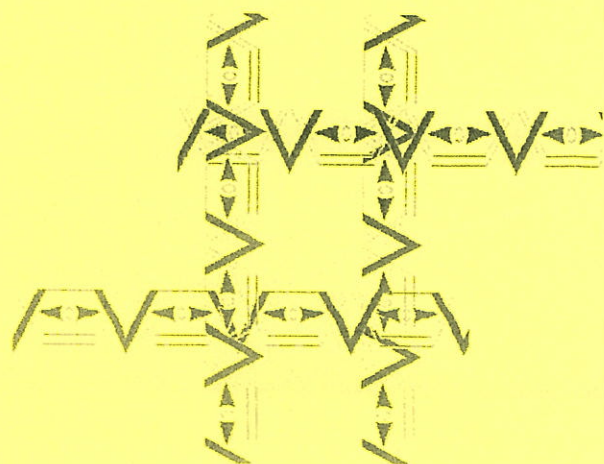


CHAPTER IV IMPORTANT IMPACT EVALUATION



CHAPTER IV

IMPORTANT IMPACT EVALUATION

Evaluation of the significant impacts that occur for Capacity Building activities Bangkanai power plant of 140 MW, 150 kV SUTT Bangkanai - Muara Teweh and PLTMG Bangkanai and CNG Plant 155 MW Central Kalimantan in the pre-construction, construction and operation is performed by using a flow chart. Flowchart of impact each phase in each component of the environment is made to identify the interaction between the activities that are the source of impact and environmental components are affected by a tangle of causes, conditions and effects.

Impact evaluation for capacity addition of Bangkanai power plant of 140 MW , 150 kV SUTT Bangkanai - Muara Teweh and PLTMG Bangkanai and CNG Plant 155 MW Central Kalimantan described below include :

- Review of the significant impact;
- The study as a basis for management ;
- Recommendation .

By using the flowchart, shown the components most affected by the pre-construction , construction and operations and impacts that happen will also be seen whether the impact is a primary or secondary impacts .

4.1 Assess Important Impact

Based on estimates of significant impacts the components or environmental parameters that will change the quality, either towards positive or negative, it shows that the component geophysical - chemical that is widely affected by construction activities Capacity power plant Bangkanai 140 MW, SUTT 150 kV Bangkanai - Muara Teweh and the 155 MW Bangkanai PLTMG CNG Plant Central Kalimantan.

At the stage of pre-construction activities, such as surveys and licensing, socialization projects and land acquisition component only affect the social, economic and cultural. The impact of social unrest may arise directly or indirectly in the pre-construction phase of this activity. Although the impact on the pre-construction phase is temporary (not long), but will affect the next stage of activities that would arise if the impact is not managed properly .

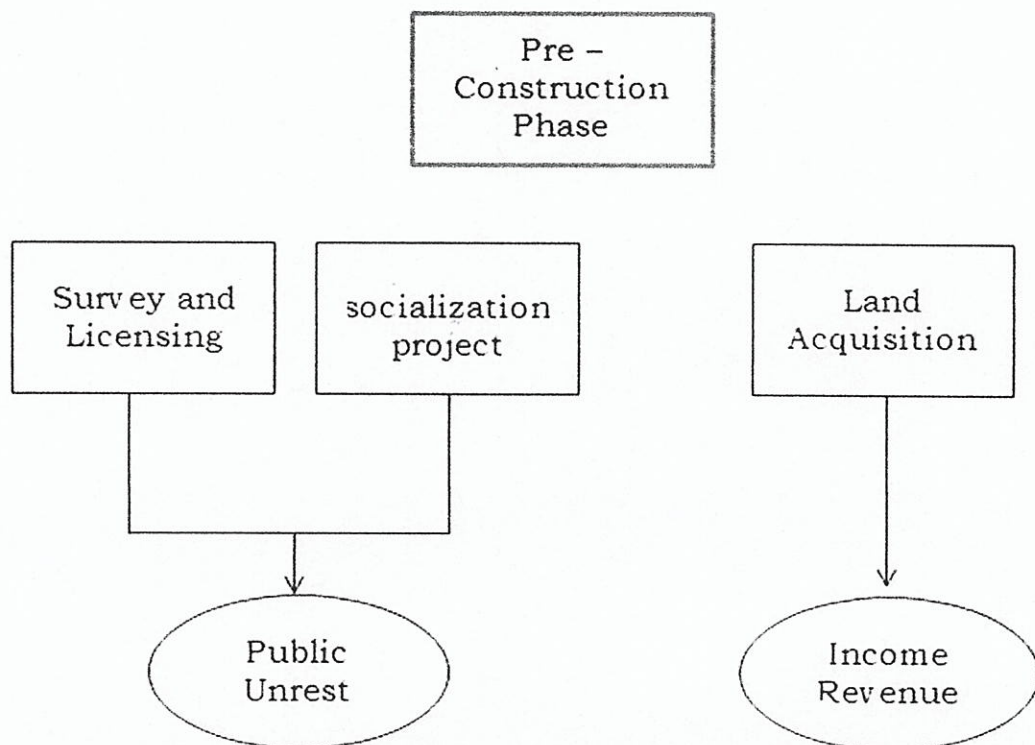


Image 4.1 Flowchart Pre-Construction Impact

In general, there are ten (10) activities of construction phase which can have an impact, such as:

- 1) Mobilization and Demobilization of Labor
- 2) Creation and Operation Base Camp
- 3) Making Access Road
- 4) Mobilization and Demobilization of Equipment and Materials
- 5) Preparation of Land
- 6) Main Building Development & Support
- 7) Cleaning Tread Tower & Free Space
- 8) Construction of foundation and establishment Tower
- 9) Installation & Withdrawal Conductor Wire
- 10) Commissioning Activity

Geophysical - chemical and biological impact inflicted more directly at this stage. As for the social, economic and cultural as well as the public health impact, it will usually appear as a result of the multiple effect of the impact of geophysical chemical.

