Mr Mark Howe,
Mining Regulation and Rehabilitation Branch
DMITRE
CPO Box 1264
Adelaide 5001

8th November 2013

Dear Mr Howe

Proposed Rex Minerals Mining Lease Proposal for Hillside

Please find attached my submission in relation to this proposal

Yours sincerely,

[redacted]
Joy Wundersitz
[redacted]

Address: [redacted]
Highgate, 5063

File No: T2951-V03
Ens No: A1806885

HILLSIDE MINING LEASE PROPOSAL AND MANAGEMENT PLAN: A RESPONSE

Joy Wundersitz
8th November 2013

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1. Introduction

I am the owner of a property located at the southern end of Rogues Point. Since retirement, I use this as my semi-permanent residence.

My association with Rogues Point dates back to the early 1950s when my family regularly camped there. In the early 1960s my father, after lengthy negotiations with the then Lands Department, was given approval to build a house there. It was the first residence to be constructed at Rogues Point.

Further subdivision followed, resulting in the establishment of the present Rogues/ Point/James Well community.

Rogues Point has been an integral part of my life for many decades and I am appalled that it will be ruined by the establishment of a large, polluting open-cut heavy metal mine at Hillside.

The section of coast extending from the north of James Well southwards to Black Point and Port Julia constitutes one of the major holiday/retirement locations in South Australia and is highly valued for its quiet rural lifestyle, healthy environment, safe swimming beaches, excellent recreational fishing and crabbing, and family oriented activities. All this will be put at risk to line the pockets of a small group of company directors and predominantly overseas investors.

My house at Rogues Point is situated only two kms from the northern end of the proposed Hillside mining lease, and three kms from the crushing and processing plant. Rex Minerals'' claim that Rogues Point is five kms away is totally inaccurate, as is so much other material contained in the MLP. From my window, I look straight towards Hills Beach and the mine site, and so will not be able to escape the inevitable visual and light pollution, the dust, noise, vibrations and rain water contamination problems.

I have been concerned about the mine for some time. I attended Rex's public meeting at James Well in September 2012 and early in the following year went on one of the 'tours' of the mine site. I was appalled that the tour 'guide' was unable to answer any of the questions I put to him regarding potential environmental damage, simply responding with the phrase 'it is just a matter of ticking the boxes for the EPA". His focus instead, was entirely on the profits the mine would make and the so-called economic benefits to the local community.

It was only with the release just eight weeks ago of the full Mining Lease Proposal and its accompany appendices that the full extend of the environmental and social harm that is likely to result has become obvious.

The fact that the public has been given only eight weeks to work their way through an extremely long and highly technical document demonstrates that neither the Government, the regulatory bodies nor Rex Minerals want full and informed public scrutiny of the intended operations.

I therefore submit this document with no optimism that the concerns and criticisms raised either by myself or by others in their submissions will have any effect on the final decision by Government. Comments

made by the Minister for Mineral Resources and Energy, Mr Koutsantonis, indicates that he is anxious to approve this mine as soon as possible, probably to use it as part of his election campaign.

2. Open-cut copper mining – a history of devastation

There is now a vast literature on the long term damage caused by open cut copper mining. Heavy metal copper and iron mines are notorious polluters. To list just a few:

- The abundant water usage during the mining and mineral processing reduces water levels and fresh inflows.
- Water quality is affected by activities such as drilling, blasting, pits.
- Water processing operations produce large quantities of waste product that lead to contamination.
- Huge amounts of dust are generated along with gases and tailing. The transportation of dust can cause reduced visibility, coating of houses, vegetation damage and numerous health impacts.
- Mineral processing releases large quantities of toxic air particles and gases.
- Airbone toxins can harm both workers and citizens located at distant locations from the mine
- Acid Mine Drainage
  (http://academics.uww.edu/cni/webquest/Fall03/mine/penny2htm)

The MLP itself identifies a considerable range of potential negative impacts on the environment and the local communities (some of which are detailed later).

I do not expect Hillside to be any different!

3. Issues of specific concern to Rogues Point

The issues of primary concern to me as a resident of Rogues Point are:

- Noise pollution
- Dust pollution
- Contamination of the waters of St Vincent's Gulf and
- Rehabilitation
- Lack of full cost/benefit analysis

Of secondary concern are issues associated with

- Visual pollution
- Light pollution
- Blasting impact
- Surface and groundwater contamination
- The threat to agriculture and tourism.

However, because of time limitations, I cannot address all of these in this submission.

3.1 Noise

Rogues Point, like other small coastal holiday settlements generally experiences very low noise levels. The assertion in the MLP that at times the levels reach what could be classified as 'light industrial' is patently absurd.

Apart from the occasional noise from trucks travelling along St Vincent's Highway or fishing boats at sea, the majority of noise experienced is generated by wind, rain and the sea itself – ie from naturally occurring, intermittent sources that reflect its rural and coastal location.

However, if Hillside is approved, this situation will change dramatically.

As noted earlier, my residence is located within 3 kms of the crusher and processing plants, which produce extremely high noise levels. (See Table 16, Appendix 6.6A.). We are only two kms from the NE corner of the mine where the north east waste rock dump will be situated. The noise emitted by haul trucks and other mining equipment is substantial (See table below) and during the early life of the mine, haul trucks will be constantly traversing the north eastern corner of the mine site as they deposit and slowly build up the north east waste rock dump.

Appendix 6.6-A – Tables 11

Item no.	Sound power level [dB(A)
Blasthole Drills	118
Tracked Bulldozers	116
Excavators	120
Face shovels	123
Graders	113
Front-end loaders	111
Water cart	116

Then there is the noise from the crushing and processing plants, with dB(A)] levels generally within the 107 – 109 range. As noted earlier, they are situated only three kms from my residence.

In a quiet rural environment noise carries great distances, particularly on very still, calm days. During the exploration phase at Hillside background noise from the drills were clearly audible, especially on calm days and nights. It will be infinitely worse when mine construction commences.

