# 9 CONCLUSIONS AND RECOMMENDATIONS

## 9.1 INTRODUCTION

The aim of the EIA for the Project is to provide information to inform decision-making that will contribute to sustainable development. This report is submitted to the Western Cape Department of Environmental Affairs and Development Planning (DEADP) to provide information and an independent assessment, thus enabling the DEADP to make an informed decision regarding whether or not to grant an environmental authorisation for the Project in terms of NEMA. If granted, this report will also assist the DEADP to define under what conditions the development should go ahead.

Through the EIA process which included various stakeholder and specialist input, ERM has identified and assessed a number of potential impacts relating to the development. This chapter provides an overview of the EIA findings and overall recommendations.

A number of layout alternatives have been considered during the engineering design and EIA process for the proposed facility. Many iterations of preliminary engineering drawings were completed for layout alternatives. The Site Layout Alternative 3 is the preferred and final layout (see *Figure 9.1, Figure 9.2* and *Figure 9.3*). This site layout alternative is as a result of discussions with and approval from TNPA to have the layout design according to SANS 10089 and not the Transnet National Ports Authority (TNPA) Guidelines on Fuel Storage. This site layout allows for the storage of a total working volume tank capacity of approximately 109,400m$^{3.}$
Any amendments to the final layout will be submitted to DEADP before construction, with an indication of the extent of change and associated changes in significance ratings of impacts, if applicable.