The emergence impact of geophysical-chemical as traffic disruptions, damage to roads, increased vibration, dust and air quality deterioration, and others will make public unrest. The public will be worried about the health and feel disruption of their activities. The impact derived from geophysical - chemistry also change the affect ecosystem of flora and fauna around.

In the construction phase, activities that generate a positive impact, mobilization and demobilization activities of labor and commissioning activities. Impacts employment opportunities and an increase in electrical energy has great benefits for social, economic and cultural surrounding communities.

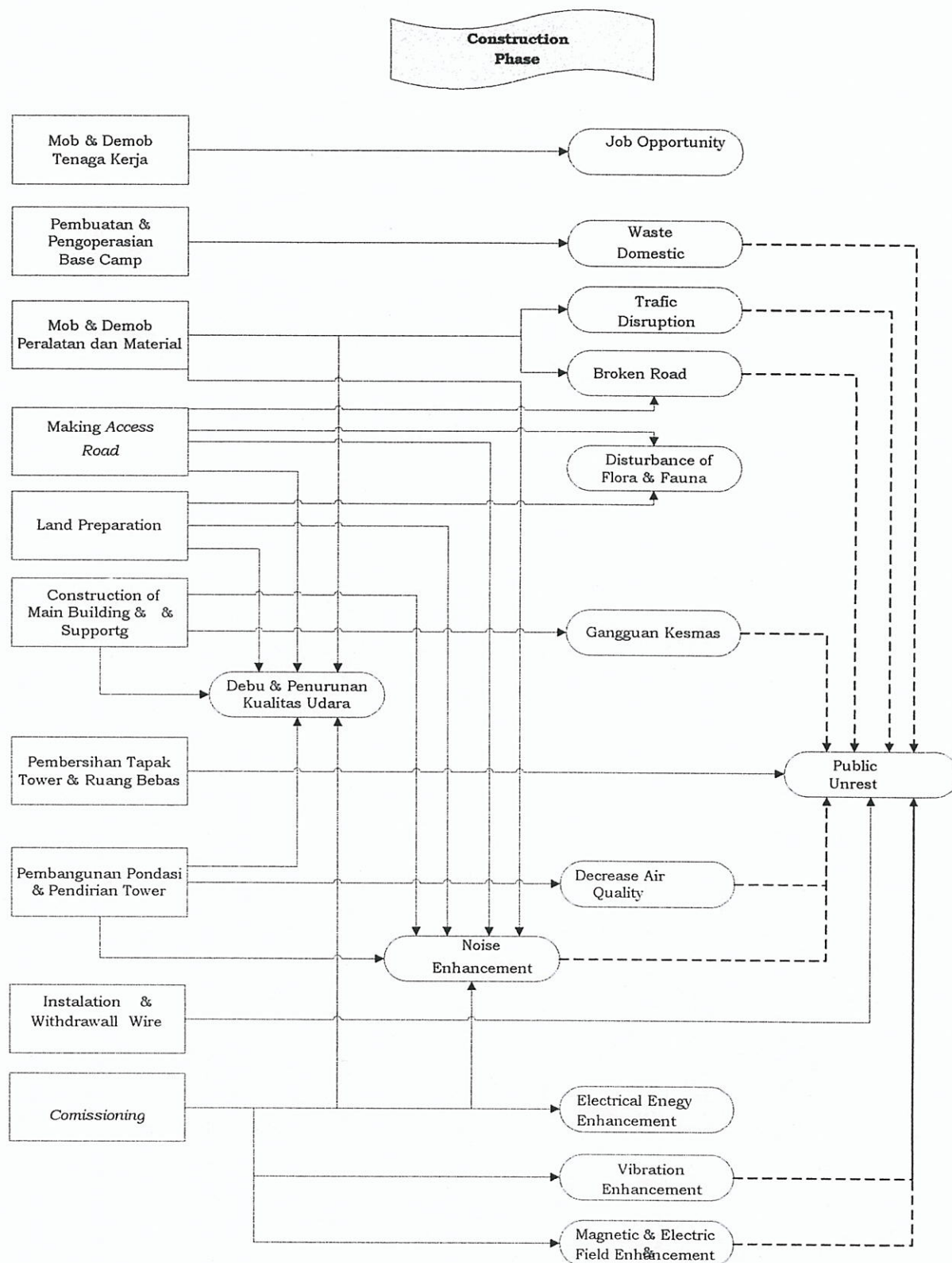


Image 4.2 Flowchart Construction Impact

Based on the flow chart, there are 13 impact on the 10 activities of the construction phase. Where the greatest impact arises is dust and decrease air quality as well as increased noise, which will raise the impact of social unrest.

Whereas at this stage of the operation will last five (5) types of activities, namely Acceptance of Labor, Gas Distribution, Operation & Maintenance in Power Plants, Electric Energy Distribution and Transmission Network Maintenance. At this stage, the impact of geophysical components - chemical will be more frequently caused by the activities.

Operational services and maintenance in power generation and distribution activities of electrical energy is an activity that most impact directly, including the impact of dust and air quality deterioration, increased noise, increased electrical energy, the increase in the magnetic field and electric, waste dumps and public unrest, These activities have a major positive impact and long for the surrounding community, increase in electrical energy. With increasing electrical energy capacity of 140 MW and 155 MW and the addition SUTT 150 kV lines, it will increase the supply of the electricity needs of the surrounding community. But besides that, the event was also a big negative impact on the surrounding environment changes with an increase dust and decreased air quality and noise generated.