And unlike environmental 'noise' from wind, rain etc, this noise is more grating and persistent. It will be present 24 hours a day, sseven days a week, without surcease.

The problem will be particularly acute in the warmer months, especially at nights when it will be impossible to sleep with windows open. If we are forced to keep air conditioners on all night to block out the noise, will Rex compensate us for the additional electricity costs?

3.1.1 How much more continuous noise will Rogues Point experience?

Unattended noise measurements were undertaken at six locations surrounding the proposed mine and port sites over the period 14-28 August 2012. At Rogues Point (see Table 2.1.4 Appendix 6.6-A) noise levels were generally low, with a median LAeq of 34.

The highest noise levels at Rogues Point coincided with rainfall and high wind speed – ie natural sounds (see Appendix 5.6-A).

The Operational Noise Assessment maps (Appendix 6.6A, Maps 1-1 to 12.1) indicate much higher noise levels than is currently the case, particularly during periods 1 through to 5. During Period 1, for example, predicted noise levels will consistently exceed 43 (dB(A). And this will apply during both day and night, every day of the year.

It should also be noted that Map 1.2 is flawed, because it does not take account the noise from haul trucks traversing the north-eastern waste rock dump. It is also curious that the noise levels stop abruptly at the coast line, and then resume across St Vincent's Gulf. Equally puzzling is the detour of the 40+ db(A) contour at the southern end of Rogues Point. Am I to believe that the noise will stop at my back fence and then resume on the beach side of my property?

3.1.2 Potential impacts identified by Rex

According to the MLP (section 8, Table 8.3-11) the following potential noise impacts during construction, operation and mine closure at the mine site have been identified:

- Public nuisance impacts on surrounding residential receptors from noise emanating from the mine site during construction
- Public nuisance impacts on surrounding residential receptors from noise emanating from increase in road traffic from road diversions required for the Hillside Project
- Public nuisance impacts on surrounding residential receptors from noise emanating from the fixed plant mine site during operation
- Public nuisance impacts on surrounding residential receptors from noise emanating from the mobile plant mine site during operation (including rehabilitation)
- Public nuisance impacts on surrounding residential receptors from vibration during construction
- Public nuisance impacts on surrounding residential receptors from vibration during operation
- Displacement of terrestrial native fauna and marine fauna due to noise and vibration from mine construction and operation
- Reduced public amenity as a result of air overpressure (noise) associated with blast
- Public nuisance impacts on surrounding residential receptors from noise emanating from the removal and transport of extractive stockpiles.

3.1.3 Proposed Mitigation Strategies

Rex have identified very few control measures that could be implemented to effect major reductions in noise impacts.

The proponents refer to only three mitigation strategies:

- Control of noise at the source, including the use of quieter haul trucks
- Noise shielding within the propagation path
- Control of noise at the receiver.

But again, implementation of these will be at Rex's discretion, and there is also an indication that Rex has been 'let off the hook" by EPA. It seems that the need for the Company to adhere to regulatory noise levels have been waived.

Appendix 5.6B states that

> *Because the Hillside Copper Mine is a planned new mine, the EPA generally require that the project be designed to meet the indicative noise level criteria less 5 db(A) where reasonable and practicable. However, through the Hillside Cooper Project consultation process, if was agreed that the planning penalty does not apply in this case.*

Rex also note that *"strict compliance with the planning criteria, under worse case conditions, is neither reasonable nor practicable to achieve."*

In other words, it would be too costly for them to them to adhere to the criteria. Again, the prime consideration seems to be cost savings, rather than concern for the welfare of local residents..

The way in which Rex intends to respond to residents' complaints about high noise levels is also dismissive. The MLP (8-369) notes that, in relation to pre-construction noise complaints,

All noise complaints will be investigated and a response provided to the complainant within two working days. All noise complaints will be resolved and associative actions will be recorded in the data base.

Monitoring of construction related noise levels shall be undertaken in response to a complaint ***where this is considered an appropriate response*** (my italics)'.

[Since there are no predicted exceedances of the internal noise level criterion for the mine site construction, ***routine monitoring of construction noise is not warranted****].*

Again, all responses will be at the discretion of Rex with no stipulated oversight by an independent watch-dog, and presumably no recourse for appeal by the complainant to a third party.

3.1.4 Rezoning issues and noise levels

Rex's recent application to the YPDC to have 5,000 hectares of land surrounding the MLP redesignated from Primary Production and Coastal Conservation Zone to Mining seems to be based on its need to increase the permissible noise levels in the vicinity of the Mine site.

According to the MLP,

> *"The derivation of the applicable Noise EPA criteria is particularly dependent on the Council land use zones that Rex's proposed Mining Lease spans. In this case, the proposed ML spans the Primary Protection Zone and the Coastal Conservation Zone requiring an average indicative noise factor to be calculated for the noise source. ..... Based on advice received by Council the most appropriate Noise EPP land use category applicable should be Rural Industry.*

In contrast, Rogues Point is classified as settlement. According to the EPA's Environment Protection (Noise) Policy 2007 (see table below), indicative noise levels vary depending on the zoning allocated to the site/area in question. Permitted noise levels are clearly higher in an area designated as 'rural industry' than an area classified as 'rural living' or 'residential'.

Given the size and complexity of the proposed Hillside mine, classifying it as 'rural industry' also seems inappropriate

Land use category	**Indicative noise factor (dB(A))**	
	Day	**Night**
Rural Living	47	40
Residential	52	45
Rural Industry	57	50
Light Industry	57	50
Commercial	62	55
General Industry	65	55
Special Industry	70	60

The Government, DMITRE and Rex need to provide

- **unconditional guarantees that the potential impacts outlined in Table 8.3-23 will not occur, in line with a recent comment by the Minister for Mineral Resources and Energy, Mr Koutsantonis that "the first principle of mining is 'do no harm'"**
- **evidence that, if mining approval is granted, there will be stringent, external and independent monitoring systems in place that will identify problems and implement remedial responses immediately.**

3.2 · Air quality

According to the MLP, over 1.6 million kg of TSP (ie the total amount of particles suspended in the air regardless of particle size – referred to as 'nuisance dust') will be emitted each year at Hillside, including over 620,000 kg per year of PM10 (ie particles with a diameter of less than 10 um).