*Figure 9.1 Plot 1 Preferred Layout Alternative 3*

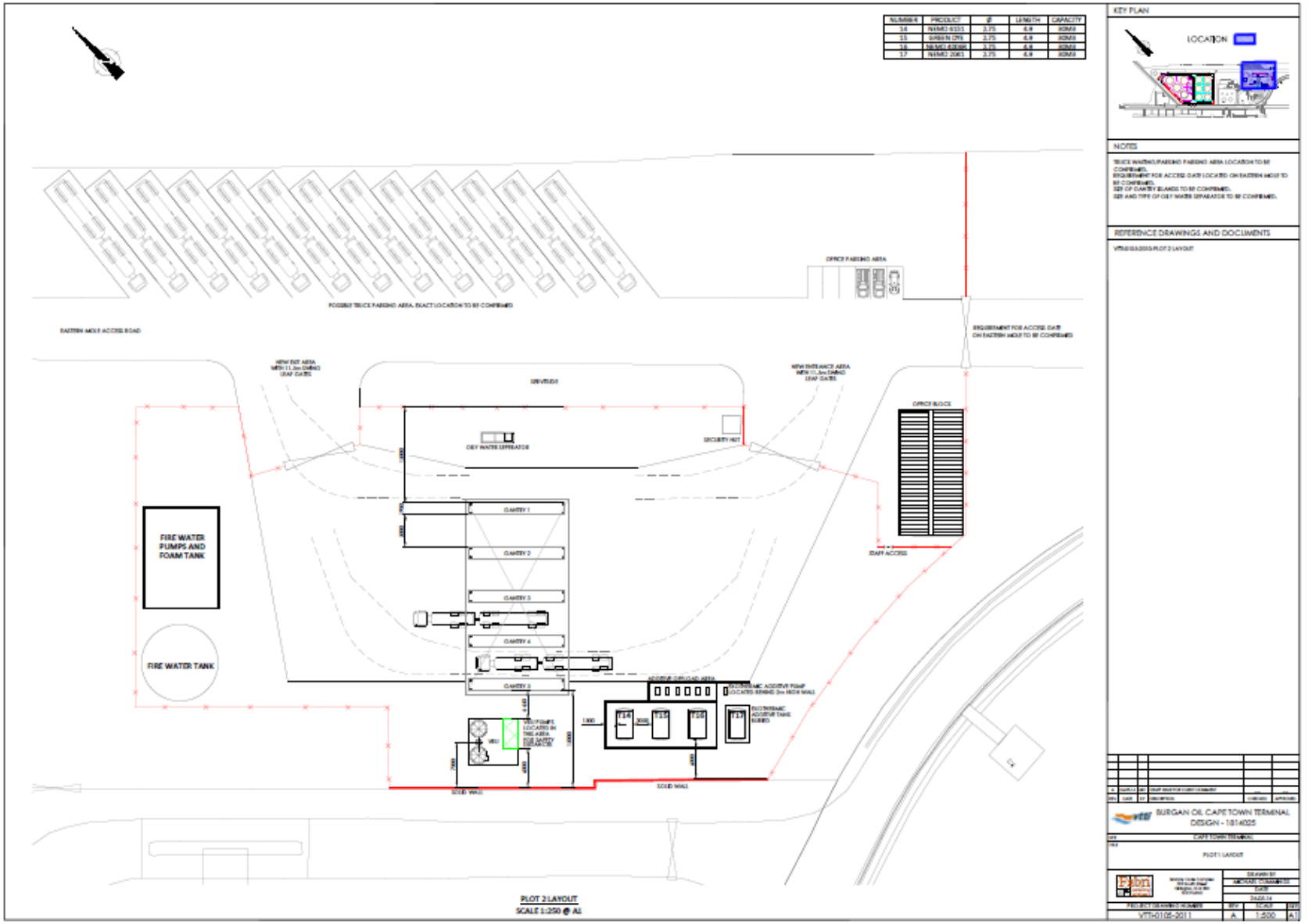


*Figure 9.2 Plot 2 