

## **Appendix E**

### **Construction Management Plan**



## KIMBERLEY DIAMOND PROJECT

### CONSTRUCTION MANAGEMENT PLAN BARGE ACCESS, LAYDOWN AND SERVICE ROAD

**JANUARY 2002**

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## **1. INTRODUCTION**

Striker Resources NL propose to establish a dry door barge access and linked laydown and service road from an inlet known locally as Gumboot Bay, 36 km south east of Cape Londonderry. The project's primary objective is to construct and operate the facilities in a safe and environmentally sustainable manner so as to ensure security of supply for their Ashmore Operations. Details are outlined in the following Plan. The road would be segregated to minimize interaction between non-project light vehicles, and managed as a Restricted Access Road. The road would be closed to unauthorised public use.

### **1.1 Purpose**

This Construction Management Plan (CMP) is designed to cover all construction activities associated with the project. Route details are shown on Figures 3 and 5 in the primary PER document. This Plan describes design criteria, activities associated with the earthworks, identifies the significant environmental issues and outlines management aims and practices to be followed during construction.

The broad objectives of the CMP include:

- design and construction of the laydown area and road so as to provide for safe and efficient operation of plant and to minimise the potential for interaction of tanker traffic and light vehicles;
- adopt management practices to reduce visual impacts and minimize nuisance noise to Bush Camp residents during the short construction period;
- recovery and management of skeletal topsoils from areas to be disturbed;
- minimisation of impacts to any identified environmentally sensitive habitats or significant vegetation communities;
- minimisation of land disturbance and significant alteration to drainage;
- adoption of appropriate fire prevention measures and contingency plans to minimize the risks from bushfire, and
- management of Aboriginal Heritage aspects.

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## **2. PROJECT DESCRIPTION**

The project will include the following components:

- barge access during high tides to a dry dock landing site up to 40 times during a year;
- a 50m long, 8m wide access road from the beach to a laydown area located above the 100 year storm surge level;
- a 50m x 50m laydown area that would contain graded hardstand areas and bunded containment for 2 x 20,000 litre camouflaged fuel storage tanks and packaged product;
- a 15 metre wide perimeter fire buffer zone and a low profile water tank for fire fighting use;
- low unidirectional light towers;
- planted visual amenity screens and navigation markers;
- barge to shore fuel unloading infrastructure including fuel spillage containment;
- a Restricted Access Road (RAR) approximately 3.6 km long and consisting of a 8 metres wide unsealed trafficable formation that would link with a new 36 km alignment to the west of the existing road on Carson River Station;
- investigate methods for restricting road access by tourists to the Faraway Bay facilities are under consideration, and
- rehabilitation of redundant sections of the existing road no longer required for ongoing exploration, pastoral or Bush Camp use.

The area of disturbance on EL80/1840 within the proposed national park (PNP/215) would be approximately 4.0 ha.

Road tankers would transport fuel and supplies to the Ashmore Plant – a distance of 36 km during daylight hours between March and December. For safety and security reasons light vehicle segregation procedures are proposed for the new road.

### **2.1 Laydown Area**

The laydown area will be located in a lightly timbered flat area above the low beach basalt cliffs. The hardstand sections will be raised and compacted with locally sourced materials to assist in drainage segregation. External stormwater runoff will be directed around the laydown into regrowth and screen planting areas.

Drummed product handling areas will be bunded or centrally graded to contain spills, stormwater or fire fighting residues. Discharges will be directed to a central grated sump to facilitate cleanup and treatment.

Skid mounted bulk fuel tanks will be placed within low permeability banded compounds designed to allow recovery of any spillage. Compounds will be lined with a H.D.P.E. liner in accordance with AS1940-93. Spills will be cleaned up on discovery with waste materials removed from site for appropriate disposal. Tanks will be centrally located within the laydown area taking into account the need for safety, product security, access for deliveries and annual tank removal.

All pipeworks will be constructed to recognised engineering standards and be wholly within the bund. Fuel dispensing facilities will not be installed at the barge site. The provision of tank overfill warning devices is under consideration. The tanks will be removed at the end of the field season and stored at the Ashmore Plant.

The laydown facility will be surrounded by a cleared 15m wide fire-break.