3.2.1 PM10 emissions

Rex Minerals' Dust Predictive Map (Figure B..5.4), based on full production for all days with no limitations on operations, and **all 'so-called' dust controls applied** shows maximum levels of dust that would be experienced in a 24 hour period. As shown, PM10 emissions extend from the north of Ardrossan township, covering a wide area to the south of Black Point, moving well inland and also extending well into the Gulf, raising issues of sea water contamination from dust settling on the surface of the water.

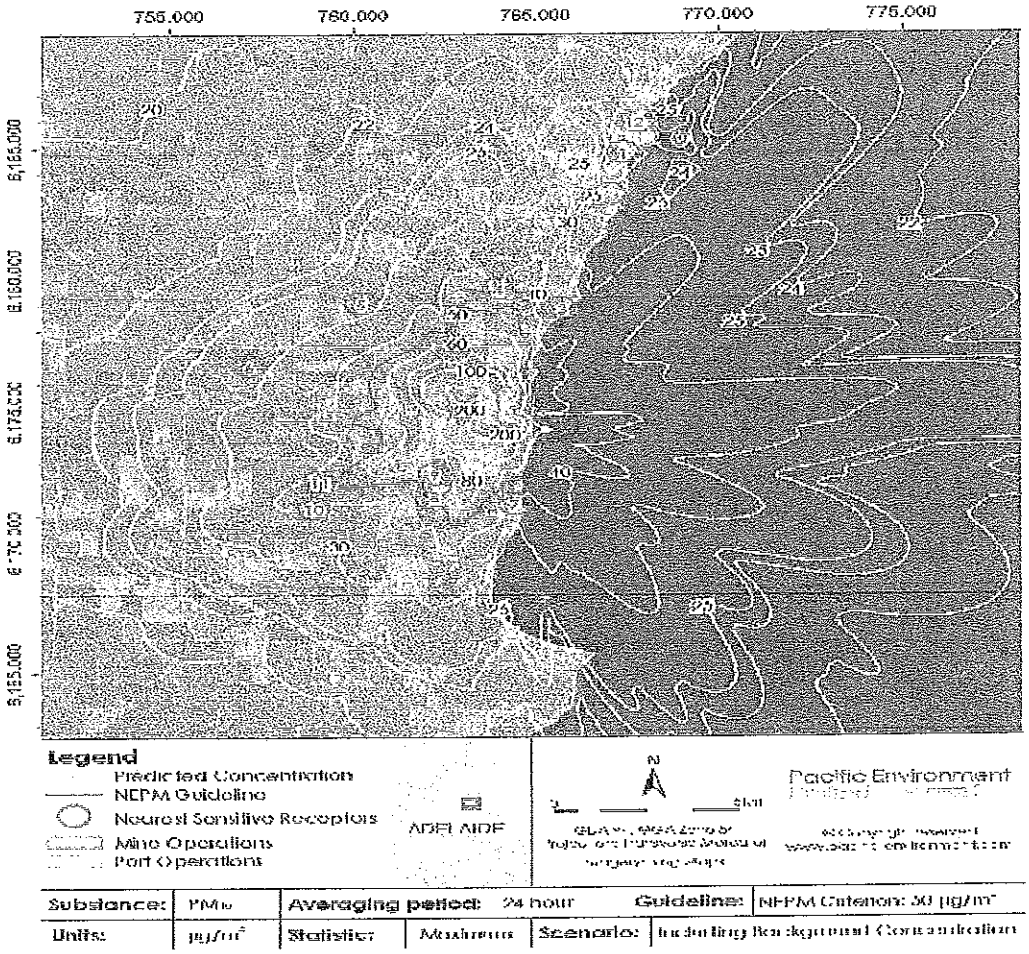
- Rogues Point will experience predicted 24 hour maxima of 35.3up/m3.
- A section of St Vincent's Gulf adjacent to the mine falls within the 50+ range, and a much larger area is predicted to have dust concentrations in excess of 25 up/m3.

Rex Minerals argue that, according to the model, compliance with the NEPM criterion of 50 up/m3 is predicted at receptors 1 – 7 (including Rogues Point) on all days of the year.

Given the huge amount of additional dust generated by the mine, it is difficult to believe Rex's reassurances that at Rogues Point there will be no days on which full compliance with NEPM criteria cannot be met.

- The eastern coast of Yorke Peninsula is notoriously windy (as exemplified by the fact that Ceres propose to locate a massive wind farm in the area). Strong winds buffet Rogues Point on many days of the year, especially during summer when dry land surfaces and sparse vegetation cover result in significant airborne dust levels.
- Even the flawed baseline data collected by Rex over an 11 month period (January 2012 to November 2012) showed that NEPM air quality standards were exceeded on **six** occasions as a result of strong northerly winds. Importantly, these high levels occurred without the 1.6+ million kgs of additional dust that the mining operation will generate.

Figure B.5.4: Predicted maximum 24-hour PM10 Concentration (Mine Operations) – including background concentration



While the above figure focuses on 24 hour maxima PM 10 levels, a more important consideration is "How much extra PM10 dust will we actually experience at Rogues Point on a day to day and month-to-month basis.

