Supplemental Environmental and Social Assessment Report

PT. Domas Agrointi Prima (DAP) Oleochemical Project – Medan, Indonesia

October 2017

Prepared for Pacific Harbor Group

ESSA

Supplemental Environmental and Social Impact Assessment Report

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Pacific Harbor Group

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Cover Photo: View of Kuala Tanjung industrial complex, Indonesia © 2015 P. de la Cueva

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Organization of the Report

To facilitate the reader's ability to identify background and findings that are of most interest, this report is organized as follows:

Chapter 1: Introduction – This chapter describes the scope and objectives of the work done so far under this Independent Environmental and Social Consultant (IESC) assignment.

Chapter 2: Project description – This chapter describes the DAP project in terms of its components, location, and expected operations.

Chapter 3: Updated baseline – This chapter provides an overview and summary of the main findings of the various additional studies that have been conducted since 2015 in order to bring the Project in conformance with international standards (i.e. IFC Performance Standards on Environmental and Social Sustainability). In particular the scope and main findings of the different studies are discussed in this section:

Chapter 4: Identification of Risks and Impacts – This section summarizes the findings of the additional impact analyses which have been conducted to fill in information gaps identified during the initial review of the Project.

Chapter 5: Environmental and Social Management System – This chapter presents DAP's organizational structure and management plans and explains how environmental and social risks will be addressed and mitigated during the operations phase.

Chapter 6 – Summary of findings and compliance with IFC standards – This section of the report summarizes the findings presented in previous chapters and provides an overview of the Project's compliance with IFC standards.

Appendix A: Complementary Environmental Baseline – This report summarizes the findings of the complementary environmental baseline survey conducted in November 2016 to analyze water quality (freshwater and sea water), air quality and noise levels in the proximity of the Project.

Appendix B: Updated Social Baseline – This report summarizes additional social baseline investigations conducted since 2016, including stakeholder mapping.

Appendix C: Rapid Cumulative Impact Assessment – A Rapid Cumulative Impact Assessment was conducted to assess potential impacts resulting from the Project and other activities in the surrounding area.

Appendix D: Review of the ANDAL for the jetty – This section presents the results of the review of the ANDAL or environmental assessment report developed for the jetty.

Appendix E: Air Dispersion Model – This report presents the results of the air dispersion modelling exercise conducted to evaluate potential impacts of the emission on the DAP complex on ambient air quality.

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Abbreviations

ANDAL	*Analisis Dampak Lingkungan* / Environmental Impact Analysis Report
BOD	Biological oxygen demand
BSP	Bakrie Sumatera Plantation Tbk
CPO	Crude palm oil
DAP	PT. Domas Agrointi Prima
DELH	Environmental Evaluation Document

EXECUTIVE SUMMARY

The present supplemental Environmental and Social Impact Assessment (ESIA) provides an overview of the updates and additional assessments that have been conducted since 2015 in relation with the pre-investment environmental and social due diligence of the PT. Domas Agrointi Prima (DAP) oleochemical complex (the Project) in North Sumatra, Indonesia. Since 2011, DAP is part of PT Bakrie Sumatera Plantation Tbk (BSP), a large Indonesian plantation conglomerate and a vertically integrated palm fruit plantation and processing operation

The Project, currently mothballed and under maintenance work, is a 114 Ha industrial complex located on the coast in Kuala Tanjung. The plant processes palm oil and manufactures oleochemical products. DAP is seeking for international funding to expand the capacity and restart the operations of this industrial complex. In this context, the Project needs to be compliant with international environmental and social standards, particularly with IFC Performance Standards.

Engaged by the Pacific Harbor Group, ESSA conducted an initial environmental and social assessment of the Project in 2015. Based on this initial due diligence assessment, the assessment team identified a number of environmental and social information gaps or follow-up questions that needed to be addressed prior to financial closure. This report addresses these remaining gaps and consolidates the information on the progress made by DAP/BSP in environmental and social management.

This Supplemental ESIA complements and updates the information and impact assessment presented in the original impact assessment for the DAP complex; the 2010 DELH. Specifically, this ESIA updates the baseline information and addresses gaps between Indonesia ESIA requirements and international ESIA requirements. It should be noted that this ESIA does not constitute a comprehensive environmental and social assessment and does not guarantee the Project's ongoing compliance with IFC Performance Standard during operations. However, it does provide a consolidated overview of the known risks and impacts at the time of this assessment, the environmental and social management plans and tools developed by DAP/BSP and an evaluation of current conformance of the Project with IFC standards.

Updated baseline

In order to complement the environmental baseline information of the industrial estate as presented in the 2010 DELH, PT Hatfield Indonesia conducted a complementary environmental baseline survey in November 2016 to collect data on freshwater and seawater quality, air quality and noise.

Compared to the baseline conditions documented in the 2010 DELH, no significant changes in the parameters analyzed were detected. Given that the survey occurred during the rainy season, high levels of turbidity were found in both freshwater and seawater. Ambient air quality was overall good. The quality of marine habitat in the proximity of the jetty is low, likely as a result of decades of industrial activity on the nearby coast and the sediment inputs from the rivers discharging in the area.

In terms of updated social baseline, DAP conducted a stakeholder reconnaissance survey in July-August 2016. For the various impact zones identified for the Project (e.g., fence line communities, proximity communities and those along the transportation corridor, etc.), the key stakeholders were identified along with the types of impacts that could affect these groups (and potential mitigation efforts) at the stakeholder group level. Subsistence-level fishing families and female-headed households have been identified as vulnerable

stakeholders. DAP has consolidated the results of this stakeholder mapping exercise in their *Stakeholder Engagement Plan*.

Additionally, and as part of the complementary environmental baseline conducted by PT Hatfield in November 2016, a number of interviews were conducted with key informants from local fishing communities living near the Project. It was found that the livelihoods of 15% of the sampled household in Kuala Tanjung depend on fishing. It is estimated that most of these fishermen exploit marine resources located are 12-25 miles from the DAP complex.

Social risks

Based on a conceptual framework of potential social impacts during construction and operations, this ESIA includes the identification of social risks based on a qualitative assessment of the updated social information recently gathered by DAP. The main social risks identified are the following:

- Worker influx: Overall the local hiring plan notes that 720 workers will be required for construction of the Project, consisting of workers for the civil works, technical and mechanical works, and jetty works. Approximately 50% of this work force will be migrant workers. Since the overall workers influx (360 people) represents less than 3% of the existing population level (6,000 people in total in the two closest communities), this is considered to be a low level of impact, especially given the cultural continuity between workers and local people.
- Marine-based livelihoods: It appears that fishermen in the Project area rely heavily on key fishing grounds which are 12-25 kilometers from the plant site, and are therefore are unlikely to be affected by jetty operations. Some local fishing households may use areas closer to the construction areas either for fish farming or for clam collection or fishing, and might not have the resources to fish offshore, and this should be clarified to determine whether mitigation measures are needed.
- Water use: Because of the location of the water intake in proximity to the coast and downstream from plantations and irrigation users, it seems unlikely that the Project's water consumption will be in conflict with downstream users.
- Conflict over benefit distribution: In association with the bust phase of worker influx and local construction employment there are a number of livelihood impacts and problems around indebtedness that are likely to occur, if not adequately mitigated. In addition, as employment at the project becomes scarcer conflict around access to employment may develop.

Climate risks

Using the World Bank's *Climate & Disaster Risk Screening Tool*, the assessment team screened the Project for potential climate risks using readily available information on historic and future climate projections for the study area. Given the Project's location on a flat coastal area, the current climate and expected trends, the following climate hazards were considered in the analysis: extreme temperatures, extreme precipitation and flooding, drought, and sea level rise.

Under the current climate, the level of climate risk of the Project is considered moderate. However, under a future climate, the level of climate risk could increase to high risk because exposure to climate hazards (especially flooding and drought) is expected to increase and the adaptive capacity of the Project and of the sector and broader context are likely to not substantially reduce the level of impact. BSP/DAP management

team should conduct a more detailed risk assessment and explore measures to manage or reduce these longer-term risks.

Impacts to air quality

Impacts to ambient air quality (i.e., beyond the facility property boundary) from the Project air emissions were assessed using the United States Environmental Protection Agency (US EPA) preferred dispersion model, AERMOD. Two operating scenarios were modelled: one without the natural gas power plant and a second scenario with the natural gas power plant in which the power plant offsets the steam demand from the high pressure boiler and this boiler does not operate.

All model results show predicted ambient air concentrations below the established ambient air quality thresholds, with the exception of the 24-hour SO_2, which is below Indonesian thresholds and other internationally recognized thresholds such as the US EPA NAAQS but above the WHO guideline. However, the model results from the emissions of the Project itself (without considering background concentration of SO_2) are below the WHO guideline (16.1 or 16.8 μg/m^3 versus 20 μg/m^3).

Cumulative impacts assessment

A Rapid Cumulative Impacts Assessment (RCIA) was developed, according to international best practice and based on easily accessible information, to provide a high-level assessment of how the combined effects of the Project with other projects and activities, and natural environmental drivers, could affect valued environmental and social components (VECs) in the Project's area.

The assessment focused on five VECs: marine habitats, air quality, water supplies, community health and local livelihoods. And consider cumulative effects on these VECs for two scenarios: i) Scenario 1: Near-term development (2020) representing the cumulative effects in the near future, after DAP upgrades and restarts operations; and ii) Scenario 2: Long-term development (2040) considering the expected effects of climate change on the VECs and that planned and ongoing activities are fully operational.

Based on available information, the RCIA analyzes the current state and trend of the priority VECs and identifies potential near and long-term cumulative effects. The RCIA also suggests potential contributions of the Project to regional mitigation programs or initiatives.

Supply chain risks

DAP has committed to source its feedstock from existing plantations and has recently developed a Feedstock Supply Chain Management Action Plan that lays out a number of legal, social and environmental standards that suppliers need to meet and that will be part of the supply contracts. Section 5.2.4 provides some recommendations to ensure compliance with PS5 (potential resettlement and livelihood restoration) and PS6 (conversion of natural and/or critical habitats) and screen out suppliers that do not meet these conditions.

Environmental and social management

At the time of the 2015 due diligence assessment, most of the required elements of an ESMS were in place in some form, including a corporate sustainability policy, 23 standard operational procedures (SOPs) covering different aspects of the environmental and social management of the plant, etc.. Since then, DAP/Bakrie has developed additional plans and policies, including:

- Community Action Plan

- Stakeholder Engagement Plan
- Local Hiring Action Plan
- Road Traffic Safety Plan
- Grievance Procedures
- Feedstock Supply Chain Management Action Plan
- Security Policy
- Work Health and Safety Policy

Compliance with IFC standards and recommendations

The Project is overall compliant with IFC standards. Recommendations for continued compliance are suggested in Section 6 and summarized in the following Environmental and Social Action Plan (ESAP):

PS	Action item(s)	Implementation timeline
	Additional baseline information *Social* - Track fishing activity in the proximity of the jetty. - Include considerations of health status as part of the follow-up with vulnerable groups - Identify potential water users downstream from the intake. Engage with relevant authorities to obtain more information on the flows at this point of the river - Additional social baseline information should inform and be integrated into the social impact assessment (SIA) and the social management plans as required, as part of an ongoing social management process *Environmental* - Complement environmental baseline (water and air quality) during the dry season - Conduct additional noise levels baseline measurements and develop a noise monitoring plan for the construction and operations phases.	To be tracked during operations
1	Social impacts - Develop SIA into a coherent document, including a defensible baseline, impact assessment, identification of mitigation actions and estimation of residual impacts by consolidating existing information and filling existing gaps. Progress and updates of the SIA need to be documented. - Consult on the impacts and mitigation measures identified with a broad array of representatives from affected communities. - Consider potential impacts on benefit distribution as part of the ongoing stakeholder engagement processes. - Develop a monitoring program for impacts during construction of the power plant which focuses on potential impacts on nearby communities (i.e., noise levels).	Before commencement of operations and to be updated throughout operations

PS	Action item(s)	Implementation timeline
	Social management - Social management plans are subject to review and update based on the outcomes of additional social baseline information and the SIA process - Identify indicators, define responsibilities and schedule for implementation for each of the social management plans and provide reports on outcomes. - Revise organization chart to show social team reporting lines. - *Community Action Plan:* include details on criteria, eligibility, funding, documentation of activities, etc. - Develop a *Local Procurement Plan* - *Stakeholder Engagement Plan* (SEP): Keep updating the schedule and documentation of the engagement events, incorporate mechanisms to adapt the plan as new stakeholders are identified (link to SIA) - *Develop the grievance procedures need to be developed into a cohesive Grievance Management Plan* - *Noise management:* Adopt mitigation as required depending on the monitoring results.	Before commencement of operations and to be updated throughout operations
	Additional baseline information - Track fishing activity in the proximity of the jetty. - Include considerations of health status as part of the follow-up with vulnerable groups - Identify potential water users downstream from the intake. Engage with relevant authorities to obtain more information on the flows at this point of the river - Complement environmental baseline (water and air quality) during the dry season	To be tracked during operations
2	Hiring - Improve *Local Hiring Action Plan* – The updated plan should include detailed recruitment processes (e.g., how to apply for jobs (for applicants) and how to process applications (for DAP and its contractors / subcontractors); eligibility criteria for training initiatives; and preference areas (with names of villages) for local hiring and training initiatives.	Before recruitment starts prior to construction commencement
	Contractors and sub-contractors - Provide a document describing how DAP will support and oversee compliance with laws and standards by contractors and subcontractors on site	Before recruitment starts prior to construction commencement
3	Resource and Energy Efficiency Plan	To be implemented during operations

PS	Action item(s)	Implementation timeline
	- Develop a plan to track and minimize energy and resource (water) consumption of all the facilities of the Project, including the natural power plant	
4	Community health and safety risks - Incorporate adequate health baseline data into the SIA, to enable identification of potential community health impacts and risks. - Develop a Community Health and Safety Monitoring Plan - Develop a Security Management Plan to include management of public and private security force that will be assigned to the project and explicit rules on use of force among others	Draft before the start of construction activities and update/complete on an ongoing basis
5	Resettlement and livelihood restoration risks - As part of the management of supply chain risks, confirm status of the lands as owned, occupied or used (formally or informally) by communities or individuals for any plantation that involves expansion of new land. If any areas trigger the requirements of PS 5, then appropriate management plans and processes will need to be developed.	Include screening criteria for this risk in the Feedstock Supply Chain Management Action Plan and start applying before commencement of feedstock purchases.
6	Biodiversity conservation - Include in the Feedstock Supply Management Plan a mechanism to ensure feedstock does not come from a recently developed (DAP should define an appropriate time period) agricultural area which was previously under natural conditions (natural or critical habitat). Ecosystem services - Confirm water consumption for the project is not affecting water availability for downstream users	Before commencement of operations (screening for biodiversity risks as part of feedstock management) and throughout operations.

1 Introduction

1.1 Rationale for the Supplemental ESIA Report

ESSA Technologies Ltd. (ESSA) was retained by Pacific Harbour Group (PHG) in 2015 to conduct an environmental and social assessment of the baseline conditions of the environment around the oleochemical processing facilities (the "Project") of *PT. Domas Agrointi Prima* (DAP), located in the industrial estate of Kuala Tanjung approximately 120 km southeast from the city of Medan in North Sumatra (Indonesia), and review the conformance of the Project's future operations with IFC's sustainability performance standards.

Since 2011, DAP is part of *PT Bakrie Sumatera Plantation* Tbk (BSP), a large Indonesian plantation conglomerate and a vertically integrated palm fruit plantation and processing operation. The project is currently mothballed, and the BSP management is working to fund and execute a restart of the existing operating equipment and a build-out of the partially-completed capabilities.

ESSA reviewed DAP's environmental and social documentation and, in December 2015, conducted a site visit of DAP's project site and one of BSP's plantations in North Sumatra. The findings of this environmental and social review were compiled in an *Environmental and Social Baseline and Compliance Review Report* (ESSA, April 2016).

Based on this initial environmental and social due diligence a number of environmental and social gaps were identified, mainly: the need to update the environmental (originally collected for the 2010 DELH) and social baseline and to make progress on developing and updating key management plans and policies.

1.2 Scope of the Supplemental ESIA Report

This Supplemental Environmental and Social Impact Assessment (ESIA) Report addresses the gaps identified in 2016 and consolidates the information on the progress made by DAP/BSP in environmental and social management of the Project since the completion of the initial assessment by ESSA in April 2016.

As identified in the 2016 assessment and given the nature of the Project's activities (i.e., processing and manufacture of palm oil products), the IFC Performance Standards on Environmental and Social Sustainability applicable to the future operation of the DAP complex include the following:

- PS 1: Assessment and Management of Environmental and Social Risks and Impacts
- PS 2: Labor and Working Conditions
- PS 3: Resource Efficiency and Pollution Prevention
- PS 4: Community Health, Safety, and Security
- PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

As mentioned in the April 2016 compliance review, the palm oil processing and refinery area is the refurbishment of an existing facility and did not involve any land acquisition. It is understood that there were no informal occupants of the site. None of the reviewed documents show that there will be land acquisition carried out resulting from the construction of the planned associated facilities. Regarding potential land acquisition from plantations supplying the plant, DAP/Bakrie commit to resourcing from existing plantations and will not purchase palm raw materials from new/expanded plantations under third party's control or from newly developed agricultural land from Bakrie-owned plantations (see further discussion in Section 4.6).

Based on this supply management decision, it is assumed that the Project will not trigger the requirements of PS 5 (*Land Acquisition and Involuntary Resettlement*).

In terms of the applicability of PS 7 (*Indigenous Peoples*), it should be noted that more than half of the population in the Project area is composed of Malay people, who are local to this area of Sumatra. The remaining ethnic groups are the Javanese, Bataks and Minangs, all of whom have been in the area for generations and have intermarried. These groups do not self-identify as indigenous nor meet the criteria set up in PS 7 to be considered indigenous peoples; i.e., self-identification as members of a distinct indigenous cultural group and recognition of this identity by others, collective attachment to ancestral territories or habitats in the Project area, customary institutions (social, cultural, economic) that separate them from mainstream society and/or a distinct language or dialect different from the language of the region/country in which reside. In addition, the Project is located in an area that was industrialized decades ago and this means that any land acquisition and significant impacts occurred well before the 'within living memory' criterion included in PS 7. For this reason, the assessment team determined that IFC PS 7 does not apply to this Project.

Based on the information reviewed so far it seems that neither the Project nor its associated facilities are part of any known sacred sites or other types of physical cultural heritage that may trigger PS 8. As mentioned in the April 2016 compliance review, the project is located in an export development zone and the oleo-chemical facilities in a larger industrial estate. Surrounding the project are communities classified as industrial, residential and agricultural. Given the absence of indigenous peoples and the plant location, it is considered very unlikely that any cultural heritage will be affected by the plant and quite unlikely that cultural heritage will be affected by associated facilities. Cultural heritage impacts at associated facilities should be ruled out.

In terms of the World Bank Group Environmental, Health and Safety (EHS) Guidelines, which contain the performance levels and measures that are normally acceptable to IFC, the following guidelines are also applicable to this investment:

- General EHS Guidelines
- EHS Guidelines for Vegetable Oil Production and Processing[i]
- EHS Guidelines for Oleochemicals Manufacturing[ii]
- EHS Guidelines for Thermal Power Plants (for the natural gas power plant)

Another relevant reference for the Project is IFC's *Good Practice Handbook: Assessing and Managing Environmental and Social Risks in an Agro-Commodity Supply Chain*[iii], which provides specific recommendations for the palm oil sector for improving the management of environmental and social risks in the supply chain.

1.3 Sources of information and limitations

The information presented in this report is based on the review of updated environmental and social documentation provided by DAP/BAP as well as on the findings of the complementary environmental baseline survey conducted by PT Hatfield in November (see Appendix A), and the observations during the last visit to the DAP complex in July 2016. It should be noted that no senior international environmental or social specialists have been to the Project site since this date.

This Supplemental ESIA provides high-level screening of environmental and social risks and compliance of the Project with IFC standards based on a desk-review of updated E&S documentation and other easily

accessible secondary sources of information. It is not a comprehensive environmental and social evaluation and does not guarantee ongoing Project's compliance during operations. A series of recommendations are presented in Section 6 to support DAP in their environmental and social management as the Project move forwards to refurbishment and operations.

2 Project description

2.1 Project overview

The company PT. Domas Agrointi Prima (DAP), an Indonesian producer of oleochemical products derived from palm oil, owns an oleochemical plant in the industrial estate of Kuala Tanjung, approximately 120 km southeast from the city of Medan (Figure 1), in North Sumatra. Since 2011, DAP is part of PT Bakrie Sumatera Plantation Tbk (BSP), a large Indonesian plantation conglomerate and a vertically integrated palm fruit plantation and processing operation.

DAP's oleochemical complex (the Project), located on a land area of approximately 114 Ha, is currently mothballed with only maintenance work being done at the time of this assessment. The Project involves the restart of operations of DAP's plant and the expansion of its facilities and production capacity.

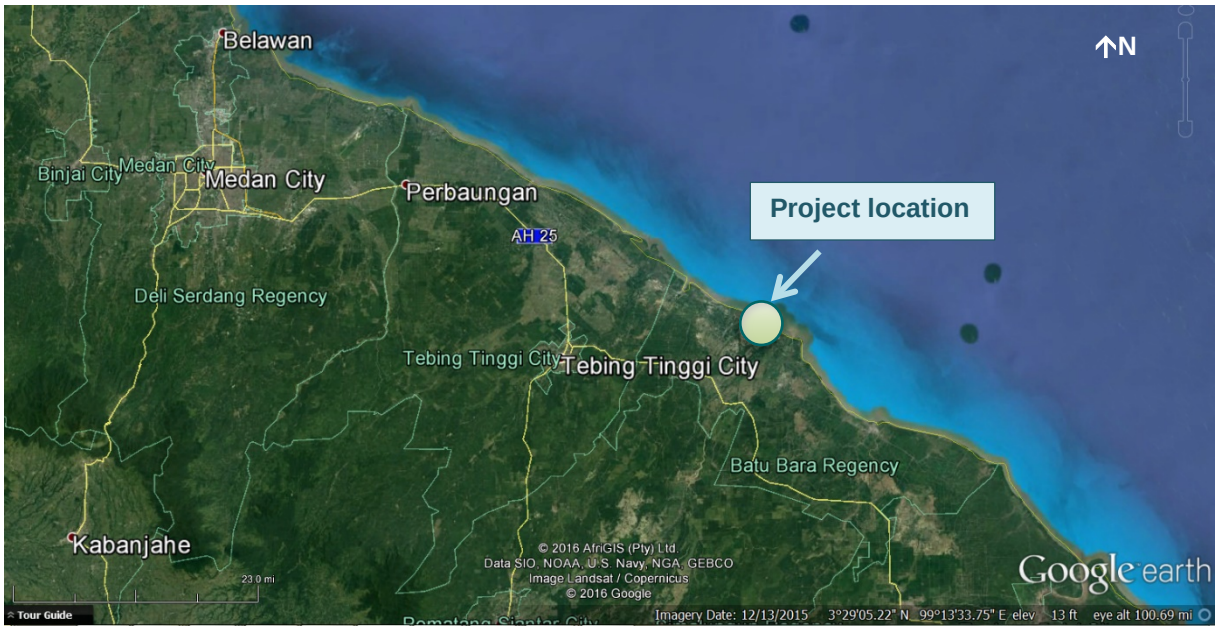

Figure 1: Project location on the coast of North Sumatra (Source: Google Earth)

The Project facilities utilize crude palm oil, palm kernels and palm kernel oil as raw material feedstocks for their oleochemical production processes. The total annual combined capacity is of approximately 200,000 metric tons of fatty acid and fatty alcohol. It also has kernel crushing capabilities of approximately 160,000 metric tons per annum and refining capacity of approximately 500,000 metric tons per annum. Once finished, the plant will include two lines for fatty acid and fatty alcohol processing (Lines 1 and 2), a kernel crushing plant and a refinery (Figure 2). Supporting facilities will include a 2.7 km jetty, which is partially built, and a 22 MW natural gas power station that will supply the fuel for the Project operation.

