Table 5.2 Parameters and Quality Standard of Air Quality and Noise

No	Parameter / Variable	Unit	Results 01	Results 02	Method	Quality standards *
(1)	(2)	(3)	(4)	(4)	(5)	(6)
1	Dust (TSP)	µg/Nm^3	83,4	166,7	JS B 7954 - 88	233
2	Sulfur Dioxide (SO_2)	µg/Nm^3	14,1	10,2	JIS B 7954 - 77-95	565
3	Carbon Monoxide (CO)	µg/Nm^3	-	-	-	10.000
4	Nitrogen Dioxide (NO2)	µg/Nm^3	68,3	44,8	JIS B 7954-77-95	150
5	Black lead (Pb)	µg/Nm^3	< 0,01	< 0,01	JIS B 7953 - 81	60
6	Noise	dBA	59,57	61,39	Sound level meter	70

Data Source: Laboratory Analysis Results Bapedalda-SU, 2003

Description:* Referring to RI Government Regulation No. 41 of 1999 and Decree of State Minister of Environment Number: Kep.48 / MENLH / II / 1996 regarding Quality Standard of Noise Level

The results of the above ambient air quality measurement, the dust parameter and gas parameter content consisting of So2, NO2 and Pb at project site location (01) and human settlement location (02) indicate that the measured contents is still far below the threshold value as stipulated by Government Regulation RI Number 41 Of 1999. However, the parameters have been detected where for dust content at the location (01) of 83.4, µg/Nm^3 and the location (02) of 166,7 µg/Nm^3, for detected SO_2 content of 14,1 µg/Nm^3 and 10,2 µg/Nm^3: detected NO2 content is 68,3 µg/Nm^3 and 44,8 µg/Nm^3, and the Pb content of both the location was detected equally, namely < 0,01 µg/Nm^3. From the measured ambient air quality indicates that the air quality in the project area and surrounding areas is still good.

The results of above noise measurements shows that the noise level for the project site location (01) and the human settlement location (02) is detected of 59.57 dBA and 61.39 dBA. This value is still far below the quality standard according to the Decree of the State Minister of

Environment Number: Kep.48 / MENLH / 11/1996 on Noise Level Quality Standards. This is possible due to the absence of construction activities that is run so as not to potentially cause the noise impact to the surrounding environment.

2) Physiography

2.1) Morphology

The Asahan regency area stretches from the Malacca Strait seaside to the mountain hill area line so that the area has an altitude which varies from 0 mdpl to 2.121 mdpl. Based on the altitude from sea level, the Asahan regency area is divided into 3 (three) categories, namely:

1. Lower Asahan : it generally has an altitude of 0-25 mdpl.
2. Central Asahan : the area is a coastal plains with a altitude of 25 - 100 mdpl.
3. Upper Asahan : this area is a plateau with an altitude above 100 mdpl.

From the topographical map of the study area of Medang Deras sub-district, it is known that morphological conditions in the area are included in the lower Asahan region. This region is a lowland or swampy area. It generally has a altitude of sea level between 0-25 m dpl and has a land slope of 0-2%. The lands in this area are commonly used for palm / cocoa, coconut, food / holticulture, saltwater and brackish fish (shrimp / grouper fish), and coastal tourism activities. Other potentials are quartz sand, aluminum industry and other industries of

marine and harbor natural resources. Map of Medang Deras sub-district is shown in Figure 5.1.

2.2) Geology

In Asahan Regency there are at least 11 types of land spatially dispersed. The soil types are Red-Yellow Podzolic (PMK), Brown-Yellow Podzolic (PCK), Hydromorphic Alluvial, Gray Regosol, PCK Association and Regosol, PCK and Gray Hydromorphic Association, PCK and Red Yellowish Podzolic (PMK) Association, Hydromorphic and Gray Alluvial Association, Gray Alluvial and Gray Brown Alluvial and the Gray Hydromorphic Association with Gray Regosol.

From the geological map can be seen that the soil types in the study area are included in the Hydromorphic Alluvial type, the gray hydromorphic association with gray regosol, gray Regosol. In general, the effective depth of soil is relatively deep, i.e above 60 cm. This means that the soil conditions in the study area is generally relatively fertile. (Data: Evaluation of Spatial General Plan (RUTRW) of Asahan Regency 2002 - 2011)

The geological map of Asahan Regency is presented in Figure 5.2.

3) Hydrology

3.1) Potential Water Resources

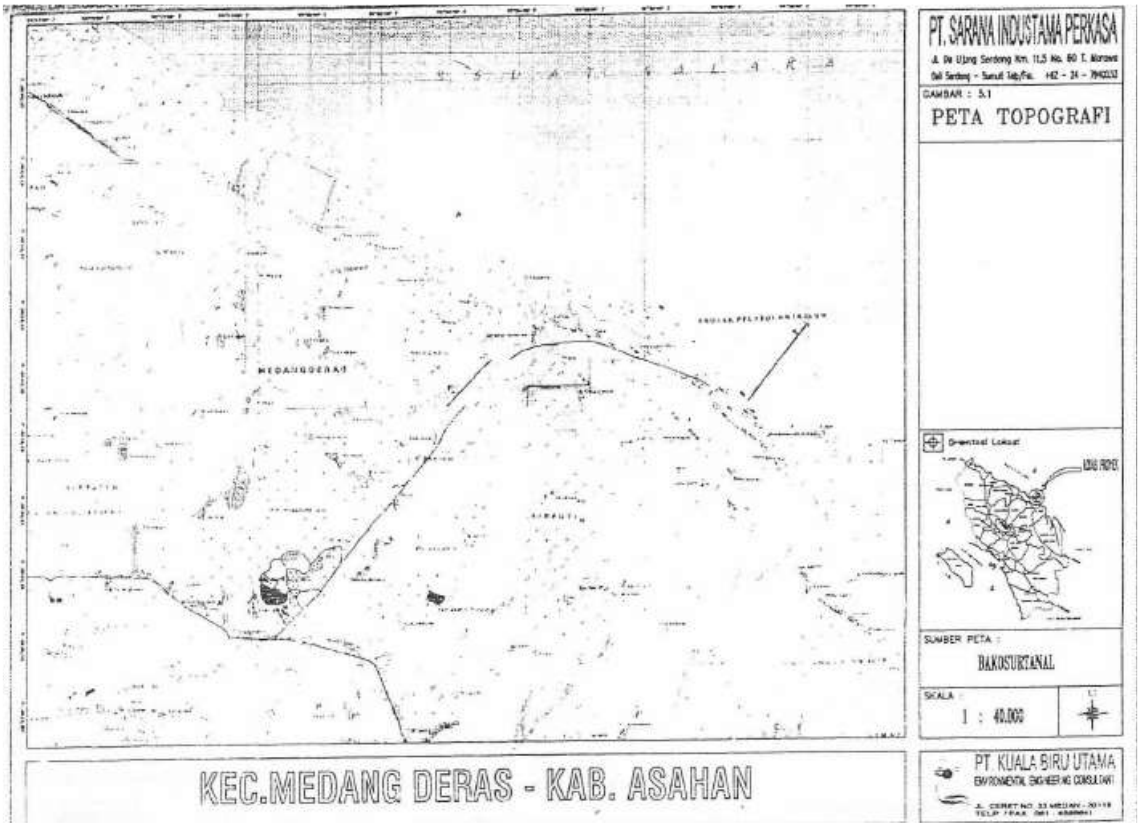
The Asahan Regency has relatively enough water. This is because the Asahan regency has many rivers, both large and small, that empties along the east coastline. There are 21 rivers crossing the Asahan Regency. These rivers are generally upstream in the Regencies of Simalungun, Toba Samosir, North Tapanuli and Asahan itself. Several major rivers that cross the Asahan regency, including the Bah Bolon and Asahan rivers. The entire river is divided into 4 (four) watersheds:

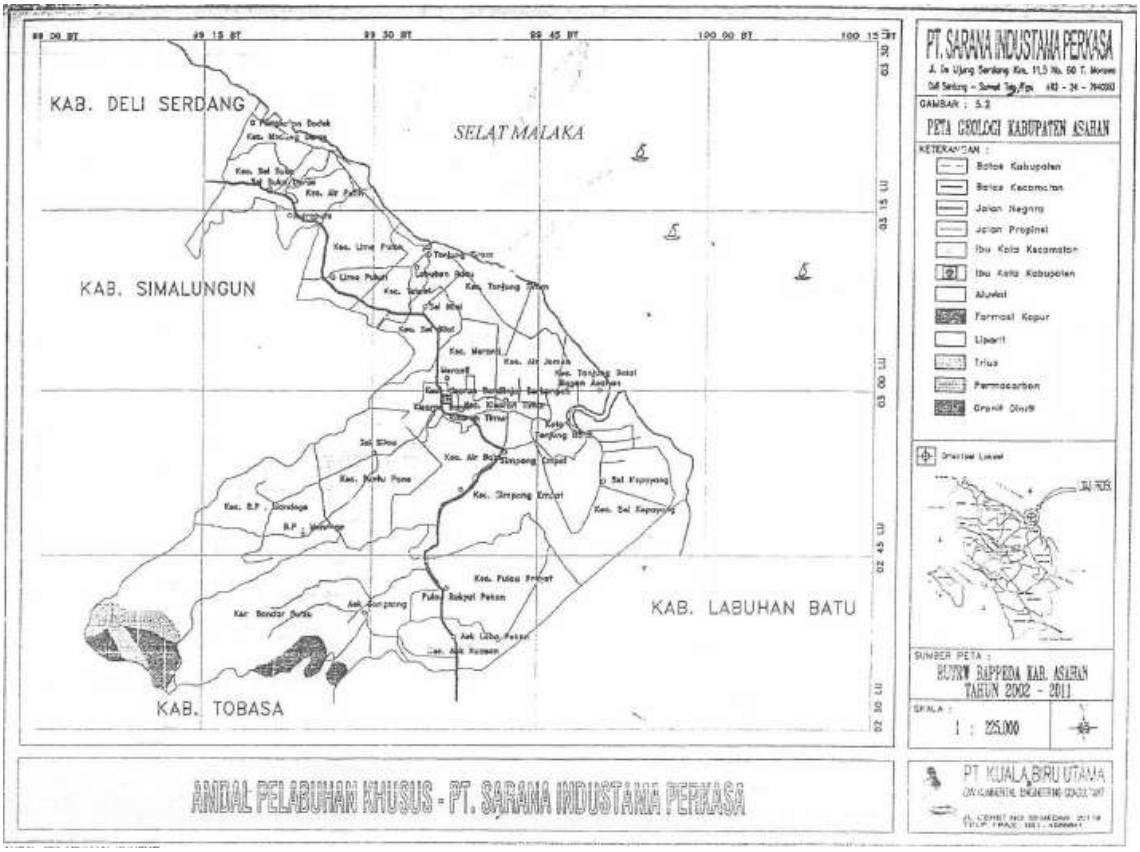
1. Asahan watershed, with an area of 13,419 ha and is the largest watershed.
2. Bah Bolen watershed, has a upstream in North Tapanuli.
3. Sei Silau Watershed, area of 1,470 ha with upstream in Simalungun Regency.
4. Sei Padang Watershed.

The closest river from the study area is the Padang River. Watershed (DAS) is an Asahan watershed where in the upstream has 3 (three) main branches, namely Pagurawan River, Sipare-Pare River, Padang River and the downstream is Sono River. The catchment area is in Sei Padang area. The catchment area maps are shown in Figure 5.3.

Some of the water coming from the river has been well managed for agricultural cultivation and plantation activities through irrigation channels. Other utilization

is for industrial activities, such as aluminum processing industry of PT. lnalum, flour processing industry, and oil palm processing industry as will be implemented by PT. Sarana Industama Perkasa.

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SELAT MALAKA
KAB. SIMALUNGUN
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KAB. TOBASA
PT. SARANA INDUSTAMA PERKASA
PETA GEOLOGI KABUPATEN ASAHAN
KETERANGAN :
Batas Kabupaten
Batas Kecamatan
Jalan Negara
Jalan Propinsi
Ibu Kota Kecamatan
Ibu Kota Kabupaten
Aluvial
Formasi Kopur
Liparit
Trias
Permocarbon
Granit Diorit
SUMBER PETA :
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TAHUN 2002 - 2011
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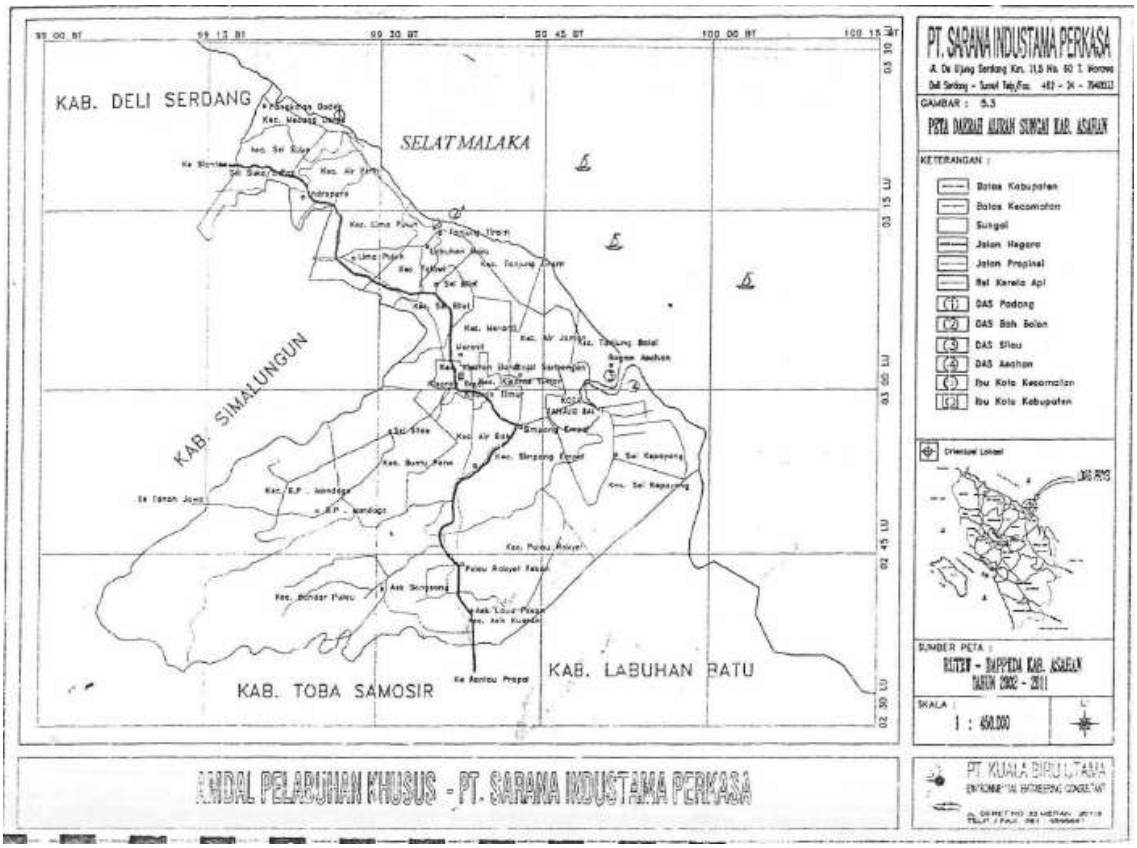
PT KUALA BIRU UTAMA
ANDAL PELABUHAN KHUSUS - PT. SARANA INDUSTAMA PERKASA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KAB. TOBA SAMOSIR
PT. SARANA INDUSTAMA PERKASA
PETA DAERAH ALIRAN SUNGAI KAB. ASAHAN
KETERANGAN :
Batas Kabupaten
Batas Kecamatan
Sungai
Jalan Negara
Jalan Propinsi
Rel Kereta Api
DAS Padang
DAS Bah Bolon
DAS Silau
DAS Asahan
Ibu Kota Kecamatan
Ibu Kota Kabupaten
SUMBER PETA :
RUTRW - RAPPERDA KAB. ASAHAN
TAHUN 2002 - 2011
SKALA :
1 : 450.000
PT KUALA BIRU UTAMA
ANDAL PELABUHAN KHUSUS - PT. SARANA INDUSTAMA PERKASA

3.2) The Quality of River Water

The quality of river water is conducted in 2 (two) locations, namely Besar river (A) and Sono river (B), where Besar river is taken as the standard water source for port operational clean water supply (Class 1 designation) and Sungai Sono as receiving water body of run off from location (designation of Class II). The measurement of water quality in the location of the Great River is intended to know the quality as a benchmark to determine the standard water treatment system into clean water. And water quality measurement at Sono River location to know initial hue condition of the water quality before port activity managed by PT. Sarana Industama Perkasa operates.

Table 5.3. Result of River Water Quality Analysis

No	Parameter / variable	Unit	Results of Analysis on location		Analysis Method	Quality standards	
			A	B		Class I	Class II
A	Physics:						
1	TSS	mg/l	68	100	JIS K 0102-24	50	50

2	pH	-	7,23	6,74	SNI 06-2413-1991	6-9	6-9
3	DO	mg/l	5,68	7,31	SNI M 11-1990	6	4
4	COD	mg/l	5	165	IK PSPDL 30085/LO/200	10	25
5	BOD	mg/l	2,84	69	JIS K 0102-21	2	3
6	NH3N	mg/l	0.11	-	Salystate	0.5	-
7	Oil Fat	mg/l	19	-	JIS K 0102-24	1000	1000
8	PO4 Total	mg/l	0.32	-	JIS K 0102-46.3	0.2	0.2
9	Nitrite (NO3)	mg/l	1,18	-	JIS K 0102 43.2.4	0.06	0.06
10	Sulfate (SO4)	mg/l	< 0.01	-	Sulfa Ver.4	400	-
11	H2S	mg/l	0.0008	-	Metylen Blue	0.002	0.002
12	Nitrate (NO2)	mg/l	0.08	-	JIS K 0102 43.2.4	10	10
13	Iron (Fe)	mg/l	1,60	-	SNI M-89-1990-03	0.3	-

14	Magnesium (Mg)	mg/l	0.62	-	JIS K 0102 51.2	-	-
15	Zinc (Zn)	mg/l	0.05	-	SNI M-73-1990-30	0.05	0.05

Data Source: Laboratory Analysis Results of Bapedalda-SU.2003

Description: Referring to the Quality Standard of Government Regulation Rl

Location A = Besar River Water

Location B = Sono River Water

Sign - = it is not done testing

From the results of laboratory analysis is known that there are several parameters of water quality measured levels exceeding the quality standard threshold set, namely the Regulation of the Republic of Indonesia no. 82 of 2001 for water quality standard criteria of Class I and Class II. The quality condition of the well water is:

- Total dissolved solids

  The dissolved solids are solids having a smaller size than suspended solids, comprising inorganic and organic compounds dissolved in water affecting the water

concentration or by water density, and sometimes the dissolution of the solid is accompanied by a change in the water color. Water containing a dark concentrated solution will reduce the penetration of sunlight into the water, which will interfere with the process of photosynthesis by water plants (phytoplankton). As a result the amount of dissolved oxygen availability will decrease and affect the life of living organisms in the water.

