



PART A – Introduction and Description

GUIDELINES FOR AN

ENVIRONMENTAL IMPACT STATEMENT

ON THE PROPOSED ALCAN GOVE ALUMINA REFINERY

THIRD STAGE EXPANSION

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These Guidelines have been developed to assist Alcan Gove Pty Limited in preparing a draft Environmental Impact Statement (EIS) for the Alcan Gove Alumina Refinery Third Stage Expansion in accordance with Clause 8 of the Administrative Procedures of the *Environmental Assessment Act (1982)* of the Northern Territory

The final guidelines will consist of 3 sections. Part A (this section) is the introduction and description of the project and the EIS process. Part B (attached) details, in a generic fashion, all the issues that require addressing by the proponent. Part C (to be attached as part of the final guidelines) will contain additional project specific issues and concerns raised during the public consultation period on the guidelines.

1 Project Description

The proponent for this project is Alcan Gove Pty Limited a wholly owned subsidiary of Alcan Inc (Alcan).

The operations are located on the Gove Peninsula in the north-east of Arnhem Land in the Northern Territory. They consist of a bauxite mine and a refinery which converts the bauxite into alumina. The alumina from Gove is exported from the refinery to aluminium smelters around the world. The operations currently employ 1,100 people who live in Nhulunbuy, a town with a population of 4,000.

Proposed Expansion

The refinery's expansion project will increase total production of alumina from 2.0 mt/a to 3.5 mt/a. Alcan's objective for the expansion is to sustain its internationally competitive alumina position and have a positive impact on environment performance.

All new plant and equipment to be installed as part of the expansion will be located within the footprint of the existing operations. There is no requirement to use any land outside the existing lease areas.

While the existing mining rate will increase, no significant change in mine plan is required to extract the increased tonnage. The crushing facility at the mine site will be modified to improve availability and capacity. The speed of the conveyor from the mine to the refinery will also increase.

Increased refinery production will be achieved by installing new process equipment which will integrate into the existing refinery process. As well as the new process equipment, an additional power station boiler to supply steam and electricity will be installed. Consideration is also being given to the installation of a liquor purification process designed to reduce the organic impurities in the residue to enable maximum recycling of caustic liquor. This will only be implemented if all appropriate environmental and health guidelines can be met.

The alkaline residue from the refinery is currently disposed of in containment ponds at the residue disposal area. Plans are currently being developed to neutralise some of the alkaline waste water and red mud before disposing of it in the containment ponds. The waste water from the neutralisation process will be saline but suitable for discharge to the marine environment. In this way the inventory of water stored in the residue disposal area can be progressively reduced and the quality of the marine discharge will be improved.

Because of the increased rate of mud disposal required as a result of the expansion, the capacity of the existing disposal facility is expected to be reached by about 2015. Prior to that time, detailed studies into future residue disposal and drainage discharge options will be undertaken and a separate government approval will be sought for any new disposal area.

The expansion design will incorporate sufficient flexibility for the refinery to burn either fuel oil or natural gas. Negotiations are currently under way to secure natural gas supply to the plant. Fuel oil will continue to be burned until natural gas becomes available, with appropriate controls to achieve acceptable air quality.

The expansion will increase the refinery's demand for water. Demand management will be implemented with the aim of remaining within the supply capacity and licence limits of the existing borefield. If demand management alone cannot ensure adequate water supply, other options will be identified.

The construction phase will extend for 33 months. At its peak there will be an estimated 1,220 construction workers. These workers will be accommodated in a self-servicing construction camp to be developed in Nhulunbuy South. Changes to the operational workforce will be determined during the design phase.

Effects of the Expansion

The environmental effects of the expansion project have yet to be studied fully and Alcan will produce a detailed assessment of all relevant aspects in the environmental assessment report. This report will be in the form of an Environmental Impact Statement prepared in accordance with the requirements of the Northern Territory Government.

Even though the studies are not yet complete, it is possible to identify positive benefits to the environment from the expansion. These include:

- Installation of the Alcan double digestion process will ensure the optimum amount of alumina is extracted from the bauxite and that lower grade bauxite can be processed. This will result in a 10% improvement in alumina extraction per tonne of bauxite mined and, as a result, an extension of the mine life.
- The improved digestion will also result in a 25% reduction in residue produced per tonne of product.
- With liquor purification there will be 25% less caustic consumption and a 75% reduction in soluble caustic waste per tonne of alumina produced.
- There will be a 5% reduction in energy consumption and a reduction in greenhouse gas emissions per tonne of product.
- Once the natural gas supply becomes available, there will be a substantial reduction in sulphur dioxide emissions and combustion particulates as well as a further reduction in greenhouse gas emissions. Appropriate control measures will be taken to ensure acceptable air quality is achieved if the supply of natural gas is delayed.
- There will be no significant increase in ship movements after completion of construction.

Table 1 summarises the main components of the existing refinery and how they will be affected by the expansion project. The significant environmental advantages from the various components of the expansion have also been summarised.