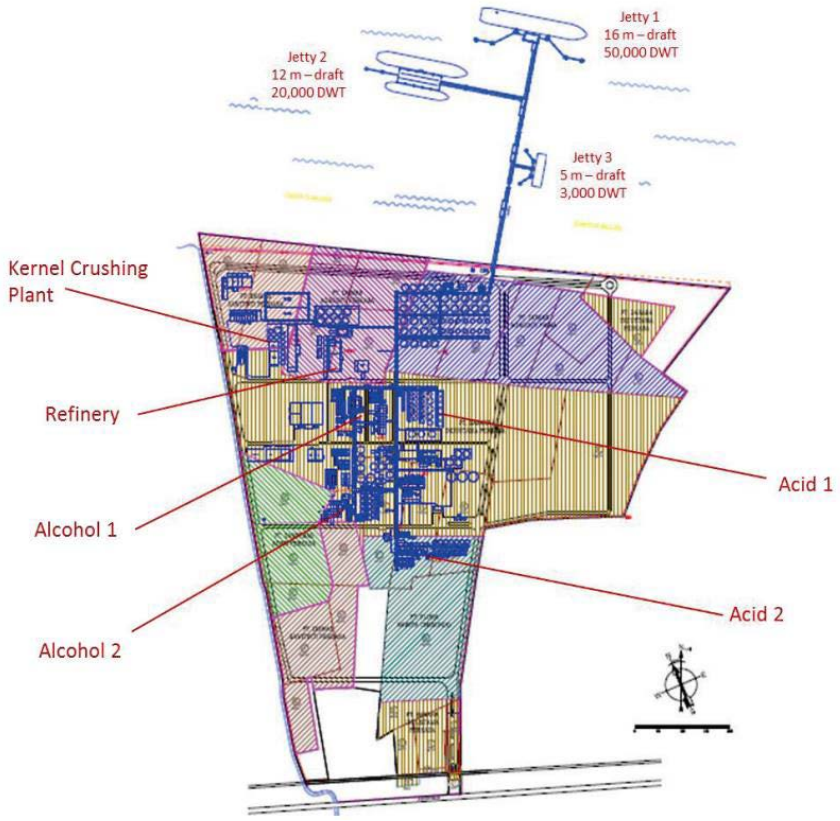

Figure 2: DAP's oleochemical complex (Source: DAP/BSP)

Line 1 is complete and was operational for a period of time between Q2 2011 and Q1 2012. The remaining facilities will be completed within 2 years of DAP receiving financing. Works on completion of Lines 1 and 2 will proceed first and the next components to be completed will be the kernel crushing plant, the refinery, and the supporting facilities (jetty and a 22 MW natural gas power station).

Table 1: DAP's oleochemical plant facilities and expected time to completion

Facility	Time to completion (from financing)
Line 1	2-5 months
Line 2	10-12 months
Power station	18-24 months
Refinery	18-24 months
Kernel crushing plant	18-24 months
Jetty	18-24 months

The primary raw materials to be used in the plant are crude palm oil (CPO), palm kernel (PK), palm kernel oil (PKO) and fatty acids that are either produced at the plant or purchased from the upstream plantation company (BSP) or from other third party national suppliers. Figures 3 and Figure 4 show the flow of raw materials and products (estimated quantities) in the various facilities of the complex.

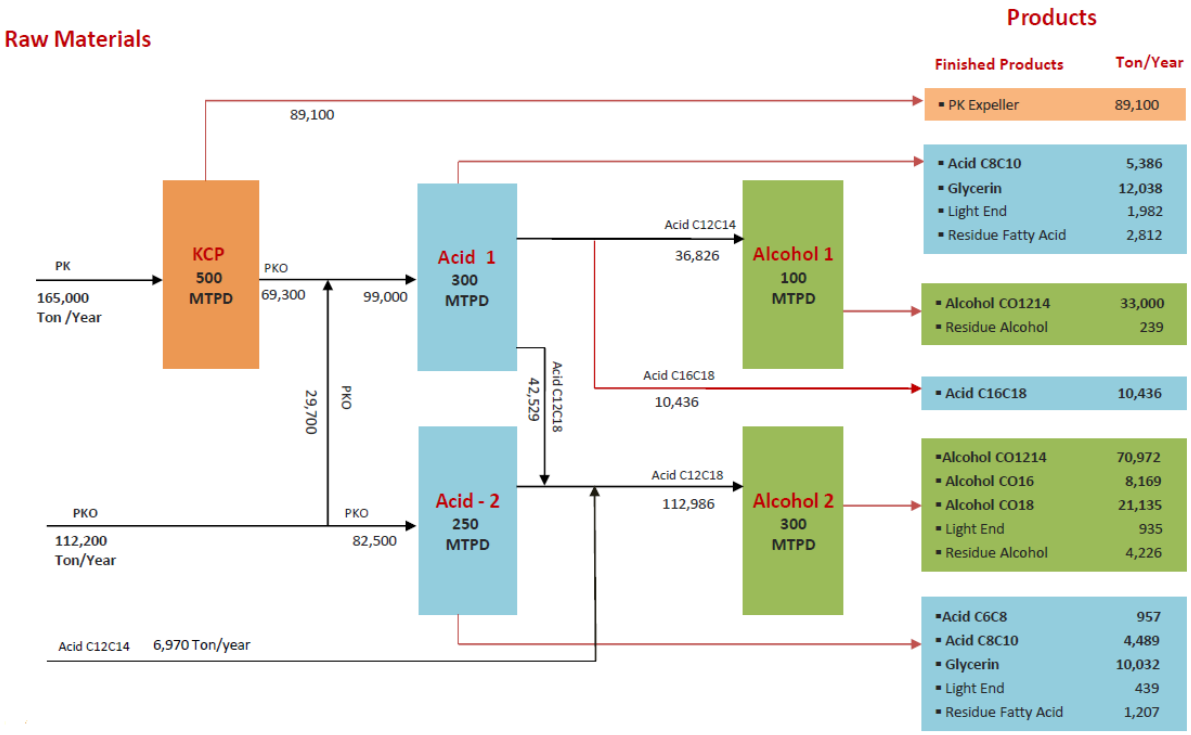

Figure 3: Flow of materials at the fatty acid and fatty alcohol lines. Quantities of raw materials and products are provided in metric ton per day (MTPD) and estimated based on 330 working days per year

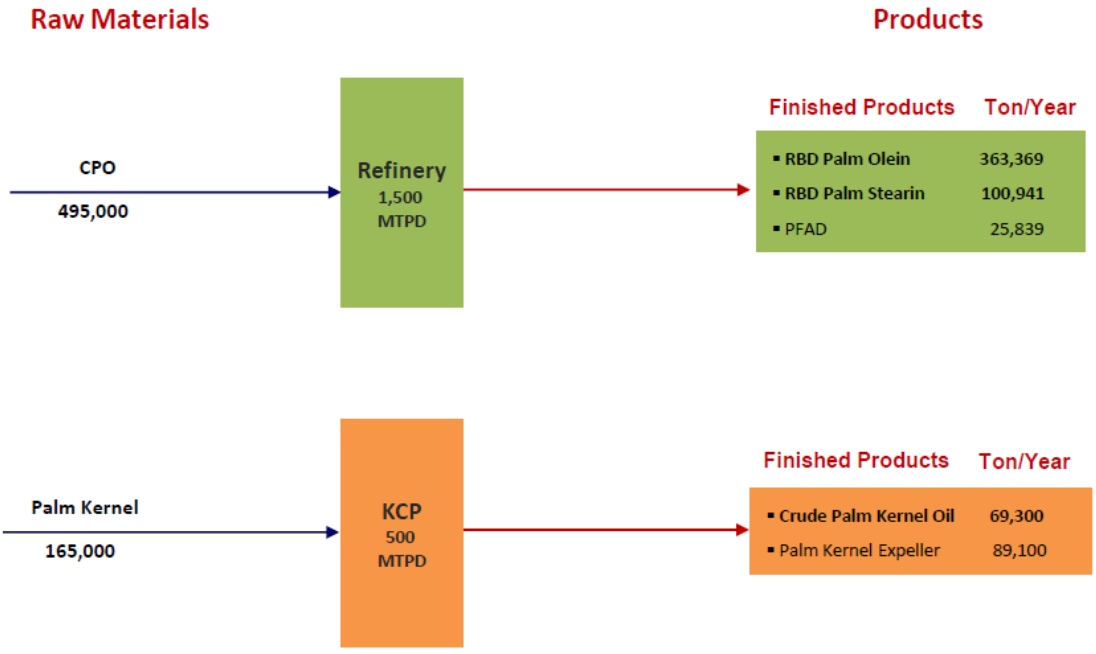

Figure 4: Flow of materials at the refinery and kernel crushing plant. Quantities of raw materials and products are provided in metric ton per day (MTPD) and estimated based on 330 working days per year

2.2 Company overview

BSP started in the oil palm business in 1993 and has since expanded this business area through both green field developments and acquisitions (Figure 5). As of 2008, oil palm plantations represented around 80% of the group's total planted area. Most of its estates are located on the island of Sumatra. As of 2014, the company owned palm oil plantations in the provinces of North Sumatra, West Sumatra, Jambi, as well as on Kalimantan Island in South Kalimantan. The company owns 5 palm oil processing plants, and 2 areas of oleochemicals processing facilities, including the Kuala Tanjung complex.

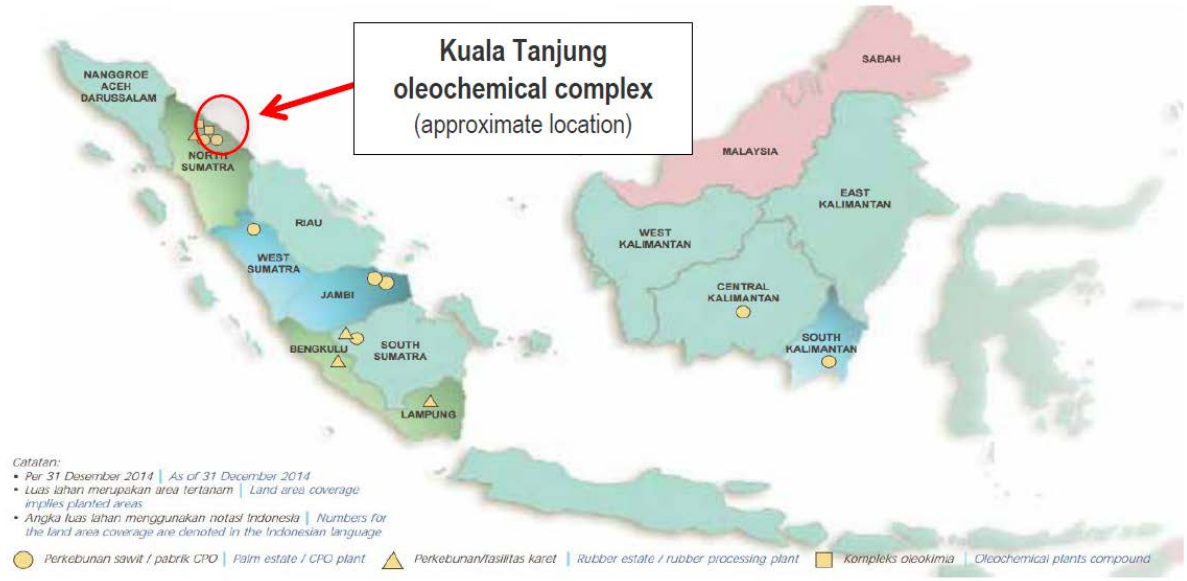

Figure 5: Map of BSP operations, including palm plantations (BSP Annual Report 2014)

2.3 Environmental and social setting

DAP's oleochemical complex is located on a land area of roughly 114 ha within the larger industrial state of PT *Sarana Industama Perkasa* in the export development zone of Kuala Tanjung, on the coast of Batu Bara district in the province of North Sumatra. The area around the Project presents a mix of industrial, residential and agricultural areas in a context of rapid development, with a trend towards more industrialization and the creation of export facilities given its strategic location on the Malacca Strait. Figure 6 shows DAP's oleochemical complex and other nearby industrial developments.

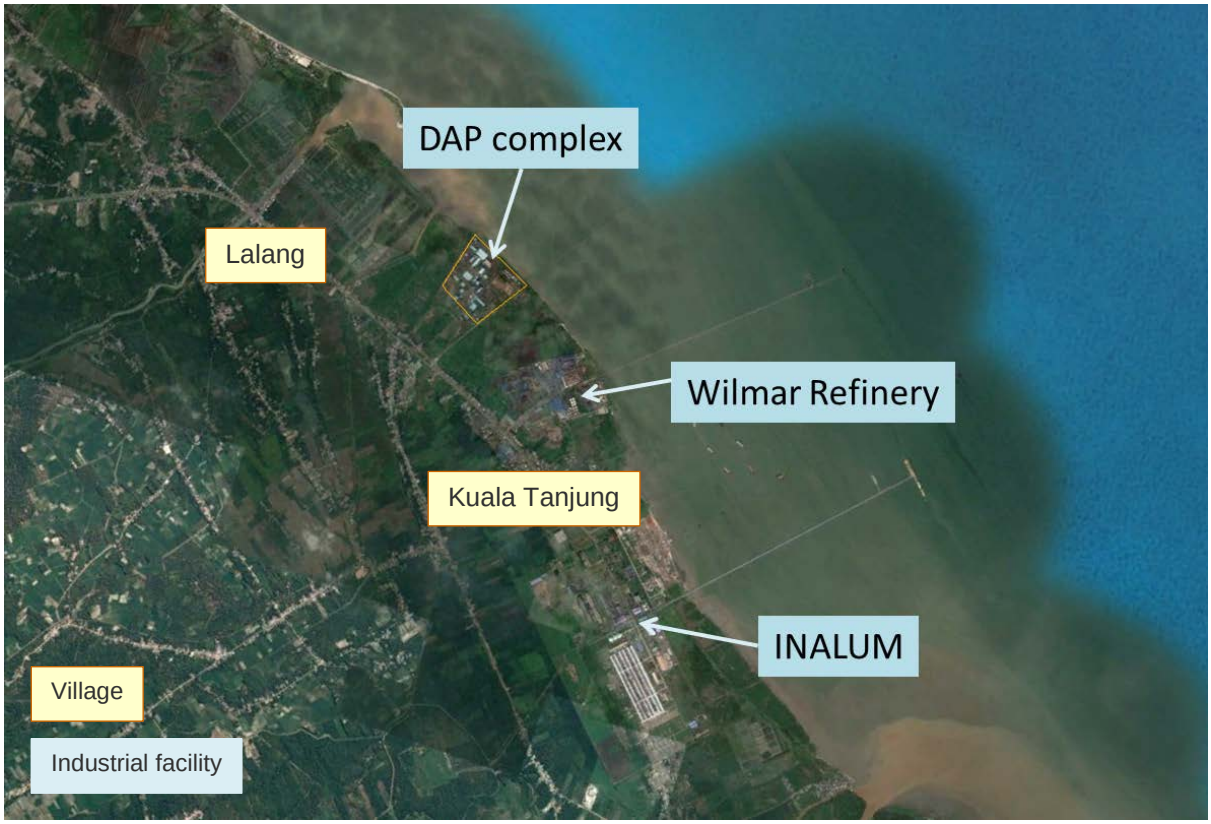

Figure 6: Location of DAP (Bakrie) oleochemical complex and other industrial facilities (existing and under construction) at the Kuala Tanjung site

2.3.1 Environmental context

Industrial activities in Kuala Tanjung have been ongoing for decades and the construction of DAP's oleochemical complex started in 2001. The Indonesian Government has long-term plans to develop North Sumatra as a cluster for the downstream palm oil industry.

Other existing facilities in the proximity of the Project (e.g., Wilmar oil palm refinery, the INALUM steel processing facility) contribute to the same type of operational impacts as the Project; mainly air emissions, increased traffic, and the generation and discharge of solid wastes and effluents.

An Environmental Evaluation Document (DELH) developed and approved by the industrial state of PT *Sarana Industama Perkasa* in 2010 documented the environmental baseline conditions and assessed the environmental impact of the various industrial facilities in the estate, which were at the time in different stages of development.

The 2010 DELH reported substandard baseline water quality conditions in the general industrial zone (in terms of surface water, groundwater and seawater), with values exceeding the Ministry of Health standards (DELH 2010) for a number of parameters. Local rivers exceeded the national standards for BOD, ammonia, total suspended solids (TSS), phosphate, iron and magnesium. Samples from two local wells (one deep well located in the industrial estate and one community well) also showed exceedances for a number of water quality parameters, including BOD, phosphates, nitrate, zinc and magnesium. Sea water sampling was conducted in three locations and results showed exceedances for copper, oil layer and phenol.

In terms of air quality, conditions at the industrial site and in the nearest residential housing were reported as good (DELH 2010); with all the measured parameters showing concentrations under the maximum national permitted levels.

Information on flora and fauna baseline in the area of the industrial estate was limited in the 2010 DELH. The fauna survey identified the presence of a number of protected bird species. For the marine environment, plankton and benthos were sampled at three locations; no fish or other marine fauna are described in the report. Marine fishing, and freshwater fishing to a lesser extent, is however practiced in the village of Kuala Tanjung.

The industrial complex is not connected to the grid and energy supply for the various activities is provided by a diesel generator. Water supply for the industrial estate comes from the Great River, located approximately 7 km from DAP complex, and from deep wells located in the estate for some activities. Community water supply for the nearby village of Lalang comes from local wells.

2.3.2 Social context

Demography

Administratively, the Project falls into the Batu Bara Regency (*Kabupatan*) which is located on North Sumatra's eastern shoreline with Limapuluh as its seat. It was formed out of the seven most westerly coastal districts of Asahan Regency in June of 2007. Administratively Batu Bara is divided into those seven districts (*kecamatan*). The Regency covers an area of 905 square Kilometers and has a total population (as of 2010) of 374,535. It can be reached from the North Sumatra provincial capital of Medan, the center of commerce and finance in the north of the island, in approximately 3 hours by Provincial highway.

The economy of the area is dominated by large scale agro-industrial estates, which diversified in the 1990's to include palm oil. Although the Batubara is still largely dependent on agriculture, the regency is trying to diversify, moving forward as both an industrial and shipping hub with the initiation of the Kuala Tanjung Port and further development of the Kuala Tanjung Industrial Zone, of which the Project is part. A joint national and regency initiative, the Kuala Tanjung Port is envisioned as the biggest port in West Indonesia, positioned to take advantage of the Regency's location on the Malacca straights and in close proximity to Singapore.

The area immediately around the Project, and considered by the 2010 DELH report, is composed of 2 sizable villages or *desas* – Lalang with a population of 6,992 and Kuala Tanjung with a population of 6,290. Population density is high in the area with the 2 *desas* averaging close to 1,000 people per square kilometer; more than twice the density of the regency as a whole.

Like Batu Bara as a whole, the two communities are ethnically mixed. The largest component is Malay (over 50%), the original group in this area of Sumatra. The next largest group are Javanese (over 30%), many of whom have been in the area for generations, originally arriving to work the rubber plantations in the area. There are smaller percentages of other Sumatran groups such as Bataks and Minangs. These groups all have a similar culture; most are Muslim and have intermarried over the years. There is no history of communal conflict.

Economy and services

Both local *desas* are rural agricultural communities with approximately 60% of the residents engaged in small holder wet rice (*sawah*) farming with a scattering of household orchards. This is largely organized by village based cooperatives that manage irrigation and commercial logistics. A substantial portion (15% of the sampled

households) of Lalang residents are fishermen, including off-shore and freshwater river fishing, as well as some people dedicated to aquaculture. The greater area produces 261,000 tons of fish annually. A small group of community members (about 10%) engage in the typical house front or stall service and commercial activity.

The roads in the area are busy and road safety could create risks for the Project. Most development occurs along the main roads (Figure 7) with houses, shops and stores located along the sides of the roads. The planned construction of a railroad line into Kuala Tanjung, the development of nearby port facilities, and a new toll road between Medan and nearby Tebing Tinggi (with an extension to Kuala Tanjung under discussion) could improve the traffic conditions and road safety from heavy vehicles in the area.

Figure 7: Street view showing typical linear development in the proximity of the DAP complex (Source: Google maps)

The local government statistics, contained in the 2010 DELH report point to a sparse social and public service infrastructure between the two communities. The education infrastructure is described as inadequate with a few elementary schools and only one small middle school above this level. There are no local high schools and no university level institutions in the greater Batu Bara area. The poor access to education has the potential to create both a general development drag and difficulties for industry trying to recruit skilled and semi-skilled workers locally. Improvements in the local school system since the 2010 DELH report are part of an ongoing attempt to mitigate these potential issues and BSP has committed to implement its best local training and recruitment practices in this regard, as broadly described in the BSP Sustainability Report.

At the time of the 2010 DELH, local health facilities were generally inadequate for the population size. The communities did not have hospitals, doctors or public health clinics. There is, however, a large Japanese-developed hospital approximately 20 kilometers away from the plant site, with capacity to provide tertiary care in some specialties. Local communities are serviced by one small auxiliary clinic, a total of seven nurses and a small maternity hospital serviced by the nurses and midwives. In the time since the report, like the school system, the healthcare system has been improved in order to provide better services to the local communities and BSP has committed to implement is best health infrastructure support practices in this regard, as broadly described in the BSP Sustainability Report.

Public utilities such as power and telecommunications have improved in the area in recent years. Due to increased project construction work in area, the local government has requested an added power allotment from state-owner power company PT PLN. Also, with increasing modernization, a new fiber optic network has been installed in the area so telephone and data service is now available.