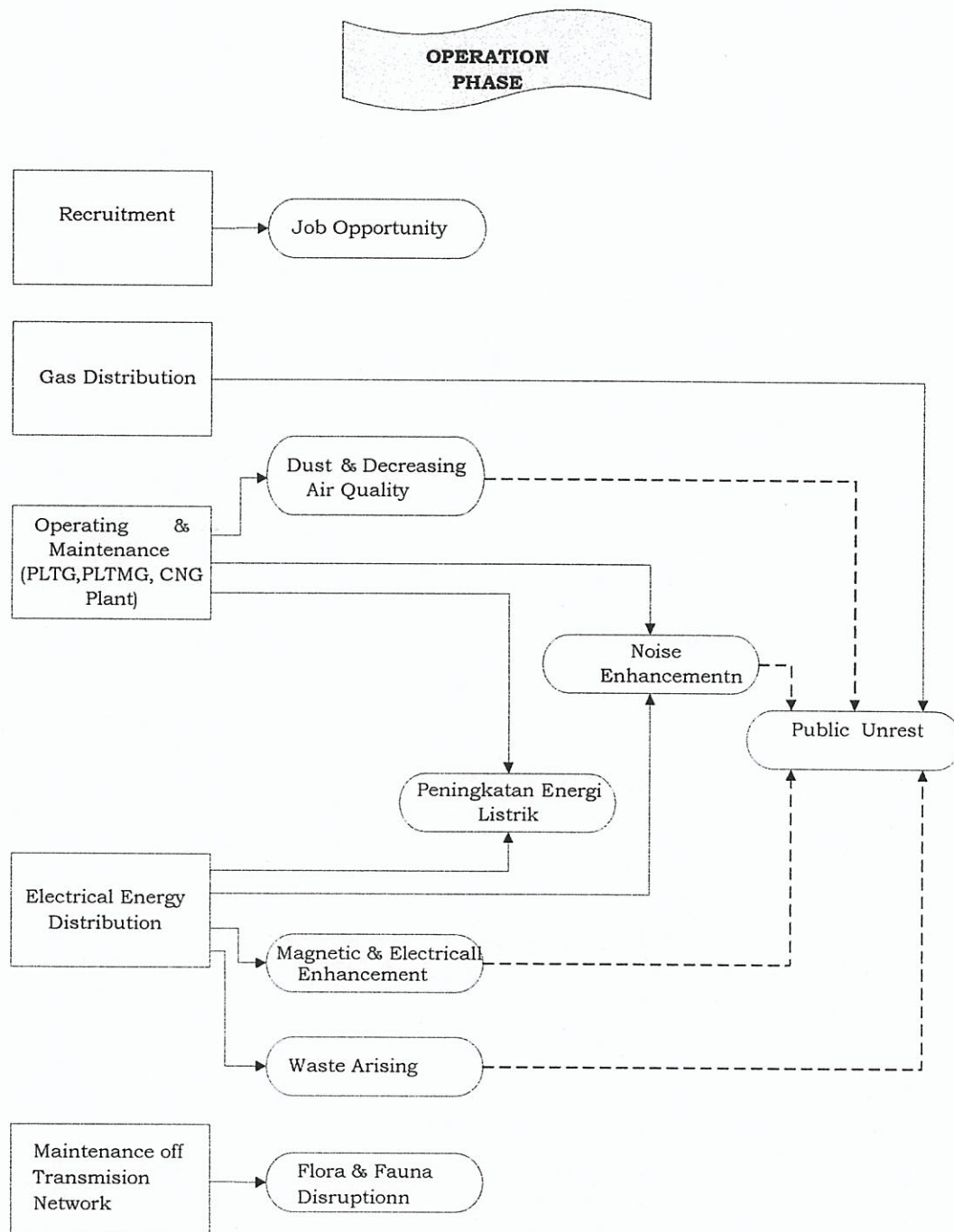


Image 4.3 Flowchart Operation Impact

4.2 Basic Management

4.2.1 Pre-Construction Phase

The impact of civil unrest is the impact that often arise during the implementation of this phase. Survey & licensing and dissemination of the project is an activity that closely related to the impact.

At the time of conducting the survey and permitting particularly with respect to the surrounding communities should be followed by early socialization explanations regarding project plans and activities. This is so that people know and understand the early going of the existence and benefits of the project. Coordination with the village and the surrounding community is very important in helping the smooth operation of the power plant development projects Increased Bangkanai 140 MW, 150 kV SUTT Bangkanai - Muara Teweh and PLTMG Bangkanai CNG Plant 155 MW and Central Kalimantan.

For the licensing activities and efforts of local community-owned land acquisition should follow the rules and regulations concerning land acquisition set by the government. Payment of compensation for land acquisition must be adjusted so it will increase household income. It is also intended that people acquire life and a better economy due to land acquisition.

Management of these impacts is crucial for the construction phase of activities can be implemented and not become an obstacle in the future or even cessation of activity in the middle of the road project..

4.2.2 Construction Phase

There are 13 impact on the activities of the construction phase. The negative impact on geophysical - chemicals components is the

impact of the mostly arise and need special attention and needs managed together, besides other negative impacts that may arise.

As was discussed earlier that the impact of increased dust, decrease air quality and noise increase is the impact intensity high enough that arise due to a number of activities at this stage, including during the mobilization and demobilization of equipment and materials, the manufacture of the access road, land preparation, and supporting the construction of the main building , construction of the foundation and establishment of the tower and commissioning activities .