Table 1
Summary of Expansion Effects

Component	Existing Refinery	Expanded Refinery
Mine		
Production	Bauxite – 6.5 Mtpa, open pit 1.8 Mtpa is exported	Bauxite – 8 Mtpa, open pit. No change to existing mining and rehabilitation practices. No bauxite is exported.
Refinery		
Production	Alumina – 2.0 Mtpa	Alumina – 3.5 Mtpa
Digestion	Low temperature digestion	High temperature double digestion (all stages). <i>10%improvement in alumina extraction and 25% less residue per tonne of alumina.</i>
Mud Separation	Multi-stage thickeners	Alcan high rate decanters plus conversion of existing thickeners to additional washers.
Evaporation	Multi-stage evaporation plant with seawater cooling.	Additional multi-stage evaporation plant with closed circuit cooling (stage 3 only). <i>No direct seawater/process contact.</i>
Precipitation	Multiple precipitation tanks with two stage cooling and cooling towers	Additional multiple precipitation tanks and cooling tower.
Classification and Filtration	Hydrocyclone classification and vacuum filtration	Additional hydrocyclone classification and vacuum filtration.
Calcining	Rotary calciners (4), stationary calciner (1)	One existing and two stationary bed calciners with rotary calciners on standby (all stages). <i>Less energy consumption and improved dust control.</i>
Impurities Removal	Organic impurities purged to residue disposal area	Liquor purification (all stages). <i>Organic impurities destroyed in purification process with 25% less caustic consumption and 75% reduction in soluble caustic concentration in the residue.</i>
		Alternative Scenario No liquor purification if environmental and health guidelines can not be met during trials. Organic impurities purged to residue disposal area as at present.
Power Station	Three pressure boilers and turbines with fourth to be installed this year	Four existing and one new high pressure boiler and turbine.
Fuel	24 PJ of 3.5% sulfur fuel oil	40 PJ of natural gas (all stages). <i>Minimal sulfur and particulate emissions.</i>
		Alternative Scenario If gas supply delayed, continue with 3.5% sulfur fuel oil until gas available with interim SO ₂ control by fuel switching.
Residue Disposal		
Red Mud Storage	Dry stacking of alkaline red mud in containment dams	Dry stacking of red mud to continue. The current inventory of stored water in the containment dams to be depleted along with the progressive introduction of neutralised red mud. Once the capacity of the existing containment dams is reached (approx 2015), a new containment area will be required. Investigations and separate approvals for new containment dam locations to be sought. <i>Neutralised runoff from containment dams suitable for direct discharge to marine environment to become available progressively.</i>
Red Mud Water Management	Stored in dams with a limited amount neutralised and discharged to the marine environment	Water stored in dams until inventory depleted by expanded neutralisation facility (all stages). Elimination of the long term storage of caustic liquor.

Component	Existing Refinery	Expanded Refinery
Air Emissions		
Combustion	SO ₂ , NO _x , and particulate emissions	SO ₂ and particulates virtually eliminated with gas (all stages). Low NO _x burners (stage 3). Particulates from calciners significantly reduced (all stages). Alternative Scenario SO ₂ and particulates from oil combustion continue for interim period until gas is available. Emissions controlled by fuel switching.
Liquor Purification	No emissions	Emissions from liquor purification plant controlled by scrubber and thermal oxidiser if necessary (all stages) Alternative Scenario No liquor purification if environmental and health guidelines not met during trials.
Water		
Caustic to Ground	Thickener cleaning practices can result in caustic material placed on ground	Existing thickeners converted to red mud washers and new thickeners will minimise placing caustic materials on the ground (all stages). <i>Significantly reduces the potential of caustic seeping to the groundwater from the thickeners.</i>
Marine Discharge	Discharge to Melville Bay of cooling water from the evaporation process, some runoff from the residue disposal area that has been neutralised, stormwater from the refinery and other minor waste streams	Discharge to Melville Bay to continue but cooling water will first be used to neutralise refinery effluent and subsequently red mud before being settled and then discharged. Progressively all of the runoff from the residue disposal area will be neutralised and discharged. Stormwater and other minor waste streams will be a controlled discharge.
Water Supply	Borefield extraction within existing licence conditions for refinery and town	Higher demand to be managed to remain within existing licence limit. Alternative Scenario If modelling indicates the licence limit cannot be met, additional borefield will be identified.
Shipping		
Ship Movements	Export of bauxite, alumina and hydrate. Import of fuel oil, limestone and caustic soda	Bauxite export will cease. Fuel oil imports will cease (apart from occasional delivery of backup supplies). Alumina exports will increase. Gas provided by pipeline. No significant increase in shipping movements except for construction.

2 The Purpose of the EIS

The draft EIS aims to provide:

- a source of information from which individuals and groups may gain an understanding of the proposal, the need for the proposal, the alternatives, the environment that it would affect, the impacts that may occur and the measures taken to minimise those impacts;
- a basis for public consultation and informed comment on the proposal; and
- a framework against which decision-makers can consider the environmental aspects of the proposal, consider whether it is environmentally acceptable, and if so set conditions for approval to ensure environmentally sound development and recommend an environmental management and monitoring program.

The object of these guidelines is to identify those matters that should be addressed in the draft EIS. The guidelines are based on the initial outline of the proposal in the Notice of Intent. Not all matters indicated in the guidelines may be relevant to all aspects of the proposal. Only those matters that are relevant to the proposal should be addressed. The guidelines should, however, not be interpreted as excluding from consideration any matters which are currently unforeseen, which may arise during ongoing scientific studies or which may arise from any changes in the nature of the proposal during the preparation of the draft EIS, the public consultation process and the preparation of the Supplement to the draft EIS (response to submissions).

The draft EIS should be a self-contained and comprehensive document written in a clear, concise style that is easily understood by the general reader. Cross-referencing should be used to avoid unnecessary duplication of text. Text should be supported where appropriate by maps, plans, diagrams or other descriptive material. Detailed technical information and baseline surveys should be included as appendices or working papers.

