

INTRODUCTION

The Coastal Ecology Protection Group Inc (CEPG) is a South Australian community group that aims to protect, preserve and restore the coastal dunes from Grange Jetty, northward to Point Malcolm and Semaphore South.

Incorporated in 2001, CEPG is a not for profit organisation of around 400 concerned individuals, including engineers, journalists, lawyers, environmentalists, architects, trades and business people, conservationists and community members young and old, all with a passionate interest in the coast between Grange and Semaphore Park.

Following the publication in late 2005 of the report "Adelaide's Living Beaches – A Strategy for 2005 – 2025" CEPG has

- Closely studied the report and information contained in the CD-ROM and other media. A CEPG Committee member with experience relative to sand collection and pumping has acted as adviser. This person has in excess of 30 years experience as a mining engineer with operational and consulting experience.
- Made site visits to monitor the progress of the sand collection equipment and sand placement trials at West Beach Harbour and the Torrens Outlet.
- Attended Public Meetings conducted by The Department of Environment and Heritage at West Beach Surf Lifesaving Club, Adelaide Sailing Club, Adelaide Shores & Semaphore Lifesaving Club as part of its Communications Program.

CEPG has a particular interest in the section of Cell 4 from Semaphore South to Grange (Tiles 4 –18). This section of Cell 4 contains 25% of the total pipeline

- 1 Main Pump Station (Project total =4)
- 2 Booster Pump Stations (Project total =7)
- 5 Discharge Points (Project total =25)

This submission on the Development Application is based on the above. It must be stressed much of the Development Application contains insufficient detail to make a definitive evaluation of many of the specific impacts of construction and operation of the project. Therefore it is critical that, as more detailed designs for these installations are completed, that they are made available in timely fashion for inspection and comment by the public.

EXECUTIVE SUMMARY

CPEG recommends that consent for the proposed project for the construction of a 22 kilometre sand transfer pipeline and associated works be withheld on the following grounds.

1. The proposed equipment and methods of sand collection have not been tested over an extended period and proven to be effective in the treatment of seagrass wrack at the throughput rates and quantities required.
2. The retention swale method for the disposal of pumped sand containing "a significant quantity of seagrass " has not been tested and proven to be acceptable to the public.
3. No water quality testing or other evidence has been presented to support the proposal that offshore disposal of pumped sand containing "a significant quantity of seagrass " will not cause turbidity problems.
4. In the section of Cell 4 from Semaphore South to Grange it is proposed that the pipeline be installed in dune areas resulting in the need to commence the difficult and time consuming task of dune revegetation. These problems must be avoided by locating the pipeline in the beach at the front of the dunes,

SAND COLLECTION (refer Section 5.1, Subsections 6.11.3 to 6.11.5 & Appendix D)

The Adelaide's Living Beaches Technical Report emphasised the need for extensive trials of the sand collection system to select suitable equipment and methods to effectively overcome the critical problem of sand recovery involving the separation of sea grass wrack. The report proposed a series of trials at three locations

- South of West Beach Harbour
- South of Torrens Outlet
- South of Glenelg Harbour

The following table shows a comparison of target and achieved volumes for these trials.

Location	Target Volume (m3)	Actual Volume (m3)	Comments
South of West Beach Harbour	30,000	5,000 – 10,000	No production data published
South of Torrens Outlet	40,000	22,000	Test period approx 6 months
South of Glenelg Harbour	5,000		Trial was omitted from subsequent schedules

The West Beach Harbour tests indicated the following:

1. The Sandshifter was unable to handle sand containing a large amount of seagrass wrack.
2. The flat screen was easily blinded and required an attendant to manage the oversize material.
3. Handling of screen oversize (seagrass wrack and other rubbish etc) was a problem.
4. Product from dredged material containing seagrass was not suitable for beach discharge as it contained a lot of fine organic matter that caused a cloudy plume of organic matter in the water adjacent to the discharge point. DEH has confirmed this did not meet environmental guidelines.

The Torrens Outlet test used loaders, trucks and a bulldozer to feed a jet pump located in a temporary sump excavated in the sand. The slurry from the jet pump was screened using the flat screen with settling pond then fed to the pipeline pump. A trommel was also tested to determine its efficiency in the removal of seagrass etc. Results indicated the following:

1. It is claimed that the modified screen was more efficient but required constant supervision. (See Appendix D).
2. Handling of screen oversize continued to be a problem.
3. It is claimed that this combination of equipment was able to meet satisfactory pumping rates. (See Appendix D). In this regard it is noted that:
 - The total volume of sand shifted over the trial period of 6 months was well below target.
 - The method used involved trucking on the beach (on occasions up to five units of equipment were in operation).
 - The screening process for separation of seagrass wrack and other oversize required constant supervision

The current proposal to solve the problems arising from the separation of seagrass wrack is to use selective recovery of sand and to eliminate the fine pre-screening of the pump feed. This will require the selective recovery of sand by the dredge and beach-plane and the placement of pumped sand product as follows. (See Subsections 6.11.3 to 6.11.5)

1. Collection

Dredged sand will be delivered direct to the pump station. This material has already been through the dredge cutter and pump so can be fed to the main pump station without further screening.

