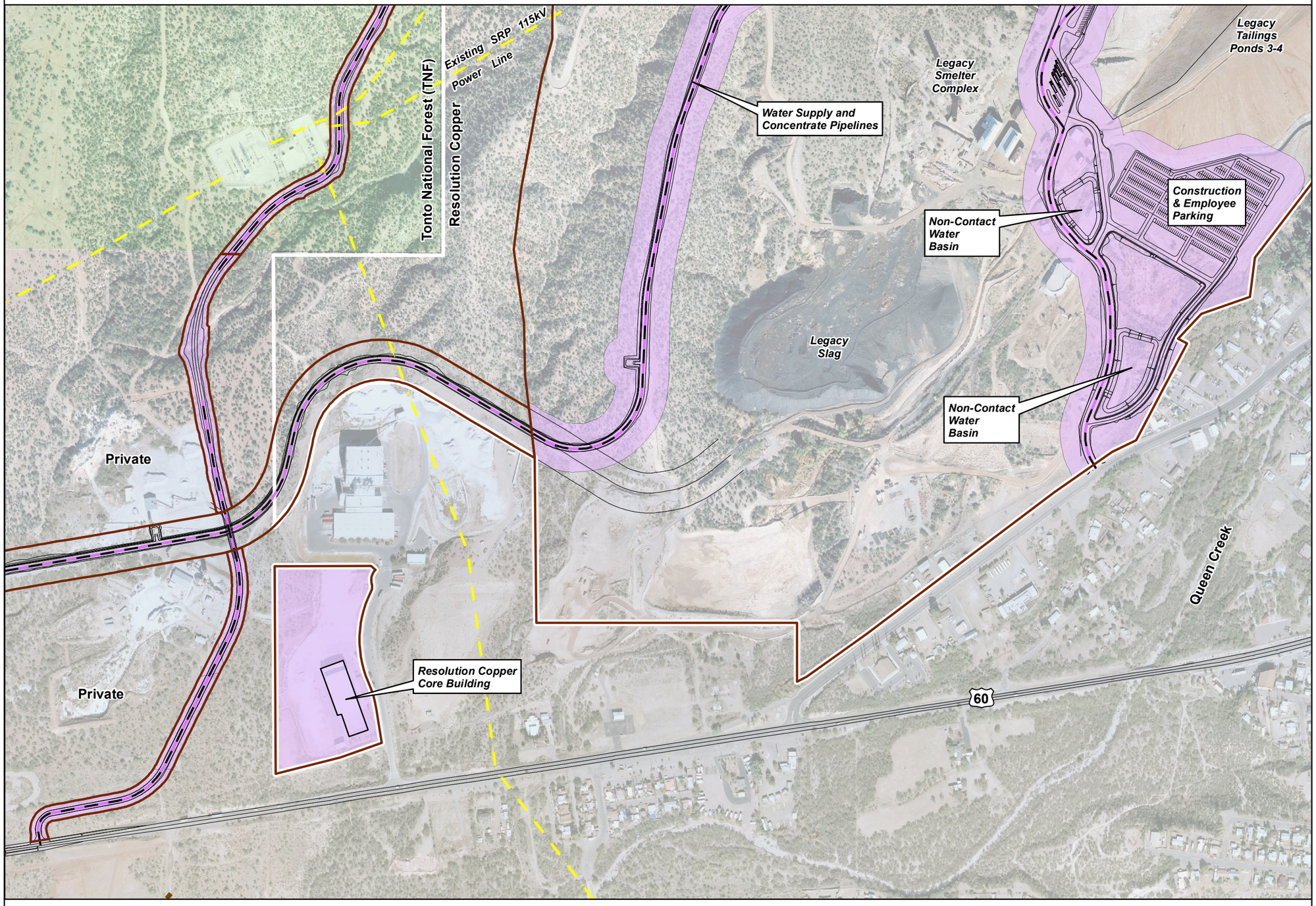
WEST PLANT SITE - SURFACE DISTURBANCE

Figure A1.5-2a

Path: M:\Jobs\800's\807.98\ENV\LandExchangeMaps\MXD\Figures from GPO\GPO_Addendum_8_13_2015\AFig1.5-2d_WPS_Surface_Disturb_S_Detail.mxd



Legend

- Resolution Holdings
- Project Area
- Feature Located on Disturbed Area / Legacy Mine Area
- Linear Disturbance Feature Located Within Disturbed Area
- Existing SRP 115kV Power Line
- Text for existing features
- Text for proposed features

Note: Portions of some underground features, such as the existing Never Sweat Tunnel and the proposed Conveyor / Infrastructure Tunnel, are not considered part of the Project Area because they lack surface expression.