## **2.2 Road Construction**

Road construction to Shire of Wyndham – East Kimberley Rural Standard – E5 to produce a running surface suitable for tanker movements will entail:

- clearing vegetation 4m either side of the road centre to produce a 8m wide formation. Cleared vegetation will be stockpiled in cleared areas and track rolled for future rehabilitation use;
- stripping topsoil (where feasible) and stockpiling in low piles in erosion free areas for further reuse;
- construction of a 8m wide unsealed pavement such that slope drainage is not significantly impeded and drainage shadows or ponding areas are not developed;
- importation of base layer where required, utilising mined materials from small borrows located outside the boundary of PNP/ 215 and in areas that will not result in significant visual impacts;
- construction would consist of spreading, trimming, profiling, water binding and traffic compacting to produce a suitable running surface;
- installation of a lockable gate(s) and appropriate signage at site(s) to be determined in consultation with other land users;
- progressively rehabilitating disturbed areas (ie borrows, bypass tracks) no longer required for construction, and
- construction of graded floodways across creeklines to minimise drainage line impacts.

## **2.3 Road Maintenance**

Road maintenance, erection of signage and dust suppression will be undertaken by the Proponent on the road extension to ensure a safe travel way is maintained at all times.

## **2.4     *Resource Requirements***

Road construction materials will be sourced from selected borrow sites away from the escarpment and outside of the proposed park boundary.

Fuel and equipment servicing requirements will be met from an existing site mobile service unit. No fuel storage capacity will be erected during construction and equipment servicing wastes will be removed and incorporated into existing waste management programmes at the Ashmore plant. All hydrocarbon wastes are currently drummed and returned to Darwin for reuse or disposal.

Water for road binding will be sourced from a standpipe to be erected at Sandy Creek although other sources, such as sea water may be utilized as required. Seawater would be used for fire fighting activities.

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### **3. ENVIRONMENTAL IMPACT AND MANAGEMENT**

#### **3.1 Overview**

The environmental impact of the proposal will be considered under the following headings with descriptions of the proposed precautions and management procedures planned to minimise any impacts during construction and operation of the road. Bearing in mind the type and scale of the proposed operations and the small area involved the impact on the environment is seen to be minimal and no change or disbenefits of regional significance are anticipated.

#### **3.2 Vegetation Clearing**

Retention of vegetation for habitat, visual amenity and soil conservation is important in maintaining the integrity of the escarpment landforms.

##### ***Aim***

To minimise disturbance of vegetation through the implementation of clearing controls, workforce education programmes and progressive rehabilitation of disturbed areas.

##### ***Management***

- clearing of vegetation will be restricted to a nominal alignment width of 8 metres;
- cleared vegetation will be track rolled and stockpiled separately from topsoil in low fire risk areas;
- vegetated areas cleared inadvertently during construction activities or temporary disturbed areas will be rehabilitated within the same year of disturbance, and
- substantial trees or areas considered to have high conservation value will be avoided where feasible.

#### **3.3 Drainage Alteration**

Roadworks commonly alter drainage patterns which can indirectly effect vegetation distribution, growth patterns and vigour. Some local drainage alteration will occur on the new alignment.

##### ***Aim***

To minimise the disruption of localised drainage flow paths and patterns.

##### ***Management***

- the final formation will avoid crossing significant drainage lines, be constructed and maintained so as not to present a barrier to sheet flow and run-on.



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- the formation will be designed so as to shed water quickly across the road to prevent upstream ponding and soil water logging.

### **3.4 Control of Erosion**

Erosion by water and to a lesser extend wind are constant features of semiarid monsoonal environments. These natural processes are exacerbated in certain terrain units (ie clay units) when the protective cover of surface lags or vegetation is removed or destroyed.

#### ***Aim***

To minimise disturbance to the land surface and progressively rehabilitate disturbed areas to promote land form stability and function.

#### ***Management***

- identifying areas of high erosion potential prior to earthworks commencing and the development of site specific mitigation measures;
- sequencing construction works to minimise the area of disturbance;
- avoiding soil stripping and drainage line works immediately prior to potential storm events;
- constructing temporary stabilisation structures to minimise sediment movement and divert runoff away from disturbed areas, and
- progressively rehabilitating disturbed areas and sites.

### **3.5 Control of Dust**

Fugitive dusts will be generated by equipment movements in a range of activities. The major focus of dust management will be directed through safety concerns with road travel and indirect impacts to the near verge environment (ie vegetation loss) from the use of sea water for dust suppression.

#### ***Aim***

To reduce dusts and minimise indirect impacts to road verge soils and vegetation.

#### ***Management***

- surface disturbance will be kept to a minimum and cleared areas will be progressively rehabilitated;
- road watering, using best available water quality will be undertaken as required to maintain a safe operating environment, and
- works will be scheduled, if possible when soil moisture levels are elevated.

### **3.6 Noise Management**

Road construction activities will increase ambient noise levels in the vicinity of the road alignment and laydown area for approximately 2 weeks. The laydown area is located 1.5 km from the nearest seasonal residential area (Bush Camp) and separated by a substantial vegetated ridge (see PER Figure 3) that attains a height of 80 meters. Nevertheless some nuisance noise disturbance may occur during construction activities under certain climatic conditions. Road construction will result in higher noise levels for a short period of time until the escarpment section is completed.