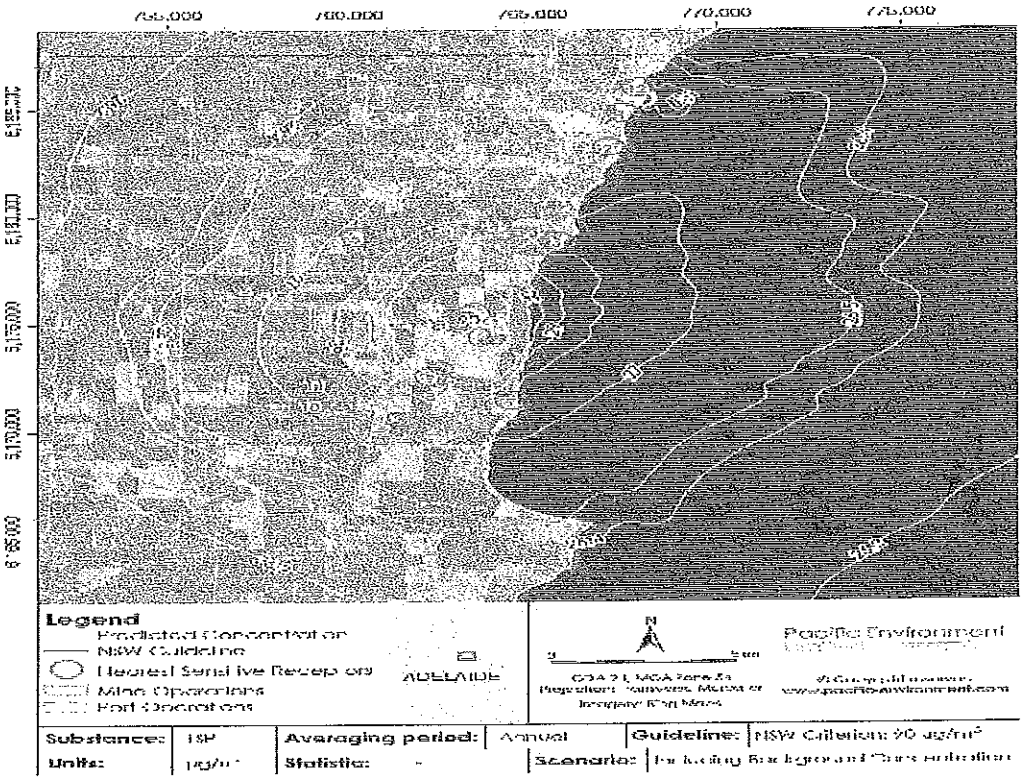
The baseline monitoring work referred to above showed very low PM10 concentration averages across all months at the monitoring stations, varying from 8.4 to 21.1 depending on the time of the year (Table 8.1 MLP 8.2, 25). What will the monthly averages (rather than the 24 hour maxima) be once mining commences?

3.2.2 TSP emissions

While PM10 emissions are more dangerous because they are easily absorbed when breathed in, the nuisance dust TSP is more visible and therefore more likely to cause annoyance.

According to Figure 9.8, Rogues Point will experience an annual average TSP concentration of between 27 and 28 ug/m3. Although this is below the NEMP criteria of 50 up/M3, it seems highly likely that these levels will be well above what is currently experienced now.

Figure 9.8 : Predicted Annual Average TSP Concentration (Mine Operations) – including background concentration



3.2.3 Community expectations versus arbitrary regulatory criteria

- While Rex Minerals are keen to stress that dust levels will be below the NEPM criteria, how acceptable will they be to local residents? Experiences in other locations suggest there is a major disjunction between what a regulator considers acceptable and what the local community, accustomed to living in a relatively dust-free environment, regard to be acceptable .

- For example, dust emissions constitute one of the major criticisms raised by residents at the regular CCG meetings regarding the Kanmantoo copper/gold mine. Kanmantoo mining personnel assure local residents that the dust emissions are still well below the standards set by the regulator. But this is not considered satisfactory by residents. It should also be stressed that Kanmantoo is a very small mining operation compared with the proposed Hillside mine and so the problems are likely to be greater at Hillside..

Rex Minerals must answer the following :

- **How much more PM10 and TSP dust will Rogues Point actually experience compared with the baseline situation? More specifically:**
  - **On how many days will PM10 concentrations approach or actually reach the maximum 24 hour levels depicted for Rogues Point in Figure B.5.4?**
  - **On how many days will increased levels of STP and PM10 (compared with pre-mining days) be experienced?**
  - **What is the average level of PM10 concentrations that we can expect?**
  - **On how many days will that average be exceeded?**

3.2.4 How effective will the dust control measures be?

The predicted dust concentrations levels after mining commences assumes that all dust control measures proposed by Rex are in place and working as efficiently as they predict. Rex are clearly placing considerable reliance on their dust suppression methods, but these seem totally inadequate.

- Water sprays will be used as the main dust suppressant. However, the efficiency for this control measure is only 65 – 85% (See Appendix 5.6C Table 7.4). Moreover, there will only be two water trucks available to undertake this task which is totally inadequate..

- Pit retention constitutes the main dust control measure for dust emitted from blasting, use of heavy plant machinery (excavators etc inside the pit) and open pit maintenance.
  - The control efficiency for blasting generated CEtsp is 50% while control efficiency for CEpm10 is estimated at 5%. These values are extremely low.
  - Similarly low levels of efficiency are anticipated for
    - controlling dust generated by excavators/shovels/front end loaders within the pit and
    - open pit maintenance by bulldozers

- There will be no dust measures in place to control wind-borne dust erosion from the waste rock dumps.
  - The MLP talks of progressive rehabilitation of open areas and stabilization of soil stockpile through the planting and establishment of annual grasses. But this will not

occur while the waste rock dumps are in active use. Even then, it is not clear whether and how long such revegetation will take.

3.2.5 Monitoring

The MLP argues that real-time monitoring systems will be put in place to inform when additional dust suppression, adjustment or operational shutdown is required.

Rex must provide answers to the following:

- **What are the additional dust suppression measures?**
- **What criteria will be used to determine when such measures need to be implemented?**
- **Under what specific conditions will shutdown of operations occur?**
- **Who will monitor compliance with this?**
- **And how will the waste rock piles be "shut down" given that no control measures will be in place for each one while they are in active use?**

3.2.6 Potential impact of mine generated dust

If the dust suppression measures do not meet the predicted efficiency levels, the implications for surrounding communities and the environment will be considerable.