The impact of social unrest arising mostly caused by the impact of geophysical - chemical components that happened. High intensity caused by the impact of geophysical - chemical will create unrest and public concern over other impacts that will arise such as health problems and work activities .

Besides the negative impact arising biological component is a disturbance of flora and fauna. Activity of making access road and site preparation will lead to a direct impact of the disruption of local flora and fauna .

However there are two (2) positive impact at this stage that will arise, when the mobilization and demobilization of manpower and commissioning activities. Job opportunities and increased electrical energy in these activities had an impact and benefits for the surrounding communities. Although these effects not long last, but it is important to improve the attitude and positive perception of the public of the existence of this project .

Although the construction phase is only temporary (not for long) but still needs to be done with good action and careful management to optimize the positive impacts and minimize negative impacts. Form of management to do the construction phase include:

1. Adjustment of planning and implementation time at the stage of construction well, in order to reduce the intensity of negative impacts;
2. Giving priority to local labor as necessary work required to remuneration in accordance with the applicable minimum wage standards, this became public expectations around for jobs and increase household income;
3. Collect and prepare container and waste management equipment;
4. Setting up an installation of waste management in accordance with the ability of liquid waste generated;
5. Perform watering in the area and the project site were dusty, especially in the dry season;
6. Make a speed restriction of conveyance equipment and materials;
7. Perform regular maintenance on heavy machinery or vehicles used;
8. Using vehicles that qualify administratively feasible road (pass the test of KIR);
9. Fencing the site boundary and area residents should be adjusted;
10. Planting buffer area around the plant is able to muffle the sound, capturing dust and reduce vibration;
11. Install noise barriers on the source of the turbine and generator;

12. Creating a high exhaust chimney and installing vacuum cleaner that can work in centrifuges;
13. Protect and preserve the flora and fauna, wildlife
14. To appeal to the public in order to protect them and their homes from dust, dirty air and noise generated by the project activity;
15. Suggest to the public to always use a mask when entering the area of the power plant;
16. Provide a clear and detailed understanding of the public about the benefits and impacts of poor existence of this project;
17. Examine and test the reliability and effectiveness of the plant working according to the standard commission testing.

4.2.3 Operation Phase

At this operation stage has 5 events and there are 8 impacts arising from such activities. Consisting of 5 geophysical - chemical components effects, two components of the socio-economic of culture impact and impact of biological components .

Operation and maintenance activities at power plants and electrical energy distribution is an activity that a lot of impact on the surrounding environment. Geophysical - chemical Impact arising from both of these activities have a long time intensity. The impact will only decrease when maintenance activities carried out.

The negative impact of geophysical - chemical can generate social unrest around. The effects such as increased dust, air quality deterioration, improvement of electric and magnetic fields and waste dumps makes people become restless and worried about the health of the environment and disruption of their activities. The lack of public knowledge about project activities and their impact is

one factor the emergence of negative attitudes and perceptions of the public to the existence of this project.

The importance of constructing the power plant Bangkanai 140 MW , SUTT 150 kV Bangkanai - Muara Teweh and PLTMG Bangkanai 155 MW and CNG Plant Central Kalimantan is an attempt to increase development growth and economic growth in the province of Central Kalimantan , especially in North Barito should be able to understand and be understood clearly by the local community.

An increase in the supply of electrical energy to meet the electricity needs of the local community and improving the economic activity, the physical development of the area is an important thing in changing attitudes and perceptions in a positive direction. In addition to the operation of the power plant will open up employment opportunities surrounding community through employment of local labor .

Therefore, in the stage of this operation, PT . PLN (Persero) should be able to maintain and even increase positive attitudes and perceptions of the community so that operations run smoothly. Attitude determination, management and operations management will bring significant changes to the impact of the continuation this project in the future.

There are some management action to conquer the impacts that will occur , such as:

- 1) Give information to the public about the operations running time, follows submit an explanation and understanding of the impact of the positive / negative existence of the project;

- 2) Giving priority to local labor and equipment as required by the provision of the necessary work wage / salary in accordance with the applicable minimum wage standards, as this became public expectations around for jobs and increase household income;
- 3) Setting the administration in the form of setting working hours of employees;
- 4) Plan and implement sound development of health and environment friendly;
- 5) Perform flue gas stack emissions monitoring on a regular basis;
- 6) Perform reforestation to reduce exhaust and noise barrier;
- 7) Make a plan that is effective in determining the time plant operations and maintenance time;
- 8) Perform maintenance of machinery, equipment and regularly equipment on time;
- 9) Make planning to use of river channels as an alternative of transport;
- 10) Provide ear plug for labor;
- 11) The operation of water waste treatment unit as optimal as possible;
- 12) Managing B3 waste, used oil, dumping area around the power plant and PLTMG unit activities;
- 13) Planting aquatic plants in wastewater pond and marsh around which could reduce liquid waste;
- 14) Implement Corporate Social Responsibility (CSR) in an attempt to approach the public.
- 15) Implement management Occupational Health and Safety (K3) and the basics of Communication, Information, Education and Communication (IEC);

- 16) Install signs or signs of danger in the vicinity of the substation and Tower SUTT;
- 17) Provide public education regarding the security of plants and pathways SUTT;
- 18) Conduct regular monitoring or supervision of health and environmental quality workplace and the community;
- 19) To coordinate periodically with the device and surrounding communities about the activities to be carried out concerning safety and health at the project site and settlement;
- 20) Approaching promotive and preventive health measures for the health of workers and the public;
- 21) Always give the best solution to the attitude and the input and public complaints as a result of this project.