Sand collected by the beach-plane will be handled as described in Section 5.2 para 2 “*Dry sand will be collected from the beach surface by machinery and then fed through a screen into the relocatable sand collection stations. The sand is mixed with seawater and pumped to the main pump stations for pumping south along the pipeline. The relocatable sand collection stations will be hydraulically operated, using high pressure jet pumps.*” Sand containing large amounts of wrack will be avoided and where wrack overlies clean sand it will be moved to one side to allow sand recovery.

2. Sand Placement

It is proposed to place pumped sand slurry in one of three locations as follows.

- Clean sand will be placed on the beach.

- Sand containing “a significant quantity of seagrass” will either be placed up to 300m offshore to allow dispersal of fine seagrass or placed in “Sand Retention Swales” where water is removed by decantation and the solids allowed to dry before being pushed to the beach.

3. Comment on Results of Trials and Proposed Methods

The results of the trials have shown what does not work and have confirmed that the pumping equipment can reach required hourly throughput rates (AppendixD). Consequently there is no **proven** reliable method for collection of sand and the removal/treatment of seagrass wrack and the latter point was proven decades ago in the mining industry!

There is no evidence that the current proposal for sand collection and handling will work. This new approach of using selective sand collection as outlined above **should** considerably reduce the problems encountered in the removal and handling of large quantities of seagrass wrack. However, this is yet to be demonstrated by trials using the equipment (both land plane and collection sump etc, and dredge) now proposed for this task to show that

- Sufficient quantities of suitable sand can be produced over an **extended period** at the rates proposed for the project.
- Placement both on the beach and offshore will meet water quality standards as proposed.

The following points also arise with regard to the relocatable sand collection stations

- These are not standard equipment items and therefore it would seem prudent that testing of a prototype should be carried out to determine throughput rates and check the materials handling aspects as was done with the Sandshifter and the various screen types.
- The photomontage shows a sump apparently designed to allow direct discharge from the beach-plane to a flat screen inset below beach level and above a sump fitted with two jet pumps. This screen is essential to prevent large oversize tramp material being fed to the main pump. As such it will have larger apertures than the screens used in the tests (stated to be 40mm in latest handout from DEH) and thus the volume of oversize is reduced.
- DEH is obviously of the view that the quantities of oversize trash involved will be very small. However, it is not clear what provision is made for removal and disposal of this material.

A suitable location for trials outlined above is West Beach Harbour with a temporary pipeline laid to the south and fitted with both on shore and off shore discharge points. This location would allow extensive testing of

- The efficiency and productivity of the selective collection methods to reduce/eliminate seagrass in the pump feed.
- The productivity of the beach plane and prototype relocatable sand collection station.
- The quality of the water which receives the discharge from dredge product which contains seagrass

“Sand Retention Swales” are opposed on the grounds that they are an unnecessary intrusion into dune areas and have potential to provide odours and other adverse effects arising from rotting accumulations of seagrass wrack. Again there has been no testing or demonstration of the operation of these installations.

PUMP STATIONS (refer Section 5.2, Section 5.3, Appendices B3 & B4)

Outline drawings for the main and booster pump stations show indicative dimensions for these installations that will now be located underground to minimise visual and noise impacts. This is a sensible modification of the 2005 proposal to locate them above ground. The montages attempt to give an indication of scale by comparison with a person placed adjacent to the structure unfortunately it does not work due to perspective effects. Marked scales in three dimensions would have been better.

SA Water in-ground sewage pump stations generally have the electrical switchgear housed in an enclosure installed on a concrete plinth at ground level. This is also the case for stormwater pump stations installed by the City of Charles Sturt. Two examples of these are shown in the attached photographs. In one example the enclosure is alongside the station and for the station in the traffic

roundabout the enclosure is located adjacent to the footpath on one corner of the intersection. The montages do not appear to show any switchgear enclosures.

It is also likely on some sites that the electrical loads will be such that ETSA will have to install additional transformer capacity. Again there is no indication or mention of this and the likely visual impact. The montages also give the impression that the tops of the stations will not provide any access for the handling of replacement units etc. Mobile crane access will be required for both construction and maintenance. The slab roofs will need appropriate large sized access ports fitted flush with the slab surface to allow handling of the pump and motor assemblies. .

The need to provide ventilation for cooling of the electric motors has been recognised and inlet and exhaust ducts are shown. The round ducts shown on the drawings appear to be mismatched, as they are approximately one tenth the area of the rectangular inlet ducts.