The justification of the project in the manner proposed should be consistent with the principles of ecologically sustainable development. Assessment of the environmental impacts of the proposal and alternatives should consider the life-cycle impacts, from cradle-to-grave, including sourcing of materials, operational impacts and decommissioning. For the purpose of these Guidelines, the “principles of ecologically sustainable development” are as follows:

- the precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- inter- and intra-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations;
- conservation of biological diversity and ecological integrity; and
- improved valuation and pricing of environmental resources.



PART B – Guidelines

GUIDELINES FOR AN

ENVIRONMENTAL IMPACT STATEMENT

ON THE PROPOSED ALCAN GOVE ALUMINA REFINERY THIRD STAGE EXPANSION

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The draft EIS should include the following sections, but need not be limited to these sections or inferred structure.

1 EXECUTIVE SUMMARY

The Executive Summary should include a brief outline of the project and each chapter of the draft EIS, allowing the reader to obtain a clear understanding of the proposed project, its environmental implications and management objectives. The Executive Summary should be written as a stand-alone document, able to be reproduced on request by interested parties who may not wish to read or purchase the draft EIS as a whole.

The summary should include:

- the title of the project;
- name and contact details of the proponent, and a discussion of previous projects undertaken by the proponent and their commitment to effective environmental management;
- a concise statement of the aims and objectives of the project;
- the legal framework, decision-making authorities and involved agencies;
- a discussion of the background to and need for the project, including the consequences of not proceeding with the project;
- a discussion of the alternative options considered and reasons for the selection of the proposed development option;
- a brief description of the current operation, proposed expansion and the existing environment, utilising visual aids where appropriate;
- an outline of the principal environmental impacts, environmental management strategies (including waste minimisation and management) and commitments to overcome or minimise these impacts;
- given the community has a large number of residents who use English as a second language the Executive Summary should also be presented in Yolngu Matha; and
- where possible throughout the EIS tables, maps, diagrams and dot point identification should be used.

2 INTRODUCTION

The introduction should include:

- a brief explanation of the purpose and structure of the document;
- title of the project;
- name and contact details of the proponent;
- scope of the proposed project;
- an outline of the environmental assessment processes under the relevant NT and Commonwealth legislation;
- reference to initial investigations and feasibility studies;
- relevant Territory, Commonwealth and International policies, legislation, and treaties; and
- planning issues such as land tenure, zoning, and timeframes, potential for additional development and the lifetime of the project.

3 OBJECTIVES AND BENEFITS OF THE PROPOSED PROJECT

Discuss the social and financial objectives and benefits of the project. This should include:

- socio-economic objectives and benefits, including reference to local and global markets, other economic activities in the affected area (eg Tourism, Pastoral etc.), foreign trade objectives, occupational health and safety objectives, and benefit to the local workforce, land users and indigenous people; and
- commercial objectives (eg predicted volume of product and proportion of market demand to be met by output) and local, regional and global environmental objectives.

4 ALTERNATIVES

Alternative proposals, which may still allow the objectives of the project to be met, should be discussed, detailing reasons for the selection and rejection of particular options. The selection criteria should be discussed, and the advantages and disadvantages of preferred options and alternatives detailed. The potential impacts of the alternatives should be described.

Alternatives to be discussed should include:

- not proceeding with the proposed expansion;
- alternative locations, including power station and process plant;
- alternative sources of raw materials for the project, including water supply and storage;
- alternative environmental management technologies considered, such as treatment and disposal of byproducts and waste products, co-generation etc;
- alternative workforce accommodation; and
- alternative power supply options and service corridors.

5 PROJECT DESCRIPTION

The draft EIS should describe the project in sufficient detail to allow an appreciation of the construction and operation timeframes and processes, and assist in determining the potential environmental impacts of the project. Key decision-making processes (such as risk assessment) should be detailed. Where appropriate, relevant Northern Territory and Commonwealth Government legislation, strategies and policies as well as international and national standards should be considered. Relevant NT Government environmental and construction guidelines should also be considered during the design phase of the project.

The use of a table describing the key characteristics of the project and a description of the phases of the proposal, including the nature and extent of proposed works likely to involve environmental impacts, may be an appropriate means of summarising this information.

The project description should consider the following, as a minimum, for all aspects and components of the project:

5.1 *Location Details*

- Provide a description of the project's location indicating distance from Darwin;
- provide a description of the location of the major components of the operation in relation to each other, Nhulunbuy, Yirrkala and other settlements, the port and the airport;
- provide maps and diagrams displaying the above information; and
- provide maps showing the project in relation to topographical features, habitats and landmarks including features such as creeks, rivers, coastline and mangroves.

5.2 *Project Design*

Provide overall layout of the current operations and the proposed expansion including the mine, processing facilities, waste dumps, tailings storage facilities, power station, other infrastructure, rivers, access and transport routes and existing features of interest.

- Describe the components of the project with a description of each component and its function, including the port facilities;
- location of the components (include detailed maps);
- land area to be used including:
 - size (area of total project and area of land disturbance);
 - tenure (mining and other land tenure);
 - current uses;
 - claims under the *Native Title Act, 1993* and the *Aboriginal Land Rights (Northern Territory) Act 1976*;
 - Aboriginal Areas Protection Authority certificates issued or required under the *NT Aboriginal Sacred Sites Act*;
 - acquisition requirements; and
 - access requirements.
- Current and proposed infrastructure (roads, airstrips, communications, power etc); and
- describe how the project design will include the existing infrastructure for the current mining processing and transport operations and effects of major rainfall and flood events in recent years.