**Tabel 4.1. Matrix Management and Monitoring Environmental Development PLTG Bangkanai
(140 MW) and SUTR 150 kV Muara Teweh - Bangkanai**

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
PRE-CONSTRUCTION STAGE							
1	Public Unrest	Pre-Construction	socialization Project	Social component in the form of social unrest that was around the location of activities	During the project dissemination activities	<ul style="list-style-type: none"> - Provide an explanation and understanding of the action plan and the benefits and negative impacts that will arise - Providing the best solution to the attitude and the input and public perception - To coordinate with the village and the local community 	<ul style="list-style-type: none"> - Monitor the effectiveness of the explanation and understanding of the project activities - Monitoring the attitudes and perceptions of the project activities to be implemented
2	Increased Revenue	Pre-Construction	Land Acquisition	Socio-economic component in the form of increased revenue	During the land acquisition activities	<ul style="list-style-type: none"> - Take measurements land accurately - Create project boundary point precisely - To coordinate with the village, local communities and the relevant agencies involved in land acquisition - Running the land acquisition in accordance with procedures and regulations - Providing the best solution attitude and perception of the public about land acquisition 	<ul style="list-style-type: none"> - Monitor the project land area and community land to be freed - Monitoring the attitudes and perceptions of the people involved in land acquisition - Monitoring the agreement of land acquisition compensation fee - Monitoring the delivery process of land acquisition compensation fee
CONSTRUCTION STAGE							
1	Job Opportunity	Construction	Mobilization and	Social component in the form of	During the construction	<ul style="list-style-type: none"> - Provide information to the public about the lack of job 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions of the job

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
			demobilization of labor	creation employment opportunities for the community around the project	phase activities underway	opportunities during the construction phase - Giving priority to local workforce in accordance with the needs of the work required - Providing wages in accordance with the applicable minimum wage - To coordinate with relevant agencies	opportunities - Monitor the number and needs of local labor - Monitoring the level of local employment income - Monitor the administration regarding the payment of wages
2	Domestic Waste Arising	Construction	Manufacture and operation of base camp	Physical components of the chemical form of domestic waste generation	During the construction phase activities underway	- To collect and domestic waste management - Setting up a container and waste management equipment - In cooperation with third parties who have a permit	- Monitoring the implementation of waste management - Monitor the health conditions of workers and the surrounding environment - Monitor the activities of cooperation with third parties who have a permit
3	Public Health	Construction	Access road construction	Social component in the form of social unrest that was around the location of activities	During the activity of making road access	- Inform the action plan which includes a schedule of activities, stage activities and procedures for the implementation of activities to the public - Providing the best solution to the attitude and the input and public perception - To coordinate with the village, the local community and relevant agencies	- Monitoring the attitudes and perceptions of the project activities are implemented - Monitor the health conditions of workers and the surrounding environment

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
4	Decrease Air Quality	Construction	access road construction	Physical chemical components form of increased dust	During the activity of making road access	<ul style="list-style-type: none"> - To speed restriction and conveyance equipment and materials - Perform regular maintenance on the machine used vehicles - Closing the tailgate with a tarp when transporting material - Using vehicles that qualify administratively feasible road (pass the test of KIR) - Doing watering in a dusty driveway area and location of the project, especially in the dry season - Set the frequency of traffic transport vehicle; 	<ul style="list-style-type: none"> - To monitor the conveyances vehicle's speed limit - Monitor the type and number of vehicles used - Monitor the activities of the transport vehicle engine maintenance - Monitor the health conditions of workers and the surrounding environment - Monitoring the attitudes and perceptions of the activity of making access road - Monitor the traffic flow of vehicles
5	Noise enhancement	Construction	access road construction	Chemical physical components include increased noise	During the activity of making road access	<ul style="list-style-type: none"> - Work during the day to reduce the impact of noise - Perform fencing or closure of the local area with the outer limits - Set the frequency of traffic transport vehicle; 	<ul style="list-style-type: none"> - Monitor work activities - Monitor the type and number of vehicles used - Monitoring the attitudes and perceptions of making access road - Monitor the traffic flow of vehicles
6	Disturbance of flora and fauna	Construction	access road construction	Komponen biologi berupa gangguan flora dan fauna	During the activity of making road access	<ul style="list-style-type: none"> - Perform logging stands on the location of the power plant - Reforming the tread area of the power plant, PLTMG and CNG Plant with existing flora - Protect and preserve the flora and fauna wildlife, not killing, capturing, and trade will 	<ul style="list-style-type: none"> - Monitoring the activities of clearing land for the access road - Monitor the type and number of flora and fauna - Monitoring the condition of the habitat of flora and fauna around

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
						<p>however maintain, rehabilitate , securing of extinction and put it in his native habitat .</p> <ul style="list-style-type: none"> - No hunting, no damage habitat, do not take the animals but rather to preserve the flora and fauna (tringgiling , lizards , birds , etc.). 	
7	Public Unrest	Construction	Mobilization and demobilization of equipment and material	Social component in the form of social unrest which are in the around of activity area	During the mobilization and demobilization of equipment and material	<ul style="list-style-type: none"> - Inform the action plan which includes a schedule of activities, stage activities and procedures for the implementation of activities to public - Providing the best solution to attitude and the input and public perception - To coordinate with the village and the local community 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions of the project activities are implemented - Monitor the health conditions of workers and the surrounding environment
8	Decrease Air Quality	Construction	Mobilization and demobilization of equipment and material	Physical chemical components form of increased dust	During the mobilization and demobilization of equipment and material	<ul style="list-style-type: none"> - To speed restriction and conveyance equipment and materials - Perform regular maintenance on the machine vehicles - Closing the tailgate with a tarp when transporting material - Using vehicles that qualify administratively feasible road (pass the test of KIR) - Doing watering in a dusty driveway area and location of the project , especially in the 	<ul style="list-style-type: none"> - To monitor the conveyances vehicle's speed limit - Monitor the type and number of vehicles used - Monitor the activities of the transport vehicle engine maintenance - Monitor the feasibility test vehicle emissions - Monitor the health conditions of workers and the surrounding environment - Monitoring the attitudes and