Preferred Layout Alternative 3*

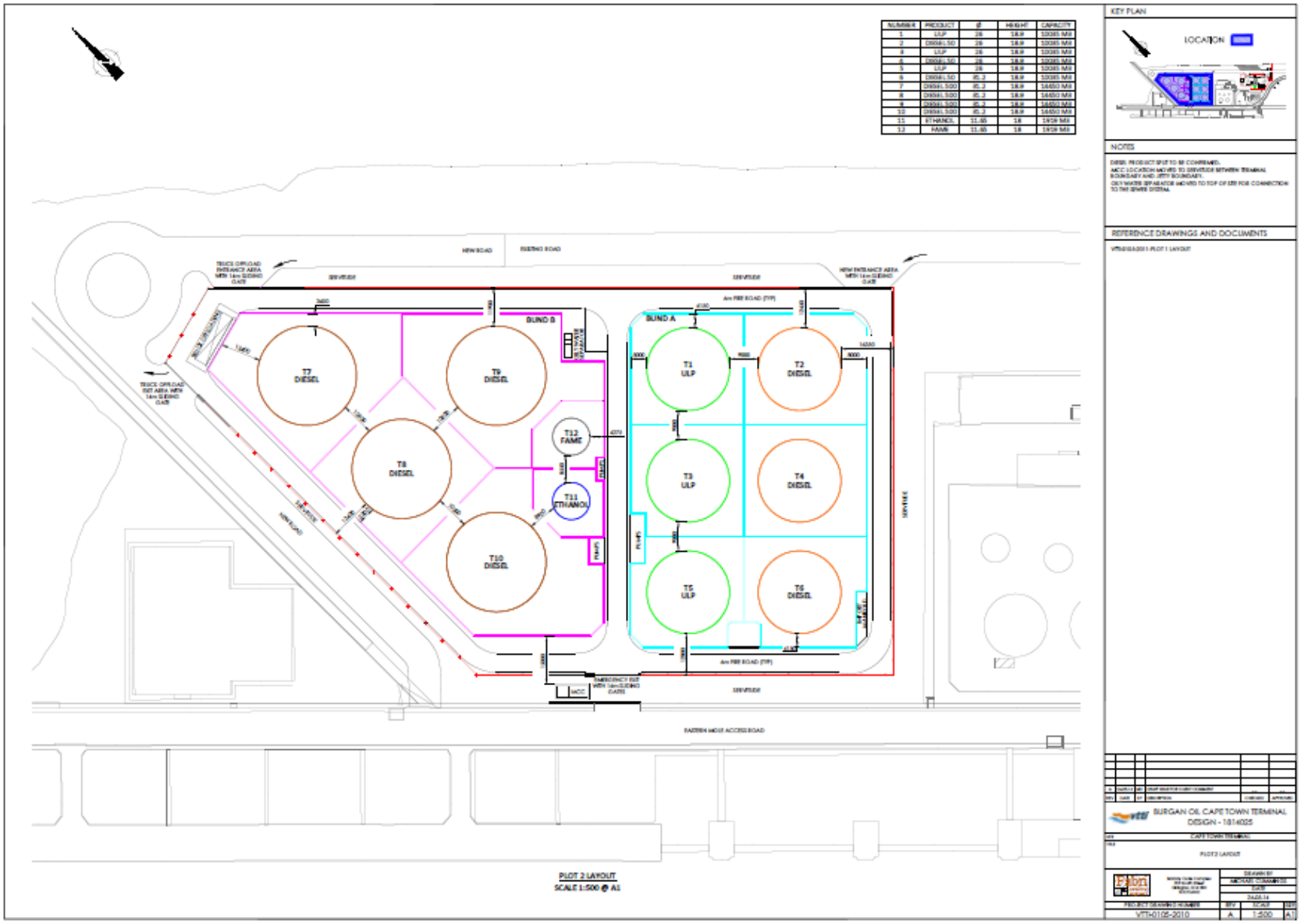
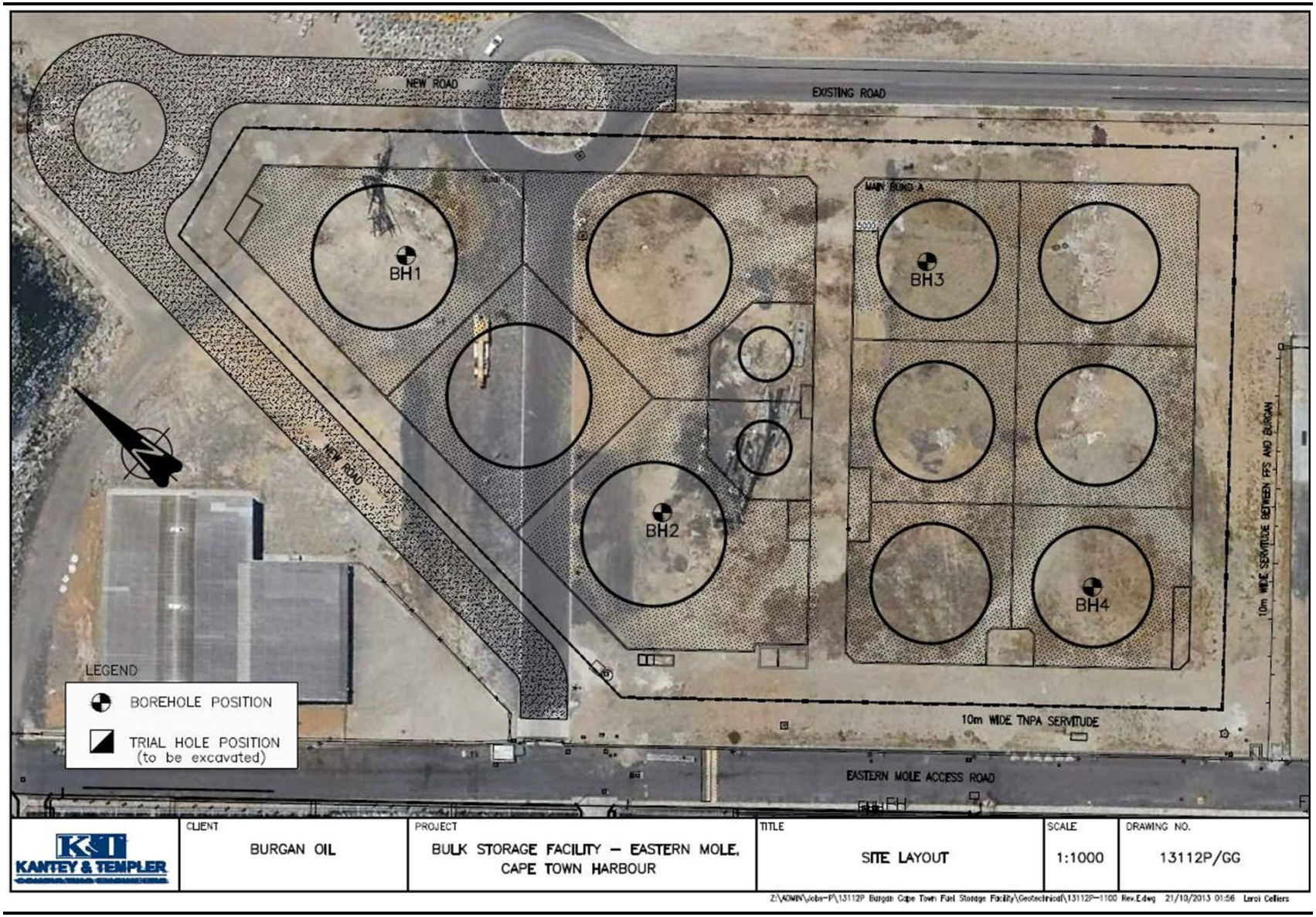