5.3 *Construction Details*

- Timing of construction activities (include a time-line of all activities);
- materials required for construction including:
 - solids;
 - water (construction and potable) and other liquids;
 - gases; and
 - power.

Tabulate details showing quantities, hazardous and non-hazardous substances and NPI reporting requirements.

- Outline plant and machinery requirements; and
- outline personnel requirements, including:
 - numbers;
 - positions;
 - shifts;
 - staff structure with responsibilities;
 - housing requirements; and
 - induction procedures for contractors and subcontractors.
- Wastes to be generated including:
 - solids (this does not include the residue – see below);
 - liquids (include sewage); and
 - gases.

Tabulate details showing quantities and highlighting hazardous substances and dust and emissions to air including NPI reporting requirements.

Applicable standards relevant to:

- mining;
 - building;
 - erosion and sediment control;
 - environmental and heritage protection (including indigenous heritage);
 - occupational health and safety (include measures to prevent exacerbating mosquito breeding in the area for example screening accommodation to prevent the spread of mosquito borne diseases);
 - project management; and
 - housing construction.
- Traffic and freight requirements:
 - vehicle types and numbers;
 - hours of operation;
 - vehicle washdown facilities and procedures;
 - define if construction material will be sourced over wharf or by road; and
 - discuss the potential impacts to the existing road network and present proposal for upgrade if required.

- Identify availability, location and suitability of :
 - borrow material including topsoil, describe requirements, extraction methods and proposed uses of the borrow material; and
 - contractor and sub-contractor lay-down and administration areas.
- Define whether the construction equipment/fabrication will be staged through Darwin or at some other location, describe alternatives;
- describe the additional services required and solutions for the construction period;
- describe the footprint for construction compared with operation;
- outline the commissioning procedure for:
 - Changes to the existing plant design; and
 - start-up of new plant and integration with old plant.

5.4 Operational Details

5.4.1 Bauxite mine

- Outline the design of the mine and its dimensions (including maps, plans and geological cross-sections);
- describe the clearing and rehabilitation of vegetation, including the use of topsoil;
- describe erosion and sediment control measures;
- describe mining methods, scale of operations and timetable for ore extraction;
- describe the upgrade of the crushing facility and other facilities at the mine;
- describe the upgrade of the conveyor between the mine and the refinery;
- outline possible future extensions to the mine operation, and discuss the probability of mining satellite ore bodies; and
- describe changes to the crushed bauxite storage area, including stacking and reclaiming.

5.4.2 Bauxite processing and refining

- Identify and describe in detail the stages of ore processing from run of mine ore to alumina. Include flow diagrams and options for processing the ore;
- detail all input products (solids, gasses and liquids) and pathways for each item in the process. Tabulate, indicating the quantity and nature of the substances, storage and handling requirements, NPI reporting requirements, sources and transport; and
- detail all output products (solids, gasses and liquids) and pathways for each item in the process. Tabulate, indicating the quantity and nature of the substances, handling, storage and transport requirements, disposal, reuse or recycling options.

5.4.3 Residue (red mud)

- Characterise the residue and other solid waste from the refining process, including mineralogy and metal content;
- describe the residue disposal location and catchment details;
- describe residue disposal and impoundment principles, surface configurations, wall designs and construction, estimated flood heights and provisions for extreme rainfall events, erosion protection, spillway design and location, subdrainage and

collection sumps. Ensure current geotechnical engineering principles/practices are met; and

- outline any provisions in the design and management of the residue disposal facility for future extraction of resources.

5.4.4 Water Management

- Detail the water requirements and sources for both surface and ground water. Breakdown the usage in terms of mine, refinery and town supplies;
- document the approach used to model impacts of proposed changes to the hydrologic regime (data sources, data limitations, model timesteps, model assumptions and uncertainties);
- describe the management of clean, dirty and contaminated surface water on the mine site, at the refinery and the residue disposal facility. Present design options for conservative management of contaminated water emerging from the site. This must reflect current industrial contaminated water management practices;
- describe monitoring of the current operations and its applicability to the proposed expanded operations;
- document the management of process waters, including contingency planning for accidents;
- document the management of high/extreme rainfall events, including contingency planning;
- describe how the water is currently recycled and how the upgrade will impact in both beneficial and adverse ways;
- detail the proposed liquor purification process and the residues from this process, including their treatment and disposal; and
- detail how the increase in storm-water flow will be dealt with regarding increased silt flow, erosion, the construction of new drains, the end point of drains and measures that will be taken to prevent the creation of new mosquito breeding sites.

5.4.5 Power requirements and generation

- Describe the energy requirements at the different stages of ore mining, processing and refining;
- describe in detail the options for power generation in terms of:
 - sources of gas or fuel oil;
 - transport, transport routes and storage;
 - cooling requirements, for seawater cooling define quantities and likely heat differential between inlet and outlet;
 - water management; and
 - emissions to air including particulates.