#### ***Aim***

To minimize nuisance noise levels.

#### ***Management***

- noise control is usually achieved by applying noise reduction measures at the source, attenuation by distance, the interaction of meteorological conditions and terrain characteristics. To minimise noise impacts, earthmoving equipment during road construction will only operate during daylight hours.

### **3.7 Weed Management**

Several environmental weed species have shown themselves to be well adapted to colonising disturbed ground in the Kimberleys. No declared noxious weed species (*Agriculture and Related Resources Protection Act 1976*) were identified during the flora surveys of the barge site and access road in PNP/215. Equipment hygiene procedures developed by Striker and the Western Australian Quarantine Inspection Service (WAQIS) have been established and implemented for barge transfers. These are referenced in Appendix H.

#### ***Aim***

To control the introduction of weed species during road construction/transport activities and implement measures to stop weed spread.

#### ***Management***

- require as a contractual condition, that all earthmoving equipment is washed down, inspected and certified (see Appendix H) prior to transportation to the site (WAQIS 2000);
- borrow materials should not be removed from sites where weed infestations are evident;
- existing infestations (two locations) on the proposed alignment will be brought to the attention of the earthworks supervisor;
- rehabilitate disturbed areas progressively to assist in reducing weed spread, and

- construction personnel shall be made aware of weed issues through the Site Induction Programme. Assistance will be sought from CALM and Agriculture WA to produce a weed identification poster for site use.

### **3.8 Significant Vegetation and Habitats**

#### ***Issue***

The Ashmore Project area and road alignment encompasses vegetation associations which are relatively widespread in the northern Kimberley bioregion. Surveys by Ecologia (1999) and Mattiske (2001) identified no habitat or communities of regional significance. Six (6) vegetation communities were recorded in PNP/215 (Mattiske 2001) and 13 in the entire survey area. Five habitat associations were identified and mapped by Ecologia (1999) and these occur to varying degrees along the proposed road alignment on the plateau. Three habitats were identified that, while extensively represented beyond the project area, warranted special consideration in development planning. These are:

- riparian habitats common to the major river catchments;
- seasonally wet plains (clay based) dominated by sedges and grasses, and
- rocky escarpments.

The proposed road alignment will cross riparian and rocky escarpments habitats although the impact footprint will be kept as small as feasible.

#### ***Aim***

To avoid where possible, or minimise impacts to significant vegetation or habitats.

#### ***Management***

- construction personnel will be made aware of the locations of significant vegetation and of the requirement to minimise clearing and disturbance in these areas, and
- unavoidable disturbance in these habitats will be monitored and specific management plans will be developed.

### **3.9 Declared Rare or Priority Flora**

#### ***Issue***

A search of the CALM and WA Herbarium flora database covering an area of 10,000 km<sup>2</sup> and encompassing the Ashmore and Barge areas identified twenty two taxa, many of which occur in habitat similar to that present in the proposed road alignment. No Declared Rare and one Priority Flora were recorded within PNP/215. One potential Priority 3 Flora species was located on the Pastoral Station.

### *Aim*

To minimise disturbance to Declared Rare Flora.

- field surveys will be conducted along unsurveyed sections of the alignment prior to earth works commencing;
- construction personnel will be provided with identification details of DRF likely to occur in the general area of the corridor, and
- ministerial Approval will be sought to remove specimens as required if avoidance strategies are not possible.

### **3.10 Fauna**

The native fauna of the Kimberley's, with the exception of most avifauna, is largely nocturnal.

Ecologica (1999) reported, that following a review of what are widespread homogenous faunal habitats, that Scheduled fauna species are likely to occur within the Ashmore Project Area in similar areas proposed for the road alignment. Riparian and rocky escarpment habitats are identified as being the most vulnerable to disturbance impacts.

### *Aim*

To ensure that the conservation status of native fauna is protected through the minimisation of disturbance to habitat and that habitat creation is included as a part of rehabilitation.

### *Management*

- vegetation clearing and off-road movement will be controlled and habitat creation/enhancement programmes will be included in site Rehabilitation Plans, and
- excavations will incorporate escape ramps. Any open exploration drill holes encountered in the corridor will be capped subsurface.

### **3.11 Bushfires**

#### *Issues*

Fuel loadings in the area of the barge site and sections of the proposed access road are high and need to be reduced. Late season fires are generally "hot" resulting in significant impacts to fauna, vegetation communities and the visual amenity of the area. Risk of ignition arising from plant/metal contact with rocks during construction activities is high.