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
						dry season - Set the frequency of engine traffic transport vehicle ;	perceptions of the activities carried - Monitor the traffic flow of vehicles
9	Noise enhancement	Construction	Mobilization and demobilization of equipment and material	Chemical physical components include increased noise	During the mobilization and demobilization of equipment material	- Doing the work during the day to reduce the impact of noise - Perform fencing or closure of the local area with the outer limits - Set the frequency of engine traffic transport vehicle ;	- Monitor work activities - Monitor the type and number of vehicles used - Monitoring the attitudes and perceptions of the activity of making access road - Monitor the traffic flow of vehicles
10	Decrease Air Quality	Construction	Land Preparation	Physical chemical components of the form increased dust	During the land preparation activities	- To speed restriction conveyance equipment and materials - Perform regular maintenance on the machine used vehicles - Closing the tailgate with a tarp when transporting material - Using vehicles that qualify administratively feasible road (pass the test of KIR) - Doing watering in a dusty driveway area and location of the project , especially in the dry season - Set the frequency of engine traffic transport vehicle ;	- To monitor the conveyances vehicle's speed limit - Monitor the type and number of vehicles used - Monitor the activities of the transport vehicle engine maintenance - Monitor the feasibility test vehicle emissions - Monitor the health conditions of workers and the surrounding environment - Monitoring the attitudes and perceptions of the activities carried - Monitor the traffic flow of vehicles
11	Noise enhancement	Construction	Land Preparation	Chemical physical components include increased	During the land preparation	- Doing the work during the day to reduce the impact of noise - Perform fencing or closure of	- Monitor work activities - Monitor the type and number of vehicles used

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
				noise	activities	<p>the local area with the outer limits</p> <ul style="list-style-type: none"> - Set the frequency of engine traffic transport vehicle ; 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions of the activity of making access road - Monitor the traffic flow of vehicles
12	Disturbance of flora and fauna	Construction	Land Preparation	Biological components such as disturbance of flora and fauna	During the land preparation activities	<ul style="list-style-type: none"> - Perform logging stands on the location of the power plant - Reforming the tread area of the power plant, PLTMG and CNG Plant with existing flora - Protect and preserve the flora and fauna, wildlife, not killing, capturing, and trade will however maintain, rehabilitate, securing of extinction and placed on native habitat . - No hunting, no damage habitat, do not take the animals but rather to preserve the flora and fauna (tringgiling, lizards, birds, etc.). 	<ul style="list-style-type: none"> - Monitoring the activities of clearing land for land preparation - Monitor the type and number of flora and fauna - Monitoring the condition of the habitat of flora and fauna around
13	Decrease Air Quality	Construction	Construction of the main building and supporting	Physical chemical components of the form increased dust	During the main and supporting development activities	<ul style="list-style-type: none"> - To speed restriction conveyance equipment and materials - Perform regular maintenance on the machine used vehicles - Closing the tailgate with a tarp when transporting material - Using vehicles that qualify administratively feasible road (pass the test of KIR) - Doing watering in a dusty 	<ul style="list-style-type: none"> - To monitor the conveyances vehicle's speed limit - Monitor the type and number of vehicles used - Monitor the activities of the transport vehicle engine maintenance - Monitor the feasibility test vehicle emissions - Monitor the health conditions of workers and the

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
						driveway area and location of the project, especially in the dry season - Set the frequency of engine traffic transport vehicle ; - Planting buffer area around the plant were able to reduce dust - Create a high exhaust chimney and installing vacuum cleaner that can work in centrifuges	surrounding environment - Monitoring the attitudes and perceptions of the activities carried - Monitor the traffic flow of vehicles - Monitor the crop planting activities around the buffer area - Monitor the effectiveness of the chimney exhaust gases and vacuum
14	Noise enhancement	Construction	Construction of the main building and supporting	Chemical physical components include increased noise	During the activity of the main building and supporting	- Work during the day to reduce the impact of noise - Perform fencing or closure of the local area with the outer limits - Set the frequency of engine traffic transport vehicle ; - Install a noise reducer on the source of the turbine and generator - Planting buffer area around the plant are able to muffle the sound	Monitor work activities - Monitor the type and number of vehicles used - Monitoring the attitudes and perceptions of the activity of making access road - Monitor the traffic flow of vehicles - Monitor the effectiveness of noise barriers - Monitoring the activities of planting
15	Public Health Disorders	Construction	Construction of the main building and supporting	Public health component in the form of a public health disorder	During the development activities of the main building and supporting	- Implement air quality management - Setting up an installation of waste management in accordance with the ability of liquid waste generated - Providing the best solution to	Monitor the effectiveness of the management of air quality - Monitor the effectiveness of waste management - Monitor the health conditions of workers and the surrounding environment