5.4.6 Management of emissions to air

- Provide a table that details the projects estimated maximum annual emissions of the following greenhouse gases: carbon dioxide, methane, nitrous oxide, hydroflourocarbons, perflourocarbons and sulphur hexafluoride.
 - These should be recorded on a gas by gas basis and as a total (in the form of a carbon dioxide equivalent) for each process;
 - any offsets or mitigation of these gases should also be detailed. The national greenhouse gas inventory (NGGI) methodology should be used to prepare these estimates; and
 - processes not covered by the NGGI or the Inter governmental Panel for Climate Change (IPCC) methodology should be referred to the Northern Territory Office of Environment and Heritage.
- Consideration of the options to minimise greenhouse gas emissions should be detailed and at a minimum, address energy efficiency, fugitive emissions and renewable energy sources. Analysis of the costs of mitigation (both financial and output related) should also be included. The proposed options should be clearly identified.
- Information on options for offsetting any greenhouse emissions produced by the project should be considered and the EIS should include:
 - a description of proposed offset programs;
 - a qualitative assessment of the programs including environmental, economic and social aspects ;
 - an analysis of costs, both financial and other; and
 - any national or international greenhouse-offset implications associated with the overall project should also be identified.
- Processes for ongoing management of greenhouse abatement should be identified including:
 - the means, by which the effectiveness of greenhouse emission minimisation and offset programs will be monitored, investigated, reviewed and reported;
 - greenhouse performance indicators that allow comparison with similar technologies producing similar products; and
 - intended participation in voluntary greenhouse programs such as the Greenhouse Challenge should be noted.
- Describe measures and techniques to minimise and manage the emissions to air (other than greenhouse gases), including the emissions from the power generation alternatives.

5.4.7 Waste Management (other than red mud)

- Describe the current and proposed waste management practices (including landfill practices) and define how best practice management will be applied to the management of industrial wastes; and
- describe the recycling process and the materials that will be recycled including the market and predicted quantities based on comprehensive market research.

5.4.8 Gove Port facilities

- Describe any changes to the port required for the changes in shipping requirements, including any dredging and widening of the channel that may be required;
- describe any changes to the port design to facilitate the import of construction materials;
- detail the vessel types and numbers used for exporting the alumina and importing fuel oil and caustic soda;
- for the fuel oil power option describe handling and storage facilities required at the port;
- for the natural gas power option describe handling and storage facilities required at the port;
- describe the methods likely to be used for transferring the fuel oil &/or gas to the power station at the mine; and
- describe water management and dust suppression at the port.

5.4.9 General

- Personnel requirements:
 - numbers;
 - positions;
 - shifts;
 - staff structure with responsibilities;
 - housing requirements; and
 - induction in relation to the local community including cross-cultural training.
- Occupational Health and Safety, and Emergency Response Details:
 - fire and emergency services planning, including bush fire management;
 - spill response plans;
 - induction details;
 - management structure responsibilities; and
 - communication details.
- Operational fleet details including cars, trucks, mining equipment etc showing:
 - ownership (ie corporate or lease/hire);
 - expected fuels, oil, tyre usage;
 - maintenance requirements; and
 - disposal options.

- Traffic and freight requirements:
 - vehicle types and numbers;
 - hours of operation; and
 - vehicle wash down facilities and procedures.

5.4.10 Rehabilitation and Decommissioning Details

The text should outline a time scale for decommissioning and for determination of compliance with (and release from) requirements of the appropriate authorities.

Specific information requirements include:

- Describe a program for engaging Traditional Owners of the land in the process of determination of land use objectives, post mining land use, completion criteria, environmental indicators and the design of rehabilitated landforms;
- identify decommissioning and rehabilitation objectives including the current operations and a plan to remediate/resolve existing environmental management constraints including ground water contamination;
- describe arrangements for the site closure of current operations and the proposed expansion under the *Mining Management Act*, include reference to a security bond;
- identify post mining land use;
- identify proposed completion criteria or process of developing these criteria;
- identify proposed environmental indicators to measure progress in achieving the completion criteria (or process to develop these);
- integration of the rehabilitation program with mine design and operation;
- design of rehabilitated landforms including consideration to prevent the creation of mosquito breeding sites;
- erosion and sediment control procedures;
- describe progressive and/or the final rehabilitation plan for the mine, the refinery and the residue disposal facility and their respective surrounds. Specifically collection and selection strategy for native species, eg native grasses and other vegetation to be used for runoff and erosion control, final topographic and drainage morphology, maintenance of water quality, prevention of leaching and revegetation procedures;
- natural and constructed drainage system design to ensure runoff discharge does not erode or add to downstream siltation;
- actions to prevent the development of mosquito and other biting insect breeding habitats;
- on-going water management requirements linking storage, quantity and quality;
- continued water monitoring and discharge requirements following decommissioning; and
- responsibilities of the proponent after decommissioning.

6 Existing Environment and Impacts of the Project

The draft EIS should include an in-depth description of the areas potentially impacted by the project. These areas should include:

- areas affected by mining operations and maintenance;
- areas affected by construction (including off site);
- construction sites, lay-down areas, corridors and buffer zones;
- offsite operational areas;
- the existing Mine site with reference to increased rate of operations;
- the existing Refinery site;
- coastal and marine and fresh water regions;
- the port at Gove; and
- natural recreation areas.

Seasonal and diurnal meteorological changes, and any significant trends (eg flood, cyclone frequency) should be indicated where appropriate. Areas of environmental sensitivity should be identified and the scope of investigations fully discussed. Where areas of environmental sensitivity have been identified any inter-relationship between sensitive areas and other areas should be discussed. Sites and species of special conservation status should be identified and described (eg RAMSAR and wetlands of national importance, endangered, protected or migratory species, environmental and conservation values to indigenous people).