From the results of laboratory analysis showed that the value of Total Dissolved Solids (TSS) of the second river water has exceeded the quality standard set PP. 82/2001, i.e. at 68 mg / l and 100 mg / l.

- pH

The pH parameter is one of the important parameters in groundwater, of which pH or Power of Hydrogen (acidity degree) is a commonly used term that indicates the acid or alkaline water conditions or more accurately indicates the hydrogen ion concentration of water. Often, the pH of water is used to express good and bad water as the environment, although the good and bad quality of water still depends on various other factors such as temperature, dissolved oxygen, and photosynthesis activity. The pH value of water can give

an idea of the continuity of acids and alkaline absolutely measuring the concentration of H+ ions. The buffer capacity in water is primarily determined by silicate ions. The acidity degree (pH) has a great influence to the life of plants and aquatic animals, among others affecting respiration, nutritional content and productivity and endurance of organisms. In addition, it is closely related to the composition of species from a community and other processes. In marine waters, the system of carbon dioxide and bicarbonate acids acting as buffr that can retain the pH of sea water in a small fluctuation. From the results of measurement and laboratory analysis of pH levels in the both rivers are still below the quality standard threshold, i.e 7.23 and 6.74.

- Dissolved Oxygen (DO)

  Oxygen is one of the gases found in seawater. The oxygen solubility in seawater is highly dependent on partial gas pressure, temperature, flow, waves, turbidity and water turbulence. The maximum oxygen solubility in seawater is ± 7.0 mg/l at 27 ° C. In general, the oxygen content < 4 mg/l can interfere with water biota (Mc Neelly et al, 1979).

The dissolved oxygen is the most critical parameter in the waters, as the every living creature (water organisms) needs dissolved oxygen to live its life processes, preserving the species reproduction, fertility, and development of a population of organisms. Threshold value is according to PP RI. 82 Of 2001 Class I = 6 mg / l and Class II = 4 mg / l. DO Parameters of Besar River are 5.68 mg / 1 and Sono River = 7.31 mg / I. The DO content of both rivers sufficiently support the life of the organisms in the waters, because the DO content for fishing activities should not be less than 4.0 mg / l and the waters containing the pollutants should not be less than 2.0 mg / l (Purnomo and Hanafi, 1982). In general, a reduction in DO levels in aquatic area can be caused by respiratory activity of plankton, nekton, benthos and microorganisms in the biochemical process.

- BOD (Biological Oxygen Demand) and COD (Chemical Oxygen Demand)

  The BOD values indicate the amount of oxygen needed by microbes to oxidize organic matter in water to inorganic compounds in a simpler form. While COD is the oxygen needed to oxidize chemical compounds. BOD and COD are generally used as an indicator of the contamination of

organic matter and not proper waters for household purposes. Both of these indicators can indicate the amount of oxygen used to decompose organic materials by microorganisms or by chemical reactions so it can also determine the pollution load of water from a pollutant source. The BOD parameters according to the measurement results on both rivers show already exceeded the established quality standard of 2 mg / l and 3 mg / l. This condition indicates that river waters contain a lot of organic waste material which may be derived from community activities in the upstream, so that a large amount of dissolved oxygen by microorganisms is required to break down or degrade the organic material. The more organic waste in the water is increasingly less dissolved oxygen content residual in it.

And for the parameter of COD indicated on the Besar River the level is still below the quality standard threshold, but on the Sono River it has exceeded the established quality standard, which is equal to 165 mg/l. It also deals with organic waste materials. Although theoretically, COD has a value doubled from the BOD value because in BOD testing there are limitations in oxidizing the organic waste and subsequent oxidation can be done by COD test reaction.

- Nitrogen

  Nitrogen compounds are one of the important parameters, because nitrogen compounds in the form of free ammonia are compounds that are toxic to fish and other biota, so that nitrogen compounds deserve to be known in the waters. The nitrogen compounds observed in this study were N-NO2, and N-NO3. The result of measurement of nitrogen compounds in the form of N-NO2 (Nitrite) is 1.18 mg / l in Besar River (for Sono River is not done testing), this value has exceeded the threshold value for nitrite = 0.06 mg / l. While the N-NO3 compound or nitrate compound is a completely oxidized nitrogen compound, in addition, this nitrate compound is a macro nutrient that determines primary productivity. This nitrate compound is a fairly stable compound due to the presence of oxygen dissolved in water. The result of measurement of nitrate compound in Besar river did not show the level exceeding the quality standard (0.08 mg / l).

- Dissolved Metals (Total of PO4, NO3, NO2, SO4, H2S, Fe, Mg, and Zn)

  Heavy metals are parameters in the waters greatly affecting the water quality because heavy metals are

stable and accumulative. Measurable metal elements include: Iron, Zinc, phosphate, Magnesium and Sulfate. From the results of Besar river water analysis some parameters that have exceeded the quality standard threshold are: levels of phosphate (0.32 mg / l); Magnesium (0.62 mg / l); Iron (1.60 mg / l) and H2S (0.008 mg / l); Zinc (0.05 mg / l), Sulfate (<0.01 mg / l); its value is still below the threshold of quality standard according to PP RI No. 82 Of 2001 Class I. The high level of metal in river water quality measured at the current condition if will be used as standard water for clean water then have to go through the processing first.

- Oil and fat

  Oils and fats are not present in natural water systems, a high enough concentration of these components may interfere with biological activity in river bodies. Oil and fats in the Besar River are detected at 19 mg / l, this value is still well below the specified quality standard threshold of 1000 mg / l.

3.3) Quality of Wells Water

The location of the sampling of the well water is selected in 2 (two) different locations by looking at the

hydrological and geology flows of the soil at the site of Location 1: the well water within the site location where the well will be used as a source of clean water reserves for the dedicated Port Operation managed industrial area. And location 2: in the residents' wells in front of the site location which functioned as monitored well to the possibility of waste intrusion due to activities or due to other activities. The results of the well water laboratory analysis from the Environmental Laboratory of Bapedalda of North Sumatra Province are presented in Table 5.4.

Table 5.4. Results of Well Water Quality Analysis

No	Parameter / variable	Unit	Results of Analysis on location		Analysis Method	Quality standards*
			A	B		
A	**PHYSICS:**					
1	TSS	mg/l	56	20	JIS K 0102-24	1500
2	pH	-	8,42	7,73	SNI 06-2413-1991	6,5 – 9.0
3	DO	mg/l	7,51	6,09	SNI M 11-1990	-
4	COD	mg/l	8	9	IK PSPDL	

					30085/LO/200	
5	BOD	mg/l	3,96	2,44	JIS K 0102-21	-
6	NH3-N	mg/l	1.4	0,25	Salystate	-
7	Oil and Fat	mg/l	5	4	JIS K 0102-24	-
8	PO4 Total	mg/l	0.12	0,48	JIS K 0102-46.3	-
9	Nitrite (NO3)	mg/l	1,10	19,88	JIS K 0102 43.2.4	1
10	Sulfate (SO4)	mg/l	1	67	Sulfa Ver.4	400
11	H2S	mg/l	0.001	0,003	Metylen Blue	-
12	Nitrate (NO2)	mg/l	0.07	0.06	JIS K 0102 43.2.4	1
13	Iron (Fe)	mg/l	0,39	0,24	SNI M-89-1990-03	1
14	Magnesium (Mg)	mg/l	2,44	2,78	JIS K 0102 51.2	-
15	Zinc (Zn)	mg/l	0.03	0,11	SNI M-73-1990-30	15
B	Microbiol					

	ogy					
1	Fecal Coliform	Jlh / 100ml	240+	240+	MPN	0
2	Total Coliform	Jlh / 100ml	240+	240+	MPN	0

Data Source: Laboratory Analysis Results Bapedalda-SU, 2003

Description: * Referring to Permenkes of Quality Standard No. 416 / Menkes / Per / IX / 1990

Location A = Drill Well Water of Project Site Location

Location B = Well Water of Population

Sign - : it is not tested

From the results of laboratory analysis is known that there are several parameters of measured water quality that its levels already exceeded the quality standard threshold Permenkes. 416 / Menkes / Per / IX / 1990, ie NO3 parameter location (1) = 1.10 mg / l and location (2) = 19.88 mg / l: microbiological parameters for Fecal Coliform and Total Coliform were detected respectively of 240 amount per 100 ml. For other water quality values are still below the specified quality standard threshold.

4) Spatial, land and soil

4.1) Spatial and land

The dedicated port development planning has considered the Asahan Regency Public Spatial Plans 2005. In addition, it has also received permission from the Regent of Asahan Regency, namely by the issuance of the Decree of Regent of Asahan Regency Number : 102 / BPN / 2003 dated March 11, 2003 regarding the granting of location permit for the purpose of development of core industry of Sawit, Oleo Kimia and Jetty on behalf of PT. Sawit Mas Agro Prima (now called PT Sarana Industama Perkasa: the deed of change is in process).