*Figure 9.3 Overlay of Plot 2 Preferred Layout Alternative 3 over current site*



## 9.2 CONCLUSIONS FOR IMPACTS IDENTIFIED AND ASSESSED

### 9.2.1 Air Quality

There exist potential adverse impacts on the ambient air quality during the construction and operational phases of the Project from the following sources:

- Air emissions will occur from diesel generators used to power construction equipment and vehicles used for construction activities;
- Fugitive dust as a result of the removal of vegetation, excavation of land, access road construction, temporary road construction, and construction of the new storage infrastructure;
- Fugitive dust from construction traffic on untarred areas of the site;
- Fugitive dust from the concrete batching;
- Dust generated in work areas; and
- Air emissions from storage tanks.

Windblown particulate matter (PM) (dust) from exposed areas around the site and emissions from various port activities, including ship exhausts, are the likely sources of air pollution in the area. There will be a direct deterioration of ambient air quality during Project construction. However, the impacts will largely be reversible. Based on the dispersion simulation of the fugitive emissions from the storage and loading operations proposed for the site, the following can be concluded regarding air quality:

- The operation of the VRU is expected to have a significant mitigation effect on the emitted quantities from the site;
- The benzene concentrations around the site are within the South African annual ambient guideline threshold; and
- The carcinogenic risk and long-term human health risk arising from the site are considered negligible.

The overall residual impact significances of impacts on air quality are considered **Negligible** during construction and operations.

### 9.2.2 Soils and Groundwater

By virtue of the nature of the site, being reclaimed land constructed through the end-tipping of a variety of materials, the results of laboratory analyses conducted on soil samples from trial pits are variable and heterogeneous. To ERM's knowledge, the land was reclaimed between 1992 and 2000 and has never been developed; hence the results of these analyses provide a reliable

indication of the baseline conditions of the site. Concentrations of mono-aromatic hydrocarbons (MAH) in soil are below laboratory detection limits for all but two trial pits (TP11 and TP22). In these pits, the concentrations are below the SSV2 (commercial/industrial) screening values. Concentrations of total petroleum hydrocarbons (TPH) in the $C_6$ – $C_{10}$ range are below laboratory detection limits for all trial pits, while concentrations of TPH in the $C_{10}$ – $C_{40}$ range vary from below the laboratory detection limit (in five of the 22 pits) to concentrations that are below the SSV2 (commercial/industrial) screening values in the remaining pits. Metal concentrations in soil vary by a factor of up to 100, with the greatest variability evident in chromium, copper and zinc. Given the nature of the site, such variability is to be expected and no spatial patterns can be drawn from the results. All metals are present in concentrations well below the relevant screening values.

There is the potential that minor fuel and oil spills could contaminate the soil and groundwater (seawater) during the construction and operations phases. The location of the site in the harbour ~3m above sea level on partially consolidated backfill material which is inherently permeable, suggest that any hydrocarbon spill from site will migrate vertically down from the source until it comes into contact with groundwater (sea water), and then migrate laterally from there. Migration paths velocity and limits are a function of many factors, but site conditions are conducive to rapid groundwater flow.

Waste and effluent will be generated during the construction and operational phases of the facility. All wastes generated from the project will be categorised as either *non-hazardous* or *hazardous* following an assessment of the hazard potentials of the material in line with South African legislative requirements.

The main sources of waste will result from the construction and decommissioning activities. One of the main sources of non-hazardous wastes will be the domestic type solid waste from the approximately 110 - 130 personnel. These wastes will be produced daily and comprise of the following:

- Domestic type waste;
    - residual packaging and food wastes
    - metal cans (from food and drinks)
    - plastics drinks bottles
    - glass jars and bottles
- Wooden pallets and cartons;
- Scrap metal;
- Concrete waste;
- Paper and cardboard;
- Grey water - from ablutions; and
- Food wastes.