3 Updated baseline

3.1 Environmental baseline

The 2010 DELH environmental study reported substandard baseline water quality conditions in the general industrial zone (in terms of surface water, groundwater and seawater), with values exceeding the Ministry of Health standards (DELH 2010) for a number of parameters. Local rivers exceeded the national standard levels for BOD, ammonia, total suspended solids (TSS), phosphate, iron and magnesium. Samples from two local wells (one deep well located in the industrial estate and one community well) also showed exceedance for a number of water quality parameters, including BOD, phosphates, nitrate, zinc and magnesium. Sea water sampling was conducted in three locations and results showed exceedance for copper, oil layer and phenol. These regional baseline conditions are not attributable to the Project but to the accumulated effect of the other industries and land-based activities, mainly agriculture, which are ongoing in the Project's area.

In order to complement the environmental baseline information on the industrial estate as presented in the 2010 DELH, PT Hatfield Indonesia conducted a baseline survey in November 2016 to collect data on freshwater and seawater quality, air quality and noise. Figure 8 shows the location of the sampling sites surveyed during this campaign. Appendix A includes a summary report documenting the results of this 2016 environmental baseline.

Compared to the baseline conditions documented in the 2010 DELH, no significant changes in the parameters analyzed were detected. The following points summarize the results obtained for the 2016 environmental survey:

- Freshwater quality: Freshwater samples from surface water bodies recorded high concentration of phosphorus, BOD_5 and total suspended solids (TSS). High values of these parameters are to be expected given that data collection occurred during the rainy season and a few days after rains. No significant differences in the two sampling periods (DELH 2010 and 2016) were found except for a potential deterioration of groundwater quality.
- Seawater quality: High turbidity and phosphorous concentrations were recorded in the seawater samples, especially at the sites closest to the shore (SQW1-3 in Figure 8).
- Air quality: All test values for both gaseous and particulate matters in ambient air measurement are below the maximum threshold values
- Noise levels: Current noise levels inside the complex were less than 70 dB, which is the maximum threshold for day and night time in commercial and industrial areas, according to IFC's EHS Guidelines[1]. In the nearby residential areas, on the contrary, both day time and night time noise measurements exceeded the guideline thresholds, which are 55 and 45 dB respectively. EHS Guidelines indicate that noise impacts should not exceed the thresholds previously mentioned or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

[1] EHS Guidelines (1.7 Noise): http://www.ifc.org/wps/wcm/connect/06e3b50048865838b4c6f66a6515bb18/1-7%2BNoise.pdf?MOD=AJPERES

Because the current noise levels in the residential area is above the thresholds, the increase of 3 dB would be the criterion applies to the Project.

- Marine habitat: Marine habitat quality in and around the jetty area is very low. Substrates appeared covered by sediments and are unsuitable for the growth and/or presence of coral, seagrass or seaweed ecosystems.

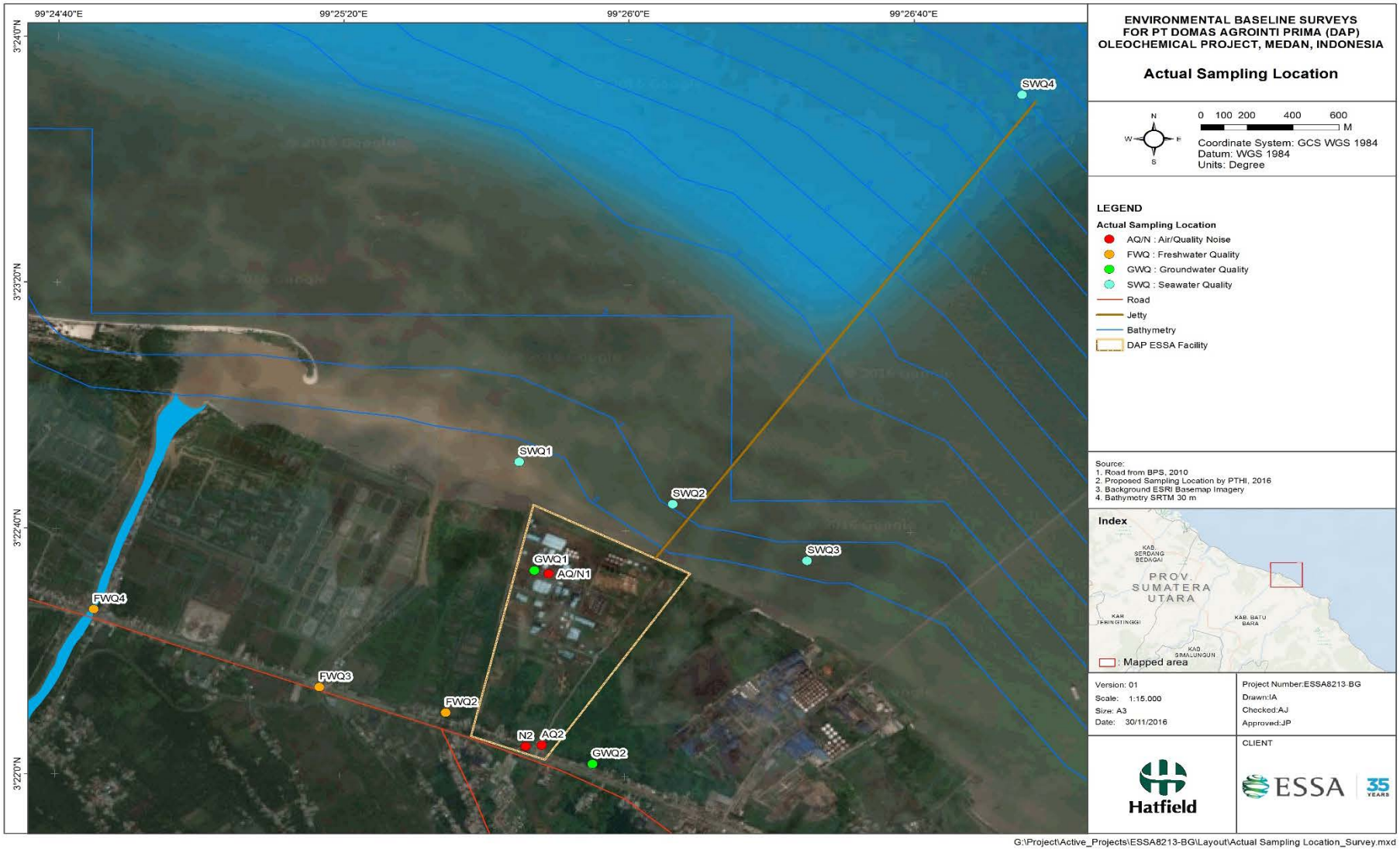

Figure 8: Field sampling sites (PT Hatfield's November 2016 Survey)

3.2 Social baseline

The 2010 DELH assessment provides limited baseline data for the two villages (*desa*) that are closest to the Project footprint area (Figure 9). These are Desa Kuala Tanjung and Desa Lalang, which had a combined population, at the time of the report, of 13,141 inhabitants. The main livelihood sources in these communities, based on the sampled households, were described as farming (56%) and fishing (15%).

Figure 9: Lalang and Kuala Tanjung communities in the proximity of the Project

The DELH report drew the socio-economic information from two sources:

- Social statistical data from the secondary source of the sub-district governments in which the Desas are located (Sei Suka and Medang Deras respectively);
- A Project perceptions questionnaire provided to 64 respondents from the immediate Project area in a convenience sample.

The 2016 due diligence report by ESSA identified the following gaps in the social baseline included in the 2010 DELH report:

- Impact zones and stakeholder groups affected by types of impact had not been differentiated.
- Individuals or groups within the impacted area that might be disproportionately affected by the Project as a result of their vulnerable status (e.g., female-headed households) had not been adequately identified.

Since ESSA's last report in April 2016, DAP has engaged in stakeholder consultations and additional social baseline data collection in the two villages (*desa*) that are closest to the Project footprint area (Figure 9). According to these

data, these two *desa*s, namely Lalang and Kuala Tanjung currently have a combined population totaling 13,282 inhabitants with an almost 50:50 male to female ratio. In Kuala Tanjung women slightly outnumber men, suggesting a normal population distribution, while in Lalang men slightly outnumber women, perhaps suggesting a small influx of manual workers. The 2010 DELH assessment, reported that main livelihood sources in these communities were farming (56%) and fishing (15%). Other than this assessment report, there are no other current sources of information that accurately indicates the sources of livelihood of the affected people from the two villages. However, several interviews carried out by DAP's community relations team indicate that an increasing number of young people from the area are reported to be losing interest in continuing farming, due to the employment opportunities available for them in the industrial zone and other Indonesian cities.

The follow-up item #6 required further understanding of social baseline conditions, namely:

- Differentiated impact zones and the affected stakeholder groups
- Community health and safety for increased traffic, noise, dust, nuisance within the Project footprint and the related activities
- Land acquisition for new plantations (assessment of PS7)
- Livelihood impacts, land-based and marine practices
- Vulnerable groups and groups that may be disproportionally affected by the Project
- Root-cause and stakeholder analysis of community actions, including entities involved and repercussions these activities may have

The following sections provide updates on these items based on the updated social baseline collected by DAP.

3.2.1 Project Stakeholders

Stakeholders that are directly and indirectly impacted by the project must be engaged to fully understand the extent of the impacts to each group. An important initial step for a successful stakeholder engagement program is stakeholder mapping and analysis. DAP made a start on identifying key stakeholders and stakeholder groups within its project impact zone in July and August 2016. The stakeholders identified for the Project include:

- Impacted Communities – These are comprised of the communities that are directly affected by construction of the expansion facilities as well as by subsequent operations. This group is further subdivided into the following categories for the project:
    1. *Fence line* – These are communities that are adjacent or right outside the permanent Project site.
    2. *Proximity* – Five villages along the road corridor (Figure 10) have been identified as proximity communities. These villages include: Lalang, Kuala Tanjung, Kuala Indah, Pakam, and Pakam Raya.
    3. *Local Fishing* – These are communities engaged in fishing activities within the area directly affected by construction and operations activities.

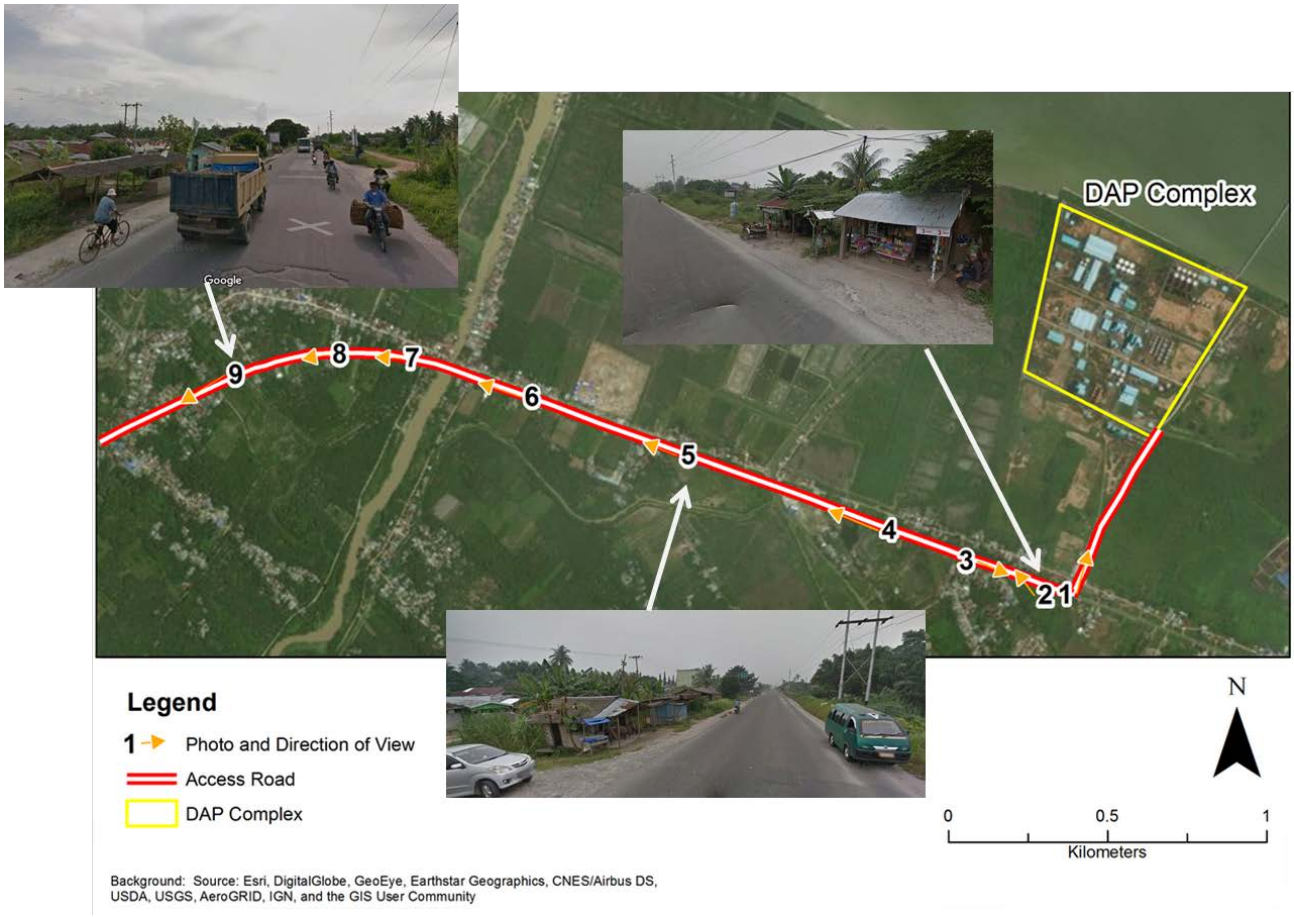

Figure 10: View of the main access road to the DAP complex and pictures showing the side of the road (Source: Google Earth and street view from Google maps)

In addition to distinguishing different levels and types of impact experienced by stakeholders in the Project's areas of impacts and influence, DAP has also identified a series of different stakeholder groups affected by Project activities. These include:

- Vulnerable Groups – comprised of vulnerable people that are often the most impacted and marginalized members of the community; typically includes elderly female-headed households, persons with disability, etc. In the case of the project fishermen and female-headed households were initially identified as vulnerable groups and a few representatives of these groups were included in engagement activities.
- Small Palm Plantation Owners – comprised of plantation owners located upstream from the Project water intake, approximately 7 kilometers away from the site.
- Small & Medium Enterprises (SMEs) – comprised of commercial businesses and establishments that supply products/services to the Project or Project personnel.
- Local Government – includes individual stakeholders working at the provincial (*provinsi*), regency (*kabupaten*), district (*kecamatan*), as well as those at the village (*desa*) level.
- NGOs and Civil Society – in general, comprised of non-government organizations and civil society organizations; this group may draw attention to the Project's benefits and impacts for affected communities

and the country in general. According to notes and the ESSA July 2016 reports, they are considered important stakeholders by the company.

- Religious Groups and Leaders – comprised of religious organizations and figures that have strong influence over the community; Islamic religion is a major part of the local communities' lives in Indonesia and religious leaders' opinions carry significant weight.
- Internal Stakeholders – comprised of DAP employees and subcontractors working in the Project.

DAP identified key stakeholders representing each of the stakeholder groups listed above in an exercise in mid-2016. To support stakeholder mapping and issue analysis, the project's community relations team developed a stakeholder list and meeting schedule for the months of July and August 2016 to document their engagement and specifically identify the interests, concerns, inter-relationships and network, and level of support and influence of key stakeholders and stakeholder groups. The stakeholder mapping and meeting scheduling process is designed to allow the company to plan their engagement strategically by prioritizing their activities and crafting key messages that are timely and appropriate. Appendix B (updated social baseline) includes the stakeholder identification list showing the results of the stakeholder identification exercise conducted by DAP/BSP at an individual level, and the Stakeholder Engagement Plan include an analysis of stakeholders groups and associated impacts (and potential mitigation efforts) at the stakeholder group level.

3.2.2 Vulnerable Groups

The project's community relations team identified ***subsistence-level fishing families*** and ***female-headed households*** as vulnerable stakeholders through their initial community engagement activities and have included them in the stakeholder list. DAP included representatives of these vulnerable groups in the Stakeholder Engagement Plan (SEP) and carried out informal meetings and small group meetings to engage these groups according to notes from the July and August 2016 meetings. According to the July 2016 report, the company was committed to expanding these vulnerable categories as stakeholder identification deepened and that, in addition, the Project would also consider special projects for these groups through their CSR activities to assist them in accessing appropriate benefits.

In the Sumatran context, affected people are listed as Malay, Javanese, Bataks and Minangs, None of these groups are Indigenous People and so it is very unlikely that Indigenous People will be vulnerable to impacts from this project.

3.2.3 Marine-based livelihoods

As part of the complementary environmental baseline conducted by PT Hatfield in November 2016, a number of interviews were conducted with key informants from local fishing communities living near the Project. The goal of these interviews was to gather information on the location of fishing grounds, perceptions on changes in water quality and fish productivity, and also to understand the types of fishing activities carried out by communities along the Kuala Tanjung coastline near the Project.

Data on the socio-economic conditions of marine communities potentially affected by the activities of DAP were gathered by interviewing 52 respondents from the villages of Kuala Tanjung, Kuala Indah, Kuala Separing, and Pagurawan. It was found that 15% of the sampled household livelihoods in Kuala Tanjung depend on fishing. Of these households, Figure 11 shows that 88% of those responding to the fishing interviews were fishermen, 8% were clam fishermen and 4% were entrepreneurs engaged in exporting fish. Nearly all local villagers have some contact with activities directly related to marine products.

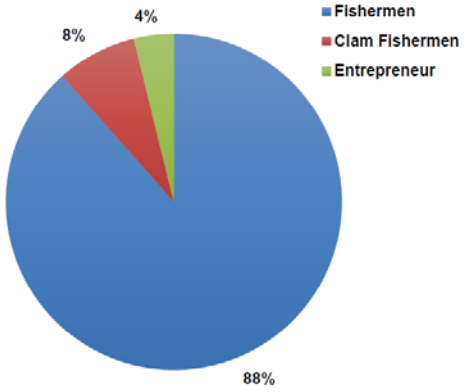

Figure 11: Distribution of livelihoods in the communities (Source: Hatfield 2016)

Based on the findings from Hatfield's report (see Appendix B), it is estimated that most of the fishermen in the proximity of the DAP complex exploit marine resources located in Berhala, Salanama and Pandan island, which are 12-25 miles from the project site (although some of the fishermen interviewed in November 2016, mainly non-commercial occasional fishers, were currently fishing within 1-2 miles from the jetty. Operation of the jetty is not incompatible with ongoing fishing activities in this area, although potential impacts to this group should be tracked (see Section 6.2). These findings are aligned with the information gathered from the local Marine and Fisheries Department prior to conducting the field survey and. The coast in Kuala Tanjung is not designated as a conservation area. According to the fisheries service, the nearest fishing area for fishermen is at the Berhala Island, ±25 mile from the village and ±20 mile at Pandan and Salanama islands.

4 Identification of risks and impacts

The 2010 DELH report, which was earlier reviewed by ESSA, provided a general description of environmental and an overview of social baseline conditions, an assessment of environmental and social impacts, and mitigation measures and monitoring requirements. However, it is incomplete and outdated given that it was done more than six years ago and its coverage most social issues was limited. Also, the report did not identify impacts on livelihoods, worker influx and in-migration, road and traffic volume. The subsequent sections summarize additional environmental and social risks identified based on information recently collected by DAP or otherwise not previously considered.

4.1 Social risks and impacts

The 2010 DELH report identified the following impacts:

- Dust and noise due to transport of materials in and around the plant;
- Air quality impacts due to gas emissions from the plant;
- Noise from plant operations;
- Impact on river and seawater quality and implicitly impacts on human activity using these resources.

The DELH assessment touches on some of the core impacts but also needs to consider some key possible impact areas. It does not specifically mention potential community health and safety impacts, livelihood impacts or worker health and safety. For instance, although dust and noise impacts are mentioned for vehicle traffic in the site, it does not specifically mention traffic safety impacts along community road corridors leading to the site. Also, possibly because the study is six years old, it did not consider any cumulative impacts of the larger Kuala Tanjung industrial zone, of which the Project is a part. In the absence of a consolidated social impact assessment document, the reviewers have sought to provide a conceptual framework for understanding Project impacts (presented below) and then to identify relevant information and descriptions in the documents provided by DAP.

From the 2010 baseline, DAP's community relations team gathered their own information to supplement the report. The team was able to collect the latest population figures and additional information required to further understand the baseline condition in the two directly impacted villages (Lalang and Kuala Tanjung) as well as other affected communities and stakeholder groups. This additional information includes:

- Impact zones and the affected stakeholder groups including vulnerable groups that may be disproportionally affected by the Project
- Impacts to communities related to worker influx, health and safety for increased traffic, noise, dust, nuisance within the Project footprint and the related activities
- Impacts on livelihood (land-based and marine)
- Stakeholder mapping and analysis of affected stakeholders

4.1.1 Conceptual Framework for Social Impact Assessment (SIA)

The social impacts of the project can be considered separately as construction impacts and operations impacts, related to these two distinct phases of the Project. Project documentation of stakeholder concerns from DAP's

community relations team identifies a number of these issues and provides recommendations of potential mitigation approaches.

Construction impacts can be conceptualized as related to four key drivers:

- Impacts linked to loss of access to livelihood resources: That is access to marine resources and/or land-based livelihood resources that may be lost or limited during the construction of the project.
- Impacts linked to transportation: These include road accidents, dust, vibrations and nuisance impacts which tend to increase in response to the increasing volume of goods and raw materials being transported for construction and of project workers and contractors commuting to work. Some of the transportation may involve hazardous materials and therefore require additional mitigation, to prevent harm in the case of accidents.
- Impacts related to the influx and temporary accommodation of migrant workers: Some of these impacts depend on the worker accommodation strategy employed by the company. The impacts include:
    - Potential conflicts and poor cultural fits between workers and the local population
    - Conflicts over limited access to employment and contracting benefits among local people due to low education levels or lack of skills
    - Increased risks of infectious and water and vector borne disease outbreaks
    - Increased pricing and stress on goods and services due to increased demand
    - Increases in social ills (e.g., drug and alcohol consumption, gambling, harassment and assault of women) linked to increased wages and stress on workers.

  In addition, there is a risk that local businesses will suffer from the post-construction bust cycle which begins during the late stages of construction and can lead to financial stress on businesses, if they have not adequately prepared for the reduced demand. The situation of the project in an emerging industrial zone, may limit some of these impacts.
- Impacts related to the types of construction activities undertaken: Construction activities are among the riskiest work activities for occupational health and safety risks and in Indonesia, worker health and safety performance is considered poor, averaging over 20 fatalities per 100,000 workers per year. This indicates the need for strong OHS management for the project.