The MLP (8-31) has identified a range of potential impacts on air quality during construction and mining operations (see table below).

Table 8.3-3: Air quality potential impacts during construction and operations (including rehabilitation) at the proposed ML and EML

Potential impact ID	Potential impact description
ML-A1	Decrease in air quality resulting in human health impacts at neighbouring sensitive receptors from dust emanating from mining operation.
ML-A2	Human health impacts resulting from the contamination of rainwater tanks with dust from the mining operation.
ML-A3 & EML-A1	Decrease in ambient air quality resulting in public nuisance at neighbouring sensitive receptors from dust emanating from Hillside
ML-A4	Decrease in ambient air quality from odour emanating from the site impacting neighbouring sensitive receptors.
ML-A5	Reduced native plant growth or abundance resulting from increased dust deposition resulting from mining operations.
ML-A6	Reduced agricultural crop growth rates/yields from increased dust deposition on leaves.
ML-A7	Degradation of marine environment from dust deposition resulting from the mining operations.

- In respect to PM10 dust emissions, the MLP (8-33) acknowledges that *"Without monitoring and operational controls it is likely that PM10 impact levels higher than NEPM guidelines from the site will occur, which could have negative impacts on the health of the local community* The risk is rated moderate to high.

- In respect to nuisance dust, it notes: *Without dust emissions controls and operational restrictions "it is highly likely that the mining operation would generate substantial volumes of dust and almost certain that this dust would create a significant nuisance for the local community... (MLP 8-35)*

- While the MLP concludes that nuisance dust deposition impacts would not be significant, it acknowledges that *"the averaging times available in relation to dust deposition monitoring for the evaluation of nuisance dust* ***did not provide the resolution required for the evaluation of nuisance dust impacts occurring over shorter time periods"***.

- The MLP (8-35) acknowledges that *"dust deposition from mine related activities in rainwater tanks is possible at the nearest receptors ....reliant on rain water (Rogues Point and James Well residents.)* These two settlements are totally reliant on rainwater tanks for all their domestic use.

  One suggestion by Rex is that *first flush systems will be discussed with concerned residents and that tanks are sampled for baseline results before mine operations commence.*

  It seems that only one rainwater tank at Rogues Point and one at James well has been sampled to date. If the intention is to limit testing after mining commences to these two only, then this is not acceptable. Two tanks out of the several hundred at these locations are not a representative sample. Nor has there been any discussion with most local residents in these locations about the viability of first flush systems.

  Rex also indicate that they will sample rainwater tanks only once per year. Again, this is inadequate. Sampling should occur more frequently, preferably following the first heavy rains after a major dust event.

The Government, DMITRE and Rex need to provide unconditional guarantees that the potential impacts outlined in Table 8.3-23 will not occur, in line with a recent comment by the Minister for Mineral resources and Energy, Mr Koutsantonis that 'the first principle of mining is "do no harm"'.

3.2.7 Rex's planned responses to complaints from residents

There is nothing reassuring about Rex's indicated response to complaints by local residents.

In the MLP (8.5.2) they note that complaints arising from the public about increased dust levels

> *"will be logged in a register and records will show that all complaints received have been investigated. And the complaints addressed within an agreed timeframe. The Air Quality Management Plan will be reviewed if required".*

These statements are meaningless. There is no reference to the need to demonstrate to an external regulator that the factors triggering the complaint have been addressed to the satisfaction of the complainant. And

the 'if required' condition attached to the review of the Air Quality Management Plan means Rex will be able to do absolutely nothing!

In summary, how much worse will the quality of life at Rogues Point be (as reflected in increased dust levels) if the Hillside project is approved?

3.3 Contamination of St Vincent's Gulf

Of major concern to me is the detrimental effect that the mining operation will have on the waters and marine life of St Vincent's Gulf.

This eastern section of St Vincent's Gulf is a major fishing, tourist and holiday settlement area, all of which are predicated on unpolluted Gulf waters.

The Hillside mining lease extends right to the cliff face and the pit and overburden heaps are within 500 metres of the sea. So far, I have not been able to identify another copper mine in Australia which is in such close proximity to a semi-enclosed slow-flushing body of water like St Vincent's Gulf.

If the Gulf is affected by seepage of contaminants from the mine, contaminated storm water runoff, or copper sulphide deposition from wind-blown dust into the Gulf the results could be catastrophic, not only for the immediate area but for the recently declared Marine Park extending northwards from Parara Point to the head of the Gulf.

This Park, designed to protect the upper reaches of St Vincent's Gulf, is of particular significance because it provides nursury habitats for commercially significant fish species and swimmer crabs as well as nesting refuges for migratory birds.

While Rex Minerals have consistently stressed that the mine will have only minor consequences for the Gulf, the submission by marine biologist, Associate Professor Jochen Kaempf, indicates otherwise (J Kaempf, School of Environment, Flinders University. 30 August 2013.)

His assessment of the MLP's technical inadequacies is scathing (Kaemph, J. 2013. An Independent Scientific Assessment of the Hillside Copper Mine Proposal (Mining Lease Proposal and Management Plan) by Rex Minerals Ltd with a Focus on Marine Impacts. Report, 7 pages. School of the Environment, Flinders University.:

- *"The proponent did not undertake any marine dispersal studies as part of their proposal. For a project of this enormous scale, the use of state-of-the-art hydrodynamic modeling tools should be a standard requirement for the assessment of the effects of the dispersal of dust and potential coastal surface discharged into the marine environment (page 1).*

- *The proponent has neither reviewed nor scientifically explored the physical oceanography of Gulf St Vincent or its upper reaches.*

- *The proponent has decided not to simulate the pathway and dispersal of coastal surface run-off events and the sediment contained in it.*

- *The proponent has also decided not to scientifically study the pathway and dispersal of mining related dust deposition in the marine environment.*

- *Consequently, the proponent's claims in the impact assessment that both factors are of minor consequences cannot be scientifically tested being void of any credible scientific evidence. and are pure speculations presented as part of the proposal.*

He argues that

- *both the locally enhanced air-sea flex of dust and the occasional surface run-off of mining-related pollutants should be legally classified as point-source discharges that must comply with the Environment Protection (Water Quality) Policy 2003. and*
- *the company should be asked to demonstrate that such events will comply with regulations set out in that policy; in particular that:*
  - *1) adverse marine impacts of pollution events are limited to mixing zones with a radius of less than 100m and*
  - *2) there are no risks to the adjacent marine park.*

In contrast to the assurances provided by Rex Minerals, Prof Kaempf concludes that

If this project goes ahead, substantial negative inferences between mining operations with the marine ecology at a large scale are unavoidable.