The following hazardous wastes may also be produced from construction activities.

- Batteries (including large lead acid type);
- Medical/clinical wastes;
- Oily rags and absorbents;
- Used oil and oil filters - from generators or vehicle maintenance;
- Contaminated water - slops and oily water from drip trays; and
- Sewage from toilets.

The main sources of waste and effluent during operations will be oily water from runoff and stormwater. Two oily water separators will be installed at the site and a drainage system constructed.

The overall residual impact significance of soil and groundwater (seawater) contamination are considered **Minor (-ve)** during the construction and operations phases.

### *9.2.3 Traffic*

The facility will make use of the road based distribution network during each phase of the Project, with the majority of the road usage taking place during the operational phase, where product is distributed via road-based tanker trucks.

During the construction phase of the facility there will be an increase in vehicle movement to and from the site. This has the potential to impact on traffic within the Port of Cape Town, and at the key intersection of Container Road and Marine Drive. An increase is traffic flow is related to the transportation of construction workers to and from the site, as well as the delivery of construction material and equipment into the area. Once constructed, the facility will make use of road tankers to distribute product via the road distribution network. The additional traffic resulting from the operational phase of the facility will increase pressure on the existing road distribution network, and particularly on the key entry point to the Port of Cape Town (Intersection of Container Road and Marine Drive). However, given the current traffic volumes in the area and the projected increase in traffic volumes as a result of the Project, the residual impact significance during construction and operations is considered **Negligible**.

### *9.2.4 Noise*

Construction activities and vehicles associated with the Project will increase the ambient noise levels during the construction phase, which may be a nuisance to the surrounding businesses and facilities. The generation of noise can also be a health and safety risk to the Project workforce if not appropriately managed. Ambient noise levels may be affected by the on-going use of road tankers to transport oil and fuel from the site. It is estimated that an average of 75 road tankers will be used, seven days a week, 24 hours a day, with a peak of 120 road tankers in a day five or six times in the year. Road tankers are estimated to produce 65dBA noise levels, which would be on

the near the upper limit of the expected current ambient noise levels of 70dBA in an industrial complex(1) . Given the site is located in the industrial setting of the Port of Cape Town, the scale of construction to be undertaken and the volume of road tankers to be used during operations, the overall residual impact significance on ambient noise levels is considered **Minor (-ve)** during the construction and operations phases.

### *9.2.5 Visual*

Key visual features of the Project site include:

- Container cranes
- Container stacks
- Large ships and oil rigs
- Shipping Berths 1 and 2
- Open area with sparse vegetation of the Project site
- The FFS storage facility
- Open ocean of Table Bay

The main view sheds are from the N2 national highway leading into Cape Town CBD, from Table Mountain and from Signal Hill. The most prominently visible aspects of the facility will be the large storage tanks and bunding infrastructure, and the six gantry loading bays. However, given the industrial nature of the Port of Cape Town and the fact that the FSS facility with large storage tanks already exists at the Project site, the Project infrastructure will not be introducing new visual aspects to the landscape. The residual impact significance of visual impact on the landscape throughout operations is considered **Minor (-ve)**.

### *9.2.6 Economic Impacts*

The available information provided no reason to suspect that the Project would be a financial failure. In addition, no hidden subsidies in favour of the applicant were found and environmental externalities or costs associated with the Project were found to be negligible to very low.

It was found that the Project is compatible with, and generally supportive of, the relevant national policies and plans. These include those related to security of supply, the maintenance of strategic stocks, infrastructural needs, spatial and capacity planning at the Port of Cape Town and the facilitation of greater competition.

Expenditure as a result of the Project will have positive benefits to the economy. The Project is also expected to have positive benefits on improved security of supply and flexibility of fuel and oil, and through increased opportunities for competition in the industry. The residual impact significance

(1) SANS 10103, 2008.

of the above mentioned impacts construction and operations phases is considered **Moderate (+ve)**.