Operations Impacts at an oil palm processing plant in an emerging industrial zone are likely to include impacts from the following sources:

- Air contamination impacts: These may have negative impacts on human health, can cause nuisance and can affect crop and animal productivity as well.
- Water quantity and quality impacts: The processing plant and power plant will use water and this may impact other water users. In addition, the plants and plantations incorporate risks of water contamination from ongoing activities or from spill and accidental releases. The impacts of these water uses and potential contamination will depend on the potential locations and the specific social receptors affected.

- Impacts from marine infrastructure: Some of the impacts on marine livelihoods from the jetty will continue after project construction is complete.
- Impacts from plantation expansions: Any additional areas of plantation to be developed may impact on local land-based livelihoods and on housing, either of formal or informal land owners, users and occupiers.
- Conflict over benefit distribution: Many community protests and conflicts at projects relate to the distribution of community development, employment and contracting benefits rather than to impacts per se. Because the numbers of jobs available during the operations phase will be lower than during the construction phase, access to employment may be a particular focus for conflict.

4.1.2 Identification of social risks and impacts

Based on the impacts framework discussed in the previous section, the reviewers identified the following potential impacts:

Construction social impacts:

1. Livelihoods impacts: For the expansion of the plant, it is understood from the initial site visit reports that additional land acquisition will not be required. In terms of marine livelihood impacts, it appears that, although local communities may rely heavily on the fishing resource for livelihoods, the key fishing grounds are some 12-25 kilometers from the plant site, and therefore are unlikely to be affected by the construction activities. Some local fishing households may use areas closer to the construction areas either for fish farming or for clam collection or fishing and this should be clarified to determine whether mitigation measures are needed.
2. Traffic Management: The traffic management plans includes descriptions of anticipated traffic impacts and risks and some of these issues are also included in the Stakeholder Analysis document. This document notes that the Kuala Tanjung Town has become accustomed to a relatively large volume of vehicle and truck traffic at present. Zoning laws have been changed to move any dwelling at least 15 meters from the road side. Thus, squatter's shacks, and temporary vending stands are the only structures adjacent to the road. In addition, actual construction work is located on an industrial park far away from the town. Thus, daily noise, construction dust, fumes, etc. will have little impact on daily life, although excessive dust and dirt, reduced air quality from trucks and construction works are a concern of houses located just outside the gate of the Project site. Increased risk of traffic accident due to proximity to Project site is another concern of houses located just outside the gate of the Project site. In addition, DAP informed that children and personal use vehicle drivers have become used to traffic safety needs due to already increased vehicular traffic. As is often inevitable in this type of situation, the mix in the types of vehicles is an issue.
3. Worker influx: Overall the local hiring plan notes that 720 workers will be required for construction of the Project, consisting of workers for the civil works, technical and mechanical works, and jetty works. Of this total, the local hiring plan predicts that between 50% and 90% will of construction workers will come from local communities. This means that the peak number of migrant workers working at the site during construction can be estimated at up to 360 people. Because of the ethnic make-up of the Project area, and the high levels of skill that exist within Indonesia, it is anticipated that migrant workers will be largely Indonesian and will be broadly culturally compatible with the local people. The influx of up to 360 people will impact two communities with populations of over 6,000 people each, so the overall influx will represent less

than 3% of the existing population level. This is considered to be a low level of impact, especially given the cultural continuity between workers and local people. These people will be largely men, however, and will have a slight impact on the gender ratio in communities.

In addition to the overall number of workers, the impacts of workers on the local population depend on the accommodation strategy used by the Company, the character of and oversight of the Code of Conduct, the endemic health issues in the region, expected worker behaviors, and the level of health infrastructure in the area. The information provided does not describe worker accommodation strategies, or baseline health conditions, although malaria and dengue can be assumed to have a presence in the project area and so, there is likely to be a small increase in infection rates, linked to migration. The level of health infrastructure is described as locally poor, but with a Japanese-donated regional hospital center 20 km away, which suggests that worker health issues may not overburden the local health services, especially as (according to the August 2016 review) the Project will have a clinic staffed by qualified nurses onsite, with an agreement to subsidize medical care for employees and their families at the local hospital. With the level of migration expected, local price inflation and service stress is not likely.

A more significant risk associated with worker influx and the increased economic movement associated with construction is the boom and (especially) the bust cycle, which will begin in the construction phase and extend into the operations phase. There are risks that local people will become indebted to build businesses linked to the boom phase of the cycle and may be unable to repay loans as the construction phase comes to an end. Similarly, people who have been working on the construction phase may not plant food or save money while they are working on construction, which could lead to impoverishment and harm to their family livelihoods.

Operations Impacts:

- Air contamination impacts on crops and health: The industrial park is near the ocean shore, where soil is not good for growing rice. The vast majority of rice farming occurs in fields approximately 30 km outside of Kuala Tanjung on the way to Medan. This grain growing area utilizes a different water source than the plant, and is too far away to experience any air quality impacts from the industrial park. Northern Sumatra is still a net importer of rice, so the few fields somewhat near the plant are not a significant source of overall rice supply. There are few rice farms, and the ones near Kuala Tanjung are not substantial suppliers to local food supply, although impacts to subsistence consumption could be important for vulnerable households. Additional information is needed to identify potential health impacts to vulnerable individuals (e.g. asthmatics).

- Marine-based livelihoods: According to documentation provided by DAP, deep water independent fishing has been a staple of the economic life of this locality for centuries, and has survived without damage from water degradation from the adjacent aluminum smelting facility and palm oil processing facility. If discharge of waste from the DAP facility is carefully managed, this economic activity should not suffer. The general aquatic life of the locality is not currently being depleted by local fishing (as the fishing activity is not growing). The environmental documentation further notes that water temperature from various discharges from plant as well as activity around jetty must be monitored for positive or negative impact on fish population and movement/migration, however DAP views this as an unlikely inhibitor of the economic activity of fishing in the locality. Additional baseline data would be helpful in support of this assertion.

Impacts on marine resources linked to the jetty and marine traffic will be ongoing through operations. As for the construction phase, in terms of marine livelihood impacts, it appears that communities rely heavily on key fishing grounds which are 12-25 kilometers from the plant site, and are therefore are unlikely to be affected by the jetty operations. Some local fishing households may use areas closer to the construction areas either for fish farming or for clam collection. This activity could continue during operations but more information about this stakeholders and the fishing activity occurring in the proximity of the Project is required to better assess this potential impact.

- Water resources and water uses: Water for operations will be taken from a water intake located on a river south of the DAP complex at a distance of approximately 7 km. There is very limited information about the both the hydrological regime (monthly and annual flows) and the existing water uses in this river (see Section 4.5). Because of the location of the water intake in proximity to the coast (it is located 3.7 km upstream of the coast - see Figure 13 – and it seems to be the last water intake on the river) and downstream from the main water users (plantations and irrigation users), it seems unlikely that the Project's water consumption will be in conflict with other users downstream, since there are no other communities or evidence of other water intake infrastructure. However, there is no enough information at this stage to completely rule out this potential risk.

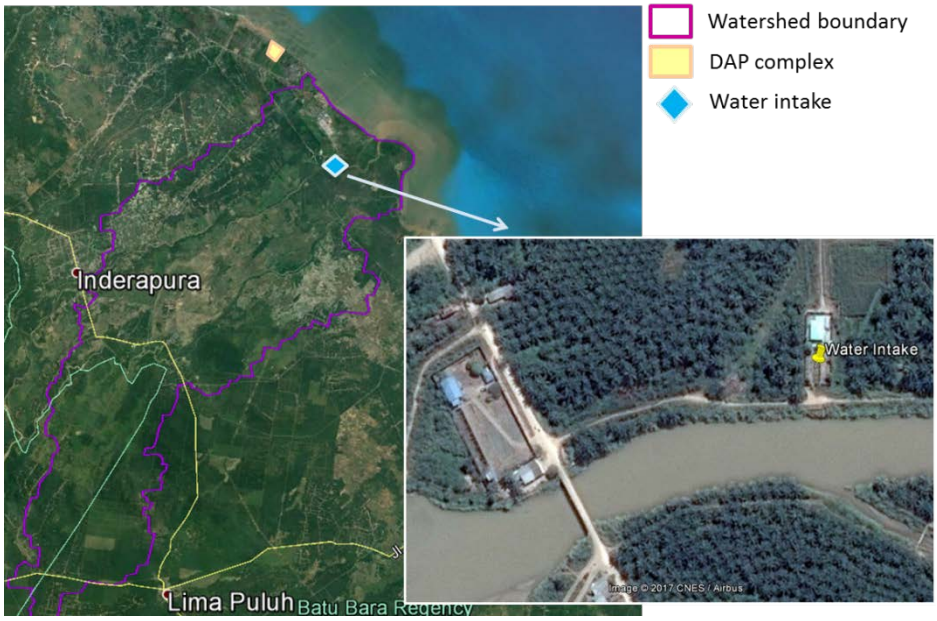

Figure 12: Location of the water intake site (Source: Google Earth)

Figure 13: Location of the water intake relative to the coast

- Impacts from marine infrastructure: Impacts on marine resources linked to the jetty and marine traffic will be ongoing through operations. As for the construction phase, in terms of marine livelihood impacts, it appears that communities rely heavily on key fishing grounds which are 12-25 kilometers from the plant site, and are therefore are unlikely to be affected by the jetty operations. Some local fishing households may use areas closer to the construction areas either for fish farming or for clam collection or fishing and this should be clarified to determine whether mitigation measures are needed.
- Conflict over benefit distribution: In association with the bust phase of worker influx and local construction employment there are a number of livelihood impacts and problems around indebtedness that are likely to occur, if not adequately mitigated. In addition, as employment at the project becomes scarcer conflict around access to employment may develop. Understanding the probability and potential patterns for these sorts of impacts requires more detailed cultural and social information than the reviewers were able to find in project documents.

Social Risk Identification:

In addition to these impacts, there are some social risk issues linked to potential protests leading to project delays, and increased social costs inherent in agreement protocols, potential reputational issues linked to project allegations and security management of disruptions, and funding delays linked to challenges in meeting finance requirements. The SEP includes a table with the stakeholder groups, potential impacts from the project, mitigation efforts and means of engagement for each group.

4.2 Climate risks

Industrial projects can be affected by changing climatic conditions, including climate variability and extreme weather events such as floods, by physical damage to their infrastructure and/or transportation networks, impacts on climate-sensitive inputs such as water and energy, impacts on the workers and local communities, and by increasing risks on environmental contamination from industrial activities.

Climate risks were not originally considered as part of the evaluation of potential impacts in the 2010 ANDAL study.

This sections presents the results of the evaluation of potential climate-related risks to the facilities and activities in the DAP complex. This assessment has been conducted using the Climate & Disaster Risk Screening Tools developed by the World Bank. This suite of online tools allow the user to conduct an early-stage screening of climate and disaster risks as part of the due diligence process during the concept stage of operations (in this case the screening is applied pre-restart of operations). It should be noted that this tool does not provide a detailed risk analysis but it does help identify potential climate-related risks that DAP/BSP management should consider in their long-term operations.

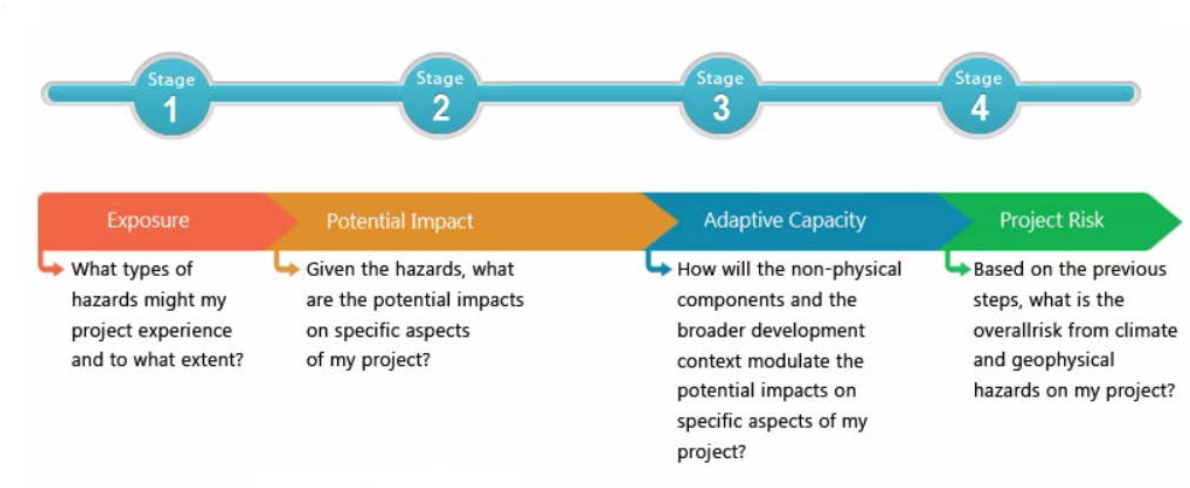

Figure 14: Overview of the climate screening process of the World Bank's Climate & Disaster Risk Screening Tool

The screening process comprises four stages (Figure 14) and provides guided questions and links to resources and climate data to assist the reviewer in evaluating: i) the exposure of the project to climate hazards; ii) the potential impacts that these climate hazards could have on the project; iii) the adaptive capacity of extent to which the project could modulate the expected impacts; and iv) the overall climate-related risk for the project based on the previous considerations. The following sub-sections present the results and conclusions obtained by applying this four-stage process to identify potential climate risks to the DAP investment.

4.2.1 Exposure to climate hazards

The DAP complex is located on the coast of Batu Bara regency, approximately 40 m from the sea line (Figure 15) and 1.6 km from a river and 400 m from a canal which seasonally carries water.

Figure 15: Relative distance of the DAP complex to water bodies and to the coast (Image: Google Earth)

At the country level[4], mean annual temperature has increased by 0.3 °C since 1990. Precipitation patterns have also changed; there has been a decline in annual rainfall (2 -3% since 1990) in the southern regions of Indonesia and an increase in precipitation in the northern regions. Recent trends can be correlated with a change in the timing of seasons and increasingly unpredictable rainfall patterns in Indonesia. It is projected that a longer dry season and a more intense rainy season will result in prolonged drought and more intense flooding.

In terms of natural hazards, floods have posed the greatest threat to Indonesians in major urban centers, including Jakarta, and Medan. The coastal regions of Sumatra are highly vulnerable to multiple climate hazards, including: drought, floods, landslides, and sea-level risks. However, the east coast of Sumatra is not exposed to cyclones (Figure 16); likely because of the protection offered by the Strait of Malacca.

Figure 16: Global cyclone data measured as wind speed that is expected to be exceeded at least once in a 100 year mean return period

In the Project area, the historic local climate (Figure 17) shows a rainy season from September to December. February is the month with the lowest precipitation (< 100 mm). The mean monthly temperature is above 26 °C year-round; with the highest values (28 °C) being rerecorded for the months of April and May.

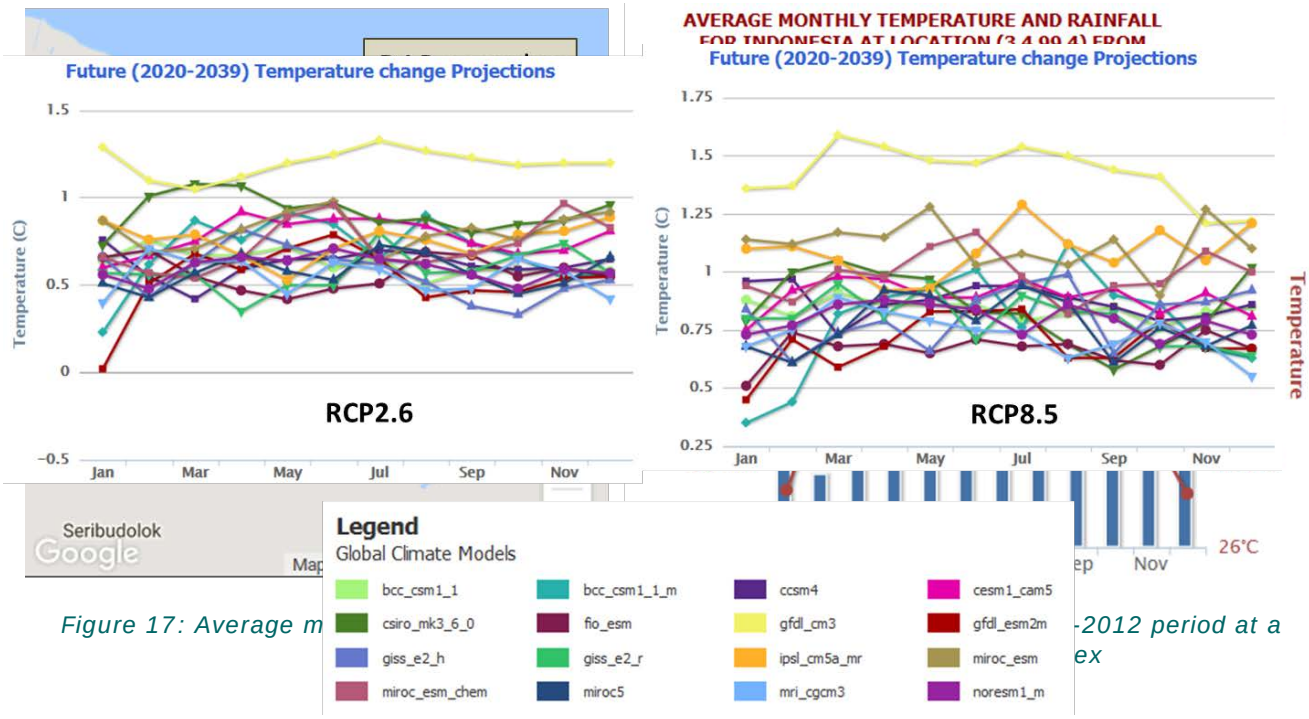

Figure 17: Average m -2012 period at a ex

Figure 18: Projected changes to mean monthly temperatures (Data source: World Bank Climate Portal)

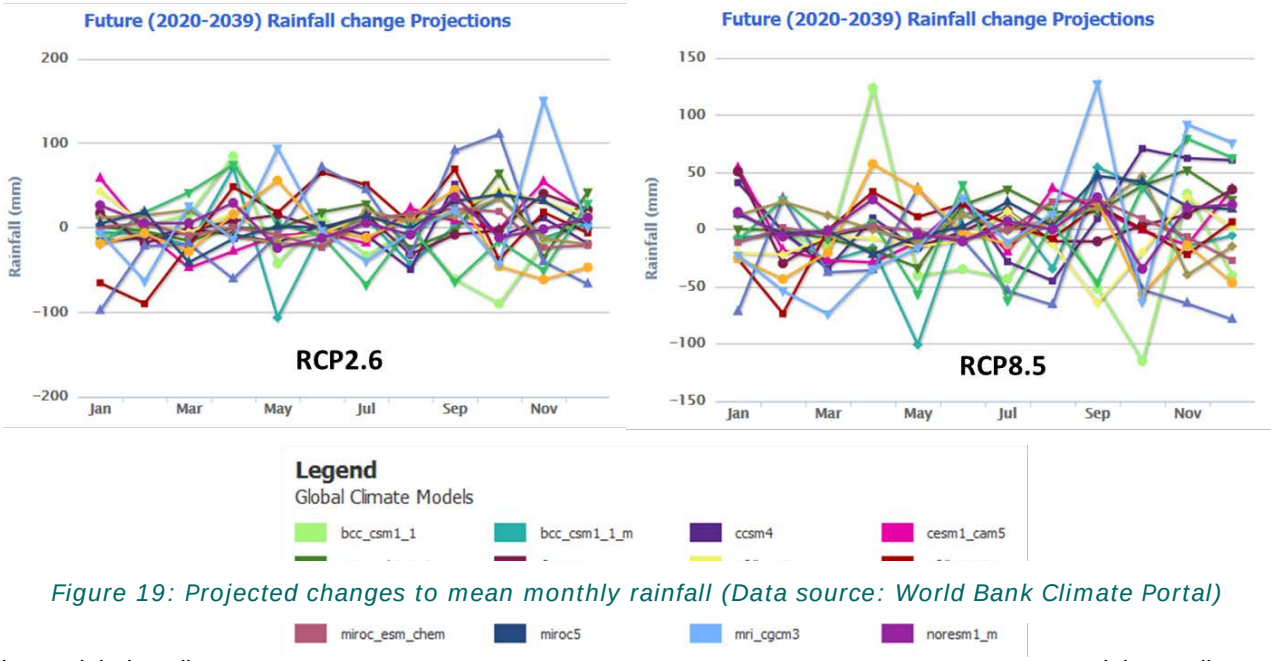

Figure 19: Projected changes to mean monthly rainfall (Data source: World Bank Climate Portal)

The global climate models predict an increase in monthly mean temperatures (Figure 18) in the range of 0.5-1 °C change for the lowest emission scenario (RCP2.6) and between 0.5 to 1.5 °C for the highest emission scenario (RCP8.5). Projected changes in mean monthly rainfall (Figure 22) show a higher degree of variability throughout the year and among the different models, although it seems that most models predict an increase in precipitation in the wet months (September – November). The charts in Figures 18 and 19 present an envelope analysis of 16 climate model ensembles from the CMIP5 distribution used by the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report.

Based on the current and future climate, and the climate sensitivity of the Project, the following climate hazards were considered for the analysis: extreme temperatures, extreme precipitation and flooding, drought, and sea level rise. Additionally, the risk of tsunami was also considered as a natural hazard.

High temperatures can cause physical damage to infrastructure, equipment overheating and failure, and public health impacts. Press reports[2] indicate the occurrence of heatwaves in North Sumatra in recent years. Future climate projections indicate an increase in monthly maximum temperatures in the order of 0.5° C (Figure 20) for the lowest emission scenario. The operations and processes within the DAP complex are not considered especially sensitive to high temperature. Therefore, the Project is considered slightly exposed; i.e., there is no critical element of the Project that may be exposed to potentially damaging extreme temperature.

