

CHAPTER 7.0 RESIDUAL IMPACTS

7.1 Introduction

This chapter discusses the residual impacts that are identified from the proposed project. Residual impacts are impacts that still exist even though proper mitigation measures have been taken to minimize the impacts. Residual impacts need to be properly identified as to formulate environmental management plans for the impacts.

7.2 Impacts to Air Quality

There will most certainly be an increase in air borne pollutants due to the influx of heavy machinery and vehicular activities during the construction phases. Several mitigation measures recommended for the purpose of minimizing air borne pollutants. However, it is anticipated that a minimal increase in air borne particles will still occurs.

Therefore, it is best that a monitoring program to be implemented during the construction phase. The monitoring program is to check the quality of the air against the implementation measures taken to minimize air pollution. The parameters to be monitored are total suspended particulates (TSP) at a quarterly interval. However, this is subject to approval from the Department of Environment, Johor.

7.3 Impacts to Noise Levels

In any construction site, the generation of noise cannot be avoided. However, it is expected to be temporary and localized in nature. Noise levels can be measured at several strategic locations to determine the noise generated by the construction activities. The location of sampling should reflect on the construction activities and as such should not be relocating at any time of the construction phase. The location and period of sampling is subject to the approval by the Department of Environment, Johor.

7.4 Impacts to Water Quality

Water quality will certainly be affected at areas where construction is taking place, rivers/streams and nearby workers quarters or workshops. Mitigation measures recommended are focused on preventing discharge into the waterways. However, this is not sufficient in controlling pollutants from entering the waterways. Construction activities nearby the rivers will disturb the riverbed causing sediment movement to other areas of the rivers. Septic tanks installed to collect sewage from the workers' quarter can only provide partial treatment if the design is done properly. Therefore, it is best that a monitoring program to be implement during the construction phase. The monitoring program is to ensure the compliance of the water quality (river & marine) against any implementation measures taken to minimize water pollution. The parameters to be monitored could include:

River:

- Dissolved oxygen (DO)
- Biochemical oxygen demand (BOD)
- Chemical oxygen demand (COD)
- Total suspended solids (TSS)
- pH value
- Ammoniacal Nitrogen (NH₃-N)

It is proposed that the monitoring be carried pending the construction activities:

Duration	Activities
Monthly	when earthworks is in progress
Quarterly	Other construction activities such as surfacing of roads etc

However, this is subject to approval from the Department of Environment, Negeri Johor.

7.5 Impacts to Safety and Health

Impacts to the safety and health of workers and residents can occur during the construction as well as the post development phase. The influx of workers (foreign) into the area can bring along communicable diseases and social ills. Accidents at the work place (construction site) can always happen. Accidents can occur due to negligence of the workers on safety regulations and improper usage of machinery.

Therefore, it orders to minimize and control accidents at the work place, main contractors will recommended preparing a Health and Safety Plan, covering the following scope:

- Channel of communication in case of emergency
- Emergency and important contact numbers such as ambulance, police, fire station etc.
- An immediate emergency response procedure.

7.6 Conclusions

The assessment carried out in this EIA study was based on field visits and observations, water quality analyses, noise analyses and air quality samplings, meetings and liaisons with relevant Government agencies, review of reference documents and environmental guidelines.



Table 7.1: Summary of Potential Impacts and Recommended Mitigation Measures (Pre-Development Phase)

Project Activity	Potential Impacts	Recommended Mitigation Measures	Residual Impacts
Reconnaissance Survey, Site Inspection and data Collection	No significant impact	No significant impact	
Topographic	No significant impact	No significant impact	
Soil Investigation	<u>Adverse</u> Boreholes are a potential hazard to local residents.	<ul style="list-style-type: none"> Boreholes are to be filled up with earth/sand. Boreholes can also be maintained for groundwater monitoring (if necessary) 	
Traffic impact Assessment	No significant impact	No significant impact	
Preliminary Environmental Impact Assessment	No significant impact	No significant impact	
Design Stage	No significant impact	No significant impact	

Table 7.2: Summary of Potential Impacts and Recommended Mitigation Measures (Development/Construction Phase)