The State Government and DMITRE must

- **require Rex to undertake the further investigations outlined by Professor Jochem Kaemph in his submission**
- **guarantee that if the mine proceeds there will be no contamination of the waters of St Vincent's Gulf**
- **ensure independent and regular monitoring of sea grass health etc. to ensure that any potential problems are identified quickly and rectified immediately.**

3.4 Rehabilitation

I understand that the Rex Minerals' rehabilitation plan for Hilllside is inadequate. The Mining Lease Proposal states that after mining the site will be rehabilitated to a level which is acceptable to the local community rather than what is required for best practice.

My concerns are outlined below. :

3.4.1 The Pit

- The pit will not be backfilled. This is inconsistent with Rex's promise to "develop.landforms that are consistent with the surrounding area". A huge water-filled hole in the ground does not fit this requirement.
- The pit will be fenced off and, with the cessation of any dewatering operations, will start to fill with what is likely to be highly toxic water.
- What guarantees are there that there will be no leakage of pit water into the aquifers, and ultimately into the Gulf waters, over the next 500 plus years?
- The pit should be backfilled in such a way that the original landscape is returned as closely as possible.

- Rex states that to backfill the pit would not be economically viable, but this should be a secondary consideration if the company is serious about meeting community expectations for rehabilitation.]

Rex Minerals must explain:

- **Why they are not adhering to best practice by opting to leave the pit open?**
- **If this decision is based on economic grounds, what other decisions regarding rehabilitation are motivated by economic considerations?**
- **How contaminated will the pit water become and what will be the consequences if it leaches into the Gulf?**

3.4.2 Tailings

- The tailings and other contaminated wastes will be buried within the waste rock pile in the west rather than being returned to the pit for safe encapsulation.
- The risk of erosion of tailings from the waste rock impoundment or seepage of contaminants from such structures would not exist if these materials were returned to the pit . There are now many examples of erosion issues and contaminant leakage from old mines such as Rum Jungle (a uranium/copper mine in the NT) and the Mount Lyell copper mine in north west Tasmania near Queenstown.
- During the mine operations, some form of dewatering system should be in place to consolidate the contaminated tailings rather than relying on natural evaporation. This would enable these metal-rich materials to be trucked back to the pit at the end of operations.

Rex must explain why it is not adhering to best practice by placing tailings and other contaminated waste in the pit and backfilling the pit for safe encapsulation

3.4.3 Land Reclamation

- The assertion that arable land can be reclaimed from the stockpile and tailings area is highly questionable. The overburden stockpiles are mostly granite and gabbro which are igneous rocks and will not support future farming.
- Rex's proposal to cover much of the site with the original topsoil is questionable. Even if the topsoil is completely stripped from the whole area before work starts there does not appear to be a sufficient amount available to do much with. Stored topsoil also loses its viability within 6 to 12 months.

Rex must answer the following:

- **Does the description of the post-mine land use as 'arable' mean that it will be suitable only for grazing?**
- **If not, precisely how much of the mine site will be returned to productive cropping land which was the prime agricultural pursuit across the entire site prior to mining?**

3.4.4 Slurry pipeline

The Company's proposal to bury the slurry concentrate and return water pipelines leading to Ardrossan is not best practice. Pipelines carrying toxic product must be above ground so that, in addition to other leak detection strategies, they can be inspected daily over the full route to ensure there are no visible leaks.

3.4.5 Road Diversion

- The diversion of St Vincent's highway will remain after mining.
- Sections of this road will be almost at the cliff face and several bridges will have constructed across the major creeks.
- The MLP states that the portion of land containing the road will, at mine closure, be transferred to DPTI/ DCYP to take over responsibility of the care control and management of the proposed highway.
- With climatic change and rising sea levels, coastal erosion and cliff undercutting is inevitable, and is already occurring on the section of St Vincent's Gulf earmarked for the road diversion.
- Road maintenance may therefore become another financial burden for the community.

3.4.6 Need for substantial bond to ensure best practice rehabilitation.

- If Rex Minerals leaves the open pit, the waste rock dumps and the enclosed tailings waste after mining, and this results in leakage into and contamination of the surrounding environment, will the bond Rex is required to lodge with the Regulator be sufficient to cover the on-going rehabilitation cost?
- If not, then the State Government will be forced to fund the rehabilitation work, which could run into the tens of millions of dollars.
- There is also a risk that the mine might cease operations prematurely because of low grade ore, low market prices or if the company becomes insolvent. (One example is the Angas Mine near Strathalbyn. If this happens, what are the plans to deal with the potential environmental legacy of the mine-site and its operational infrastructure?
- The bond needs to be properly calculated and independently verified to ensure that it adequately covers the costs of closing, decommissioning and rehabilitating the mine, including if it closes unexpectedly.

- The amount of the bond should increase steadily over time as the mine progresses.
- A full scale monitoring program should also be in place to ensure the rehabilitation process is fully adhered to.

3.5 When will lease relinquishment occur and rehabilitation be completed?

- As a resident of Rogues Point, I believed that, as per Rex's assurances, the mine had a life of (initially) 12 years now extended to 15 (because if the underground component).