[2] http://www.pressreader.com/indonesia/the-jakarta-post/20110511/281578057239214

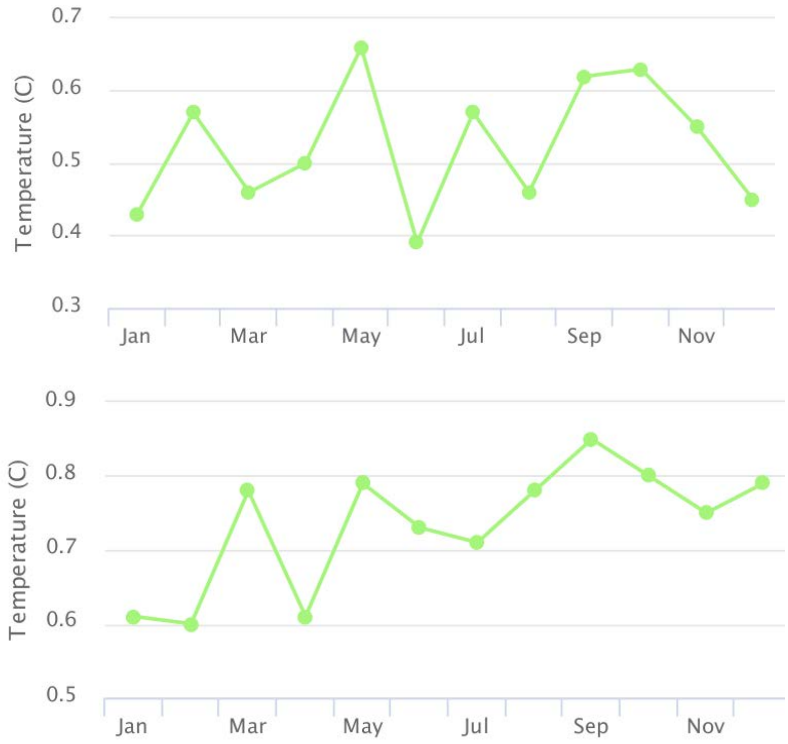

Figure 20: Changes in monthly maximum temperature projected for the Project area (Data source: World Bank Climate Portal

Extreme precipitation can cause physical damage to infrastructure and disrupt operations and maintenance. Riverine flooding can also damage infrastructure, stop supplies if access roads area affected, and increase the risk of water-borne diseases in nearby communities. Given the proximity of the DAP complex to a river; the Project is currently exposed to the risk of flooding (Figure 21).

Figure 21: Flood risk in the Project area based on global flood hazard data measured as inundation height that is expected to be exceeded at least once in 100 year mean return period

(Source: GAR Risk Data Platform)

Under a future climate, the watersheds in North Sumatra (Basin 1333), are expected to experience an increase in runoff and high flows, although there is a high degree of variability in these projections. Given its location and expected changes in precipitation, the Project is considered moderately exposed to extreme precipitation and flooding; there are critical elements (e.g., access road, hazardous materials storage, and wastewater discharge) of the project that may be exposed to potentially damaging extreme precipitation and riverine flooding.

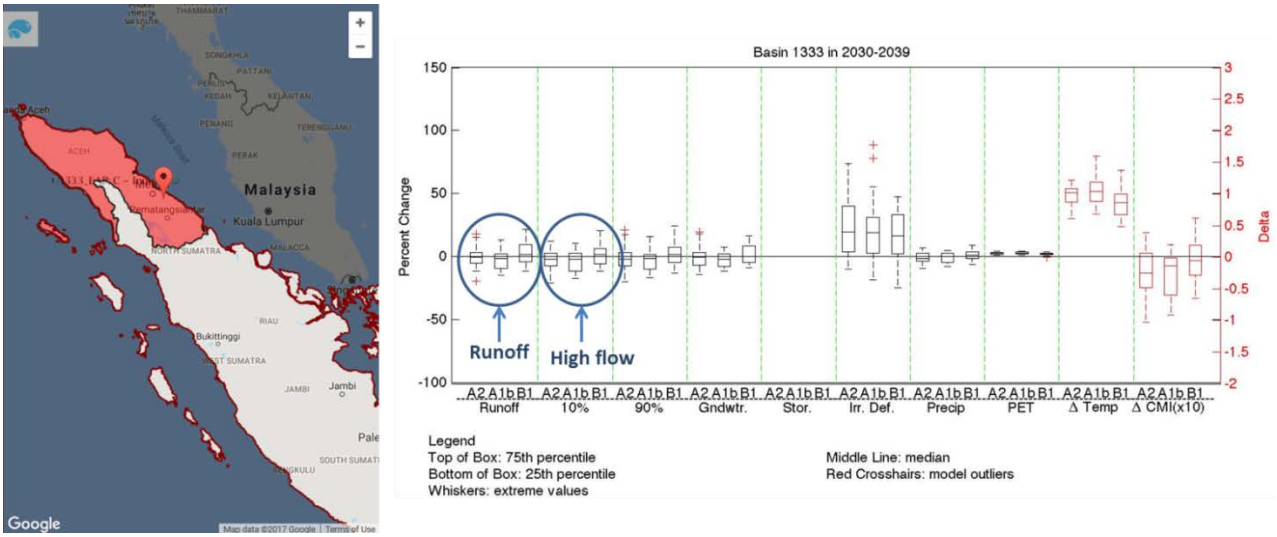

Figure 22: Projected hydrological changes for North Sumatra (Data source: World Bank's Climate Change Knowledge Portal –CCKP)

Drought can decrease water availability for industrial activities, impact freshwater ecosystems and increase competition among water users. The DAP Project takes the bulk of its water supply needs (i.e., 750 m^3/s) from a nearby river (see more details in Section 4.5). It is estimated (Appendix C) that the DAP complex is within a watershed with a moderate level of water stress (i.e., measured as the ratio of total withdrawals to the annual available renewable surface water supply). In the future, most of the global climate models (Figure 19) predict a decrease in monthly precipitation in the dry period (January-April), which could result on an increased incidence of seasonal droughts. Given these considerations, the Project is considered slightly exposed to current or historical drought conditions but moderately exposed to a future climate in which drought can become a more frequent phenomenon and affect the water supply to the plant (a critical input for DAP operations).

Both sea level rise and storm surge can harm coastal ecosystems, population, infrastructure, and economic activities. The DAP complex is located very close to the coast, within 40 m of the coat line, and one of its physical components, i.e., the jetty, is a marine infrastructure and its surface is located 3.4 m above high tide sea level. Currently, the Project is not located within the high and low sea level and, therefore, not exposed to this risk. However, the Project could be moderately exposed in the future to increases in sea level (Figures 26 and 43) given that critical infrastructure (i.e., the jetty, wastewater outfall) would likely be affected by changes in sea level between 1 and 2 m. The maps in Figures 24 and 25 show which areas (blue pixels in the images) would be under water if sea level is higher than a specific amount. Although the maps are not based on accurate topography, they can be used as an approximation to evaluate the effects of higher sea levels.

Finally, potential geophysical hazards were screened for the Project site using the risk information available in the *Climate Risk and Adaptation Country Profile* for Indonesia (2011)[5]. The Project is not subject to landslide risks given the fact that is located on a flat area. It is not exposed both to volcanic or seismic hazards and, as previously discussed, that part of the Strait of Malacca is not affected by cyclones and storm surges. There are, however, some spots along the coast which could be exposed to tsunamis (Figure 23). The Project is considered slightly exposed to this natural hazard.

Figure 23: Tsunami risk in the Project area based on global tsunami hazard data which is expected to occur at least once in 500 year mean return period (Source: GAR Risk Data Platform)

Figure 24: Areas under water for 1 m increase in sea level (Source: Alex Tingle)

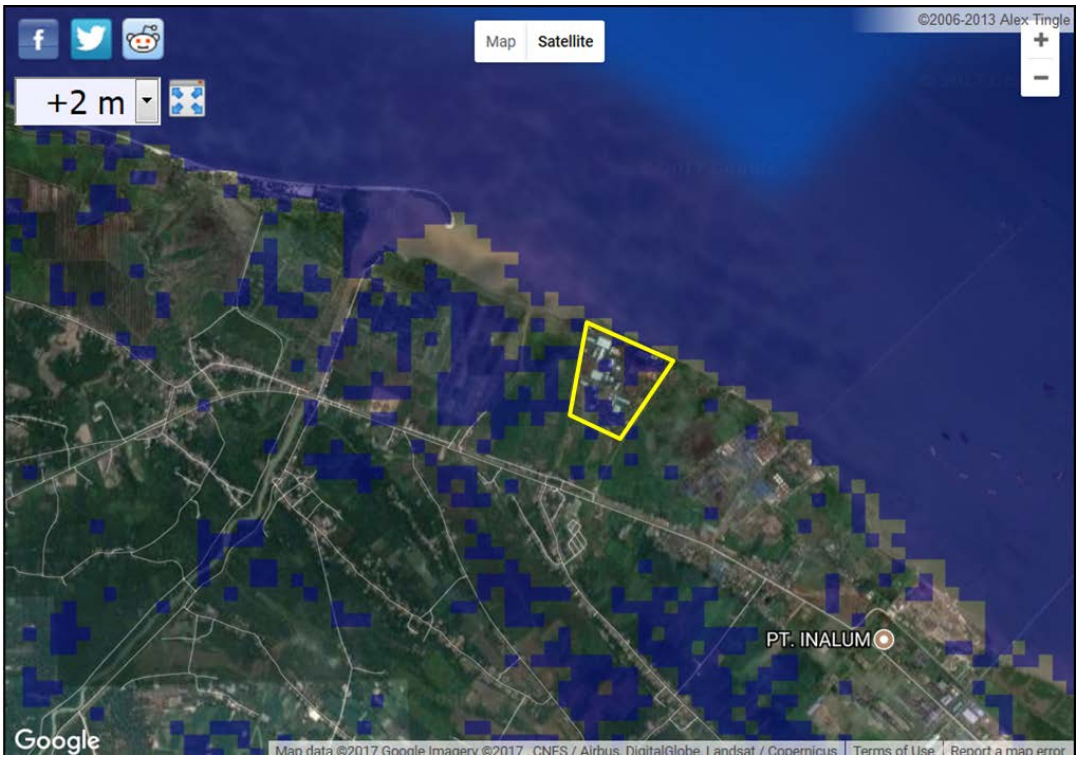

Figure 25: Areas under water for 2 m increase in sea level (Source: Alex Tingle)

Table 2 presents a summary description of exposure to climate and geophysical hazards at the project location for the historical/current and future time frames. Future time frame is based on changes projected to occur between the 1980-1999 average and a future average. The future average used in this assessment is the 2020-2039 average.

Table 2: Summary matrix of climate and geophysical risks at the Project location

Hazard	Timeframe	
	Current	Future
Extreme temperature	*Slightly exposed*	*Slightly exposed*
Extreme precipitation and flooding	*Moderately exposed*	*Moderately exposed*
Drought	*Slightly exposed*	*Moderately exposed*
Sea level rise	*Not exposed*	*Moderately exposed*
Tsunami	*Slightly exposed*	X

4.2.2 Potential climate risks

Potential impacts of climate risks depend on the exposure of your project to hazards and the extent to which the project's physical and non-physical components are affected by that exposure. In the case of the DAP project, the following aspects were considered:

- Inputs: The Project relies on climate-sensitive inputs, including water and the oil palm products used as feedstock.
- Logistics: Currently, raw materials are transported to the DAP complex via roads. These roads cross rivers and streams and could be affected by extreme precipitation and flooding events.
- Physical infrastructure: DAP facilities are located on a flat area and close to the coast. The jetty is a marine infrastructure component that goes 2.6 km offshore and will be vital for the operations of the Project.

Currently, the Project has **low potential impact**; existing climate risks could slightly affect the investment (e.g., heavy precipitation could slightly flood buildings but is unlikely to affect the operating equipment within the buildings). However, under future climate, it is expected that the Project will be moderately exposed to extreme precipitation and flooding, drought and sea level rise. All these climate risks can affect the infrastructure and operations of the Project. These climate risks could cause moderate impacts to the Project in the form of increased flooding risk, restrictions on water supply or increased sea level affecting the Project's infrastructure. Additionally, longer or more frequent drought periods could moderately impact oil palm trees yield under a future climate. For the future timeframe the Project will have a **moderate potential impact** from climate risks (Table 5).

Table 3: Summary table of potential climate risk level for the current and future timeframe

Timeframe	Potential climate risks
Historic/current	*Low potential impact*
Future	*Moderate potential impact*

4.2.3 Adaptive capacity

This step of the process assesses the adaptive capacity of the Project and the broader institutional and sectoral context in which the investment will develop. The following non-physical components of the Project were assessed in terms of its potential for adaptive capacity:

- Emergency planning: The Emergency Control Plan and Duties of Supporting Personnel (SOP-HSE-017) protocol outlines the step-by-step procedures that employees should take in the event of an emergency at the Project site. Flooding is not considered as one of the potential emergency risks.
- Maintenance and operations: As per BSP policy, every department and division has the responsibility for making efforts for reducing the use of electricity and water (BSP Sustainability Report 2013). The Project will use a significant amount of water. Options for reducing/optimizing water use have not been considered as part of the Project operations.
- Data gathering, information and monitoring systems: Little information seems to be available about the watershed of the river that supplies the plant. The Project is currently inactive but when restarting operations, information about potential climate risks should be gathered.
- Feedstock: Oil palm trees are adapted to tropical regions with consistent year-round temperatures and rainfall. To yield normally, oil palms require 2000-2500 millimeters per year. The trees can withstand short drought periods, depending on the soil type and underlying water table but longer (over 3 years) drought stress could impact productivity. Currently, the plantations around the Project area are out of the drought-affected region of Indonesia[3]. Palm trees are suspected to be more sensitive to flooding than drought. Drought is not expected to catastrophically affect the operation of the project.

Based on the above, it can be concluded that the non-physical components of the Project do not consider current and future potential impacts of climate and geophysical hazards and could therefore slightly increase the impacts and the level of risk.

Beyond the scope of the Project, the broader sector context in which the project is taking place can influence the impact of climate and geophysical hazards on the project. Currently, there is no climate change action plan or strategy for the palm oil sector in Indonesia. None of the sustainable palm oil standards (RSPO or ISPO) applicable in Indonesia include explicit considerations of climate risks. Since the impacts of climate change have not been broadly

[3] https://pecad.fas.usda.gov/highlights/2015/12/Indonesia/Index.htm

incorporated into the sector's programs and policies, the institutional capacity of the sector contributes to **slightly increasing** the impacts.

In the broader context, the current trend in industrial development in the Project area (see more details in Appendix C) can contribute to exacerbating the Project's exposure to climate risks; increased impermeabilization and risk of flooding, increased demand for water and stress on water resources, etc. Additionally, population growth can lead to higher water demand and exacerbate the drought risk for the Project.

4.2.4 Overall climate risks for the Project

The ratings are derived on the basis of the hazard information, subject matter expertise, contextual understanding of the project, and modulated on the basis of adaptive capacity and the larger development context of the sector/subsector and country. The results indicate what components are most at risk. The actual ratings themselves, while instructive, should inform further consultations, dialogue, and future planning processes.

Climate risk to the Project in the current/historical time frame is considered as **moderate risk** (Figure 26); the overall level of potential impact to the sector is low but the non-physical components and the development context have the potential to increase the level of impacts.

Under a future climate, the level of climate risk could increase to **high risk** (Figure 25) because exposure to climate hazards is expected to increase and the adaptive capacity of the Project and the development context (considering current status and likely trends of these factors of adaptive capacity) are likely to not substantially reduce the level of impact.

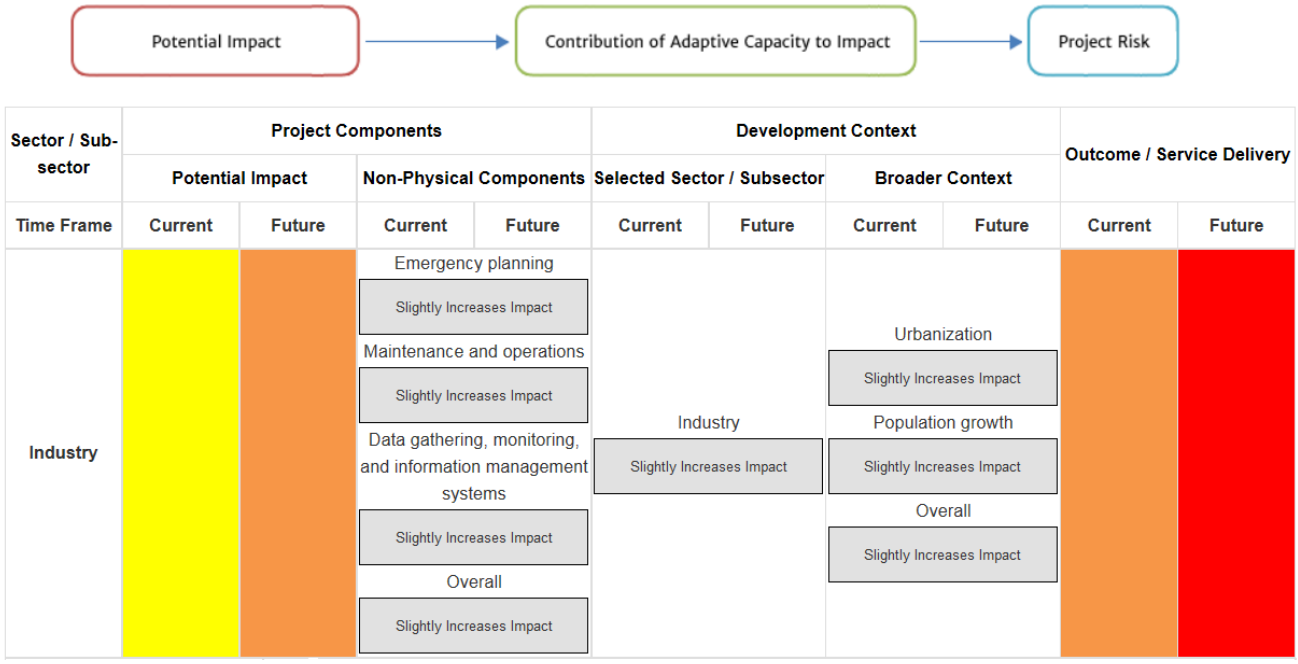

Figure 26: Summary of the overall climate risks for the Project

The results indicate where risks may exist within and where further work may be required to reduce or manage these climate and geophysical risks. An ongoing process of monitoring risks, refining climate and other information, and regular impact assessment may also be appropriate.

For areas of Moderate Risk, the BSP/DAP management team should build on this screening through additional studies, consultation, and dialogue. This initial screening may be supplemented with a more detailed risk assessment to better understand the nature of the risk to the project. For areas of High Risk, the BSP/DAP management team should conduct a more detailed risk assessment and explore measures to manage or reduce these longer-term risks.

4.3 Impacts to air quality

The DAP complex includes several sources of air emissions: boilers and heaters providing steam and hot oil needed for various processes, cooling towers, and a possible natural gas power plant. Impacts to ambient air quality (i.e., beyond the facility property boundary) from the Project air emissions were assessed using the United States Environmental Protection Agency (US EPA) preferred dispersion model, AERMOD.[4] The latest US EPA guidelines are also followed for air dispersion modelling procedures such as meteorological data processing, terrain treatment, and building downwash simulation. A full description of air dispersion model procedures, input data, and model results is provided in Appendix D.

Fugitive emissions from equipment leaks (e.g., volatile organic compound (VOC) emissions from valves, flanges, pumps, etc.) and tailpipe emissions and road dust from vehicle traffic are not included in this assessment. These types of air emissions are difficult to characterize and are generally not accurately represented in dispersion models. VOC emissions are also typically not assessed because there is no internationally recognized ambient threshold for VOC.[5]

Two operating scenarios were modelled: one without the natural gas power plant in which all existing sources operate at maximum capacity (Without Power plant Scenario; WOPP Scenario), and a second scenario in which the natural power plant offsets the steam demand from the high pressure boiler and this boiler does not operate (With Power Plant Scenario; WPP Scenario). Table 6 below summarizes the dispersion model results at the maximum location for each pollutant and averaging period corresponding to each ambient air quality threshold established by the World Health Organization (WHO). As shown in the table, all model results show predicted ambient air concentrations below the established ambient air quality thresholds, with the exception of the 24-hour WHO guideline for SO_2. Figures 27 to 29 show the spatial distribution of the modelled concentrations for 24-hour SO_2, 1-hour NO_2 and 24-hour PM.

[4] The AERMOD dispersion model is an internationally recognized air dispersion model listed in the IFC's Environmental, Health, and Safety Guidelines for Ambient Air Quality.

[5] VOC reacts in the atmosphere and can contribute to formation of ozone which does have ambient thresholds; however these complex chemical reactions are not modelled for projects, but rather, for entire regions or countries using complex photochemical models capturing all industrial and natural sources of all ozone precursor emissions.

Table 4: Air quality dispersion modelling results summary

Pollutant	Averaging Period	Unit	Threshold[1]	Threshold[2]	Background (Baseline)[3]	Result[4]	
						Without Power Plant	With Power Plant
Nitrogen Dioxide, NO_2	1-hour	µg/Nm^3	400	200	4.3[5]	60.4	134.8
	Annual	µg/Nm^3	100	40	0.4[5]	3.0	5.8
Sulfur Dioxide, SO_2	1-hour	µg/Nm^3	900	263[6]	17.0[5]	87.1	85.6
	24-hour	µg/Nm^3	365	20	10.0[5]	26.8	26.1
Particulate Matter <10µm, PM_{10}	24-hour	µg/Nm^3	150	50	19.6	36.3[7]	36.4[7]
	Annual	µg/Nm^3	--	20	3.3	8.5	8.6
Particulate Matter <2.5µm, $PM_{2.5}$	24-hour	µg/Nm^3	--	25	10.8	24.1[7]	24.2[7]
	Annual	µg/Nm^3	--	10	1.8	6.1	6.1

[1] Government Regulation No. 41/1999 regarding Air Pollution Control

[2] IFC General EHS Guidelines. Source: Air Quality Guidelines Global Update, World Health Organization (WHO), 2005

[3] The background air quality concentration is added to the model result to predict cumulative ambient air quality concentrations from the Project and from other sources such nearby industrial sources, regional sources (e.g., home heating and cooking, vehicle traffic, etc.), and natural background (e.g., road dust). The background concentrations are based on the baseline air quality study conducted in November 2016, location AQ-1 (closest location to maximum modelled impacts).

[4] Results are presented for the two scenarios modelled: One without the power plant in which the high pressure boiler operates, and a second scenario with the power plant in which the power plant offsets the steam demand from the high pressure boiler and this boiler does not operate.

[5] The air concentrations measured during the November 2106 baseline air quality study of NO2 and SO2 were below detection levels; therefore, the concentration applied in this assessment is set to half the detection level. For example, the SO_2 baseline measurement listed as "<20" results in an estimated background concentration set at half the detection level (10 ug//m3) applied in this assessment.

[6] The WHO guideline for short term SO2 is 500 µg/m3 on a 10-minute averaging period. A 1.9 factor is used to adjust the 10 minutes average to 1 hour average value for comparison to 1 hour average SO_2 modelled concentrations.

[7] The form of the WHO guideline for 24-hour PM_{10} and $PM_{2.5}$ is the 99th percentile. This equals for 4th highest daily average result from the modelled output. All other model output is the highest hour or day of the five years modelled at the maximum offsite location.

While the predicted concentrations under both scenarios do exceed the 24-hour WHO guideline, the model results from the Project itself (without considering background concentration) are below the guideline (16.1 or 16.8 µg/m^3 versus 20 µg/m^3), and the estimated background concentration representing non-project emissions of 10 µg/m^3 may result in an over-prediction of cumulative impacts, because this value is known only to be less than 20 µg/m^3 (24-hour average) based on ambient sampling results below the detection level. Additionally, the predicted SO_2 ambient concentrations are well below the Indonesian thresholds, and also well below other internationally recognized thresholds such as the US EPA NAAQS (87 µg/m^3 versus 196 µg/m^3 (1-hour).