Studies to describe the existing environment should be of a scope and standard sufficient to serve as a benchmark against which the impacts of the expansion may be assessed over an extended period. Control areas not impacted by the project should be included in studies and long term monitoring locations established. Past and current practises and studies conducted for the existing operations should be used where relevant.

This section of the draft EIS should also clearly identify, qualify and quantify, where appropriate, the potential environmental impacts expected to result from the project and from any feasible alternatives.

The potential impacts and proposed mitigation measures of the proposal should be discussed for all relevant stages of the project (including construction, commissioning, operation, decommissioning, incidents and accidents). Performance indicators for all potential impacts and remediation efforts should be identified. The nature of effects should be characterised by the following qualities:

- direct/indirect;
- short-term/ medium-term/ long-term; and
- adverse/beneficial.

The section should also include an assessment of the level of significance of the impact, be it global, regional or local (eg. localised impact of service roads or artificial water bodies). The vulnerability of key habitats and species to potential impacts should be assessed, as should visual impacts of the proposed development.

Cumulative impacts should also be discussed. The reliability and validity of forecasts and predictions, confidence limits and margins of error should be indicated as appropriate.

Description of those areas potentially impacted by the project should, as a minimum, include:

6.1 *Physical Environment*

6.1.1 Existing Environment

Air

- List all meteorological conditions including but not limited to:
 - prevailing wind directions and strengths;
 - maximum wind gusts;
 - precipitation data (max., min., avg., design rainfall intensities);
 - temperature data;
 - evaporation data;
 - relative humidity data; and
 - barometric pressure data.
- Provide air quality data including but not limited to:
 - particulate (PM₁₀) levels;
 - oxides of sulfur (SO_x) levels;
 - oxides of nitrogen (NO_x) levels;
 - lead (Pb) levels;
 - volatile organic compounds (VOC's);
 - ozone levels (O₃);
 - carbon monoxide levels (CO); and
 - radon gas and its decay products.
- Undertake studies and provide information on seasonal air dispersion;
- describe ambient light levels in the area;
- provide ambient noise levels for the area and the site; and
- discuss the current bushfire regime for the region.

Land

- Provide maps of and interpret the sites regional geology and geomorphology;
- discuss the soil types and land units;
- provide seismic information for the region;
- define the existing level of soil erosion and other disturbances; and
- document the existing contaminated land at the site for remediation in the future.

Infrastructure

- Transport including air land and sea; and
- sewage treatment system.

Hydrology

- Describe the site and regional surface water systems including:
 - rivers;
 - creeks;
 - streamlines;
 - lakes;
 - lagoons;
 - wetlands;
 - flood plains; and
 - estuaries and coastal waters.
- Describe the site and regional ground water systems including:
 - confined aquifers;
 - unconfined aquifers; and
 - ground soaks, expressions etc.
- For both ground water and surface water systems, discuss;
 - their significance (RAMSAR etc);
 - current uses, including for Gove and current mine water supply;
 - declared beneficial uses¹;
 - flows (including flood contours) and discharge rates;
 - water quality, including seasonal changes and relationship between water quality and flow; and
 - release or seepage of caustic residues and other potential toxic elements and compounds.

6.1.2 Impacts

- Describe how the project will impact on (the above mentioned issues) air, land, infrastructure and water quality and on water quantity during the construction and operation phases. Detail this with reference to construction and the inputs and outputs from the mining and refining operations, and the declared beneficial uses;
- define the impact of ground water licence restrictions and the impact of increased water demand; and
- describe the risk and seriousness of each impact.

6.1.3 Mitigation

Discuss with reference to each impact on each of the values described above the proposed management and mitigation measures to be undertaken. Define the current bunding status of the refinery against Australian Standards and describe how compliance with these standards will be achieved.

¹ The declared beneficial uses for the Gove Area are (surface water only):
“Area Aquatic Ecosystem Protection and Recreational Water Quality & Aesthetics”
Signed 27 February 1998

6.1.4 Monitoring

Baseline - Detail the baseline surveys undertaken for each value described above, identifying when the data was obtained and its relevance to the project.

Define a threshold – Define a threshold level for each of the issues described above.

Ongoing - Detail the proposed monitoring programs and reporting arrangements for each issue. Define contingency strategies in the event that the impact exceeds the threshold.

6.2 Biological Environment

6.2.1 Existing Environment – Fauna

For each terrestrial and aquatic (freshwater and estuarine) vertebrate and invertebrate species:

- Tabulate or list all resident and migratory species discussing:
 - prevalence;
 - conservation status;
 - international treaty obligations;
 - preferred habitats;
 - breeding habits;
 - native or introduced;
 - hazardous nature and pest status; and
 - social and cultural significance.
- Tabulate or list invertebrate species of importance including the range and density of mosquitos and biting midges and their seasonal habits. Also include other pests, dangerous species and harmful bacteria that may occur in the area.

6.2.2 Existing Environment – Flora

For each terrestrial and aquatic (freshwater and estuarine) flora species:

- Tabulate or list all species discussing:
 - prevalence;
 - conservation status;
 - land associations;
 - dependencies and interactions;
 - propagation habits;
 - native or introduced;
 - hazardous nature; and
 - social and cultural significance.
- Tabulate or list the declared weeds (*Weeds Management Act*) and invasive species present in the area and current management techniques.

6.2.3 Impacts

- Describe how the project will impact on each of the identified fauna and flora issues described above during the construction and operation phases, giving particular attention to species of conservation significance. Detail this with reference to the inputs and outputs from the mining and processing operations.
- Describe the risk and seriousness of each impact.