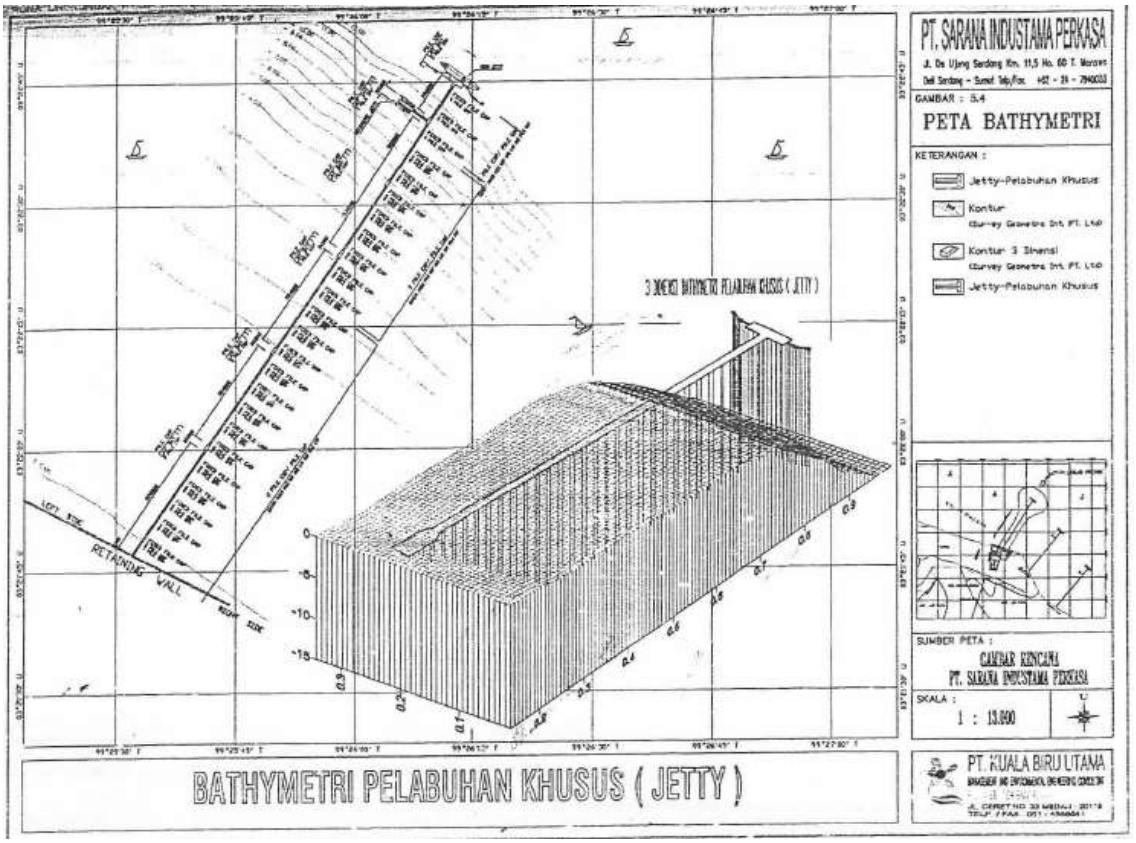
4.2) Regional Development Plan

In regional development plan of Asahan regency that is according to Regional Regulation of Asahan Regency Number 3 of 1995 concerning General Spatial Plan of Asahan Regency, study area is included in Development Area Unit (SPW) I, that is potential as industrial development area, trade and services.

5) Hydro Oceanography

5.1) Topography and Bathymetry

The topography and bathymetry conditions in the study area were described from the survey results conducted by Geometra Intl (PTE) LTD, Singapore. The coastal zona reaches 3% in the area 99. 25'30" T - 99 26'00" T and 03 21'45 "U - 03 22'30" U with bathymetry contour 0.00 to -3.00 to 150 m from shore while depth 15 m reached at 2600 m from shore (Figure 5.4). Description of bathymetry survey results is presented in the appendix.



5.2) Tides

Tidal conditions in the study area are influenced by astronomical forces, in particular the moon and sun gravity. Tidal prediction in the study area was adjusted to

harmonic constants data and admiralty method where the constants were taken from the measurement results of the Hydro oceanographic Bureau at the Port of Kuala Tanjung conducted in 1997. The tidal constant is shown in Table 5.5

Table 5.5. Tidal Constants

Constants	**M2**	**S2**	**N2**	**K2**	**K1**	**O1**	**M4**	**MS4**	**P1**	**ZO**
A cm	80	35	15	9	17	3	1	2	6	160
G	281	233	290	233	359	153	329	276	359	-

Data source: Indonesian Islands tides, 1997

Based on tidal constant value above can be determined the tidal nature by using Formzahl(F) number value with the following formula:

F = (K1 + O1) / (M2 + S2)

Where the classification of Formzahl (F) number values is as follows:

F <0.25 : The tides types a pure double

0.25 <F < 1.50 : The tides types a mixture tends to double

1.50 <F <3.00 : The tides types a mixture tends to single

F> 3.00 : The tides types a pure single

From the numerical value formula of Formzahl (F) above is obtained as follows:

F = (17 + 3) / (80 + 35)

F = 0.087

From the calculation result and the description of the above classification of Formzahl (F) numerical values, it can be classified tidal pattern in the study area in general has a pattern of tides typing pure double (F <0.75). This means that in one day on average there are 2 (two) times the water surface has tided and 2 (two) times the water surface has receded.

Pure double tidal pattern can also be determined with the difference of water level at the time spring tide and dead tide are as follows:

- The change in the water level at spring tide is

  2 x (M2 + S2) = 2 x (80 + 35) = 230 cm

- The change of water level at dead tide is

  2 x (M2 - S2) = 2 x (80 - 35) = 22, 5 cm

so it is obtained the difference of water level during spring tide with dead tide is 207,5 cm or 2,075 m.

The tidal nature of these pure double type also means, in the interval of about 6 (six) hours of relatively short tides, there can be relatively high tidal changes, so in coastal waters the activity must be performed by reacting

relatively faster than the nature of relatively longer single daily.

5.3) Flow Patterns

The condition of the flow pattern in the study area is the result of resuitante between tidal flow, flow on the surface influenced by the wind and global flows of the Malacca Strait. The flow pattern is characterized by the the amount of flow velocity with the condition of night until morning at the time of water to low tide and the amount of flow velocity with daytime conditions at the time of the water to the high tide.

From the measurements results conducted around the study sites indicate that at the time of water to the low tide the flow with a velocity of 51 - 9 cm / sec move towards 300o at night until the morning. While at the time of water to the high tide, with the flow velocity is reduced to 51 - 86 cm / sec move towards 150o during the day. From the flow velocity condition and the direction of movement of the flow are seen that the flow will travel to the southeast at the time of the water toward the high tide and the flow will move to the Northwest at the time of the water to low tide. The flow patterns moving in the waters surrounding the project site are presented in Figure 5.5 and Figure 5.6.

5.4) Waves

The sea wave height in the study area is strongly influenced by wind speed conditions. Wind speed is the maximum wind speed that occurs during a certain period so that the resulting wave height is also the maximum wave height with a maximum period as well.

From the measurement results in the field, the average wave height is 0.7 m. Where in February the wave height reaches 1.5 m - 2.0 m. Forecasting of wave height calculation is approximated using the methods used by Sverdrup, Munk and Bretschneider (S.M.B.) modified by Wilson.

With a maximum wind speed of 6.0 knots. Fetch length (based on weather map by Meteorology and Geophysics Agency) is minimum 200 NM (321,86 km) and gravity speed of 9.8 m / s^2 obtained wave height generated has high of 1.58 m with period 3,76 sec, calculations of wave height and wave period are as follows:

H 1/3 = 0.3*U2*(1-(1/(1+0.004*(g*F/U2)*1/2)*2)/g

T 1/3 = 0,861 *U2*(1-(1/(1+0.08*(g*F/U2)*1/3)*5)/g

Where,

Fl 1/3 is the main wave height (m)

T1 / 13 is the main wave period (seconds)

U2 is wind speed (knots)

F is the fetch length (km)

= the distance between the occurrence of wind to the location of the wave

G = gravity speed (m / s^2)

From the calculation formula of wave height and wave period above were obtained as follows:

H 1/3 = 0.3 *6*(1-(1/(1+0.004*(9.8*200/6)*1/2)*2)/9.8)

= 1.91 m

T 1/3 = 0.861*6*(1-(1 /(1+0.008*(9.8*200/6)*1/3)*5) / 9.8)

= 3,76 sec

5.5) Abrasion and Sedimentation

The abrasion and sedimentation process is caused by the breaking of waves that carry the sedimentary mass, where the result is carried by the ocean flows along the coast which are then transported in the direction of the flow along the shore. In the calculation of the value

determination scale of the abrasion and sedimentation process, the condition is the opposite condition.

The estimation of abrasion and sedimentation in the study area is conducted by a sedimentation survey conducted by Geometra intl (PIE) LTD Singapore. Where from the survey results can be estimated coastal zones experiencing abrasion and sedimentation.

The estimation of abrasion sediment and sedimentation mass transport in the study area is based on the sedimentation survey conducted by Geometra intl (PIE) LTD Singapore. Where from the survey results can be estimated coastal zones that have abrasion and sedimentation. Using the CERC method for 3 (three) observation points, point 1 at the furthest western coastal boundary, point 2 at the farthest northern boundary location and point 3 at the farthest eastern seafront boundary. If the difference between the two points is negative then there is the process of sedimentation. If the difference between the two points is positive then there is a coastal abrasion process.