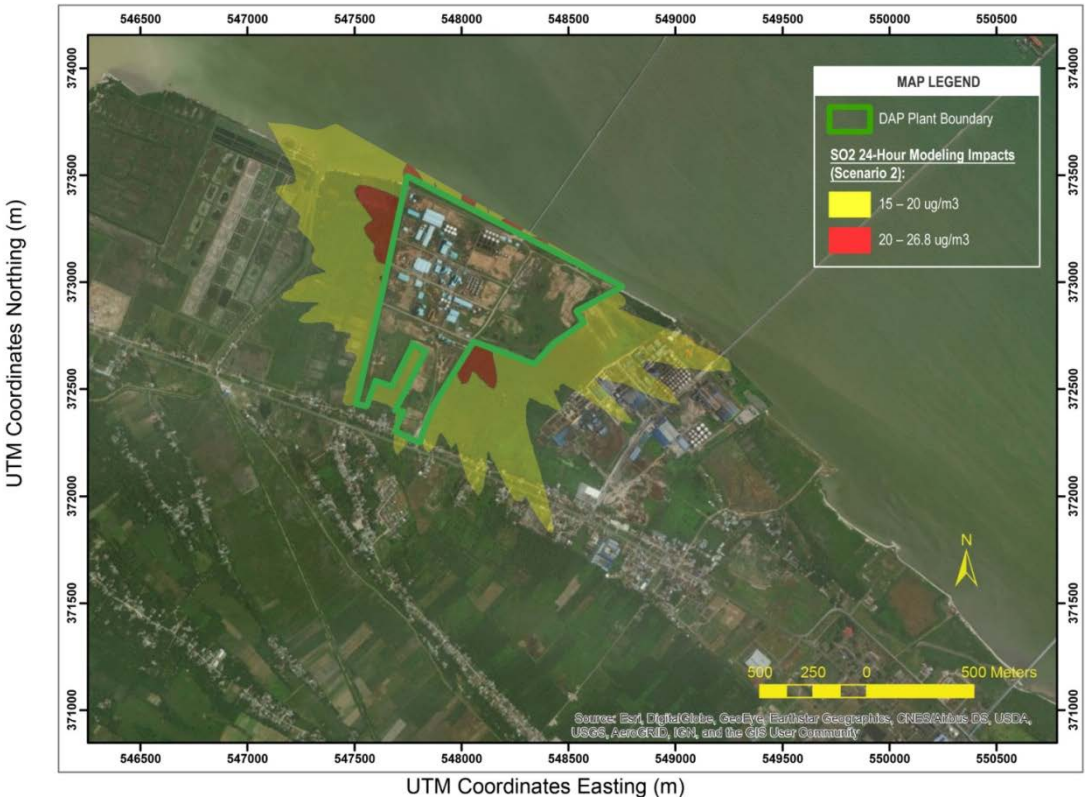

Figure 27: Dispersion plume for 24-hour SO2 concentrations (Scenario 2 with power plant). Background concentration (of 10 ug/m^3) has been added to the modeling impacts

The power plant scenario results in notably higher predicted NO_2 concentrations, and similar concentrations for all other pollutants[6]. While the model predicts the power plant will cause an increase in NO_2 concentrations, these concentrations remain below the associated ambient thresholds. The potential impact to air quality under the power plant scenario is mitigated through selection of clean burning natural gas engines using low NOx combustion technology with half the NO_X emission levels compared to the standard option (250 mg/Nm^3 versus 500 mg/Nm^3).

[6] Predicted concentrations of SO_2 are slightly lower under the power plant scenario, because the steam from the power plant would offset steam generated from the diesel-fired high pressure boiler.

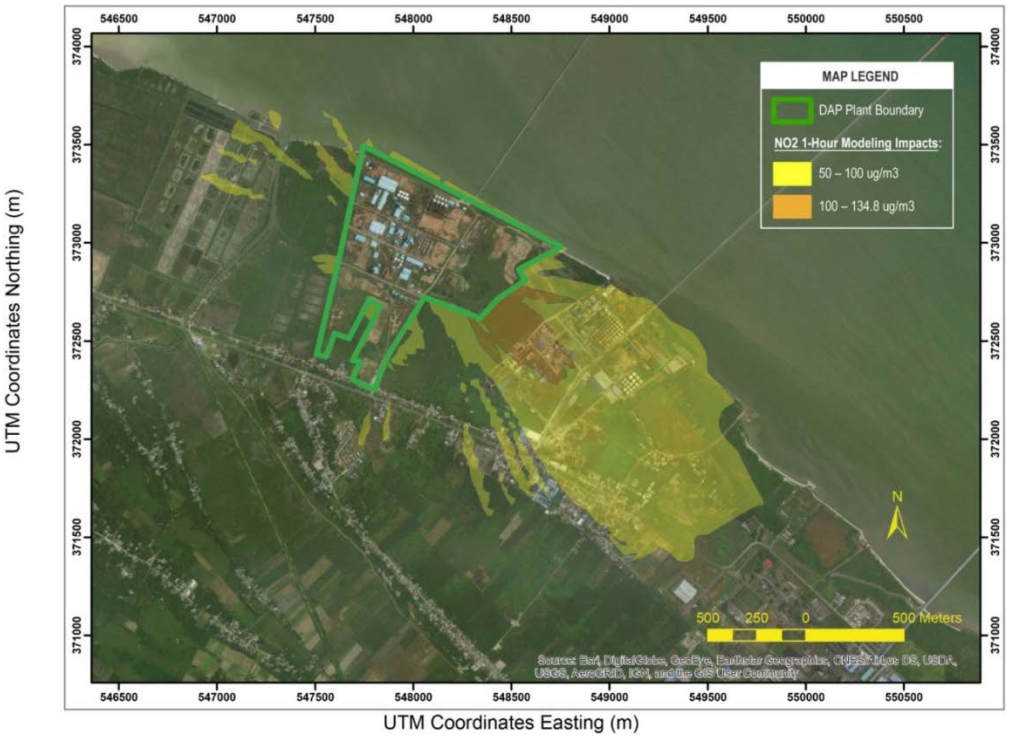

Figure 28: Dispersion plume for 1-hour NO_2 concentrations (Scenario 2 with power plant). Background concentration (of 4.3 ug/m^3) has been added to the modeling impacts

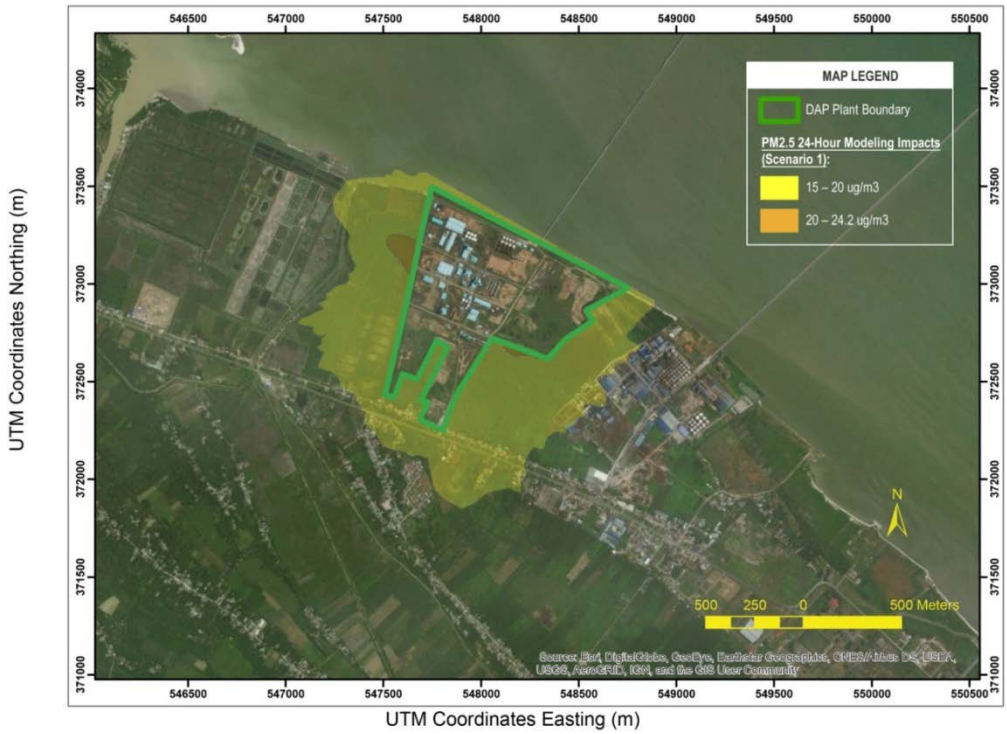

Figure 29: Dispersion plume for 24-hour $PM_{2.5}$ concentrations. Background concentration (of 10.8 ug/m3) has been added to the modeling impacts

4.4 Impacts of jetty construction and operation

The jetty (a structure 2.6 km long and with a width of 4.5 m) of the DAP complex is currently partially built (Figure 29); approximately 50% of the total structure. An ANDAL document (Environmental Impact Assessment) was developed for the construction and operation of this infrastructure in 2006. The development of the ANDAL and RKL-RPL (environmental management and monitoring) was conducted in March 28, 2006. Consulted stakeholders included: regulators, government officials, investment board, environmental impact agency, experts, representative of affected community, transportation agency, land agency, village empowerment representative, public health agency, head of Lalang Village-Medang District, University of North Sumatra academic, and the marine fisheries agency. The jetty will be built by a third party contractor in 24 months.

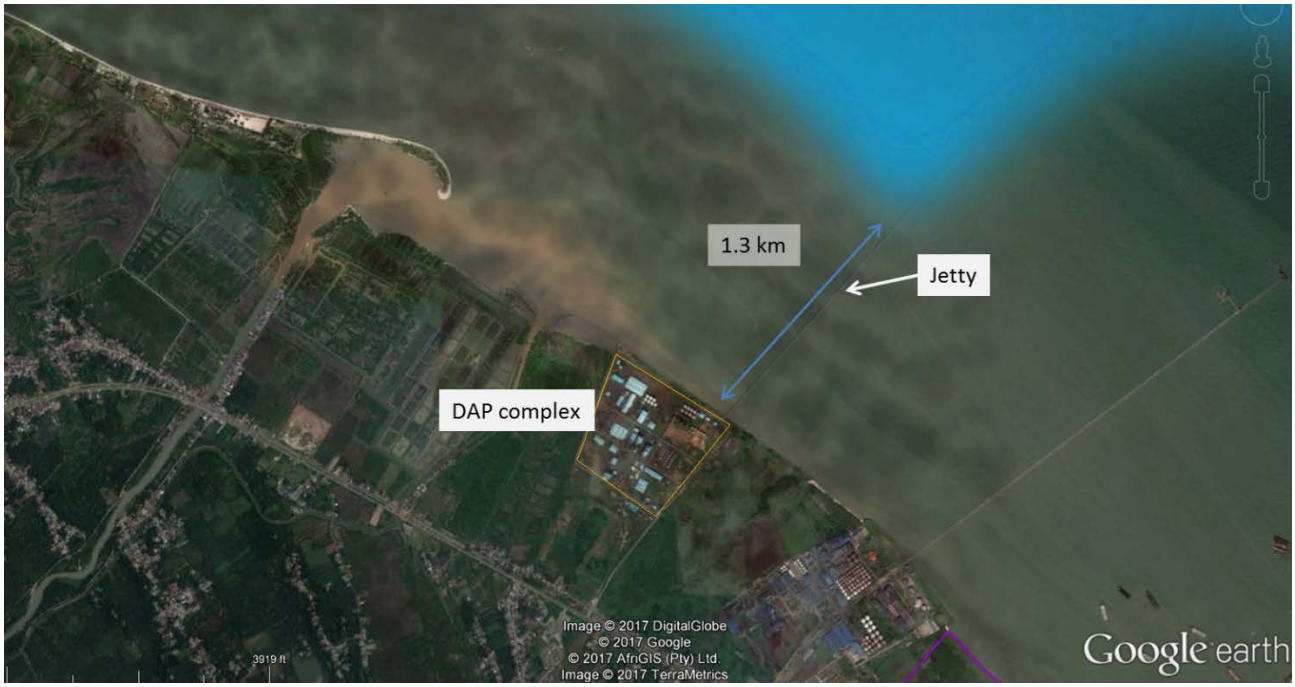

Figure 30: DAP's jetty

PT Hatfiled conducted a review of the ANDAL document (Appendix D). The key impacts identified in the ANDAL include the following:

- Changes to ambient air quality during construction (mobilization of heavy equipment, material movements, foundation work, soil compaction, construction of buildings);
- Changes to noise levels during construction;
- Changes to seawater quality during construction and operation phases;
- Impacts to marine aquatic biota during construction and operation phases;
- Impacts to marine transportation during construction and operation phases;
- Work and trade opportunities leading to increase in livelihood condition; and
- Impacts to public health.

The following gaps, which have been partially addressed in Section 4.5 and Appendix C, were identified in the review by PT Hatfield:

- *Assessment of critical and endangered species*: The assessment of the biological component in the AMDAL did not provide information on the existence of critical and endangered species at the project site with reference to Government Regulation No. 7 Year 1999 regarding Conservation of Flora and Fauna, IUCN Red List (International Union for Conservation of Nature and Natural Resources) and CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna);
- *Assessment of cumulative impacts* as result of existing activities and also future developments adjacent to the project site was not conducted by the ANDAL study.
- Potential impacts to fishermen who fish in the proximity (1-2 miles) of the jetty.

4.5 Impacts of the power plant

Upon successful financing and in order to meet its approximate 16MW of power needs, DAP plans to build a natural gas power plant to replace the current diesel generators, in an effort to reduce the CO_2 emissions of the plant. The power station will feature five 4.4MW GE Jenbacher J624 turbines and it will be designed to work on natural gas as fuel. As only four turbines will be required to meet the power needs of the plant, the fifth unit will remain unused as a backup in case of breakdown or scheduled maintenance work on one of the other turbines. The power station will incorporate a cogeneration system whereby steam will be produced in addition to electrical energy. The steam generated by this cogeneration system will be used by the plant and will further reduce harmful emissions by replacing the high pressure boilers, which burn palm husks to create steam.

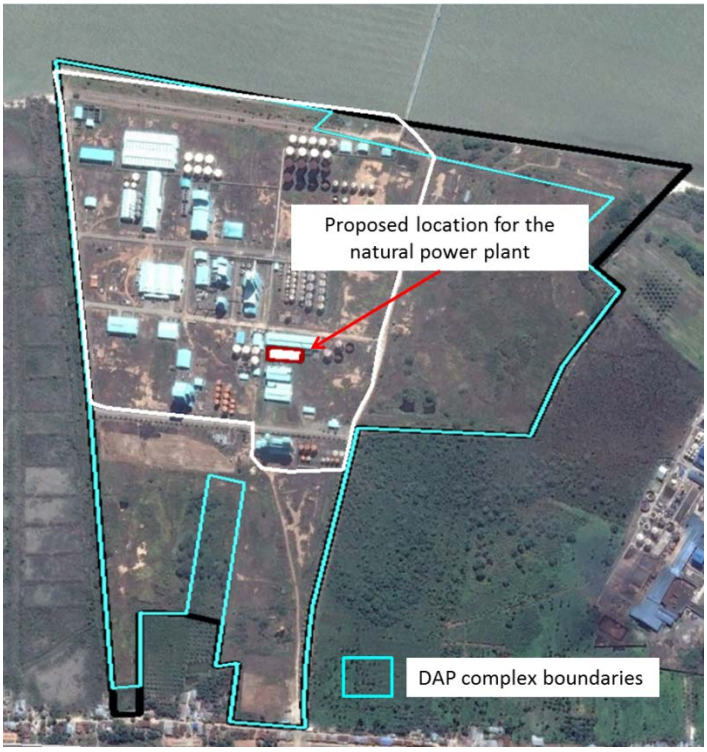

Figure 31: Location of the proposed natural gas power plant within the DAP complex

DAP/Bakrie has been considering this natural gas plant as an alternative source of energy to the current fuel oil generator. It is expected that this plant will be a combined natural gas and solar plant (with the natural gas potentially providing 10 MW and the solar plant the remaining 6 MW). The sole fuel of this plant will be natural gas.

Planning for this supporting facility is currently in the feasibility stage and the mode of delivery of the natural gas will be determined closer to operations of the power plant. The power generated by this hybrid station will be used to power DAP's processing facilities in full and any excess energy will potentially be sold back to the grid and used to power surrounding communities.

The next section lays out potential impacts and considerations that, as a minimum, should be managed through the appropriate SOPs or management plans.

4.5.1 Potential impacts

Air emissions: The primary emissions to air from the combustion of fossil fuels or are sulfur dioxide (SO_2), nitrogen oxides (NO_X), particulate matter (PM), carbon monoxide (CO), and greenhouse gases, such as carbon dioxide (CO_2). As a reference, gas-fired plants generally produce negligible quantities of particulate matter and sulfur oxides, and levels of nitrogen oxides are about 60% of those from plants using coal or liquid fuels[7]. Impacts of the power plant operation on air quality are discussed in detail in Appendix E (Dispersion Modelling Report) and summarized in Section 4.3 of this report. The model results show predicted ambient air concentrations below the established ambient air quality thresholds.

The plant will works with a gas volume of 1.032 Nm^3/hour. Assuming the power station runs 24 hours a day for the 330 days a year the plant is expected to be operational, the annual gas consumption would be approximately 8,200 Nm^3. As previously discussed in Section 4.3, air quality modelling results show predicted ambient air concentrations below the established ambient air quality thresholds, with the exception of the 24-hour WHO guideline for SO_2.

Greenhouse gas emissions: PS 3 encourages clients to promote the reduction of project-related greenhouse gas (GHG) emissions in a manner appropriate to the nature and scale of project operations and impacts. The new power plant will increase energy efficiency and reduce GHG emissions compared to the current fuel oil generator. As previously discussed, the annual consumption of natural gas will be 8,200 Nm^3. Considering an average calorific value of 39 MJ/m^3 for the natural gas usually supplied for energy purposes[8], the expected annual GHG emissions according to IPCC emission factors[9] would be as following:

$$Emissions_{GHG,\,fuel} = Fuel\ \ Consumption_{fuel} \bullet Emission\ \ Factor_{GHG,\,fuel}$$

Emissions (CO_2equivalent/year) = 8,200 · 39 · 10^{-6} (TJ) x [56,100 kg CO_2/TJ + 1 kg CH_4/TJ · 28 (kg CO_2eq./kg CH_4) + 0.1 kg NO_2/TJ·(kg CO_2eq./kg NO_2)] · 10^{-6} tons/kg = 26.9 tons of CO_2equivalent/year

[7] http://www.ifc.org/wps/wcm/connect/dfb6a60048855a21852cd76a6515bb18/FINAL_Thermal%2BPower.pdf?MOD=AJPERES&id=1323162579734

[8] http://ec.europa.eu/eurostat/ramon/statmanuals/files/Energy_statistics_manual_2004_EN.pdf

[9] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf

The threshold for PS3 is 100,000 metric tons CO_2 equivalent per year for the aggregate emissions of direct sources and indirect sources associated with purchased electricity for own consumption. The potential GHG emissions from the natural gas plant are significantly lower than this threshold. DAP/Bakrie should consider all the potential sources of GHG to obtain a more complete picture of GHG emissions associated to the Project. However, it seems the natural power plant option contributes significantly to emissions reduction.

PS3 also recommends clients to disclose their GHG emissions annually through corporate reports, or through other voluntary disclosure mechanisms currently being used by private sector companies internationally.

Water consumption: A hot water flow rate of 113.8 m^3/hour is needed for the plant operation. Assuming the power station runs 24 hours a day for the 330 days a year the plant is expected to be operational, the annual water consumption would be approximately 900,000 m^3. This water will come from the project's water intake. Additionally, the current high pressure boiler used to create steam is going to be replaced by a more efficient and cleaner cogeneration system, resulting in water savings.

Noise: Principal sources of noise in thermal power plants include the turbine generators and auxiliaries (boilers, etc.). A number of noise control techniques can be incorporated in the design of the plant to mitigate the noise impact, such as: using acoustic machine enclosures; selecting structures according to their noise isolation effect to envelop the building; using mufflers or silencers in intake and exhaust channels; using sound-absorptive materials in walls and ceilings; using vibration isolators and flexible connections. As previously discussed in Section 3, existing noise levels in the nearby communities are higher than the recommended IFC standards. It should be noted that all construction works will be done at least 100 m (approximately) away from the main road and villages, which can contribute to mitigate this impact. The natural gas power plant will be replaced the current diesel plant. It is unlikely that the level of noise of the new power plant will exceed current noise operational levels.

Wastes: The power plant will replace the diesel generators and a biomass burning boiler. Therefore, it is expected that the amount of wastes will be significantly reduced. Any potential amount of solid waste or effluent generated at the power plant needs to be identified and appropriate management measures foreseen to handle and dispose of these wastes.

4.6 Cumulative impacts assessment

IFC's Performance Standard 1 requires clients to ensure that their assessment of environmental and social risks/impacts determines the degree to which the project under review is contributing to cumulative effects. Based on this requirement, a Rapid Cumulative Impacts Assessment (RCIA) was developed according to international best practice, particularly the IFC's Good Practice Handbook on Cumulative Impact Assessment and Management (2013).

The two main objectives of this RCIA (see Appendix C) were:

- Provide a preliminary high-level assessment of how the combined effects of the Project with other projects and activities, and natural environmental drivers (e.g., climate change), could affect valued environmental and social components (VECs) in the Project's area; and
- Assess the significance of the identified cumulative risks and impacts, evaluate the Project's contribution to these impacts and suggest management measures that could be implemented to prevent unacceptable VEC condition and for which the Project could contribute.

This RCIA has been developed based on easily accessible information, mostly secondary data although we have also incorporated the information from the recent baseline studies conducted by PT Hatfield in 2016 for marine

habitats, seawater, groundwater, and freshwater, as well as additional social baseline information compiled by the DAP team. This assessment cannot be considered a detailed assessment of cumulative impacts but a screening of likely cumulative risks. It is expected that the outcomes of this RCIA will be incorporated by DAP management in their policies, procedures and monitoring systems in order to improve the environmental and social performance of the Project.

The assessment focused on five VECs: marine habitats, air quality, water supplies, community health and local livelihoods. And consider cumulative effects on these VECs for two scenarios: i) Scenario 1: Near-term development (2020) representing the cumulative effects in the near future, after DAP upgrades and restarts operations; and ii) Scenario 2: Long-term development (2040) considering the expected effects of climate change on the VECs and that planned and ongoing activities are fully operational.

Based on available information, the RCIA documents the current status and documented trends of the VECs and assesses the impacts on these VECs of existing facilities and planned developments for both scenarios. The results of this assessment are summarized in Table 7.