The key area of concern regarding the Project relates to its potential to result in imports that take market share away from the Chevron Refinery to the degree that its viability is put at risk. The fuels sector specialist indicates that, notwithstanding inherent uncertainties, risks to the continued viability of the Chevron Refinery should be negligible for the most likely scenario and for the worst case scenario low with mitigation. Chevron staff, sub-contractors and suppliers should therefore remain largely unaffected resulting in low socio-economic risks. The residual impact significance of the above mentioned socio-economic impacts is considered **Minor (-ve)**. If found to be appropriate, mitigation in this regard lies in the power of the DOE only to issue fuel importation permits only when fuel is not available locally. This must also be weighed up against the other advantages of the facility (i.e. providing storage, augmenting security of supply and facilitating competition).

### *9.2.7 Social Disturbance*

The introduction of construction activity into an area can induce social disturbance, dependent on the context and land use of the area. This change is typically linked to the presence of construction workers and machinery and equipment required for construction activities. The presence of workers on a project site can increase levels of crime and place additional pressure on the existing infrastructure and services. However, considering the scale of the construction required, there will be a relatively small workforce on site given the short construction period and the limited number of employment opportunities. The residual impact significance for social disturbance as a result of the Project is considered **Negligible** for the construction and operations phases.

### *9.2.8 Unplanned Events*

A Quantitative Risk Assessment (QRA) (ERM, 2014) (see *Annex H*) was undertaken to simulate a number of incident scenarios associated with the facility in the Port of Cape Town. The following hazardous scenarios were identified:

- Bulk Storage Tank Scenarios
- Buncefield Scenarios
- Pipework and Pipeline Scenarios
- Road Tanker Offloading Scenarios
- Road Tanker Loading Scenarios

The consequence of a pool fire from a catastrophic release from a tank on-site can extend up to 151 m and poses a threat to workers on-site and people off-site. The consequence from a flash fire following a Buncefield type overfilling incident has the potential to extend up to 470 m and poses a threat to workers on-site and people off-site.

For workers on-site the individual risks are found to be below 1000 cpm and therefore tolerable if Burgan Oil Cape Terminal can demonstrate that they are As Low As Reasonably Practicable (ALARP). For workers on other sites, namely FFS Refiners and Chevron JBS, the individual risk is below 100 cpm and therefore not considered intolerable, however the risk is above 1 cpm and therefore considered to be tolerable if ALARP. For the pipeline the risk to the workers in the adjacent facilities does not exceed 100 cpm. Therefore the risks are not considered intolerable according to the assessment criteria of the QRA. The results of the QRA show that the addition of pipeline option A or B does not increase the risk profile of the Burgan Oil site for individual risk significantly and the conclusions of the assessment do not change. This is likely due to the low frequency of use of the pipeline.

The societal risk profile for the Burgan Oil Cape Terminal site is considered to be broadly acceptable. The individual risks are considered to not be intolerable but only tolerable if proved to be ALARP for members of the public. Burgan Oil must show that actions have been taken to ensure the levels of risk are ALARP for members of the public.

The individual risk of fatality was found to not be intolerable but only tolerable if proved to be ALARP. In accordance with Section (5)(a) of the MHI Regulations shown in *Annex H* it is the opinion of ERM as an Approved Inspection Authority (AIA) that Burgan Oil have shown a commitment to the reduction of tank overfill events which could potentially result in a Buncefield type incident. This is highlighted in their Operating and Control Philosophy as shown in *Annex H* and their letter of commitment to this philosophy as shown in *Annex H*. Further, it is the opinion of ERM that the measures proposed in the Operating and Control Philosophy show a reasonable degree of risk reduction for this stage of the Burgan Oil fuel terminal design process as specific overfill prevention technologies have been accounted for. As such the individual risk of fatality posed by the proposed site can be considered as low as reasonably practicable (ALARP) for this stage of the design process and therefore tolerable. To verify this view, following completion of the Burgan Oil final design, an update of the current MHI risk assessment taking into account the final design overfill prevention measures must be carried out.

Using the criteria outlined in *Chapter 3* it has been shown that the Project falls within the 'Don't Advise Against DAA' category for all 3 probability of dangerous dose zones. As a result, for the current land-use surrounding the site, the storage and use of flammable liquids within the site is acceptable in accordance with the health, safety and environment (HSE) land-use planning assessment.