Calculation of sediment mass transport estimation using CERC method consisting of 3 (three) calculation steps where gravity speed is 9.8 m / s^2, sea water density 14.832 kg / m^2 for water depth 15 m (bathymetry survey). Calculation of

sediment mass transport estimation conducted for 1 (one) point of observation is as follows:

Observation Point 1:

Stage 1

The value C (phase velocity) is approximated by the following equation:

C = (g h) 1/2

Where :

C = Phase velocity (m / s)

g = speed of gravity (m / s^2)

H = Water depth (m)

From the above phase velocity formula is obtained as follows:

C = (9,8 * 15) 1/2

= 12,124 m / s

The value E (Wave energy) is approximated by the equation

E = 1/8 [*p* gH2]

Where

E = wave energy (m^3 / day)

P = Sea water density (y / H - kg / m^3)

g = speed of gravity (m / s^2)

H = wave height (m)

From the above wave energy formula is obtained as follows:

E = 1/8 [14,832 * 9,8 * (15) 2]

= 4,088,07 m^3 / day

The value P (flux Energy) is a function of wave energy, wave phase velocity and constant of water depth.

P = E Cn cos α

Where,

P = Flux energy (m^3 / day)

E = Wave energy (N)

C = Wave phase velocity (m / s)

n = Constant of depth function (1.08 for deep waters)

α = the wave angle based on the direction of the wind and the location of the observation point

From the above flux energy formula is obtained as follows:

P = E Cn cos α

= 4,088,07 * 12,124 * 1,08 * cos 35°

=43,845,49048 (m^3 / day)

The three stages of above calculation at one point of observation can be calculated the amount of mass sediment transport estimation obtained as follows:

Q = 6.8 P

Where

Q = Sediment mass transport (m^3 / day)

6.8 = Constant

p = Flux energy (m^3 / day)

The above mass sediment transport formula is obtained as follows:

Q = 6.8 P

= 6 * 43.845,49048

= 263.072,9428 m^3 / day

= 259.93 tons / day

Mass sediment transport calculations at 2 (two) of other observation points are shown in Table 5.6. below:

Table 5.6. Calculation Result of Mass Sediment Transport Around the dedicated Port Area

Observation Point	Mass Sediment Transport (ton / day)	Sediment Transport Mass Difference (ton / day)	Sedimentation (ton / year)
1	259,93	-	-
2	259,77	-0,48	-175,2
3	259,71	-0,64	-232,5

Source: Results of consultant analysis in 2003

Description : Point 1 on the farthest beach boundary to the west

Point 2 at the North Sea Frontier location

Point 3 at the farthest east boundary location

The sign(-) indicates a sedimentation process

Based on the above calculations, the annual sedimentation in the East (- 232.5 ton / year) is greater than the annual sedimentation of the North (-175.2 ton / year). This sedimentation is relatively small because the beach is

classified as sloping so that the waves towards the coast are reduced.

5.6) Sea Water Quality

Sea water quality is needed as a starting point before the dedicated Port activities operate. The sampling was conducted in 3 (three) locations, namely: Point I at the farthest coastal area to the west, Point II at the northernmost frontier, and Point III at the farthest east boundary. The following lab analysis results are tabulated in Table 5.7.

Table 5.7. Results of Sea Water Quality Analysis

No	Parameter	unit	results			quality standards*
			01	02	03	
A	**PHYSICS:**					
1	Turbidity	Ntu	9,90	5,56	9,90	5,00
2	Smelling	-	-	-	-	natural
3	Suspended Solids (TSS)	Mg/lt	100	58	96	80,0
4	Temperature	°C	26,6	26,7	26,7	natural
B	**CHEMISTRY:**					

1	pH	-	7.00	7,43	6,86	7 - 8,50
2	Salinity	%	29,6	25,2	24,5	34,00
3	Ammonia (NH3-N)	mg/lt	0,01	0,01	0,01	0,30
4	Sulfide (H2S)	mg/lt	-	-	-	0,01
5	Total Phenol Compounds	mg/lt	-	-	-	0,002
6	Surfactant (Detergent)	mg/lt	0,44	0,38	0.31	1.00
7	Oil and fat	mg/lt	53	241	126	1,00
8	Dissolved Metal:					
	- Mercury (Hg)	mg/lt	<0,0005	<0,0005	<0,0005	0,001
	- Cadmium (Cd)	mg/lt	0.01	<0,005	<0,073	0,001
	- Copper (Cu)	mg/lt	-	-	-	0,008
	- Lead (Pb)	mg/lt	0,08	0,26	0,23	0,008
	- Zinc (Zn)	mg/lt	<0.005	0.001	0.001	0.05
	- Chrome	mg/lt	0.01	0.01	0.01	0.005

	Hex					
	- Arsenic	mg/lt	<0,02	<0,02	<0,02	0,012
	- Nickel (Ni)	mg/lt	<0.02	<0.02	<0.02	0.05

Data Source: Laboratory Analysis Results Bapedalda-SU, 2003

• = Quality Standard of Sea Water Quality Analysis in accordance with Ministerial Decree No. 51 of 2004

- = Not Measurable

Point 1 on the farthest coastline to the west

Point 2 at the North Sea Frontier location

Point 3 at the farthest east boundary location

From the results of laboratory analysis, it is known that there are some parameters of seawater quality measured its levels exceeded the quality standard threshold established ministerial decree of the Ministry of Environment Number: Kep 51 Of 2004 Appendix I of Sea Water Quality Standard For Port Waters with parameters such as: TSS Parameters at measured location (1) 9.9 mg / l, location (2) = 5.64 mg / l and location (3) = 9.90 mg / l; pH parameters of location (3) = 6.86; lead level of location(1) = 0,08 mg / l,

location (2) = 0,26 mg / l, Hexavalent Chromium levels of location (1) = 0,01 mg / l, location (2) = 0,26 mg / l, location (3) = 0,01 mg / l and location (3) = 0,23 mg / l and fatty oil parameter of location (1) = 53 mg / l, location (2) = 241 mg / l and location (3) = 126 mg / l. The existence of several parameters whose value has exceeded the quality standard threshold that is set may be a lot of activity in the waters, both port activities in the surrounding location and existing fishery activities.

5.2. BIOLOGICAL ENVIRONMENT

1. Vegetation

The inventory results of vegetation around the operational plan location of the Dedicated Port is dominated by natural vegetation. Primary data collection is done through the roaming method with sampling at location / habitat of the project site and surrounding areas within the scope of the ecological boundary. Completely, it is presented in the following table:

Table 5.3: Types of Vegetation Growing on Dedicated Port Locations

No	Local Name	Scientific Name	Description
	Location: Project Site		
1	wild lily	Cocos nucifera	Wild plants
2	Coconut	Nipa frutescens	Garden plants
3	Nipah	Ceraptopteris	Wild plants
4	Swamp Ferns	Thaliotroides	Wild plants
5	Banana	Musa Paradisiaca	Garden plants
6	Mango	Mangifera Indica	Garden plants
7	Grass	Cyperus rotundus	Wild plants
8	reed	Imperata cylindrica	Wild plants
9	cassava	Manihot utilissima	Garden plants
	Location: South side (residential area)		
1	Bougenville	Bougenvillea Spectabilis	Decorative plants
2	Jasmine	Jasminum Sambac	Decorative plants

3	Rose	Rossa Sp.	Decorative plants
4	Suplir	Adiantum sp.	Decorative plants

Table 5.9 Type of Land Fauna around the Dedicated Port location

No	Class	Local Name	Scientific Name	Description
1	Mammals	Squirrel	lomys horsfield	few
		White Squirrel	Peraurista elegans	few
		Cat	Felix sp	Many
		Bat	Pteropus vampirus	few
		Mangrove Cats	Felix badia	few
		Dog	Canis	few
2	aves	The White	Heliaeetus lencogaster	Moderate
		Sea Eagle Bondol	Heliastur indus	few

		Eagle Shrimp King Herons Alap-Alap turtledove Woodpecker Murai stone Chicken duck	 Cexylepidus Egretta garzetta Ralcitium culus Gallus Domesticus Anas sp.	few Moderate Moderate Few Few Few Many Moderate
3	Reptiles	Snake	Sarpentes sp	Moderate
		Lizard	Maboreya multifasciata	Many
		monitor lizards	Varanus sp	Few
		Chameleon	Gonocephalus sp	Few
4	Insect	Locusts	Locusta sp	Many
		Ant	Angg. Fam. Formicidae	Many
		Cockroach	Periplaneta Americana	Moderate

		Spider	Arachnoidea	Few
		Mosquito	Culex sp	Many
		Dragonfly	Macromia sp	Many
		Flies	Syrphydae sp.	Many

Data Source: Field Survey Year 2003-2005.

3. Plankton Aquatic Ecosystem

Plankton is a living micro organism floating in the water pool and its movement is influenced by water movement. Plankton consists of phytoplankton, zooplankton and various animal larvae. Phytoplankton is a primary producer in most waters, while zooplankton is the first consumer which transfers energy from producers to higher-level consumers such as shrimps and fish. As primary producers and consumers, plankton is strongly influenced by changes in waters quality through assessment of the stability and quality of aquatic environments by looking at the composition and abundance of plankton types. Plankton has a short life cycle, which is about 7 - 10 days and is very sensitive to changes in water environment conditions, so that the water quality and

environmental disturbances can affect the plankton community and populations.