Table 5: Cumulative risks identified through the RCIA

Valued Environmental or Social Component	Scenario 1: Near-term development (2020)			Scenario 2: Long-term development (2040)			Project contribution	
	Likelihood	Consequences	Risk level	Likelihood	Consequences	Risk level	Mitigation	Additional efforts
Marine habitats 	Likely: probably will occur in project plan	**Minor impact** ▪Decreased fish biodiversity, increase in polluted waters	M	Possible: might occur in some circumstances	**Moderate impact** ▪Loss of fish species in the Strait, polluted waters	H	Continued water quality monitoring and engagement with local fishermen	Adapt a Climate action plan, and/or carbon offsetting plan
Water resources 	Likely: probably will occur in project plan	**Moderate impact** ▪Less water resources available for local agriculture, towns and industries ▪Freshwater contamination	H	Likely: probably will occur in project plan	**Serious impact** ▪Increased frequency of droughts ▪Contaminated freshwater ▪Unpredictable water resources	H	Continued water quality monitoring	Data collection on water users in the area, overall water demand and estimates of future water demand
Air quality 	Possible: might occur in some circumstances	**Moderate impact** ▪Respiratory issues and public health concerns	M	Likely: probably will occur in project plan	**Moderate impact** ▪Respiratory issues and public health concerns ▪Contribution to climate change ▪Heat waves ▪Higher air quality related deaths	H	Continued air quality monitoring	Preventative measures to reduce plant emissions, assess plant emission activities , promote sustainable sourcing methods
Community Health & Safety 	Likely: probably will occur in project plan	**Moderate impact** ▪Increased road fatalities ▪Respiratory issues and public health concerns	H	Likely: probably will occur in project plan	**Moderate impact** ▪Increased road fatalities ▪Respiratory issues and public health concerns ▪Contribution to climate change	H	Road Safety Action Plan and community support on health initiatives	Health campaigns to raise awareness of smog/air pollution, create a smog alert system road safety campaigns for plant drivers and locals

Valued Environmental or Social Component		Scenario 1: Near-term development (2020)			Scenario 2: Long-term development (2040)			Project contribution	
		Likelihood	Consequences	Risk level	Likelihood	Consequences	Risk level	Mitigation	Additional efforts
Local livelihoods		Possible: might occur in some circumstances	**Moderate impact** ▪Loss of livelihoods ▪Land loss, decreased yields and catches ▪Potential job creation in the industrial sector	M	Possible: might occur in some circumstances	**Moderate impact** ▪Stress on resources (water, land, fisheries) ▪Job opportunities in industrial and services sector	M	Local hiring and community action plan	Collaborate with regional initiatives for local economy development

4.7 Supply chain risks

The feedstocks (crude palm oil, palm kernels and palm kernel oil) required by the DAP complex (i.e.,) will all be provided by various oil palm plantations within North Sumatra, including BSP owned plantations. Compliance with IFC Performance Standards requires agri-business operations to include in their risks and impacts identification process, and to the extent they can exercise reasonable control, the risks and impacts associated with primary supply chains.

As previously discussed, raw materials for the Project will come from a combination of BSP own plantations and from other third party suppliers. BSP's palm oil production comes from company-owned plantations (nucleus) and plasma plantations, as well as purchases from third parties. BSP applies a Sustainable Palm Oil Policy (Kebijakan Sustainable Palm 2013) on its plantations. It is also a member of the Roundtable on Sustainable Palm Oil (RSPO) and is in the process of obtaining RSPO certification for all its plantations. As of 2013, seven BSP plantations had obtained Environmental Management Systems according to ISO 14001 certification (BSP Sustainability Report 2013). BSP also applies a Supply Chain Certification System (SCCS) by category mass balance on the processing of CPO/PK at mills. BSP has also been completing the Indonesian Sustainable Palm Oil (ISPO) certification for all its plantations.

IFC Performance Standards require companies to identify and manage the following risks in their primary supply chain:

- Hazardous/harmful child labor, forced labor, and significant safety issues leading to life-threatening situations related to supply chain workers (IFC PS2);
- Livelihood restoration and resettlement due and
- Significant conversion of natural and/or critical habitats from primary suppliers (IFC PS6).

DAP has committed to source its feedstock from existing plantations and has recently developed a Feedstock Supply Chain Management Action Plan that lays out a number of legal, social and environmental standards that suppliers need to meet and that will be part of the supply contracts. Section 5.2.4 provides some recommendations to ensure compliance with PS5 and PS6 and screen out suppliers that do not meet these conditions.

4.8 Noise impacts

Noise impacts are likely during the construction and operations phases of the project. This section presents a qualitative assessment of noise impacts based on the description of potential noise sources and the national and IFC compliance requirements. This approach is frequently used[10,11] for preliminary screening of risks and impacts or when the available information is insufficient to conduct a more detailed quantitative assessment.

[10] http://www.sahra.org.za/sahris/sites/default/files/additionaldocs/Ann%20E9-%20Noise%20IA%20BHD.pdf

[11] http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/CamdenAshDamExt/Documents/App-P-Noise%20Report.pdf

4.8.1 Noise receptors and baseline conditions

The closest settlements are located 0.5 km from the fence of the DAP complex (Figure 32). These settlements are made up of a mix of residential and commercial buildings/facilities located along the road.

Figure 32: Location of DAP complex and proximate residential areas

It should be noted that the DAP complex is located in a developed industrial area, in proximity to other industrial facilities and bordered to the south by a busy road. Current noise levels inside the complex were less than 70 dB, which is the maximum threshold for day and night time in commercial and industrial areas, according to IFC's EHS Guidelines[12]. In the nearby residential areas, on the contrary, both day time and night time noise measurements exceeded the guideline thresholds, which are 55 and 45 dB, respectively.

During the social assessment enquiries conducted for this report, noise levels did not come up as a major concern for local communities.

[12] EHS Guidelines (1.7 Noise): http://www.ifc.org/wps/wcm/connect/06e3b50048865838b4c6f66a6515bb18/1-7%2BNoise.pdf?MOD=AJPERES

4.8.2 Qualitative impact description

Because the current noise levels in the residential area are above the thresholds in the EHS Guidelines, the increased noise level produced by the project should result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Construction

The extent and character of construction phase noise will be highly variable as different activities with different equipment will take place at different times, over different periods, in different combinations, in different sequences and on different parts of the construction site. The noise source during construction will include:

- Transport of materials and staff (increased traffic on the road).
- Construction activities (e.g., digging, machinery, etc.) mainly for the construction of the power plant and the finalization of the jetty.

It is expected that noise levels will increase intermittently during the day, depending on which activities are happening at a given time. Exceedance of the 3 dB increase threshold cannot be ruled out although it will be a temporary exceedance,

Operations

The main sources of noise at this stage will be the natural gas power plant (i.e., the turbine generators and auxiliaries -boilers, etc.) and the noise generated at the different oil processing facilities. The natural gas power plant will be replaced the current diesel plant. It is unlikely that the level of noise of the new power plant will exceed current noise operational levels. The various oil processing facilities are located between 0.5 and 1 km from the closest receptors. It is expected that the noise impacts of these sources can be easily mitigated, considering the distance to receptors and the existing noise levels. Special attention should be given to noise levels at night (the power plant and the facilities will operate 24 h).

4.8.3 Management, mitigation and recommendations

The following measures are provided as potential noise reduction measures to be implemented during the construction and operations phases. The distance of the project (0.5 km) to the closest receptors can significantly contribute to mitigate these impacts.

Construction

High noise levels on construction worksites can be lowered by using commonly accepted engineering and administrative controls:

- Engineering controls: substituting existing equipment with quieter equipment; retro-fitting existing equipment with damping materials, mufflers, or enclosures; erecting barriers; and maintenance. Stacks, spoils, and other construction material can be placed or stored around noise sources to reduce the hazard to receivers. Advantage should be taken of the screening effect any nearby object, such as cooling tanks, trailers or temporary site offices.
- Administrative controls: limiting construction work to day time, moving workers away from the noise source; restricting access to areas; rotating workers performing noisy tasks; and shutting down noisy equipment

when not needed. In terms of personal protective equipment for workers, and as a general rule, workers should be using earplugs whenever they are exposed to noise levels of 85 dB (A) or when they have to shout in order to communicate.

Operations

- Engineering controls: A number of noise control techniques can be incorporated in the design of the power plant to mitigate the noise impact, such as: using acoustic machine enclosures; selecting structures according to their noise isolation effect to envelop the building; using mufflers or silencers in intake and exhaust channels; using sound-absorptive materials in walls and ceilings; using vibration isolators and flexible connections.

- Barriers: They can be constructed from common construction building material (plywood, block, stacks or spoils) or the barriers can be constructed from commercial panels which are lined with sound absorbing material to achieve the maximum shielding effect possible. To be effective, the length of the barrier should be greater than its height. The noise source should not be visible and barrier should be located as close as possible to either the noise source or the receiver. Table 6[13] shows the muffling effect of barriers depending on the distance between the barrier and the receiver:

Table 6: Lowering effect of barriers for noise levels

Decibel level at noise source (dB)	Distance from noise receiver to noise source (feet)	Decibel level at noise receiver (dB)
105	5	102
105	10	96
105	20	90
105	40	84

[13] https://www.lhsfna.org/LHSFNA/assets/File/bpguide%202014.pdf

Monitoring and mitigation

DAP/Bakrie needs to develop a mechanism to monitor noise levels, record and respond to complaints and mitigate impacts. During the construction phase, monitoring could happen on a monthly basis and with less frequency during the operations phase (and including night time measurements). To contrast with existing baseline data, it is suggested that monitoring should be done in locations proximate to the locations used for the baseline, and including measurements within the DAP complex and at the closest residential receptors.

5 Environmental and Social Management System

5.1 Environmental and social management context

Oversight of environmental management in the industrial estate is the responsibility of district and provincial authorities. Due to the Plant's short trial operating period and subsequent mothballing, the DELH report highlighted a lack of reporting of environmental monitoring results to the relevant authorities and recommended greater coordination and communication between the company and the governments of Batubara District and the province of North Sumatra. Lack of monitoring data at the time limited the assessment of impacts. BSP has shown a strong willingness to engage with local governments, conduct environmental monitoring and report the findings of its environmental monitoring and analysis and practice best level BSP policies in this regard.

The 2010 DELH indicated that environmental management in the industrial area has focused on dust (regular road watering and maintenance) and noise control (maintenance of tree vegetation in the areas bordering community settlements). The Environmental Management Plan (EMP) included in the 2010 study describes management actions for air emissions and dust control, effluents treatment and water quality control and management of hazardous wastes, for both the construction and operations period. Although it provides goals and benchmark standards for each of these environmental management components, the level of detail provided in the EMP is limited.

The EMP in the 2010 DELH also included an Environmental Monitoring Program for air quality, water quality and hazardous wastes; with monitoring sites at the same locations as the sites sampled for the DELH. Post-2010 environmental monitoring results were not available for review by the Assessment Team as the Plant was mothballed and the relevant environmental monitoring was not being conducted by the Project Company.

5.2 DAP Environmental and Social Management System

5.2.1 Environmental and social management system

A series of specific management plans, integrated into an overarching structure and approach are the core component of an effective Environmental and Social Management System (ESMS), which is a dynamic and continuous process initiated and supported by a company to manage environmental and social risks in a structured way on an ongoing basis. An effective environmental and social management system, per IFC PS1, is made up of a number of elements, including:

- Environmental and social policy
- Identification of risks and impacts
- Management programs
- Organizational capacity and competency
- Emergency preparedness and response
- Stakeholder engagement
- Monitoring and review

At the time of the 2015 due diligence assessment, most of the required elements of an ESMS were in place in some form, including a corporate sustainability policy, 23 standard operational procedures (SOPs) covering different

aspects of the environmental and social management of the plant, etc.. Since then, DAP/Bakrie has developed additional plans and policies, including:

- Community Action Plan
- Stakeholder Engagement Plan
- Local Hiring Action Plan
- Road Traffic Safety Plan
- Grievance Procedures
- Feedstock Supply Chain Management Action Plan
- Security Policy
- Work Health and Safety Policy

These new management instruments addressed key gaps identified in the April 2016 assessment report and gaps with the IFC Performance Standards; the approach built into these plans appears to be in alignment with IFC Performance Standards. Implementation of the ESMS will require continued senior management involvement, as well as technical competence to embed the project's environmental and social performance effort into DAP's overall Project management systems.

Environmental and Social Policy

BSP applies a Sustainable Strategy (and publishes annual reports) for all its operations and a Sustainable Palm Oil Policy (Kebijakan Sustainable Palm 2013) for all their plantations.

Although environmental and social objectives are implicit in the various environmental and social management programs, the Project will need to develop a policy (as part of a Project ESMS) stating the overall environmental and social assessment commitments, management process, and certifications and standards to which the Project subscribes.

Organization and Management Capacity

Corporately, BSP has a Division of Environment, Quality and Occupational Safety and Health, which reports directly to the Upstream Department. BSP enforces various regulations and environmental standards in their operations, and as of 2013, seven BSP plantations had obtained Environmental Management Systems according to ISO 14001 certification (BSP Sustainability Report 2013). BSP also applies a Supply Chain Certification System (SCCS) by category mass balance on the processing of CPO/PK at mills.

According to the August 2016 report, the project appeared to have committed sufficient organizational resources to social performance management, for this stage of the Project having formed a three-person community relations team. One of these was a female staff member, who would engage women's groups in the surrounding communities. Structurally, this team was within the Human Resources Department and has a clear line of reporting through the HR Manager to the project GM. Both the GM and HR Manager play roles in stakeholder engagement and other social programs. Although no member of the current team was trained community relations specialists, field observation of their engagement activities in July 2016 indicated that they had the right sort of aptitude and approach for success. BSP has a community relations training program at corporate level and planned to enroll the DAP team in the program in September 2016.

The team divided its time between stakeholder engagement and other duties such as permitting, licensing and personnel administration. As the project draws close to start-up, DAP will need to commit at least one of the team members to full time community engagement and other social program activities.

In terms of the capacity of the environmental team, DAP has retained an overall EHS Manager on site. Once in operations, environmental capacity will be increased by an additional four EHS permanent staff. Corporate BSP sustainability and EHS staff also provide support capacity to the Project. The Project is ISO14000 certified

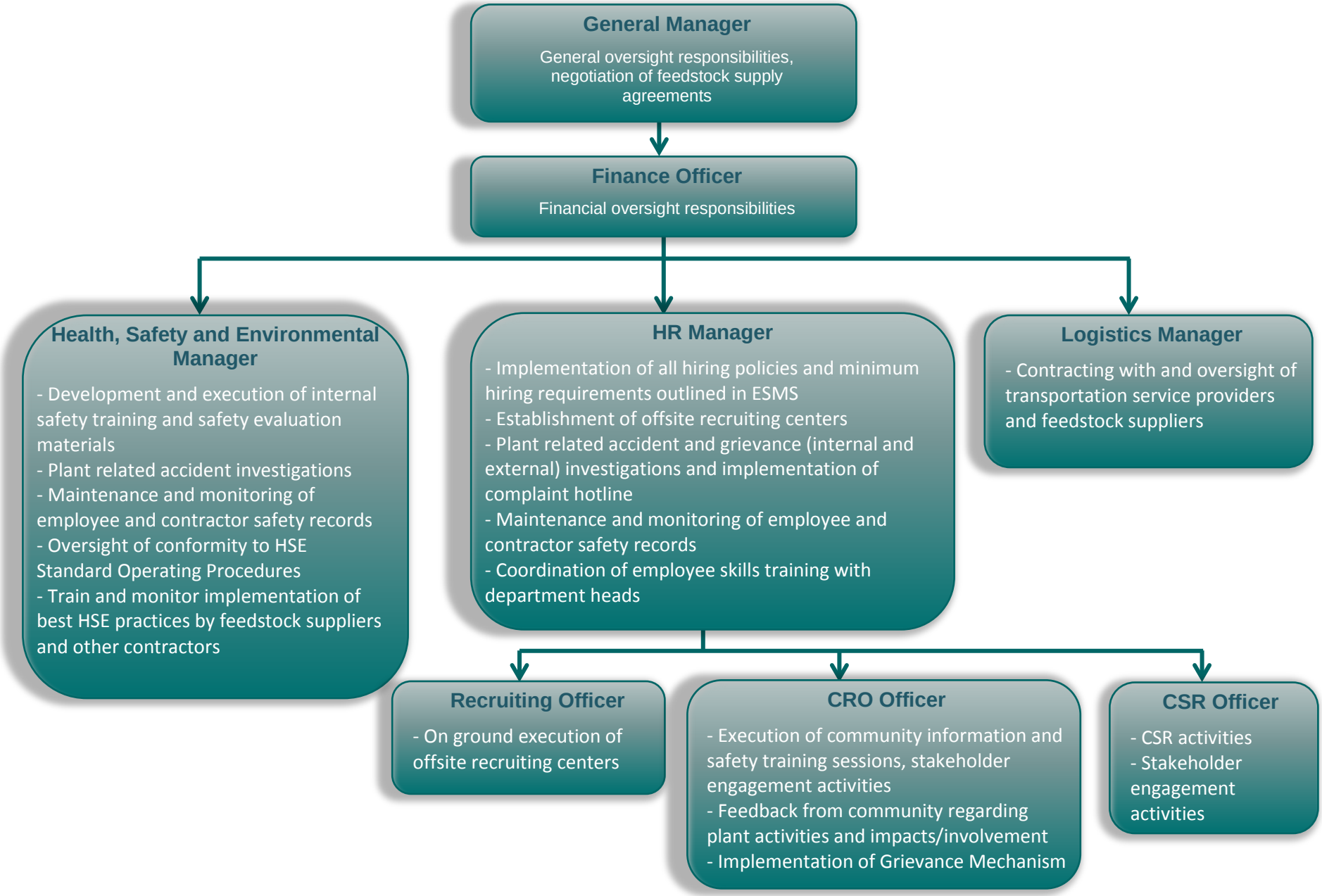

Figure 33: DAP's environmental and social organizational chart

Management programs

DAP has developed a set of environmental and social management plans to structure approaches to managing and monitoring key social impacts and risks identified by the team. The existing management plans are shown schematically in Figure 34.

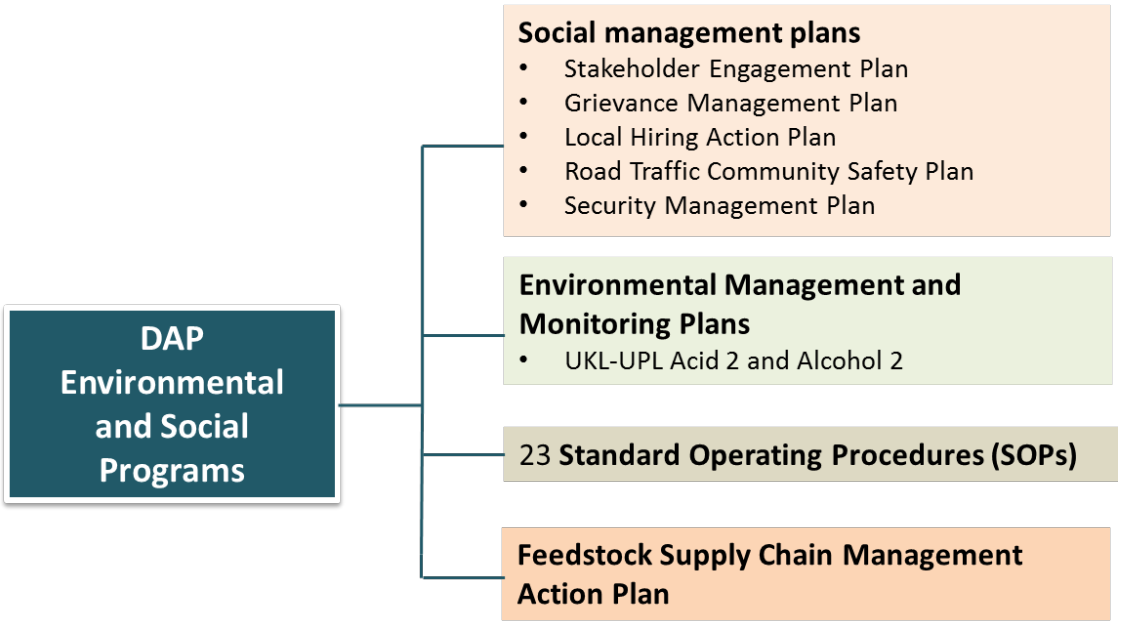

Figure 34: DAP's environmental and social management programs

Monitoring and review

According to the August 2016 review report, the project appeared to have built adequate internal monitoring and review of its social performance into each of its social program plans. However, except for the Stakeholder Engagement Plan, none of the other social management policies and plans reviewed by ESSA includes a separate section on monitoring. This section will need to discuss the company's planned approach to monitoring its activities related to social performance. This will need to be consolidated in the overall ESMS that is currently being drafted.

5.2.2 Environmental management programs

The Project was in operation for a brief period during which time the facilities were tested and commissioned. The company has developed a number of environmental management documents and operational procedures through time. The environmental management documentation provided to the Assessment Team for review included:

Environmental Management and Monitoring Plans (UKL-UPL 2011) for the Acid 2 and Alcohol 2 facilities. These documents include information on environmental impacts, management actions and monitoring indicators. DAP has developed UKL-UPL for the various facilities under construction, including the jetty.

Standard Operating Procedures: SOP-HSE-006: Pest control and cleaning/sanitation program, SOP-HSE-013: Industrial waste control management and SOP-HSE-021: Handling and storage of hazardous materials. These documents detail responsibilities for particular environmental management actions.

5.2.3 Social management programs

As of August 2016, DAP was reported as having made good progress in the development of the following priority social management plans:

- Stakeholder Engagement Plan
- Grievance Management Plan
- Local Hiring Action Plan
- Road Traffic Community Safety Plan
- Security Management Plan

The August 2016 report noted that, an initial review of these plans suggested that they covered the priority programs that would need to be in place as the project prepared for and began plant start-up. This initial review of the plans showed that the company had an appropriate approach, was sufficiently detailed, assigned responsibilities and integrated programs into the overall project management system. The report stated that, as stakeholder engagement and analysis continued and the community relations team gained a deeper understanding of its affected communities, DAP intended to continue to refine the plans. The company would also add more detail on resourcing as the project gained financing.

As of June 2017, DAP provided the reviewers with the following social management plan documents:

- Stakeholder Engagement Plan
- Grievance Procedures
- Community Action Plan
- Local Hiring Action Plan
- Road Traffic Community Safety Plan
- Worker Health & Safety Policy

An initial review of these documents indicates that DAP has prepared the ***framework***, ***policy, and procedures*** documents outlining stakeholder engagement, grievance redress, community donations, local recruitment, traffic and road safety and worker health and safety approaches. The documents state the purpose of the intended social management plan or policy and provide a general outline of the types of approach, principles and/or actions that need to be implemented for each social management plan. In the documents, DAP recognizes that these plans are living documents that will have to be updated and refined following feedback and consultation with relevant stakeholders. In addition to these plans, the community relations team has identified and consulted key stakeholders and developed a list that will evolve into a database that includes information that is crucial to carrying out regular stakeholder mapping and analysis activities throughout the life of the project. These documents were designed to serve as guides for the project to undertake its social activities in a responsible and effective manner.