6.2.4 Mitigation

Discuss with reference to each impact described above, the proposed management and mitigation measures to be undertaken including impacts on any threatened and migratory species.

6.2.5 Monitoring

Baseline - detail the baseline surveys undertaken for each value (including mosquitoes), identifying when the data was obtained and its relevance to the project.

Define a threshold – Define a threshold level for each of the issues described above.

Ongoing - Detail the proposed monitoring programs and reporting arrangements for each issue. Define contingency strategies in the event that the impact exceeds the threshold.

6.3 Cultural and Socioeconomic Environment

6.3.1 Existing Environment – Cultural

- Provide a detailed description of the past and present uses of the site (Aboriginal and non-Aboriginal);
- tabulate or list all terrestrial and aquatic areas of cultural and social importance that may be influenced by the project (both on and off-site) including:
 - areas nominated for listing or listed on the Register of the National Estate or the Interim list of the Register of the National Estate;
 - archaeological and heritage places and objects under the *Northern Territory Heritage Conservation Act 1991*;
 - historic sites;
 - areas with special values to indigenous and non-indigenous people (eg. traditional land use, landscape, visual environment, recreational, commercial, tourism, scientific, educational);
 - areas of significance to the Aboriginal population and culture, including sacred sites within the meaning of the *Aboriginal Land Rights Act* and the *NT Aboriginal Sacred Sites Act*;
 - implications of the *Native Title Act* (including potential compensation issues);
 - national parks;
 - conservation reserves;
 - wilderness areas; and
 - wetlands of national importance, discussing:

- importance;
- conservation status;
- national and international treaty obligations; and
- clearance permits required or obtained.

6.3.2 Existing Environment – Social

- Discuss the social characteristics of the region including:
 - demographics;
 - lifestyle and values;
 - social trends;
 - employment levels and characteristics;
 - economic structure;
 - community services and facilities;
 - recreational and commercial fishing; and
 - other recreational activities.

6.3.3 Impacts

- Detail how the project will impact on each cultural and social issue described above during the construction and operation phases; and
- describe the risk and seriousness off each impact.

6.3.4 Mitigation

Discuss with reference to each impact described above, the proposed management and mitigation measures to be undertaken.

6.3.5 Monitoring

Baseline - Detail the baseline surveys undertaken for each value, identifying when the data was obtained and its relevance to the project.

Ongoing - Detail the proposed monitoring programs and reporting arrangements for each issue that is to be impacted and requires management.

6.4 Systems and Habitats

6.4.1 Existing Systems and Habitats

- Identify all systems and habitats discussing their:
 - uniqueness;
 - importance;
 - interrelationships
 - dependencies;
 - sensitivities;
 - vulnerability's;
 - conservation status; and
 - national and international treaty obligations.

linking the four categories of:

- Physical environment;
- biological environment – fauna;
- biological environment – flora; and
- the cultural and socioeconomic environment, where appropriate.

6.4.2 Impacts

- Describe how the project will impact on each ecosystem and habitat value (described above) of the area during the construction and operation phases. Detail this with reference to the inputs and outputs from the mining and processing operations; and
- describe the risk and seriousness of each impact.

6.4.3 Mitigation

Discuss with reference to each impact described above, the proposed mitigation measures to be undertaken.

6.4.4 Monitoring

Baseline - Detail the baseline monitoring undertaken for each value, identifying when the data was obtained and its relevance to the project.

Define a threshold – Define a threshold level for each of the issues described above.

Ongoing - Detail the proposed monitoring programs and reporting arrangements for each issue. Define contingency strategies in the event that the impact exceeds the threshold.

6.5 Hazard/Risk to Humans and Facilities

The draft EIS should include a preliminary hazard analysis and assessment of the risks to people, the environment and nearby facilities from potential accidents associated with the construction, operation and maintenance of the various components of the proposal. The storage and transport of materials to and from the complex and the port should be included in this analysis/ assessment.

The preliminary hazard analysis and risk assessment should outline and take into account emergency plans that detail strategies, response procedures and staff responsibilities in the event of an emergency or accident. Issues such as cyclones, floods, bush fires, lightning strikes, mine collapse and landslip should be considered. Contingency plans for dealing with spillage of any hazardous materials should be detailed. The risks in relation to underground and open pit rescue should also be discussed.

The hazard/risk analysis will identify the critical areas that need to be addressed in management plans, monitoring programs and contingency/emergency plans (for example Oils Spill Contingency Plan).

6.6 *Summary*

A summary table listing undertakings and commitments made in the draft EIS, including performance indicators, with cross-referencing to the text of the report should be provided.

6.7 *Environmental Management Plan*

A draft Environmental Management Plan (EMP) should be provided in a form suitable for inclusion in a Mining Management Plan as required under the *Mining Management Act*. The draft EMP should be strategic, describing a framework for environmental management. Where possible specific management policies, practices and procedures should be included in the draft EMP. A final EMP would be prepared at the conclusion of the assessment, taking into consideration comments on the draft EIS, the Supplement and incorporating the Assessment Report recommendations. The draft EMP should:

- Define the framework for effective liaison with stakeholders, including Traditional Owners;
- provide a full description of the environmental reporting structure including monitoring results and notification of unexpected impacts;
- provide for peer review of monitoring arrangements;
- define the management structure of both the construction and operational phases and the relationship to the environmental management of the site;
- describe the proposed measures to minimise adverse impacts and the effectiveness of these safeguards (eg provide performance indicators by which all anticipated and potential impacts can be measured);
- describe monitoring to allow early detection of adverse impacts;
- describe remedial action for any impacts that were not originally predicted;
- detail how monitoring will be able to determine the differences between predicted and actual impacts;
- provide for the periodic review of the management plan itself;
- larval mosquito monitoring and control plan include areas to be surveyed frequency and method for control;
- include management of off-site areas impacted by the expansion; and
- make reference to relevant legislation and standards, and note proposed arrangements for necessary approvals and permits. The agencies responsible for implementing and overseeing the management plan should be identified. Proposed reporting procedures in relation to the implementation of the management plan, independent and self- auditing and reporting of accidents should be outlined.