Environmental impact analysis

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
16	Public Unrest	Construction	Construction of the foundation tower	Social component in the form of social unrest that was around the location of activities	During the construction of the foundation and establishment activities tower	<p>the attitude and the input and public perception</p> <ul style="list-style-type: none"> - To coordinate with the village and the local community - Inform the action plan which includes a schedule of activities, stage activities and procedures for the implementation of activities to the public - Providing the best solution to the attitude and the input and public perception - To coordinate with the village and the local community 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions of people who suffered health problems as a result of the project - Monitoring the attitudes and perceptions of the project activities are implemented - Monitor the health conditions of workers and the surrounding environment
17	Decrease Air Quality	Construction	Construction of the foundation tower	Physical chemical components of the form increased dust	During the construction of the foundation and establishment activities tower	<ul style="list-style-type: none"> - Perform regular maintenance on the machine used vehicles - Closing the tailgate with a tarp when transporting material - Using vehicles that qualify administratively feasible road (pass the test of KIR) - Doing watering in a dusty driveway area and location of the project, especially in the dry season - Set the frequency of the carrier vehicle engine traffic 	<ul style="list-style-type: none"> - Monitor the type and number of vehicles used - Monitor the activities of the transport vehicle engine maintenance - Monitor the feasibility test vehicle emissions - Monitor the health conditions of workers and the surrounding environment - Monitoring the attitudes and perceptions of the activities carried - Monitor the traffic flow of vehicles
18	Public Unrest	Construction	Installation and withdrawal	Social component in the form of	During the installation	<ul style="list-style-type: none"> - Inform the action plan which includes a schedule of 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions of the project

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
			wires	social unrest that was around the location activities		activities, stage activities and procedures for the implementation of activities to the public - Providing the best solution to the attitude and the input and public perception - To coordinate with the village and the local community - Inform the action plan which includes a schedule of activities, stage activities and procedures for the implementation of activities to the public - Providing the best solution to the attitude and the input and public perception - To coordinate with the village and the local community - Implement air quality management - Inspect and test the reliability and effectiveness of the plant working according to the standard commission testing - Implement noise management - Inspect and test the reliability and effectiveness of the plant working according to the standard commission testing	activities are implemented - Monitor the health conditions of workers and the surrounding environment - Monitor the condition and effectiveness of wires
19	Public Unrest	Construction	Commissioning	Social component in the form of social unrest that was around the location activities	During the commissioning activity		- Monitoring the attitudes and perceptions of the project activities are implemented - Monitor the health conditions of workers and the surrounding environment
20	Decrease Air Quality	Construction	Commissioning	Physical chemical components of the form increased dust	During the commissioning activity		- Monitor the effectiveness of the management of air quality - Monitor the effectiveness of inspection and testing activities
21	Noise enhancement	Construction	Commissioning	Chemical physical components include increased noise	During the commissioning activity		- Implement noise management - Inspect and test the reliability and effectiveness of the plant working according to the standard commission testing

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
22	Improved electrical energy	Construction	Commissioning	Chemical physical components include increased noise	During the commissioning activity	<ul style="list-style-type: none"> - Inspect and test the reliability and effectiveness of the plant working according to the standard commission testing - Provide an explanation and understanding of the action plan and the benefits and negative impacts that will arise 	<ul style="list-style-type: none"> - Monitor the effectiveness of generators - Monitoring the attitudes and perceptions commissioning activities
OPERATION STAGE							
1	Job Opportunity	Operation	Recruitment	Social component to creation of employment opportunities for the community around the project	During operations activities	<ul style="list-style-type: none"> - Provide information to the public about the job opportunities - Giving priority to local labor and equipment in accordance with the needs of the work required - Providing wage / salary in accordance with the applicable minimum wage - Approach promotive and preventive health measures for workers' health - Implement management Occupational Health and Safety (K3) and the basics of Communication , Information , Education and Communication (IEC) - Setting the administration in the form of employee working hours arrangements 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions of job opportunities - Monitor the number and needs of local labor - Monitoring the level of local employment income - Monitor the administration regarding the payment of wages - Monitor the effectiveness of management Occupational Health and Safety (K3) and the basics of Communication , Information , Education and Communication (IEC) - Monitor the effectiveness of employee working hours arrangements

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
2	Public Unrest	Operation	Gas Distribution	Social component in the form of social unrest that was around the location activities	During the gas distribution activities	<ul style="list-style-type: none"> - Inform the action plan which includes a schedule of activities, stage activities and procedures for the implementation of activities to the public - Providing the best solution to the attitude and the input and public perception - To coordinate with the village community and relevant agencies - Conduct periodic inspection of gas pipeline 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions of the project activities are implemented - Monitor environmental conditions surrounding the possibility of the danger of a gas leak - Monitoring the activities of gas distribution pipeline inspection - Monitor the effectiveness of gas distribution pipelines
3	Public Unrest	Operation	Operating and Maintenance PLTG, PLTMG and CNG Plant	Social component in the form of social unrest that was around the location activities	During the operation and maintenance activities	<ul style="list-style-type: none"> - Provide an explanation and understanding of the action plan and the benefits and negative impacts that will arise - Providing the best solution to attitude and the input and public perception - To coordinate with the village and the local community - Implement a program of Corporate Social Responsibility (CSR) - Approach promotive and preventive health measures for public health - To coordinate regularly with the device and surrounding communities about the 	<ul style="list-style-type: none"> - Monitor the effectiveness of the explanation and understanding of the project activities - Monitoring the attitudes and perceptions of the activities - Monitor the health conditions of workers and the public - Monitor the effectiveness of program activities CSR