As a result of being declared a MHI, the Requirements of the MHI Regulations must be followed completely to ensure the Burgan Oil is legally compliant. Copies of this risk assessment must be submitted to the Local Provincial Director of the Department of Labour, the Chief Inspector of the Department of Labour Head Office in Pretoria and the Local Authorities.

An impact assessment was undertaken for the unplanned event of an oil spill impacting marine fauna in Table Bay, particularly the Bank Cormorant *Phalacracorax neglectus* and the African Penguin *Spheniscus demersus* which are listed as Endangered according to the International Union for Conservation of Nature (IUCN), while the African Black Oystercatcher *Haematopus moquini* is classified as Near Threatened. The assessment found that although the magnitude of the impact of an oil spill on marine fauna would be high, as an unplanned event the likelihood of the impact is low. Given this and the implementation of specific oil spill response mitigation measures, the overall post-mitigation impact is considered **Moderate-Minor (-ve)**.

### *9.2.9 Balance Between Direct Costs and Benefits*

Cost-benefit analysis which focuses on direct costs and benefits is probably the most widely used technique aimed at providing an indication of the economic efficiency and basic economic desirability of a project. It also forms the conceptual departure point for the DEADP guideline for economic specialist inputs to EIA (van Zyl et al., 2005).

In applying basic cost-benefit principles to the Project, financial costs and benefits facing the applicant were considered to the degree possible. These were then assessed for potential distortions and for externalities that the project might provide for or impose on the wider society.

*Private Costs and Benefits*

Discussions with the applicant revealed that the financial viability of the project has been considered at length. Their appraisal followed standard viability, risk assessment and general business planning methods that have been applied in numerous similar projects across the globe (1). In their view, the expected rewards of the Project outweigh risks, making it financially viable to make the necessary investment (M Mseleku and S. van Zelst, Burgan and VTTI, pers com).. Note that Burgan Oil was among the companies that showed earlier interest in establishing similar facilities at the site. Transnet's tender process included a pre-qualification evaluation, following which requests for proposals were sent to five prospective bidders. Full proposal for the site were then received from three bidders including Burgan Oil (J. Claassen, Transnet, pers com). Burgan Oil was thus not alone in recognising a potentially viable commercial opportunity for liquid fuel facilities at the site.

The Fuels Sector Specialist Report (see *Annex I*) provides further input regarding likely financial viability and key risk associated with the proposed facility. This assessment concludes that there is a "high probability" that the Project will be viable when one considers the key drivers of viability alongside risks. It points out that the key requirements for the viability of a project of this nature have been met as follows (Buley, 2014):

(1) VTTI who have bought out Burgan Oil operate 11 storage facilities across five continents with a combined storage capacity of 8.6 million cubic meters (see www.vtti.com).

- *"An anchor tenant agreement has been signed with a major oil company and additional agreements including strategic stock storage will be advanced.*
- *The facility has been designed for efficiency which is primarily driven by size, as similar staffing levels would be required for a smaller facility and smaller tanks would be more expensive on a cost/volume basis.*
- *Capability to handle cleaner fuels is an essential component to minimise the cross contamination of product and would further enhance the viability given the increasing demand for these fuels as the demand will not be able to be met by the refinery.*
- *Connectivity into the Chevron pipeline would enable product from the refinery to be received into the facility and road hauled into the supply area.*
- *Storage of 14 days strategic stocks for those companies without storage in the Cape Town supply area would require ~40 Ml of storage."*

The Project's viability has been extensively considered and a major anchor tenant has been secured making it possible to attach a high probability to the achievement of viability. It is important to bear in mind that financial sustainability/viability is never a certainty in any commercial venture. Applicants can assess only expected risks and use these to make an informed decision. The available information gives no reason to anticipate financial failure that would argue against the Project.

*Public Costs and Benefits*

While analysts are rarely in a position to second guess private companies regarding the private financial viability of a project, they are obliged to check that the expected private viability is not a consequence of market distortions or aberrations. In this case, no hidden subsidies or other distortions in favour of the applicant were found that could have made the project 'artificially' viable.