The planned locations of the main and booster pump stations indicate that the spacing of the stations varies from 1300m to 2400m (approx). It is unlikely that any single size sand pump can efficiently span this range of duties. This can be solved either by using pumps of different size or installing similar pumps in tandem with consequent variation in the size of the underground station. One such station is that for Glenelg Esplanade which must also accommodate a water supply pump.

In light of the above comments and the lack of detailed design it is essential that as design work proceeds further consultation with councils and the public is undertaken as indicated in the submission.

PIPELINE (see Section 4.1.1, Section 5.7, Section 6.1 & section 6.1.1 Section 6.10)

1. Location

In Section 4.1 Locality Description the use of the noun esplanade in section 4.1.1 {defined as “a long stretch of open level ground (paved or grassy) for walking beside the seashore”) tends to cause some confusion as in Tiles 6, 14 and 17 “Esplanade” is also a street name. The description concentrates on the built environment that adjoins the coastal and dune environment. Passing mention is made of the “Tennyson Dunes” (Tile 12) and the contiguous dune corridors of varying width to the north and south.

CPEG strongly believes that no development should occur in the Tennyson Dunes and supports the removal of weeds and the planting of recommended native species in the north and south dune corridors as indicated in the document “Vegetation Management Plan” January 2006. This document was prepared by the SA Urban Forest Biodiversity Program in partnership with the City of Charles Sturt.

Many CPEG members have considerable experience in the above activities both as members of dune care groups and landowners and thus understand the problems involved in rehabilitation and dune management in the harsh coastal environment. In particular it must be stressed that low plant survival rates are common and growth rates are often low. Consequently a healthy low bush aged five years takes a minimum of five years to replace at best but if one or more extra harsh summer seasons are encountered and cause a plant to die the replacement period increases. Thus CPEG is opposed to any development in the dune corridors which involves the destruction of any native vegetation.

CPEG therefore only supports the installation of the pipeline in the beach.

2. Installation Methods

The following comments apply to the methods proposed in Section 5.7

- 3.5 metres width for open thoroughfares is tight and no mention is made of the additional areas required to turn equipment and to act as temporary storage/lay-down areas.
- 3.5 metres width for dune areas not acceptable as destruction of some native vegetation will invariably be involved.
- 2.5 metres width method is considered impractical as it would involve excessive vehicle trips to remove spoil and the poor stability of an open trench dug in sand and located in the centre of the track. These problems are all exacerbated where sloping ground is traversed.

CPEG believes these add further weight to the requirement for installation of the pipeline in the beach.

3. Layout (depicted in Tiles 7 -17)

The pipe location shown in Tile 10 south of 6138400 should be changed to the beach and continued to 6137950 where the “Alternate Pipeline Laid in Front of Dunes” starts and then continued south to the Grange Jetty. It should be noted that in relation to the alternate location Mr Tucker agreed in a meeting with CEPG Committee on 10th December to not install the pipe in the Tennyson Dunes. This is not reflected in the Development Application under consideration that was submitted on 3rd December.

CPEG believes the best way “to preserve and manage the environmentally important features of coastal areas, including wetlands, dune areas, stands of native vegetation ...” (Development Application section 6.10) is to keep heavy equipment and vehicles out of these areas. The beach location is the best way to avoid the destruction of established native dune vegetation.

There is much native vegetation that is not evident in the photographs used as a basis for the Tiles. This photography is estimated to be at least three years old and therefore does not contain details of native planting conducted by both private landowners and the City of Charles Sturt. It also does not indicate the fact that lawn areas have been reduced as the result of these plantings and the water restrictions. DEH should be encouraging the continuation of these planting activities not destroying current vegetation and replanting it.

GREENHOUSE GAS EMISSIONS

The 2005 report showed that the estimated emission rates of carbon dioxide for sand pumping and excavators and trucks were

Sandshifter & Pipelines	1027 tonnes
Excavators & trucks	641 tonnes

With additional equipment required to collect sand the amount of emissions for the pipeline option will be further increased. This is the “price” to be paid to remove trucks from suburban streets.

COSTS

The application shows two estimates for the cost of the project these are

Application form	\$14 million
Section 3.4	\$17 million

The 2005 report estimate for comparable activities was \$12.5 million.

The content of work in this project has changed for a number reasons including

- The proposed sand collection method has changed and the amount of equipment has increased.
- Pump stations are now located underground with resultant increase in installation costs.

Cost inflation of labour, materials and equipment has also occurred in the interim and as initial cost estimates based on limited design are invariably low it would not be surprising if an estimate based on latest prices and a more detailed design would result in a capital cost in excess of \$30 million. This should be of concern to the SA Government in the current economic conditions.