The sampling location of plankton in Malacca Strait waters, which is a dedicated port location, is carried out in 3 (three) locations, namely: Point I at the farthest coastal area to the west, Point II on the farthest northern boundary, and Point III at the farthest east sea boundary location. In the waters of the Sea water at the location (1) there is an abundance of plankton 1147 individuals per liter (phytoplankton 728 individuals per liter and zooplankton 419 individuals per liter), location (2) there is an abundance of plankton 1133 individuals per liter (phytoplankton 710 individuals per liter and zooplankton 423 individuals per liter) and location (3) there is an abundance of plankton 1153 individuals per liter (phytoplankton 729 individuals per liter and zooplankton 424 individuals per liter). The number of plankton taxa of the three sites of 34 taxa (consisting of 19 phytoplankton taxa and 15 zooplankton taxa), with phytoplankton Diversity Index 1.95; Heterogeneity Index 0.66 and Zooplankton Diversity Index 1.82; Heterogeneity Index 0.63. Phytoplankton laboratory analysis results are

presented in Table 5.10 and the zooplankton are presented on Table 5.11.

Table 5.10. Results of Phytoplankton laboratory analysis

PARAMETER	**RESULTS**		
PHYTOPLANKTON	**(1)**	**(2)**	**(3)**
Bacillariophyceae class			
Asterionella	45	43	40
Chaetoceros	42	40	40
Cymbella	35	35	38
Fragiloria	35	40	40
Gyrisigma	30	35	38
Novicula	40	38	35
Synedra	37	40	40
Tabellari	35	37	40
Chlorophyceae class			
Ankistrodermus	30	35	35
Cosnicodiscus	35	34	35
Dinophysis	38	35	40
Noctiluca	40	35	38
Rhizosolenia	35	37	37
Skeletonema	37	32	35

Spirogia	30	32	30
Thalassiosira	52	50	30
Cyanophyceae class			
Mirismopedia	42	40	40
Osillatoria	35	32	35
Trichodesmium	45	40	43
Total Phytoplankton / L	728	710	729
Total Taxa	19	19	19
Diversity Index	1,95	1,95	1,95
Heterogeneity index	0,66	0.66	0.06

Data source: Results of laboratory analysis Bapedalda-SU, 2003

Table 5.11. Results of Zooplankton Laboratory Analysis

PARAMETER	**RESULTS**		
ZOOPLANKTON	**(1)**	**(2)**	**(3)**
Ciliata Class			
Euplotes	30	27	27
Halteria	28	25	25
Stylonyshia	27	30	30
Crustaceae class			

Arcocalamus	25	28	25
Amphileptus	28	30	30
Cyclops	30	27	25
Diaptomus	27	25	25
Eubrancipus	27	30	30
Limnocapalamus	30	27	27
Naulpius	25	28	30
Flagellata class			
Ceratium	27	25	30
Noctilluca	30	32	32
Peridinium	25	28	28
Parameter	results		
	(1)	(2)	(3)
Ratipfera class			
Pleosoma	25	26	25
Testudinella	25	25	25
Total Zooplankton/ L	419	423	424
Total Taxa	15	15	15
Diversity index	1,82	1,82	1,82
Heterogeneity index	0,63	0,63	0,63

Data source: Results of laboratory analysis Bapedalda-SU, 2003

4. **Nekton and Benthos**

Nekton is the type of existing fish in the waters. Benthos consists of fitobenthos and zoobenthos, both macro and micro. In general, it is presented as an environmental indicator is macrozoobenthos. With its sedentary nature, macrozoobenthos organism community is the most suffering organism by the pressure of the aquatic environment. The eating properties of benthic animals range from detritus feeders, suspended feeders, plankton feeders, scavengers, grazing and carnivore. Therefore its community structure is a good indicator for the environmental impact of the waters. Biota of live macrobenthos is in the upper layers of waters with the name epifauna or slightly under it (infauna). Therefore, to be able to guess the type and amount in the waters of the basic sediment samples are not only taken the surface only.

The sampling location is the same as the plankton taking location. From the results of laboratory analysis, it is known at location (1) there is an abundance of benthos 114 individuals per liter with 5 taxa, location (2) there is an abundance of 126

individuals per liter and there are 5 taxa; location (3) there is an abundance of benthos 128 individuals per liter with the number of taxa 6. The diversity index of three location = 1.42 and the heterogeneity index = 0.51. The complete laboratory analysis results are presented in table 5.12.

And for the nekton species of visual observation in the study area there are several types, among others: *Kakap* (Lutjanus sp.), *Tengiri* (Scombermorus sp.), *Bawal* (Stromateus sp.), *Senangin* (Eleutheronema sp.), *Belanak* (Mugil Sp.), *Udang* (Penaeus, Metpenaeus sp.), *Tongkol, Gembung, Kerapu, Teri, Tuna, Layur, Cucut, Pari, Selar*.

Table 5.12. Results of Benthos Laboratory Analysis

PARAMETER	**RESULTS**		
	(1)	**(2)**	**(3)**
BENTHOS			
Bivalvia class			
Psidium lijborgii	12	12	18
Sphaerium Come	18	18	18
Crustaceae class			
Nerila Bermanica	24	24	24
Terebralia	18	24	24

Polistris			
Polycaeta class			
Nereis sp.	24	24	24
Stenalais sp.	18	24	24
Total Benthos / L	114	126	128
Total Taxa	5	5	6
Diversity index	1,42	1,42	1,42
Heterogeneity index	0,51	0,51	0,51

Data source: Results of laboratory analysis Bapedalda-SU, 2003

5.3. SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

The Socio-economic and cultural analysis in the study area include administrative boundaries and social boundaries. The analysis within the administrative boundary is intended to obtain an overview of the socio-economic and cultural conditions of the community in the study area in general, while within the social boundary to see directly the socio-cultural conditions of the people around the project site that are expected to be directly affected by project activities. Some parameters to be discussed include:

population, economy, socio-cultural, public health and community expectations of the project (community perception). The following is explanation of each of these parameters:

1. Demographics

a. Total population

Medang Deras sub-district has a population of 38,819 people, in which 19,599 people are male and 19,220 female. The number of people by age can be differentiated by the classification in Table 5.13 as follows:

Table 5.13: Population by Age in Medang Deras Sub-district

Population by Age	Amount (soul)	Percentage (%)
0 - 6 years	5574	14.35
7 - 12 years	5132	13,22
13 -18 years	5450	14,03
19 - 24 years	2997	7.72
25 - 55 years	12461	32,10
56 - 79 years	2702	6,96
80 years or	4503	11,62

older		
Total	**38.819**	**100**

Data Source: Monographic Data of Medang Deras sub-district, 2003-2005

From the above table, it is known that the highest number of population is in the age group 25 - 55 years as many as 12,461 people or 32.10% of the total population. This proves that the residents of Medang Deras sub-district are in productive age.

b. Number of Households

Medang Deras sub-district consists of 14 villages with 9,299 households. With an area of 6,547 Ha and a population of 38,819 people, it can be known the population density is 5 people / Ha.

c. Population growth

The population growth rate of Medang Deras sub-district is about 2.5 % per year. Based on the latest population census data in 1996 the

population of 37,068 people and in 2001 amounted to 38,979 inhabitants.

The data on planned family participants is almost 20% of couples of childbearing age who participate in planned family programs. This growth consists of natural growth of 1.7% and urbanization of 0.8%.

d. Birth, Death and Migration Rate

The number of residents births in Medang Deras sub-district in the year 2002 as many as 301 infants, so that the fertility rate of 7.75 per thousand populations. The mortality rate reached 3.19 per thousand populations. The rate of population movement is per thousand populations. More data is presented in Table 5.14.

Table 5.14: Many of Population Mutations and Mutandis According to village of Medang Deras sub-district in 2002

No	Type of Mutation	Male	Female	Total
1	Move between sub-districts	27	8	35
2	Comer	101	146	247

3	Birth	143	158	301
4	Mortality	83	41	124
5	Mortality < 5 year	20	15	35
6	Mortality > 5 year	15	17	32

Data source: Monographic Data of Medang Deras Sub-district, 2003-2005

e. Level of education

The number of educational facilities in the Medang Deras Sub-District has been sufficient. School facilities are available from elementary (SD), junior high school (SMP), and high school (SMU). Data on educational facilities are presented in Table 5.15.

Table 5.15 Number of Education Facilities in Medang Deras Sub-District in 2002

No	Education	Private	Public	Amount
1	TK	2	-	2
2	SD	4	12	16
3	SLIP	7	2	11
4	SMU	2	4	6
	Total	**15**	**18**	**33**

Data source: Monographic Data of Medang Deras Sub-district, 2003-2005

2. Socio-Economic

a. Livelihood

The types of livelihoods of the population in the study area are mostly farmers, private employees, fishermen, traders, ranchers and government employees. Quantitatively, the type of livelihoods of the population in the study area is presented in Table 5.16.

b. Economic growth

As an industrial development area, Medang Deras Sub-District has had 6 major industries, 2 (two) markets and about 57 shops / stalls. And many more economic means such as workshops, gas stations, salons and so forth.

Table 5:16: Composition of Population Livelihood of Medang Deras sub-district Year 2002

No	Livelihood	Amount (soul)	Percentage (%)
1	Farmers	7.420	34,73
2	Government employees	402	1,88

3	Private employees	7.148	33,45
4	TNI / Polri	27	0,13
5	Trader	1.117	5,23
6	Pensioner	25	0,11
7	Fishermen	2.952	13,8
8	Large / Medium Entrepreneurs	1.267	5,93
9	Industrial Workers	356	1,66
10	Construction workers	207	0,97
11	Breeders	444	2,08
	Total	**21.365**	**100**

Data source: Monographic Data of Medang Deras Sub-district, 2003-2005

c. Employment and Business Opportunities

The economic centers in this area are located along the main road that crosses the Medang Deras Sub-District. Along the way there are several grocery stalls, gas stations, food stalls, and other economic activities.

d. Income per capita population

The income of the people in Lalar village ranges from Rp 360,000 to 700,000 per month. When it is viewed the

average income of the population is Rp 555.000 (Data: Monograph of Medang Deras Sub-District 2001).