Stakeholder engagement

DAP's Stakeholder Engagement Plan (SEP) and associated documents describe an active stakeholder engagement program that has been extended to other stakeholders not previously considered. Prior stakeholder engagement efforts were limited to traditional leaders, who were engaged by the community relations team. Documentation provided by DAP indicates recent engagement with informal but key stakeholders in affected communities. For instance, the stakeholder list shows that the team met with influential business

owners/entrepreneurs and sectoral representatives, who were also influential in the villages. This allowed the team to better understand community perspectives and improve stakeholder representation in the engagement activities. Moreover, DAP included an additional community (*Kuala Indah* village) in their engagement efforts and stated that it planned to engage with other impacted communities as the work continues. Some vulnerable groups (e.g., subsistence fishermen and women) as well as other key stakeholders from fence line and proximity communities had also been engaged along with one representative of a youth civil society organization.

During the July 2016 site visit ESSA observed engagement sessions with informal community leaders from affected communities and found the community relations team to be developing effective positive relations and exchanging information with stakeholders in those communities. This more inclusive engagement is expected to allow the team to develop a broader understanding of impacts and perceptions within those communities.

The SEP summarizes the results of the stakeholder identification and analysis activities. While it provides a good basis for ongoing stakeholder relations, the implementation of the plan would benefit from including clear descriptions of staff responsibilities, overall engagement strategy and key messages, resourcing, budgeting and a forward-looking schedule of planned engagement activities and priorities, assigning specific responsibilities to individual community relations officers or senior staff members. There is also a need for ongoing and more detailed documentation using a field visit report or meeting report.

Evidence of engagement with vulnerable groups currently demonstrates engagement with a few individuals. DAP should consider expanding this engagement effort to a bigger number of people, possibly through focused group discussions.

Community Action Plan

DAP has developed a Community Action Plan (CAP) following a recommendation from ESSA's July 2016 visit. The document shows that the company recognized the need to manage requests from various stakeholders and plans to consult them (i.e. determine the areas of great need) before CSR programs are implemented during operations. DAP equates the CAP to a Corporate Social Responsibility (CSR) program document that is commonly known in social performance as a community development or community investment plan. Some of the initiatives listed in the CAP have the potential to become good programs, especially the following initiatives:

- Job Training and Adult Education
- Scholarships

To become an operational plan, the CAP should include a few details, including: relevant information on criteria, eligibility, funding, etc. as well as the details of the process by which requests will be handled by the company. As the implementation of community initiatives moves forward, the CAP will also need to document details on staffing, resourcing and budgeting. It should be noted implementation and monitoring is also a key aspect of community investment programs.

The CAP sets out a donation-based approach to community investment. This type of social investments can create confusion in stakeholders if they do not understand the company's investment priorities and why some communities' requests are not granted. To reduce these potential risks, DAP could consider reducing the focus on donations and focusing instead on programs where sustainable community development aspirations overlap with company priorities

and operational needs, creating development opportunities that jointly satisfy project risk mitigation needs and community aspirations.

Grievance management

The Grievance Procedures prepared by DAP include a flowchart that provides a solid basis for developing an implementable grievance process. The chart identifies the roles and responsibilities of the various parties involved and indicates the timing/duration for each step to ensure that case is resolved in a timely manner. The procedures also include a complaints sample form and a template for a grievance log.

The document also includes a separate clause on the protection of the grievant from possible repercussions related to employment (i.e. losing their jobs). Moreover, grievants can request that their names be kept confidential. This is a very important feature of a grievance management plan, as grievants are often reluctant to lodge their grievances for fear of repercussions. Confidentiality and anonymity protects grievants and encourages them to have faith in the system.

Despite these strong points, DAP will need to build on these procedures and include important sections like the regulatory requirements and the summary of grievances/complaints submitted to-date related to the project (including status). Furthermore, step-by-step instructions on how to file a grievance (for the benefit of the grievant) and step-by-step instructions on how to receive, register, investigate, file and resolve a grievance including categorization of grievances, urgency, the composition of the DAP Grievance Committee, etc. (for assigned DAP personnel) will need to be developed. Detailed roles and responsibilities of parties involved including monitoring and reporting should be included as well.

Consultation with the people who are going to use the procedure needs to be done so they can provide their insights on the applicability and effectiveness of the process. In addition, a stakeholders' disclosure process is highly advisable so that community members (and workers, if a similar process is developed as a worker's grievance process) are aware of the process and can develop the trust in the process that will be required for effective operation.

Local hiring

A review of DAP's Local Hiring Action Plan (LHAP) indicates that the company is strongly committed to maximizing the number of employment opportunities available to local people. The plan calculates the approximate number of workers for construction and operations and notes that for the earlier civil works activities, the company sourced approximately 90% of its workers locally. Currently, the Project is mothballed but still employs 256 people: 75% of whom are local hires. These figures show that DAP has appropriate hiring targets for the affected communities, which should enable them to manage the existing high levels of expectations, if accompanied by strong expectations managing communication and transparent and fair hiring processes.

It should be noted that in December 2015 during the E&S site visit, local residents were asked for their opinions and expectations for the Project. They were generally positive about the recommissioning of the Project and their support was premised on possible employment opportunities. DAP has identified in the LHAP the processes for disseminating job opportunities to local population when construction and operations resume. Publicity will be done through public meetings, posting of vacancies in local newspapers and other local publications; and by establishing a local recruitment office. Furthermore, the plan includes a section describing basic training and education initiatives, which recognizes the importance of holding training for interested unskilled workers to provide them with the basic technical skills and education that they will need to participate in the construction and operation of the plant.

Further development of the LHAP should include more detail in some issues such as the *recruitment process* (i.e., what are the steps to be undertaken when applying for a job (for applicant) and when recruiting someone from the community (for company and subcontractors) and *monitoring*. It will be important to include these descriptions in the plan to ensure transparency towards local stakeholders, who value highly this aspect in their relations with the company. As part of this transparency effort, DAP may consider publishing the data describing the results of the local hiring process in terms of numbers of people hired in each community.

It might also be helpful to clearly identify in the LHAP which groups of people will be eligible for the training programs the company plans to carry out during the operations phase. As a rule, residents of directly impacted communities are given preference in this type of program. However communication needs to be careful to frame employment as an opportunity and not as an entitlement, which tends to lead to conflict and poor attitudes to work.

Road and traffic safety

The Road Traffic Safety Plan (RTSP) outlines a series of measures to address the potential community safety hazard posed by increased project-related truck traffic in the affected communities. This plan establishes the following requirements:

- Enhanced driver safety training
- Vehicle safety inspection requirements
- Road safety training programs for schools and key road communities
- Coordinating with local government to improve infrastructure (e.g., lobbying for alternate truck route, improvement of sidewalks, construction of speedbumps)
- Monitoring, investigation and compliance procedures employing both sure sanctions and incentives
- Regular reporting of accidents, complaints, and other road traffic safety developments

The RTSP clearly identifies the risks to communities and lists the specific mitigation measures that DAP (with the support of PHG) will implement to address these risks. Further clarification will be required of the "reward system for responsible drivers and penalty and warning for irresponsible drivers" mentioned in the document. As operations resume, the RTSP will need to include details on staffing, resource and budgetary allocations as well as a detailed schedule of activities assigned to responsible persons, with clear monitoring indicators and a budget for monitoring to enable continuous improvement of the process.

Occupational Health and Safety

According to the August 2016 report, DAP appeared to have a broadly adequate set of safety procedures in the form of 23 Standard Operating Procedures, which include occupational and safety considerations. Since then, DAP has developed a Work Health and Safety Policy (WHSP) that captures most of the key elements expected in a policy, including the requirement to conduct of bi-annual health and safety risk assessments.

5.2.4 Supply chain management

BSP has developed a Feedstock Supply Chain Management Action Plan for the raw stock feed into the DAP plant. It is currently being reviewed by BSP corporate staff for its integration into their overall supplier management system. BSP will select feedstock suppliers for the DAP plant once a start-up schedule becomes clear. The status of the framework plan will need to be reviewed at that point.

The draft Feedstock Supply Chain Management Action Plan includes standards on labor, social and environmental management. Suppliers will be required to comply with these standards and DAP plans to conduct unannounced semi-annual visits to the plantations to verify the conditions in the field.

The plan also covers relevant sections on supplier onsite inspections, suppliers' workforce consultation, and community consultation to assess adherence to labor, social and sustainable farming standards. It also states DAP's commitment to *educate* plantation owners and communities through instructions sessions during site inspections on the benefits of adhering to these standards as well as the risks and consequences with the failure to do so. Information from these sessions will be made readily available to members of the community and local government offices.

As previously discussed, DAP/Bakrie has committed to resourcing from existing third-party or Bakrie-owned plantations. To avoid the risks associated to newly developed plantations (PS 5: resettlement and livelihood restoration and PS 6 - conversion of natural/critical habitats), it is recommended that DAP includes the following standards in their Feedstock Supply Chain Management:

- Social: The supplier should be able to confirm that feedstock does not come from expanded or new plantations. This condition should rule out the possibility of resettlement or livelihood restoration due to land acquisition and economic displacement.
- Environmental: The supplier should be able to confirm that feedstock does not come from a recently developed (DAP should define an appropriate time period) agricultural area which was previously under natural conditions (natural or critical habitat).

The IFC *Good Practice Handbook on Assessing and Managing Environmental and Social Risks in an Agro-Commodity Supply Chain* provides guidance for companies to develop or strengthen their ESMS, especially as it relates to supply chain management. A step-wise process for assessing environmental and social risk and leverage in the supply chain is included in this IFC guidance document.

6 Summary of findings and recommendations for continued compliance with IFC standards

6.1 Compliance with IFC Performance Standards

PS 1: Assessment and Management of Environmental and Social Risks and Impacts

Environmental and social management

DAP has developed a number of plans, programs and procedures to address key gaps identified in the April 2016 assessment report. The approach built into these plans appears to be in alignment with IFC Performance Standards. Implementation of the ESMS will require continued senior management involvement, as well as technical competence to embed the project's environmental and social performance effort into DAP's overall Project management systems. Although the report outlines BSP overall commitment, the Project will need to develop its own environmental and social policy as part of the ESMS.

Identification of risks and impacts

IFC PS requires the identification and characterization of all potential project risks and impacts. It is recommended that DAP maintains a continuous process for impact identification and integrates and consolidates the findings of this ESIA (e.g., cumulative and climate risks) and their own progress on impact identification (e.g., impacts on stakeholders) in their existing and future plans and programs as appropriate. There are currently some social risks that are considered non-significant based on the information available (i.e., potential impacts to subsistence/occasional fishers in the proximity of the jetty and potential impacts to water users downstream from the Project's water intake). If additional baseline information and the SIA process determine that these livelihoods impacts exist, DAP/Bakrie will need to adapt their social programs accordingly to mitigate these impacts. Ongoing social risk assessment should articulated under the SIA framework and develop into a coherent document, including a defensible baseline, impact assessment, identification of mitigation actions and estimation of residual impacts by consolidating existing information and filling existing gaps. Progress and updates of the SIA need to be documented.

Social Management programs

DAP has made significant progress in developing a series of social programs (Section 5.2.3). It should be noted that these are live documents that will need to be updated and revised as the Project resumes operations. Especially important for the effective implementation of these programs is to include in them details pertaining to: prioritized activities, responsible people, schedules, resourcing, budgeting, monitoring and oversight responsibilities. The Stakeholder Engagement Plan (SEP) offers a good template for the required level of detail since this plan includes most of the relevant sections.

DAP should also consider developing a Local Procurement Plan as a complement to the social programs already developed.

Organizational capacity and competency of social team

DAP has set up a social team made up of three key officers: the recruiting officer in charge of the on-the-ground recruitment activities, the CRO officer with responsibility on community relations and communication, and the CRS officer in charge of the implementation of the corporate social responsibility activities and stakeholder engagement. All three report to the Human Resources Manager. Based on the recent interactions (August 2016) of the assessment team with the social team, it seems the social staff have the right mindset and aptitude for the job, despite not having received formal training for community relations. These personnel would benefit from enrolling in BSP's community relations training program in order to strengthen their skills and capacity to effectively manage community relations. Evidence of implementation of an effective social performance capacity development program would limit project risks from inappropriate action.

Stakeholder engagement and grievance address

DAP's Stakeholder Engagement Plan described its plans to carry out formal and informal activities with the key stakeholders in project affected communities including formats of communications and key message development. The implementation of the SEP would benefit from including the following elements:

- Schedule of engagement activities (ideally a 3- to 6-month timeline)
- Documentation of engagement activities (in the form of stakeholder meeting reports)
- List of key messages to disclose to target stakeholders
- Mechanisms to adapt the plan as new stakeholders are identified and/or the conditions change

The Grievance Procedures need to be developed into a cohesive Grievance Management Plan that meets the IFC guidance requirements and include a history of previous grievances/complaints and their status (resolved versus unresolved). A good grievance redress system not only helps process grievance in a systematic and timely manner but it also helps reduce the chances of recurrence if proper root-cause analysis is done using available documentation.

Monitoring and review

The social management plans should clearly identify indicators to monitor the effectiveness of the plans. Monitoring is part of a good environmental and social management system. It helps the project assess progress towards its objectives and fine-tunes its policies and procedures to better address the risks.

PS 2: Labor and Working Conditions

Employment and Local Hiring

DAP is committed to maximizing the number of employment opportunities available to the local people. It's *Local Hiring Action Plan* shows that at a minimum, it plans to offer at least half of the number of job vacancies to qualified candidates from affected communities, particularly for professional/technical and skilled workers. The company also plans to implement basic training and education to unskilled workers to give them a better opportunity in landing a job.

The lack of information related to employment opportunities in the Project was a major concern that people in the affected communities voiced out back in 2015. DAP has proactively addressed this in the plan by identifying processes for disseminating job opportunities to the local communities when construction and operations resume. While DAP

plans to disclose vacancies to the communities, it has not outlined in the plan other key issues such as the actual recruitment process and preference areas (i.e., priority villages) eligible for employment and the training initiatives.

Best practice would prescribe companies to encourage or use contract language to induce contractors and subcontractors to adopt/use the same policy. Thus, DAP should consider putting this stipulation in contracts it enter with contractors or subcontractors that would require them to fill vacancies that match the qualifications of the local workers.

Supply Chain Management

DAP has drafted a *Feedstock Supply Chain Management Action Plan* that compels its suppliers to promote workplace safety and adhere to international standards related to child and forced labor. The company has committed to doing unannounced site inspections and consultations to assess if a supplier is being a socially responsible business partner. DAP has also committed to educating plantation owners and communities through instruction sessions on the benefits of adhering to workplace safety and labor standards.

In this case, DAP has complied with IFC PS2 standard requiring companies to take responsibility for ensuring that their supply chain does not involve illegal labor or unsafe workplace practices.

PS 3: Resource Efficiency and Pollution Prevention

Resource and Energy Efficiency Plan

The total demand from the various facilities on water and energy should be combined in a Resource and Energy Efficiency Plan which also identifies the measures and options that DAP is planning to implement to increase energy efficiency. The plan should contain water use efficiency measures and benchmark current consumption with the World Bank Group EHS Guidelines. This plan can also serve to track over time water availability from Large River; the source of water for the industrial estate which will be more under pressure as the region develops and more industries are established.

PS 4: Community Health, Safety, and Security

Community Health

There is limited baseline data available on community health that DAP can use to prevent and monitor when it goes into construction and then operations. Without any comparative data, it will be difficult for DAP to document the linkages of significant health changes experienced by communities surrounding the site as a consequence of the Project operation. Misinformation that the Project is causing the health problems in the area can turn into a potential risk.

PS 5: Land Acquisition

DAP/Bakrie has committed to resourcing from existing third-party or Bakrie-owned plantations so this performance standard should not be triggered by DAP's operations. However, in order to avoid the risks associated to newly developed plantations (resettlement and livelihood restoration), it is recommended that DAP includes the following standard in their Feedstock Supply Chain Management:

- The supplier should be able to confirm that feedstock does not come from expanded or newly developed plantations. This condition should rule out the possibility of resettlement or livelihood restoration due to land acquisition and economic displacement.

PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

Performance Standard 6 recognizes the need for protecting and conserving of biodiversity and for the Project operation not to interfere with maintaining ecosystem' services.

Biodiversity conservation

DAP/Bakrie has committed to resourcing from existing third-party or Bakrie-owned plantations so this requirement standard should not be triggered by DAP's operations. However, in order to avoid the risks associated to the conversion of natural or critical habitat, it is recommended that DAP includes the following standard in their Feedstock Supply Chain Management:

- The supplier should be able to confirm that feedstock does not come from a recently developed (DAP should define an appropriate time period) agricultural area which was previously under natural conditions (natural or critical habitat).

Maintaining ecosystem services

The Project will use water for its operations. The water intake that supplies the Project is located in proximity to the coast (3.7 km) and it seems there will not be significant water uses downstream from this intake. However, the information on water use is insufficient at this stage to completely rule out potential risks for downstream water users.

- DAP/Bakrie should identify water users downstream of the Project's intake. If there are individuals or communities who make use of the river's water passed the Project's water intake, these groups should be incorporated in the Stakeholder Engagement Plan.

PS 7: Indigenous Peoples

More than half of the population in the Project area is composed of Malay people, who are local to this area of Sumatra. The remaining ethnic groups are the Javanese, Bataks and Minangs, all of whom have been in the area for generations and have intermarried. These groups are not identified as indigenous. As such, PS 7 does not apply to the Project.

PS 8: Cultural Heritage

Based on the information reviewed so far it seems that neither the Project nor its associated facilities are part of any known sacred sites or other types of physical cultural heritage that may trigger PS 8. As mentioned in the April 2016 compliance review, the project is located in an export development zone and the oleo-chemical facilities in a larger industrial estate. Surrounding the project are communities classified as industrial, residential and agricultural. Given the absence of indigenous peoples and the plant location, it is considered very unlikely that any cultural heritage will be affected by the plant and quite unlikely that cultural heritage will be affected by associated facilities. Cultural heritage impacts at associated facilities should be ruled out.

6.2 Recommendations for ensuring ongoing compliance

Based on the current status of environmental and social management and the understanding of the potential risks and impacts associated to the upgrading and operation of DAP's oleochemical complex, the assessment team recommends that DAP/BSP implements the following action items to ensure ongoing compliance of the Project with IFC standards:

Table 7: Environmental and Social Action Plan

PS	Action item(s)	Implementation timeline
	Additional baseline information *Social* - Track fishing activity in the proximity of the jetty. - Include considerations of health status as part of the follow-up with vulnerable groups - Identify potential water users downstream from the intake. Engage with relevant authorities to obtain more information on the flows at this point of the river - Additional social baseline information should inform and be integrated into the social impact assessment (SIA) and the social management plans as required, as part of an ongoing social management process *Environmental* - Complement environmental baseline (water and air quality) during the dry season - Conduct additional noise levels baseline measurements and develop a noise monitoring plan for the construction and operations phases.	To be tracked during operations
1	Social impacts - Develop SIA into a coherent document, including a defensible baseline, impact assessment, identification of mitigation actions and estimation of residual impacts by consolidating existing information and filling existing gaps. Progress and updates of the SIA need to be documented. - Consult on the impacts and mitigation measures identified with a broad array of representatives from affected communities. - Consider potential impacts on benefit distribution as part of the ongoing stakeholder engagement processes. - Develop a monitoring program for impacts during construction of the power plant which focuses on potential impacts on nearby communities (i.e., noise levels).	Before commencement of operations and to be updated throughout operations

PS	Action item(s)	Implementation timeline
	Social management - Social management plans are subject to review and update based on the outcomes of additional social baseline information and the SIA process - Identify indicators, define responsibilities and schedule for implementation for each of the social management plans and provide reports on outcomes. - Revise organization chart to show social team reporting lines. - *Community Action Plan:* include details on criteria, eligibility, funding, documentation of activities, etc. - Develop a *Local Procurement Plan* - *Stakeholder Engagement Plan* (SEP): Keep updating the schedule and documentation of the engagement events, incorporate mechanisms to adapt the plan as new stakeholders are identified (link to SIA) - *Develop the grievance procedures need to be developed into a cohesive Grievance Management Plan* - *Noise management:* Adopt mitigation as required depending on the monitoring results.	Before commencement of operations and to be updated throughout operations
	Additional baseline information - Track fishing activity in the proximity of the jetty. - Include considerations of health status as part of the follow-up with vulnerable groups - Identify potential water users downstream from the intake. Engage with relevant authorities to obtain more information on the flows at this point of the river - Complement environmental baseline (water and air quality) during the dry season	To be tracked during operations
2	Hiring - Improve *Local Hiring Action Plan* – The updated plan should include detailed recruitment processes (e.g., how to apply for jobs (for applicants) and how to process applications (for DAP and its contractors / subcontractors); eligibility criteria for training initiatives; and preference areas (with names of villages) for local hiring and training initiatives.	Before recruitment starts prior to construction commencement
	Contractors and sub-contractors - Provide a document describing how DAP will support and oversee compliance with laws and standards by contractors and subcontractors on site	Before recruitment starts prior to construction commencement
3	Resource and Energy Efficiency Plan	To be implemented during operations

PS	Action item(s)	Implementation timeline
	- Develop a plan to track and minimize energy and resource (water) consumption of all the facilities of the Project, including the natural power plant	
4	Community health and safety risks - Incorporate adequate health baseline data into the SIA, to enable identification of potential community health impacts and risks. - Develop a Community Health and Safety Monitoring Plan - Develop a Security Management Plan to include management of public and private security force that will be assigned to the project and explicit rules on use of force among others	Draft before the start of construction activities and update/complete on an ongoing basis
5	Resettlement and livelihood restoration risks - As part of the management of supply chain risks, confirm status of the lands as owned, occupied or used (formally or informally) by communities or individuals for any plantation that involves expansion of new land. If any areas trigger the requirements of PS 5, then appropriate management plans and processes will need to be developed.	Include screening criteria for this risk in the Feedstock Supply Chain Management Action Plan and start applying before commencement of feedstock purchases.
6	Biodiversity conservation - Include in the Feedstock Supply Management Plan a mechanism to ensure feedstock does not come from a recently developed (DAP should define an appropriate time period) agricultural area which was previously under natural conditions (natural or critical habitat). Ecosystem services - Confirm water consumption for the project is not affecting water availability for downstream users	Before commencement of operations (screening for biodiversity risks as part of feedstock management) and throughout operations.

Endnotes

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