*Integrated Perspective*

*Table 9.1* and *Table 9.2* below provide a summary of the pre-mitigation and residual impact significance ratings for identified and assessed impacts, which provide a backdrop for the integrated analysis of overall costs and benefits to the Project. During the construction phase the residual negative impacts of the Project are rated Minor (-ve) to Negligible, while there is a positive impact from project expenditure of Moderate (+ve). During the operational phase the potential negative impacts most of the impacts are considered Minor (-ve) to Negligible (with one impact regarded as Moderate-Minor (-ve)), while three economic positive impacts are considered Moderate (+ve). From an integrated perspective, for relatively low estimated potential negative impacts, there are some key positive, more significant potential positive impacts as a result of the Project.

*Table 9.1 Summary of Pre-mitigation and Residual Significances during Construction Phase*

| | Section | Impact | Pre-mitigation Significance | Residual Impact Significance *(Based on mitigation)* |
|---|---|---|---|---|
| Air Quality | 8.1.1 | Dust and Emissions | **MINOR (-VE)** | **NEGLIGIBLE** |
| Soils and Water | 8.1.2 | Soil and Groundwater contamination | **MODERATE (-VE)** | **MINOR (-VE)** |
| Traffic | 8.2.1 | Increased traffic volumes | **MINOR (-VE)** | **NEGLIGIBLE** |
| Noise | 8.2.2 | Increased ambient noise levels | **MINOR (-VE)** | **MINOR (-VE)** |
| Project Expenditure | 8.2.7 | Economic impacts from Project expenditure | **MINOR-MODERATE (+VE)** | **MODERATE (+VE)** |
| Social Disturbance Factors | 8.2.8 | Impacts from increased social disturbance | **MINOR (-VE)** | **NEGLIGIBLE** |

*Table 9.2 Summary of Pre-mitigation and Residual Significances during Operations Phase*

| | Section | Impact | Pre-mitigation Significance | Residual Impact Significance *(Based on mitigation)* |
|---|---|---|---|---|
| Air Quality | 8.1.1 | Dust and Emissions | **MINOR (-VE)** | **NEGLIGIBLE** |
| Soils and Water | 8.1.2 | Soil and Groundwater contamination | **MODERATE-MINOR (-VE)** | **MINOR (-VE)** |
| Traffic | 8.2.1 | Increased traffic volumes | **MINOR (-VE)** | **NEGLIGIBLE** |
| Noise | 8.2.2 | Increased ambient noise levels | **MINOR (-VE)** | **MINOR (-VE)** |
| Visual | 8.2.3 | Visual impact on landscape | **MINOR (-VE)** | **MINOR (-VE)** |
| Improved Security of Supply and Flexibility | 8.2.4 | Economic impacts from increased security of supply | **MODERATE (+VE)** | **MODERATE (+VE)** |
| Increased Opportunities for Competition | 8.2.5 | Economic impact from increased opportunities for competition | **MODERATE (+VE)** | **MODERATE (+VE)** |
| Impact on Competitors | 8.2.6 | Socio-economic impacts on competitors to the Project | **MODERATE-MINOR (-VE)** | **MINOR (-VE)** |
| Project Expenditure | 8.2.7 | Economic impacts from Project expenditure | **MINOR -MODERATE (+VE)** | **MODERATE (+VE)** |
| Social Disturbance Factors | 8.2.8 | Impacts from increased social disturbance | **NEGLIGIBLE** | **NEGLIGIBLE** |
| Unplanned Event of Oil Spill on Marine Fauna | 8.3.6 | Impacts of oil pollution on sensitive marine fauna | **MODERATE(-VE)** | **MODERATE-MINOR(-VE)** |

## *9.3 RECOMMENDATIONS*

ERM is confident that every effort has been made by Burgan Oil to accommodate the mitigation measures recommended during the EIA process to the extent that is practically possible, without compromising the economic viability of the Project. The implementation of the mitigation measures detailed in *Chapter 8* and listed in the Environmental Management Programme (EMPr), including monitoring, will provide a basis for ensuring that the potential positive and negative impacts associated with the establishment of the development are enhanced and mitigated to a level which is deemed adequate for the development to proceed.

In summary, based on the findings of this assessment, ERM finds no reason why the facility proposed for the site should not be authorised, contingent on the mitigations and monitoring for potential environmental and socio-economic impacts as outlined in the EIR and EMPr being implemented.