- What I did not expect was Rex's expansionist plans which could see another 50 mine sites established along our section of the Peninsula.

- This would mean constructing a network of haul roads across this region, keeping the crushing and processing plant at Hillside fully operational, and creating more waste dumps, tailings dams and other infrastructure at Hillside.

- This means that for the rest of my life I will never see Rogues Point revert to what it is now, and potentially in a few years time the settlement will be completely surrounded by dirty, noisy, open cut pits.

- To argue that Rex will have to go through the whole process of pre-feasibility studies, etc to seek approval for new mines is not reassuring. Once Hillside is approved, it will be extremely difficult to refuse approval to any subsequent mining venture in the area if the copper reserves prove to be economically viable to mine.

4. Secondary environmental concerns

In relation to my secondary concerns, it is sufficient simply to list the potential impacts of the Hillside mine as identified by Rex themselves.

If Rex get any of these wrong, if their operational controls and monitoring systems fail in any way (as is likely to be the case), these impacts spell out very clearly just what I can expect to experience as a resident of Rogues Point.

4.1 Visual amenity

The MLP (Table 8.3.-19) lists the following potential impacts:

- Reduction in visual amenity from clearance of vegetation and excavations during construction
- Change in land forms (temporary and permanent) causing a reduction in visual amenity during operation.
- Nuisance to the public from light spill derived from mobile plant during construction and operation.
- Reduction in aesthetic and recreational value of area from increase in general solid waste and litter.
- Decrease in ambient air quality resulting in public nuisance at neighbouring sensitive receptors from dust emanating from Hillside.
- Reduced productivity resulting from shading of farm land by changed landscape
- Displacement of native fauna from light spill from Hillside mining and associated infrastructure.

Given that my residence looks directly at the Mining Lease site, it is inevitable that the stunning views that I have grown accustomed to over the past 60 years will be permanently lost. I will be looking straight at

- the road diversion, and the light spill emanating from vehicles moving along it
- the bore field
- the north easterly waste rock dumps
- the Rex office/conference complex that is likely to be built near the cliff tops at Hills Beach.

This entire stretch of coast from Rogues Point to Pine Point, with its natural beauty and scenic value, will be permanently lost.

4.2 Blasting

As per the MLP (Table 8.3-15), the potential impacts identified by Rex are as follows:

- Reduced public amenity as a result of ground vibration associated with blast activities
- Reduced public amenity as a result of air overpressure (noise) associated with blast activities
- Reduced public safety and damage to third party property (including stock) from fly rock
- Structural damage to roads and houses caused by blast activities
- Disturbance to native fauna (terrestrial and marine) due to blasting activities
- Disturbance to livestock on neighbouring properties as a result of blasting activities
- Impact on agricultural aircrafts flying over the clearance zone during a blast.
- Disturbance to geological monuments from blasting activities.
- Dust deposition impacting on public health, public nuisance, native vegetation, marine fauna and agricultural crop
- Blast exclusion zone restricting access to adjacent land user for normal faming activities and aerial spraying.
- Reduced access to land parcels as a consequence of blast exclusion zone and road changes.

4.3 Light Pollution

The amount of lighting required to enable an operation of this size to function during hours of darkness means that considerable amounts of artificial lighting will be required. .Given the proximity of Rogues Point to the mine site, it is unlikely that we will ever experience true darkness again.

It will be impossible for Rex to mitigate this.

The State Government, DMITRE and Rex Minerals must guarantee that none of the above-listed potential impacts will not occur if the mine proceeds.

5. Some economic considerations

5.1 Cost/benefit analysis

Cost Benefit Analysis attempts to measure all of the positive or negative consequences of a project.

Because they are relatively easy to calculate, direct financial costs and benefits (such as increased employment) are most likely to be documented in any development proposal..

In contrast, because putting value on factors such as the value of a human life or the actual compensation an individual would require to have his/her quality of life and wellbeing unchanged by a development is difficult . Putting a value on environmental issues is also difficult. This is now typically assessed by valuing ecosystem services to humans, such as air and water quality and pollution.
(en.wikipedia.org/wiki/Cost–benefit_analysis).

Given the magnitude of the proposed Hillside mine, and its potential for major environmental impacts on both the environment and local residents, a fll cost-benefit analysis should be mandatory.

Yet Rex Minerals has chosen not to undertake a thorough and fully documented cost/benefit analysis.

Instead, they focus on the tangible issues such as the purported increase in employment opportunities, the increased water supply for the Peninsula, the amount of royalties that will be paid to the State Government etc.

The potential negative impact upon the social fabric and quality of life of residents in the region has not been costed or taken into account at all.

No attempt has been made to put dollar values on the following:

- The impact on landowners/householders adjacent to the mine as a result of:
    - Reduction in land and property values
    - Noise and light pollution from round the clock mining activity and heavy vehicle movements, 24 hours a day 7 days a week.
    - Vibrations from the blasting causing damage to homes and other buildings
    - Reduction in the aesthetic value with compromised views

- The impact on road safety as a result of:
    - increased traffic associated with the project, particularly an increase in heavy vehicles using roads also shared by rural bus routes
    - Ratepayers having to fund the cost of increased road repairs needed

- The impact on residents' health, including:
    - Increase in respiratory diseases such as asthma, caused by the dust
    - Toxicity in the groundwater and rainwater tanks impacting health

- Pressure upon local services
    - Rex Minerals quote in their proposal that the workforce will vary between 383 to 1,000 people over the 15 year life of the mine, with a sharp reduction in employment of 40% between years 10 and 11. If that workforce is drawn entirely from the local region, the increased population will be only temporary. The region will therefore not qualify for any increased provision of health, childcare, education and other associated services, yet the Rex workforce will use these services.

- Decrease in property values
    - Decrease in property values in the long term due to the proximity of the mine and the long-term inertia on its completion.

- Competition for rental and purchase of properties – the SA average wage is $60,559 (ABS, 2011) whereas Rex quote in their proposal that the average wage at Hillside will be $100,000+. This puts the general population at risk of not being able to afford homes in the area when competing with Rex employees for property sales or rental applications.