Data Source:
West Plant Facilities
Provided by M3 Engineering
July 10, 2013

Image Source: Cooper Aerial Surveys Co. 2010
Data Source: BLM Surface Management modified 5-2015 to reflect post land exchange status.

N

0 250 500 Feet

0 100 200 Meters

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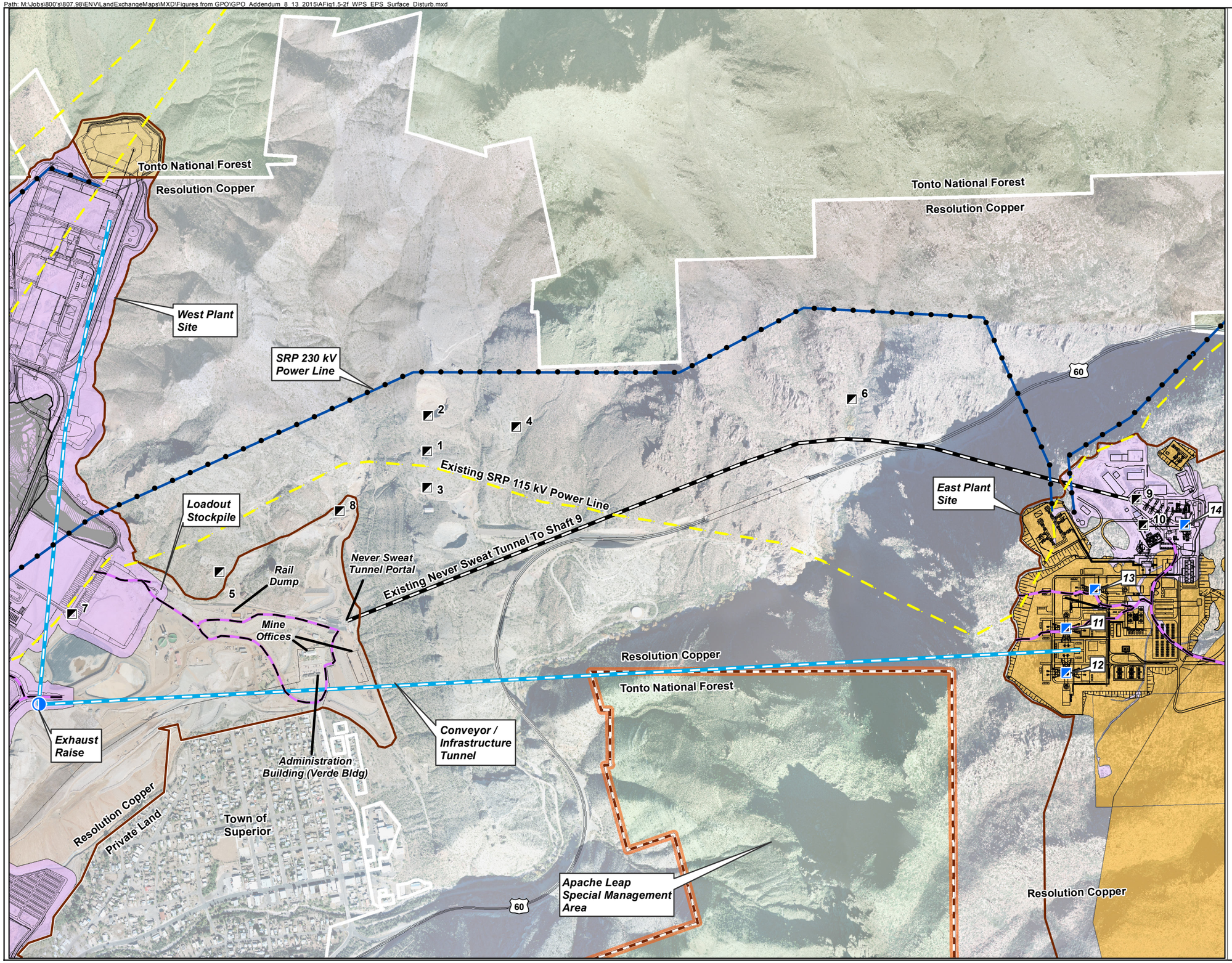
WEST PLANT SITE - SURFACE DISTURBANCE DETAIL

Figure A1.5-2d

Path: M:\Jobs\800's\807.98\ENV\LandExchangeMaps\MXD\Figures from GPO\GPO_Addendum_8_13_2015\AFig1.5-2f_WPS_EPS_Surface_Disturb.mxd



Legend

- Resolution Holdings
- Project Area
- Withdrawal Boundary
- Apache Leap Special Management Area
- Feature Located on Minimally Disturbed or Undisturbed Area
- Feature Located on Disturbed Area / Legacy Mine Area
- Linear Disturbance Feature Located Within Disturbed Area
- Existing SRP 115kV Power Line
- Power Line
- Existing Never Sweat Tunnel
- Conveyor / Infrastructure Tunnel
- Existing Mine Shaft
- Mine Shaft
- Exhaust Raise
- Text for existing features
- Text for proposed features

Note: Portions of some underground features, such as the existing Never Sweat Tunnel and the proposed Conveyor / Infrastructure Tunnel, are not considered part of the Project Area because they lack surface expression.