3. Socio-Culture

In the study area, the majority ethnics are Malay ethnic 62.07% and Batak 3.33%, followed by Java ethnic 28.77% and the remaining ethnic is Mandailing and Minangkabau 2.47%. Religion adopted is 96,47% Moslem, 2,17% Christian and 1,36% Buddhist and 0,00% Hinduism. The customs in this area are dominated by the Batak and Malay customs. The kinship system that bases itself on clan relationships is still closely attached to the population at the study site.

Relationships with other regions or locations are not so difficult in terms of transportation. Residents in this area are generally familiar with existing other ethnic groups in Asahan, such as Java, Batak Toba, Mandailing, kayo, Minangkabau, Aceh, and China.

4. Public Health

The number of health facilities and infrastructure is sufficient to serve public health. But for severe diseases there are still many of Asahan residents and surrounding areas who have to seek treatment to Medan / Jakarta city.

Until the end of 2001, the total number of public hospitals in Asahan sub-district is available in 2 units, 5 units of puskesmas, 6 units of general medical center, 16 units of maternal and child health centers. Means of available health services such as hospitals, community Health centers, maternity hospitals and so forth are also relatively adequate.

The diseases that are present in the study area are almost no different from other area in Asahan regency. List of 10 diseases types most commonly suffered according to the disease type in Medang Deras Regency in 1 year is presented in table 5.17.

Table 5.17 List of Top 10 Diseases in Medang Deras Regency in the last 1 year

No	Diseases Type	Total
1	Diarrhea	632
2	Malaria	517
3	ISPA	108
4	Skin allergies	101
5	Diseases of the muscle and tissue system	92
6	Wormy	69
7	Ear infections	55
8	Measles	55

9	Dysentery	55
10	Asthma / ISPB	53

Data Source : Pagurawan community Health centers of Medang Deras regency in the 2005 figures.

5. Security and discipline

The condition of security and discipline in the study area is a very determining factor in the process of dedicated port development activities. From secondary data, it is found that crime and social vulnerability of Medang Deras Sub-district are generally still within the limit of fairness compared to other sub-district conditions in Asahan Regency. The criminal rate for Asahan Regency occupying the top position is the theft by weighting (308 cases), followed by severe maltreatment case (229 cases) and gambling case 216 (cases), as tabulated in Table 5.18.

Table 5.18: Asahan Regency Security Level

No	Type of crime	Total case
1	Crimes against public discipline	0
2	Wildfire	12
3	Currency crime	0

4	Scandalize	0
5	Rape	9
6	Gambling	216
7	Killing	18
8	severe persecution	229
9	mild persecution	43
10	ordinary theft	103
11	Theft with violence	88
12	Theft by weighting	306
13	Extortion	5
14	Embezzlement	0
15	Fraud	19
16	Damaging	48
17	Receptacle	8
18	Curanmor	127
19	Narcotics crime	79
20	Etc	73

Data source: Central Bureau of Statistics of Asahan Regency, 2005

6. Public perception

The public perception is obtained from the interviews results with respondents as many as 50 people living in the nearest settlement with activity location (10% of

the total population), namely Lalang village and Pagurawan Village.

a. Respondents knowledge of project activities

Based on the results of interviews with respondents, it is revealed that 85% of respondents know the plan of dedicated port development through mass media, local government officials, and other activities, as presented in table 5.19.

Table 5.19: Respondents Knowledge of Activity Plans

No	Knowledge of Project Plan	Percentage (%)
1	Announcement	0.00
2	mass media	10
3	local government officials	30
4	Etc	45
	Total	**85**

Data Source: Survey results, 2005

When the study was undertaken, the project activity had begun in stages, ie pre-construction stage activities. Seeing the activities that are already running they know there will be development. But the shape of the building and its activities is not know by some of them for sure but most know will be built

an industrial area with some activities included for the dedicated port.

b. Public perception of activity plan

the responses given by respondents to the development activity plan of the dedicated port and other project development 100% agreed with the various reasons, such as the availability of employment for the surrounding community, the possibility of opening a business, reducing the unemployment rate, increase in people's incomes and making the area more crowded. The community also does not feel disturbed by the existence of project activities, this is possible the distance is not too close and not yet running construction activities. The community's hope is that they are included in the project activities as well as after the operational period.

5.4 COMMUNITY DEVELOPMENT PROGRAM PLAN

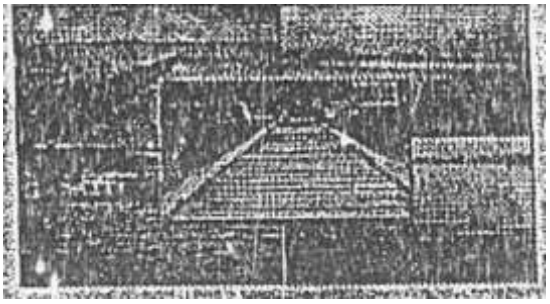
in executing the commitment to environmental management efforts and in order to balance the benefits and impacts that will be generated, PT. Sarana Industama Perkasa as a dedicated port management plans to develop Community Development(hereinafter abbreviated as CD) program mainly related to port activities. The concrete

form is the manager will be open in terms of accommodating or receiving complaints from the Community associated with the port activity area.

The first step of this CD activity, the manager of PT. Sarana Industama Perkasa has conducted a socialization activity of the activity plan related to the implementation of AMDAL at the Lalang Urban Village Office and Pagurawan Urban Village and Medang Deras Sub-District. The existence of activities to the community in the study area directly affected by the dedicated port activities is a goodwill and firm commitment in an effort to involve the community. This activity will continue to the socialization activities on CD program that will be planned by the initiating party, where in this activity, the community associated with the study area needs to know that the CD program funds will not be given in the form of fresh instant money but given in the form of guidance and empowerment of the local community skills and education. This needs to be emphasized, given the public perception stating a CD program is a compensation activity.

Approaches that can be taken to realize the CD program are ecological, financial, political, social, and Hankamnas approach, so it is not enough with the

commitment of the initiator only, but there must be the involvement of various parties, such as government, the environmentalist community, Non-governmental organizations and communities directly involved. Implementation of CD program will be adjusted to the ability of PT. Sarana Industama Perkasa and the needs of the local community concerned with study areas that will be poured in the form of separate CD format, alternative activities can be in the form of awarding scholarships for achievement and for those who cannot afford, procurement of supporting facilities and infrastructure (health and social), disaster management and empowerment of farmers/fishermen groups, etc



CHAPTER IV

IMPACT FORECAST

PT SARANA INDUSTAMA PERKASA

CHAPTER IV

FORECASTS OF MAJOR AND IMPORTANT IMPACTS

The forecasts of major and important impacts are made with reference to important impact criteria according to the elucidation of Article 15 paragraph 1 of Law Number 23 The year 1997, Article 5 of Government Regulation No. 27 of 1999 and the Decree of the Head of Environmental Impact Management Agency no. Kep-056 of 1994 specified;

1. Number of people affected
2. Area of impact distribution
3. The duration of impact takes place
4. Intensity of impact
5. The number of other environmental components affected
6. The cumulative nature of the impact
7. Reversed or not reversed impact

This important impact forecast is done by considering:

a. Environmental capabilities (from the initial hue) in neutralizing / dampening impact;
b. The possibility of neutralization or accumulation between one of impacts with other impacts by means of discussion among the members of the ANDAL study team.

The impact of activities on the environment is the changes that occur in the environment as a result of dedicated Port development activities of PT. Sarana Industama Perkasa. The activity, in this case, is something that is planned and executed by the initiator. Impact on the environment meaning as an event that can be measured both the qualitative and quantitative. Based on the activity plan undertaken by PT. Sarana Industama Perkasa, the stages of development activities of the dedicated Port will have positive and negative impacts in this regard to estimate the impact of a dedicated port development plan on the Environment using the large and important impact identification matrix in Table 6.1 as well as the flowchart presented in Figure 6.1; Figure 6.2, and Figure 6.3.

This flowchart covers all components of the activity from the start of construction to the post-construction activities. The possibility of an impact and an environmental component to both physical, chemical, biological and social, economic, cultural and public health components described in the flowchart.