7 PUBLIC INVOLVEMENT AND CONSULTATION

Public involvement and the role of government organisations should be clearly identified. The outcomes of surveys, public meetings and liaison with interested groups should be discussed, and any resulting changes made to the proposal clearly identified. Any plans for ongoing liaison with the local community (Aboriginal and non-Aboriginal) should also be discussed.

Negotiations and discussions with local and community government, the Territory Government and the Commonwealth Government should be detailed, and any outcomes referenced. Details of any ongoing negotiations and discussion should also be presented.

8 INFORMATION SOURCES, REFERENCE LIST, BIBLIOGRAPHY

The draft EIS should contain a comprehensive reference list/bibliography. Any source of information such as studies, research, maps and personal communications used in the preparation of the draft EIS should be clearly identified, cited in the text and referenced in the bibliography.

This may include Medical Entomology data and references such as:

- *Construction Practices Near Tidal Areas in the Northern Territory. Guidelines to Prevent Mosquito Breeding.* Northern Territory Coastal Management Committee, June 1988.
- The Prevention of Mosquito Breeding in Sewage Treatment Facilities. *Bulletin of Mosquito Control Association of Australia Vol. 10, No. 3, November 1998*, PP. 19-28.
- *Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites.* Medical Entomology Branch handout.
- *Drainage Considerations for Mosquito Control.* Australian Mosquito Control Manual, 1998.
- *Personal Protection from Mosquitoes –information kit.* Medical Entomology Branch handout.
- Montgomery, B & Love, B (1995) “*Nhulunbuy and Wallaby Beach Mosquito Investigation.*” Medical Entomology Branch, Department of Health and Community Services.
- Whelan, P., & Hayes, G. (1992) “*Arbovirus outbreak Nhulunbuy NT 1992. Medical Entomology Aspects.*” Medical Entomology Branch, Department of Health and Community Services.

- Wilson, A. (2000) “*Larval Mosquito Survey, Nhulunbuy 31 October – 3 November 1999.*” Medical Entomology Branch, Territory Health Services.
- Lamche, G. (in preparation) “*Mosquito Survey in Nhulunbuy 29-30 October 2002.*” Medical Entomology Branch, Department of Health and Community Services.

9 APPENDICES, GLOSSARY

Information and data related to the draft EIS but unsuitable for inclusion in the main body of the statement should be included as appendices. This may include detailed analyses, monitoring studies, baseline surveys, raw data and dispersion modelling data. Where necessary, specific guidance should be provided on the most appropriate means of accessing information not appended to the draft EIS.

Include items such as:

- An updated Oil Spill Contingency Plan; and a
- draft Environmental Management Plan

A glossary should be provided, defining the meaning of technical terms, abbreviations and colloquialisms. (Note: throughout the EIS, technical terms and jargon should be minimised).

10 ADMINISTRATION

The Project Officer is Kath Nash, Office of Environment and Heritage, Department of Infrastructure, Planning and Environment. The contact number is (08) 8924 4553 and facsimile (08) 8924 4053, e-mail kathy.nash@nt.gov.au

“Preliminary” copies of the draft EIS should be lodged with the Office of Environment and Heritage, NT Department of Infrastructure, Planning (and Environment and the Environment Assessment Branch of Environment Australia if the proposal is determined to be a controlled action) for internal review prior to release for public and advisory body comment.

The number of copies of the draft EIS required for distribution to Territory and Commonwealth advisory bodies will be determined at the review of the ‘preliminary’ draft EIS. The Northern Territory will require approximately 20 copies (plus 10 CD ROM copies). **CD ROM** copies should be in ADOBE® *.pdf format for placement on the Internet.

Several copies of the draft EIS should also be prepared for distribution to relevant Public Libraries for public review. Several copies of the draft EIS should be available for purchase by the public on request. Locations for public review will be determined at the review of the “preliminary” copies of the draft EIS.

COMMONWEALTH OF AUSTRALIA

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

DECISION THAT ACTION IS NOT A CONTROLLED ACTION

Pursuant to section 75 of the *Environment Protection and Biodiversity Conservation Act 1999*, I, MARK FLANIGAN, Assistant Secretary, Policy and Compliance Branch, Environment Australia, decide that the proposed action, set out in the Schedule, is not a controlled action.

SCHEDULE

The proposed action by Alcan South Pacific Pty Ltd to expand the existing alumina refinery on the Gove Peninsula, Northern Territory, from a two-stage to a three-stage operation, and as described in the referral received under the Act on 15 May 2003 (EPBC 2003/1068).

Dated this 13 day of JUNE 2003



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**ASSISTANT SECRETARY
POLICY AND COMPLIANCE BRANCH
ENVIRONMENT AUSTRALIA**