Data Source:
West Plant Facilities
Provided by M3 Engineering
July 10, 2013

Development Rock Stockpile
Provided by Resolution Copper 2013

Intermediate Rock Stockpile
Provided by Golder Associates 2012

East Plant Facilities
Provided by AMEC
2012

Image Source: Cooper Aerial Surveys Co. 2010
Data Source: BLM Surface Management modified 5-2015 to reflect post land exchange status.

N

0 500 1,000 Feet

0 200 400 Meters

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CONNECTING INFRASTRUCTURE
SURFACE DISTURBANCE
Figure A1.5-2f

Legend

- Resolution Holdings
- Project Area
- Withdrawal Boundary
- Apache Leap Special Management Area
- Feature Located on Minimally Disturbed or Undisturbed Area
- Feature Located on Disturbed Area / Legacy Mine Area
- Linear Disturbance Feature Located Within Disturbed Area
- Existing SRP 115kV Power Line
- Power Line
- Existing Never Sweat Tunnel
- Conveyor / Infrastructure Tunnel
- Existing Mine Shaft
- Mine Shaft
- Campground
- Text for existing features
- Text for proposed features

* Note: Mine Panel Configuration Subject to Change

Note 1: Disturbance area around mining panels defined by modeled fracture zone. Project area around disturbance area defined by modeled zone of continuous subsidence.

Note 2: Portions of some underground features, such as the existing Never Sweat Tunnel and the proposed Conveyor / Infrastructure Tunnel, are not considered part of the Project Area because they lack surface expression.

Image Source: Cooper Aerial Surveys Co. 2010
Data Source: BLM Surface Management modified 5-2015 to reflect post land exchange status.

N

0 500 1,000 Feet

0 200 400 Meters

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EAST PLANT SITE - SURFACE DISTURBANCE
Figure 1.5-3a

Path: M:\Jobs\800's\807.98\ENV\LandExchangeMaps\MXD\Figures from GPO\GPO_Addendum_8_13_2015\AFig1.5-3a_EPS_Surface_Distur_Subsidence.mxd

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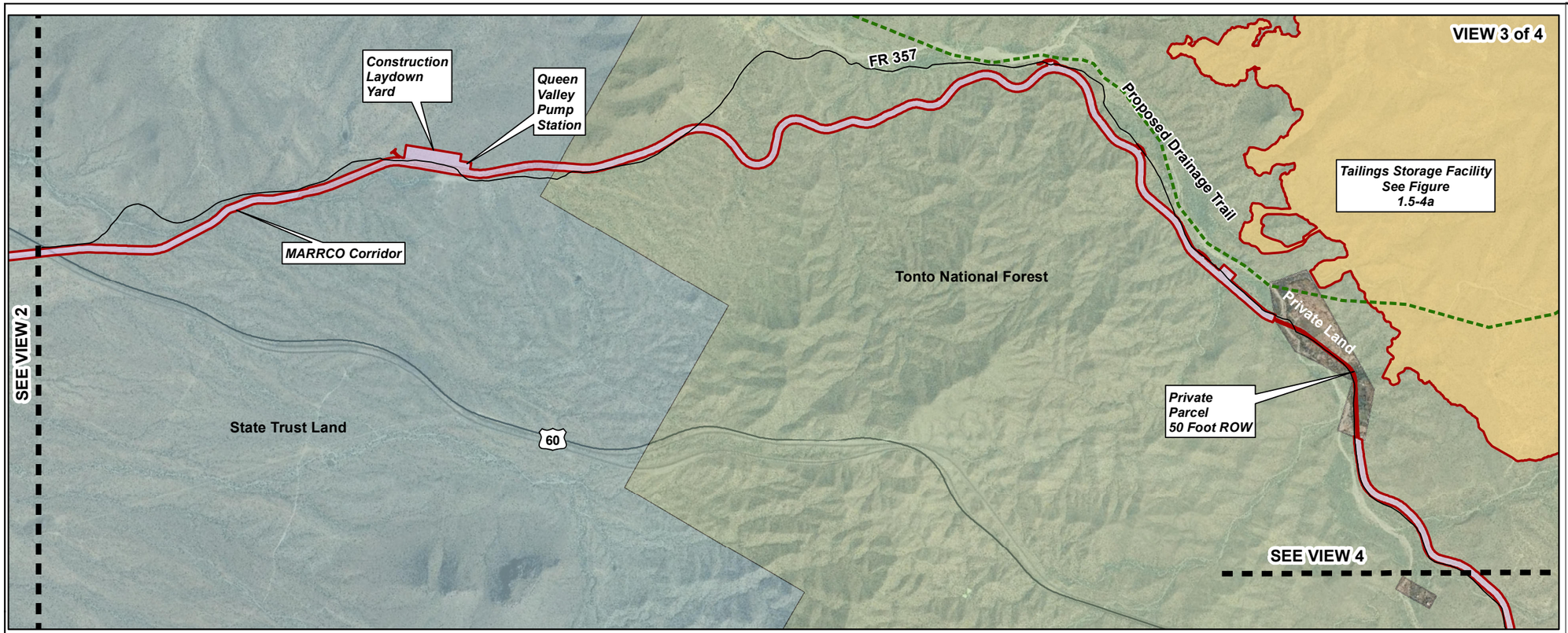