- Costs from possible reduction in tourism resulting from the Peninsula's loss of reputation for being "naturally beautiful".

- Costs to professional fishing if the waters of St Vincent's Gulf become contaminated.

- Costs of rehabilitating the mine site if this is not done appropriately.

To enable an accurate understanding of the economic import of the Hillside proposal, the State Government and the regulators must require Rex Minerals to undertake a comprehensive cost/benefit analysis.

At the very least, this should take into account the factors identified above.

5.2 How real are the projected economic benefits?

In the Hillside Copper Mine Executive Summary (August 2013) included in the MLP, Rex note the following socio-economic benefits:

- Economic benefits include project expenditure and investment in infrastructure, taxes, royalty payments and salaries from created jobs and indirectly generated jobs
- Rex will continue to support a wide range of community initiatives through its Community Sponsorship Program, initiated in early 2011.
- Over the life of the Hillside Mine, it is likely that the majority of Rex's workforce will become, or are already, permanent residents within a radius of 50 km of the Hillside Mine.
- The new water supply will serve as a significant long term benefit well beyond the requirements of the Hillside Mine for the community in Yorke Peninsula.
- The Hillside Mine may act as a stimulus to upgrade power supply to Yorke Peninsula before 2018. Discussions with state power agencies include the timing of planned upgrades and the opportunities to provide long term benefit with respect to improved power supplies for the Yorke Peninsula.
- Environmental benefits include best practice mine rehabilitation including increased area for native vegetation, provision of significant increase in environmental knowledge from collection of baseline data and improving the understanding of biodiversity, native vegetation and landscape values for the region.

Some of these are worth further examination.

5.2.1 Employment opportunities:

Rex consistently point to the number of jobs that will be created in the local region. However, these figures have shifted over the past twelve months.

Initially, Rex claimed that there would be 1,000 jobs during the construction phase and 600 during on-going operations. The 1,000 jobs has now been reduced to about 600 - 700 because, as we understand it, the Chinese company with whom Rex have a Memorandum of Understanding require that the manufacturing of the infrastructure should take place in China, therefore reducing the number of jobs available to Australian workers during the set-up phase.

The opportunities created by the mine at Hillside will only be temporary. Rex quote in their proposal that they expect to recruit 33% of their workforce locally, 33% from those living on the Yorke Peninsula but currently working elsewhere, and 33% from outside the region. Some of the workforce will also be sourced from "elsewhere and interstate".

These figures should give local communities such as Ardrossan pause to consider just how many of the promised 500 -600 jobs will in fact come from Yorke Peninsula itself.

Competition for employment with established local businesses may also be problematic. It is likely that these will not be able to afford to pay the same rates as Rex Minerals. Industries such as agriculture and tourism will be particularly affected, as they also have a highly seasonal, primarily casual employment profile.

5.2.2 Increased water security.

Rex have consistently lauded the fact that, as a result of their initiatives, a pipeline capable of carrying 2.2 ggls of water will be brought to the Peninsula and, after Hillside has extracted its required 1.6 ggls, the remainder will be available to increase water supplies to local communities..

This claim needs questioning.

- For a start, a report by SA Water earlier in the year indicated that Yorke Peninsula's water supply is secure through until 2050. This indicates that extra water is simply not required.

- The argument that holiday settlements such as Rogues Point and James Well will be able to receive reticulated water does not take account of the fact that many residents in these locations simply do not want mains water. Instead, we are very happy relying on rain water (unless, of course, it becomes contaminated by dust form the mine site. Then we may have little choice.

5.2.3 Royalties paid to the South Australian government

In the MLP, Rex indicate that the State Government will receive annual royalties of $30m. However, they also note that the income from the mine will be $800 m. per year. This means that SA will receive only 3.75% of the total. Royalty payments will only continue to be paid while the mine operates.

Given that the mine site can never be returned to the level of agricultural productivity experienced pre-mining, this represents 'short term gain for long term pain'.

5.2.4 Rehabilitation as an economic benefit?

The fact that Rex lists as one of its environmental benefit "best practice mine rehabilitation including increased area for native vegetation, provision of significant increase in environmental knowledge from collection of baseline data and improving the understanding of biodiversity, native vegetation and

landscape values for the region" is strange to say the least, given that without the mine, the need for rehabilitation would not exist!

6. Conclusion

Given all that could go wrong with this mining operation, I am extremely surprised that the venture has been allowed to reach this stage of a formal Mining Lease Proposal to the Government

The risks as outlined in the MLP itself are huge.

What we have here is a huge mining venture – lauded by Rex as the largest proposed open-cut copper mine in Australia – situated in a highly sensitive, highly productive rural environment within one half of a kilometre of the vulnerable waters of St Vincent's Gulf. And it is not as if SA does not have other copper deposits that could be mined, as evidenced by the deposits at Olympic Dam.

The environmental track record of heavy metal mines extracting copper, gold and iron are notoriously bad. There are many examples across the world where the environmental damage bill from badly managed and poorly rehabilitated mining operations has been huge.

Why should this one be any different, particularly given that the mining company seeking to develop Hillside is essentially an exploration company with no mining experience at all?

Rex Minerals is a young, financially vulnerable company with no prior mining experience, and no track record that would prove to the community that they could successfully undertake an enterprise of this size and sensitivity. Even the well-established companies with a long history of mining, such as BHP, still make mistakes.

As a fledgling mining company without the experience and financial reserves of the big miners, I have no confidence in Rex's ability to develop and manage Hillside in a way that will avoid all of the potentially damaging environmental impacts that could result.

They have, I understand, made mistakes during the exploration phase and have reassured the individuals involved that 'they will learn from their mistakes'. How much damage could occur if 'learning from their mistakes' continues into the mining phase?

I therefore urge DMITRE and the State Government to reject Rex Minerals' Application for a Mining Lease at Hillside.