Project Activity	Potential Impacts	Recommended Mitigation Measures	Residual Impacts
Construction of Temporary Access Roads	<u>Adverse</u> <ul style="list-style-type: none"> Dust problems during dry season and water pollution by sediment transported by surface runoff. Generate minor traffic especially to the private property nearby. 	<ul style="list-style-type: none"> Wheel washing bay and water trucks will be employed control dust. Proper traffic signage and traffic management during construction work. 	Might affect water quality of smaller streams.
Site Clearing	<u>Adverse</u> <ul style="list-style-type: none"> Land that is left barren has high erosion potential. Water quality will be affected when surface runoff brings pollutants into the waterways. Generation of biomass waste. 	<ul style="list-style-type: none"> Land clearing to be carried out in phases eg. areas to be developed to be cleared first and vice versa. Land clearing activities should best be carried out during non-monsoon seasons. 	Water quality of nearby streams potentially affected.
Transportation of Construction Materials and Machinery	<u>Adverse</u> <ul style="list-style-type: none"> Safety and hazard: Potential spillage of materials on existing roads. Air quality: Dark smoke emitted by vehicles. Noise quality: Generate by various sources such as construction vehicles, <u>Beneficial</u> Activity will spur businesses like retail and food.	<ul style="list-style-type: none"> Transportation vehicles are to be covered to avoid dispersion of granular based materials. Other materials are to be fastened securely on the trucks to prevent accidental spillage. Machinery such as excavators, back pushers to be transported and not driven on the public road. A vehicle cleaning pit to be prepared so that dirt from site is not transferred to main roads. 	



Project Activity	Potential Impacts	Recommended Mitigation Measures	Residual Impacts
<p>Construction of Site Office, Workshop and Workers' Quarters</p>	<p>Adverse</p> <ul style="list-style-type: none"> • Improper sanitation facilities for the workers' quarters • Poor housekeeping of workshops. • Generation of solid waste <p>Beneficial</p> <ul style="list-style-type: none"> • Increase employment opportunities for local residents. • Spur businesses like food and retail. 	<ul style="list-style-type: none"> • Location of site office, workshop and workers' quarters to be marked on plan for management. • Sanitary facilities to be provided. • Bunds are to be provided for any diesel tanks to collect spillage and leakage. • Used oils and lubricants are to be collected and sent to other workshops for reuse or disposed off at recovery plants. • Upon completion of works, workers' quarters and septic tanks should be removed. The sewage should be disposed off in any nearby sewage treatment plant (STP). 	<p>Poor housekeeping at workshops will lead to contamination of the waterways.</p> <p>Improper sanitary facilities will lead to contamination of the waterways.</p>
<p>Earthworks</p>	<p>Adverse</p> <ul style="list-style-type: none"> • Degradation of water quality. • Generate of sediment load into the waterways • Risk of slope failure. • Generation of biomass wastes. • Erosion due to clearing of vegetation will cause siltation <p>Beneficial</p> <ul style="list-style-type: none"> • Improvement of infrastructure (drainage) 	<ul style="list-style-type: none"> • Major earthworks such as filling to be carried out during non-monsoon seasons. • Implement the slope protection to prevent any potential erosion. • Slopes that has been cut and finalized are to be turfed immediately with suitable grass crops to prevent further erosion of the slopes. • Proper drainage to be constructed early to channel surface runoff. • Vehicles carrying earth or sand should be covered (with tarpaulin or canvas) to prevent these granular materials from air borne or spilling onto the existing road. • Spillage of earth, sand, aggregates on the existing roads are to be removed as soon as possible for the convenience of existing traffic users. • Temporary access roads should be paved at least 10m away from where these roads join the existing paved roads. • Washing through are to be provided to wet/wash vehicle tires upon entering and exiting a designated site. • BMPs (ESCP) implementation such as silt curtain, sediment fence, sediment basin, wash through and etc. 	<p>Surface runoff from downpour will bring sediments to the rivers.</p>