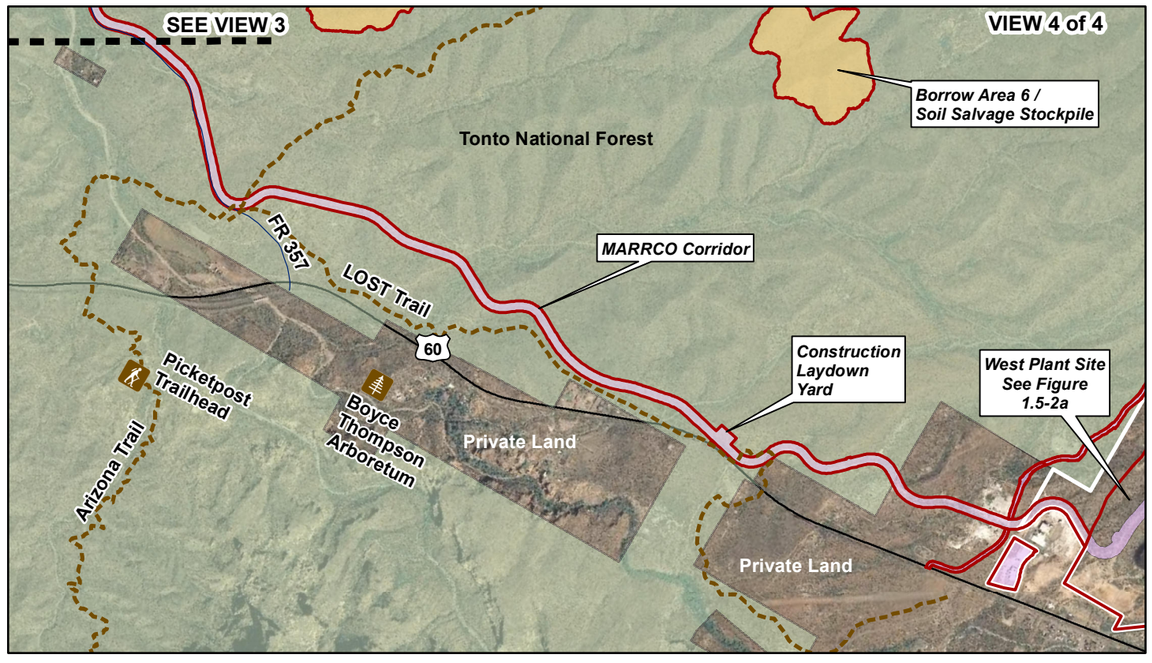

Legend

- Resolution Holdings
- Project Area
- Feature Located on Minimally Disturbed or Undisturbed Area
- Feature Located on Disturbed Area / Legacy Mine Area
- Trail
- Proposed Drainage Trail
- Trailhead
- Arboretum
- Text for existing features
- Text for proposed features

Note: Portions of some underground features, such as the existing Never Sweat Tunnel and the proposed Conveyor / Infrastructure Tunnel, are not considered part of the Project Area because they lack surface expression.

Data Source:
Pinal County Open Space and Trails Master Plan 2007
USFS Forest Maps and AZ Recreation Map
Arizona Trail Provided by Arizona Trail Association Aquired September 2012

Image Source:
2010 National Agriculture Imagery Program
Data Source: BLM Surface Management modified 5-2015 to reflect post land exchange status.

N

0 1,500 3,000 Feet

0 500 1,000 Meters

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MARRCO CORRIDOR AND
FILTER PLANT AND LOADOUT FACILITY
SURFACE DISTURBANCE

Figure 1.5-5b