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
4	Decrease Air Quality	Operation	Pengoperasian dan pemeliharaan PLTG, PLTMG dan CNG Plant	Physical chemical components of the form increased dust	During the operation and maintenance activities	<p>activities to be carried out concerning safety and health at the project site and settlements</p> <ul style="list-style-type: none"> - Continuing the management of air quality that has been done before - Plan and implement sound development of health and environment-friendly - Creating effective planning in determining the time plant operations and maintenance time - Perform maintenance of machinery, equipment and supplies regularly and on time - To monitor the exhaust gas stack emissions on a regular basis - Conducting reforestation to reduce exhaust gas - Doing plan to use of river channels as an alternative means of transport 	<ul style="list-style-type: none"> - Monitor the effectiveness of the management of air quality - Monitoring the attitudes and perceptions of the activities - Monitor the health conditions of workers and the public - Monitor the traffic flow of the river to be used as transportation lines - Monitor the results of air quality testing at regular intervals
5	Noise enhancement	Operation	Pengoperasian dan pemeliharaan PLTG, PLTMG dan CNG Plant	Chemical physical components include increased noise	During the operation and maintenance activities	<ul style="list-style-type: none"> - Continuing the noise management activities that have been implemented - Plan and implement sound development of health and environment-friendly - Doing plan to use of river channels as an alternative 	<ul style="list-style-type: none"> - Monitor the effectiveness of the management of noise already implemented - Monitoring the availability of ear plugs - Monitor the awareness of workers to use ear plug - Monitoring the attitudes and

Environmental impact analysis

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
						<ul style="list-style-type: none"> means of transport Provides ear plug for labor 	<ul style="list-style-type: none"> perceptions of the activities of plant operations Monitor the traffic flow of the river to be used as transportation lines Monitor the noise level test results on a regular basis
6	B3 waste arising	Operation	Operating and Maintenance PLTG, PLTMG and CNG Plant	Chemical physical components include increased noise	During the operation and maintenance activities	<ul style="list-style-type: none"> Perform the operation of the wastewater treatment unit as optimal as possible Manage the B3 waste, used oil, dumping area around the power plant unit activities and PLTMG Planting aquatic plants in wastewater pond and marsh around which can reduce wastewater In cooperation with third parties who have a permit 	<ul style="list-style-type: none"> Monitor the effectiveness of wastewater treatment unit Monitoring the environmental conditions around the pond and marsh WWTP Monitor cooperation with third parties who have a permit Monitoring the attitudes and perceptions Monitor the health conditions of workers and the public
7	Magnetic Field and Electric Field Enhancement	Operation	Distribution of electrical energy	Chemical physical components by increasing the magnetic field and electric field	During the electric energy distribution activities	<ul style="list-style-type: none"> Promote the emergence impact of the magnetic field and electric field does not exceed the quality standards Installing an alarm in the vicinity of the substation and 150 kV Tower SUTT Install lights on wires in between tower -tower SUTT 150 kV Coordinate between PT . PLN with the Department of 	<ul style="list-style-type: none"> Monitoring the environmental conditions around the track SUTT Monitor the effectiveness test electrical energy Monitor the results of the coordination of activities between PT . PLN with the Department of Communication and Information of the local district

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No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
						<p>Communication and Information the local district of aircraft flight paths</p> <ul style="list-style-type: none"> - Install a grounding cable according to the climatic conditions in each region (more lightning , the more the ground mounted) 	<ul style="list-style-type: none"> - Monitoring the attitudes and perceptions - Monitoring the condition of public health
8	Disturbance of flora and fauna	Operation	SUTT network maintenance	Biological components such as disturbance of flora and fauna	During network maintenance SUTT	<ul style="list-style-type: none"> - Perform logging stands on the location SUTT - Reforming the tread area SUTT with existing flora - Protect and preserve the flora and fauna, wildlife, not killing, capturing, and trade will however maintain, rehabilitate, securing of extinction and placed pda native habitat. - No hunting, no damage habitat , do not take the animals but rather to preserve the flora and fauna (tringgiling , lizards , birds , etc.) . 	<ul style="list-style-type: none"> - Monitor the effectiveness of Yapak SUTT - Monitor the maintenance and condition of the habitat of flora and fauna
9	Improved electrical energy	Operation	Plant operation and distribution of electrical energy	Chemical physical components by increasing the electrical energy	During power plant operation	<ul style="list-style-type: none"> - Inspect and test the reliability and effectiveness of the plant working according to the standard commission testing - Optimizing the performance of generators - Set the electrical energy generated channeling plant to the substation through the 	<ul style="list-style-type: none"> - Monitor the effectiveness of generators and transmission lines - Monitoring the attitudes and perceptions towards operations

No.	Impact Will Happen	Activity Stage	Impact Source	Affected components	Impact Period	Management	Monitoring
						Switch Yard - Provide an explanation and understanding of the action plan and the benefits and negative impacts that will arise	

4.3 Environmental Feasibility Assessment Recommendations

Based on the results of the study, the environmental impact would be caused by the activities of Capacity power plant Bangkanai 140 MW , SUTT 150 kV Bangkanai - Muara Teweh and PLTMG Bangkanai 155 MW and CNG Plant Central Kalimantan, the business plan and or activity can be declared worthy of the environmental aspect, taking into several aspects , among others :

- 1) Construction of power plants and networks will strongly support this SUTT in an effort to encourage physical development and economic growth of the region.
- 2) Development Bangkanai power plant of 140 MW and 155 MW PLTMG Bangkanai will increase the installed capacity in the province of Central Kalimantan, which currently only has an installed capacity of 191 MW with power capable of approximately 154 MW and a peak load of 169 MW.
- 3) Construction of 150 kV lines Bangkanai SUTT-Muara Teweh will be able to provide electricity surrounding population, considering the population distribution in the region apart.
- 4) The location of the power plant is located in the forest area so that environmental impacts will occur will be isolated by plants or plants that are around.
- 5) The location of the power plant is located near the river path Lahei, so it can be used as an alternative access point mobilization and demobilization of equipment / material.
- 6) Power plant, PLTMG and CNG Plant has technology machinery and equipment and facilities which allows to reduce the environmental impact that occurs.