Project Activity	Potential Impacts	Recommended Mitigation Measures	Residual Impacts
Construction of Sub-structure and Super-structure	<p>Adverse</p> <ul style="list-style-type: none"> Noise pollution from erection activity. Safety and health of workers are at risk during construction. 	<ul style="list-style-type: none"> Formworks need to be properly sealed to prevent loss of cement slurry, which can affect concrete strength. Construction should practice the 'SAFETY FIRST' concept, to ensure that safety is never compromised. All personnel that enter the site should wear personal Protective Equipments (PPE) 	
Construction of Infrastructure and Utilities Development	<p>Adverse</p> <ul style="list-style-type: none"> Potentially generate disconnected of power supply such as electrical and telecommunication to surrounding area. Flooding cause by network system failing to function when the construction process. Un-tarred road surface will cause air dispersion. Discharging of sewage will cause deterioration of the receiving water bodies <p>Beneficial</p> <ul style="list-style-type: none"> It will be beneficial to local and nearby residents to have such an infrastructure as to reduce traveling time and cost saving. 	<ul style="list-style-type: none"> Diversion of traffic may also be required and flagmen should be engaged to proper divert the existing traffic. Roads that have yet to be tarred (crusher run or earth road) have to be wetted periodically to prevent the dispersion of dust into the atmosphere. Proper signage to inform existing road d users on the diversion in traffic flow. Flagman (if necessary) should be engaged to direct traffic. Regular maintenance for the main drain and sub drain to avoid clogging/trap of rubbish at the manhole/culvert. 	
Disposal of Construction Wastes	<p>Adverse</p> <ul style="list-style-type: none"> Improper disposal will lead to hazards as well as environmental degradation. <p>Beneficial</p> <ul style="list-style-type: none"> Creation of aesthetically pleasant to traffic. It will not pose any hazards to other road users. 	<ul style="list-style-type: none"> Wastes should be collected and disposed off at approved landfill sites. Wastes should be removed periodically from the project site. This is to ensure that pollutants from the construction wastes are not leached into the waterways during a downpour. 	
<ul style="list-style-type: none"> Schedule Waste Management 	<ul style="list-style-type: none"> The impacts are generated from construction activities related to handling and manage the scheduled wastes such as oil waste (diesel drum), paint and others. 	<ul style="list-style-type: none"> Scheduled wastes shall be stored in drum/container to be stored, durable and which are able to prevent spillage or leakage of the scheduled wastes into the environment. Each drum/container has to be properly labeled and recorded. Each drum/container has to be kept at storage facility. Areas for the storage of the drum/container shall be designed, constructed and maintained adequately in accordance with the guidelines prescribed by the 	



Project Activity	Potential Impacts	Recommended Mitigation Measures	Residual Impacts
		Department of Environment to prevent spillage or leakage of scheduled wastes into the environment. <ul style="list-style-type: none"> • Drum/Container containing scheduled wastes shall always be closed during storage except when it is necessary to add or remove the scheduled wastes. • All the drum/container containing scheduled waste shall be transfer or move by the registered contractors by Department of Environment (DOE) and adhered to license condition issued by DOE. 	
Abandonment	<ul style="list-style-type: none"> • The construction materials that are left behind unmanaged would pose potential harm to the environment. • Abandonment of the project at early stage, after site clearing and earthworks will cause pollution of water from soil erosions and air pollution from airborne dust generation. 	<ul style="list-style-type: none"> • Abandonment during the operational stage requires the project proponent to consider plans for the removal or disposal of temporary structures and facilities. 	

Table 7.3: Summary of Potential Impacts and Recommended Mitigation Measures (Post Development Phase)

Project Activity	Potential Impacts	Recommended Mitigation Measures	Residual Impacts
Landscaping	<ul style="list-style-type: none"> • Without proper maintenance, it will destroy the esthetic value of the surrounding. 	<ul style="list-style-type: none"> • More landscaping be carried out to improve the aesthetic of the area as well as for environmental functions such as reducing the level of carbon dioxide in the air, increasing oxygen level etc. 	
Solid Waste Disposal	<ul style="list-style-type: none"> • Littering and indiscriminate dumping and discharge of solid wastes will result in the deterioration of the environment with respect to general aesthetic and health impact. 	<ul style="list-style-type: none"> • Recycling programs around the communities can maximize the amount of waste that is diverted from disposal. • 3R campaign needs to be implementing by occupants. • The other alternative are to dispose the solid waste is to provide centralized composting park. 	



Project Activity	Potential Impacts	Recommended Mitigation Measures	Residual Impacts
General maintenance (Infrastructure and Utilities)	<p><u>Adverse</u></p> <ul style="list-style-type: none"> Resurfacing of roads will cause temporary jams to the existing road users. It is sillage will cause deterioration of the receiving water bodies. Wastewater enters the existing waterway without treatment will harm and kill various types of sensitive aquatic life. <p><u>Beneficial</u></p> <ul style="list-style-type: none"> Comfort of driving to access the project side. 	<ul style="list-style-type: none"> Proper signage for diversion should be installed to warn traffic users on works carried out ahead. Proper road maintenance contributes to reliable transport at reduced cost, as there is a direct link between road condition and vehicle operating costs. Maintenance of drains will be critical in order to prevent blockage in the drainage channels and reduce flooding. A regular maintenance to ensure STP is working effectively. 	