### *Aim*

To conserve ecological integrity and protect life and property during fire burns.

### *Management*

- prepare a Fire Management Plan;
- liaise with local Fire Control Officers and other area residents on proposed burning initiatives, and
- instruct personnel on the use of fire fighting equipment and fire survival strategies.

### **3.12    *Rehabilitation and Decommissioning***

Detailed site specific environmental management guidelines are prescribed for site construction project prior to earthworks commencing.

Management objectives are directed towards:

- minimising disturbance during the construction phase;
- returning disturbed areas to a condition that will support activities consistent with multiple land uses with pastoralism as the primary land use;
- re-establishing stable topographic conditions that will support, where feasible, self sustaining indigenous vegetation communities consistent with the nominated land use objectives;
- minimising off-site impacts by controlling infiltration, erosion, deflation, sedimentation and the degradation of drainage and ground water resources, and
- employing rehabilitation methods that are technically effective and cost efficient, rely on proven engineering practice and do not require ongoing maintenance.

Rehabilitation of historically disturbed areas will be inspected on a regular basis using Ecosystem Function Analysis (EFA) methods to monitor rehabilitation, success and erosion control structures.

#### **3.12.1    *General Techniques***

During the life of the project it is intended to commence progressive rehabilitation of any areas that are no longer required for access. Rehabilitation work will consist of:

- profiling finished surface so that they are free of large depressions, windrows or ridges and are free draining at low gradients;
- all surfaces will be left rough and mulched (rock/timber) where resources are available;

- seeding of locally sourced shrub and perennial species compatible with surrounding vegetation communities, and
- installation of appropriate erosion control structures to minimise sediment loss.

### *3.12.2 Borrow Pits*

The project will utilise new borrows located outside the Proposed National Park for road and maintenance materials. Rehabilitation of borrow excavations will include:

- grading the borrow floor and sides to give a contoured finish consistent with adjacent surfaces;
- stockpiled overburden, boulders and topsoil will be returned to the borrow and spread;
- drainage diversion structures will be installed as required to divert runoff away from the borrow;
- the floor and sides will be ripped where possible on the contour to a depth of 40 cm;
- access tracks to completed borrows will be bunded and ripped. Erosion control structure will be installed as required, and
- disturbed areas to be seeded with species compatible with surrounding vegetation communities.

### *3.12.3 Decommissioning*

Closure and rehabilitation requirements will be developed in consultation with the area stake holders, the Pastoral Board and other Regulatory Authorities (ie DMPR, CALM) approximately 2 years prior to the planned closure of the barge site. Rehabilitation requirements will be included on the Site Closure Plan as part of the Annual Environmental Reporting process to the Department of Mineral and Petroleum Resources.

## **3.13 Aboriginal Heritage**

### ***Issues***

Heritage surveys in accordance with formal clearance protocols established with the Balangarra Traditional Owners have been completed over the barge site, laydown areas and access within PNP/215 and the alignment to the Ashmore project area road.

### *Aim*

- to avoid disturbance to Aboriginal sites, and
- encourage all project personnel to obtain a knowledge, understanding and respect for the traditions and culture of Aboriginal people.

### *Management*

- site clearances will be obtained before the commencement of site works;
- all site personnel will be advised of their responsibilities under the Aboriginal Heritage Act (1972) in the compulsory site induction, and
- site personnel are required to report any suspected Aboriginal sites located within the area to the Project Manager.

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#### 4. REFERENCES

- Craig, A.,B (1997). A review of information on the effects of fire in relation to the management of Rangelands in the Kimberley high rainfall zone. *Tropical Grasslands*, 31, 161 – 187.
- Ecologia (1999). Ashmore Diamonds Biological Survey. Unpublished report for Striker Resources NL.
- Kabay, E.,D & Burbidge, A.A. (1997). Biological Survey of the Drysdale River National Park, North Kimberley, Western Australia. Research Bulletin No. 6. Fisheries and Wildlife, Perth.
- Mattiske Consulting (2000). Vascular Plant Species Identified for Striker Resources NL – Barge Site, Laydown and Access Road Survey.
- Mattiske Consulting (2001). Flora and Vegetation Survey – PNP/215 and Striker Resources Survey Area. Unpublished Report prepared for Striker Resources NL August 2001.
- WRC (1998). Temporary Skid Mounted Fuel Transfer Storage in Public Drinking Water Source Areas – Water Quality Protection Note
- WRC (1998). Toxic and Hazardous Substance Storage – Water Quality Protection Note. Perth
- SWEK (1999). Road Construction Rural Standard - E5 Shore of Wyndham – East Kimberley.
- WAQIS (2000). Permit to Import Quarantine Material (Interstate). Perth.