Table 6.1 Matrix of Great Impact Interactions and Significant Impacts on Pre-Construction, Construction and Post-Construction Stage of dedicated Port Activities Plan

Activities of environmental components	**Activities**																					
	Pre-construction				**Construction**													**Post-construction**				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Physical-chemical components																						
1. Ambient air quality	0	0	0	0	0	v	v	v	v	v	v	v	0	0	0	0	0	0	0	0	0	0
2. Noise	0	0	0	0	0	v	v	v	v	v	v	v	0	0	0	0	0	0	0	0	0	0
3. Liquid waste	0	0	0	0	0	0	0	0	0	v	0	0	0	0	0	0	0	0	0	0	0	v
4. Solid waste	0	0	0	0	0	0	0	0	0	v	0	0	0	0	0	0	0	0	0	0	0	v
5. Sea water quality	0	0	0	0	0	0	0	v	0	v	0	0	0	0	0	0	0	0	v	0	0	0
6. Abrasion / sedimentation	0	0	0	0	0	0	0	v	0	v	0	0	0	0	0	0	0	0	V	0	0	0
7. Safety of the voyage	0	0	0	0	0	0	v	v	0	v	0	0	0	0	0	0	0	0	V	0	v	0
8. Traffic Generation	0	0	0	0	v	v	v	v	0	v	0	v	0	0	0	0	0	0	V	0	v	0

Biological components																						
1. vegetation and land animals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. aquatic biota	0	0	0	0	0	0	0	v	0	v	0	0	0	0	0	0	0	0	v	0	0	0
Socio economic components																						
1. People's economy	0	0	0	0	v	0	0	0	0	v	0	0	0	0	0	0	0	0	v	0	0	0
2. Employment and Business Opportunities	0	0	0	0	v	0	0	0	0	v	0	0	v	0	0	v	v	v	v	0	0	0
3. people's perception	v	v	v	v	0	0	0	0	0	v	0	0	0	0	0	0	0	0	v	0	0	v
4. people’s healthy	0	0	0	0	v	v	0	0	0	v	0	v	0	0	0	0	0	0	v	0	0	v

Data source: Field Survey and Consultant Analysis Results, 2003-2005

Description :

1. land supply
2. preliminary survey
3. bathymetry survey and land investigation
4. preparation of technical planning
5. labor mobilization
6. heavy equipment mobilization
7. transportation of materials
8. Foundation work
9. soil compaction work
10. port construction
11. operational support facilities
12. material transportation
13. construction supervision
14. mechanical and electrical
15. utility
16. commitioning / testing
17. operator training
18. recruitment of operational workforce
19. port operations
20. shipping traffic
21. loading and unloading activities
22. Waste management

v = impact interaction
0 = no impact interaction

Figure 6.1 Flow Chart of Impact Forecast of dedicated Ports Development Pre Construction stages

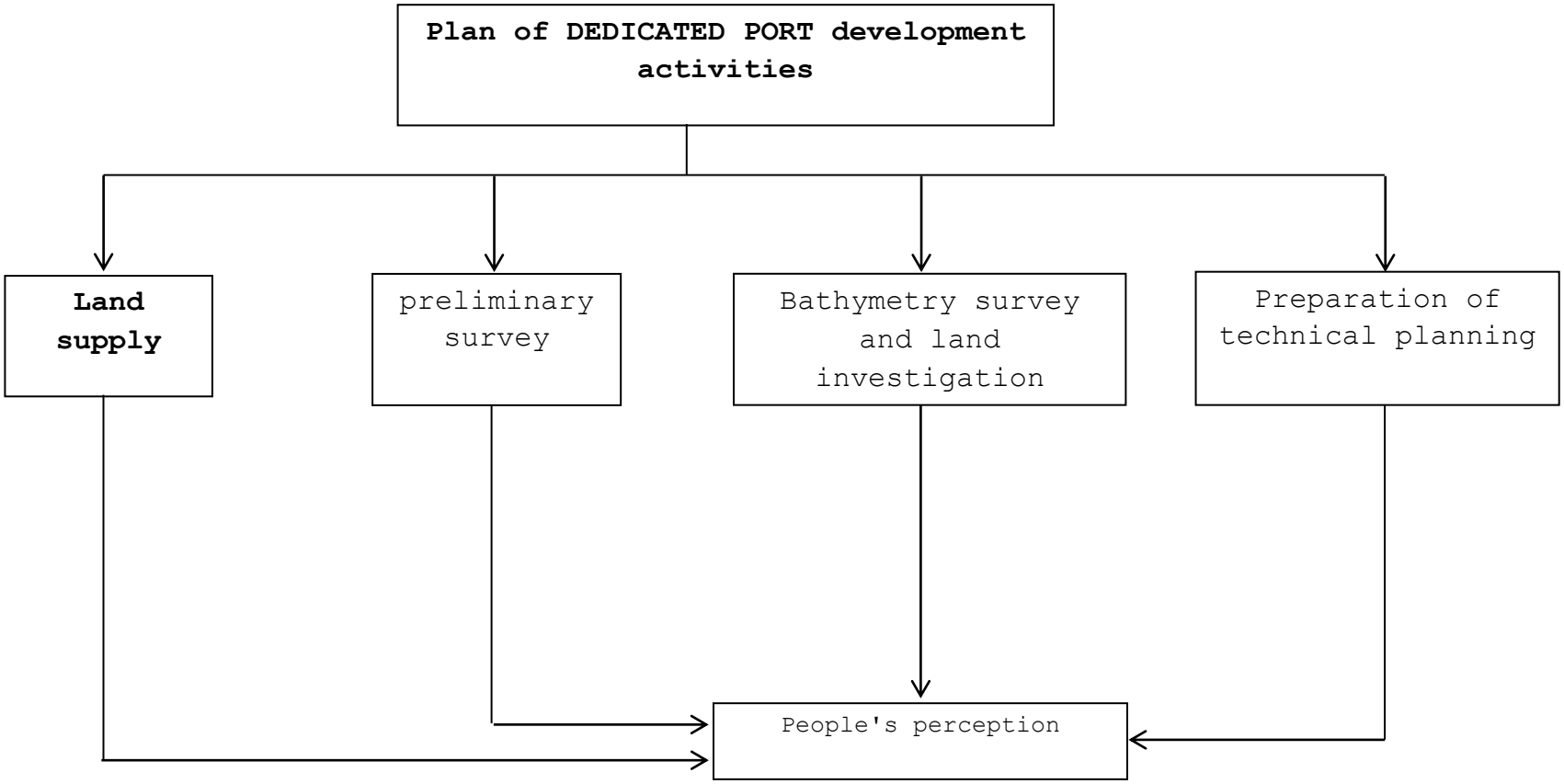
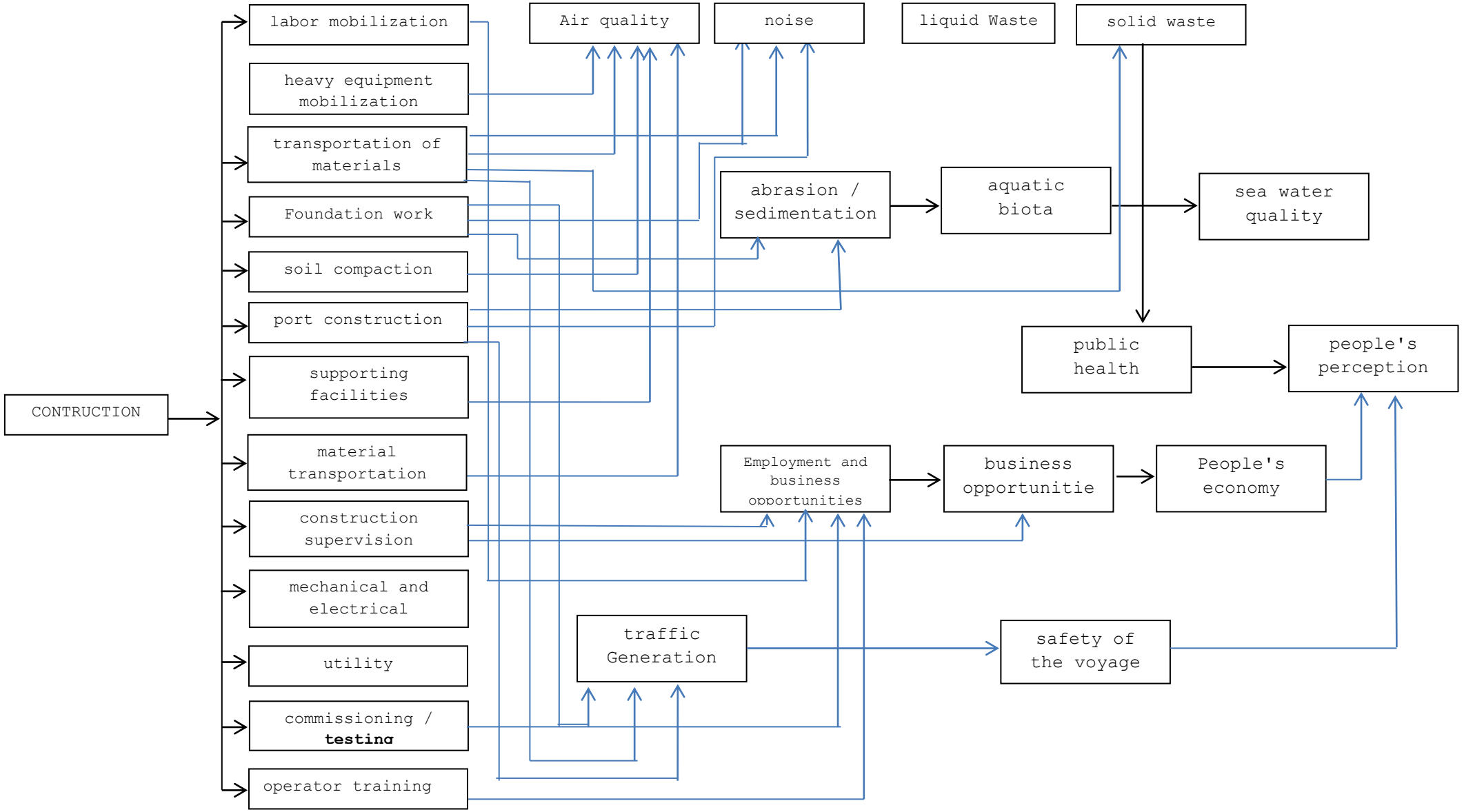
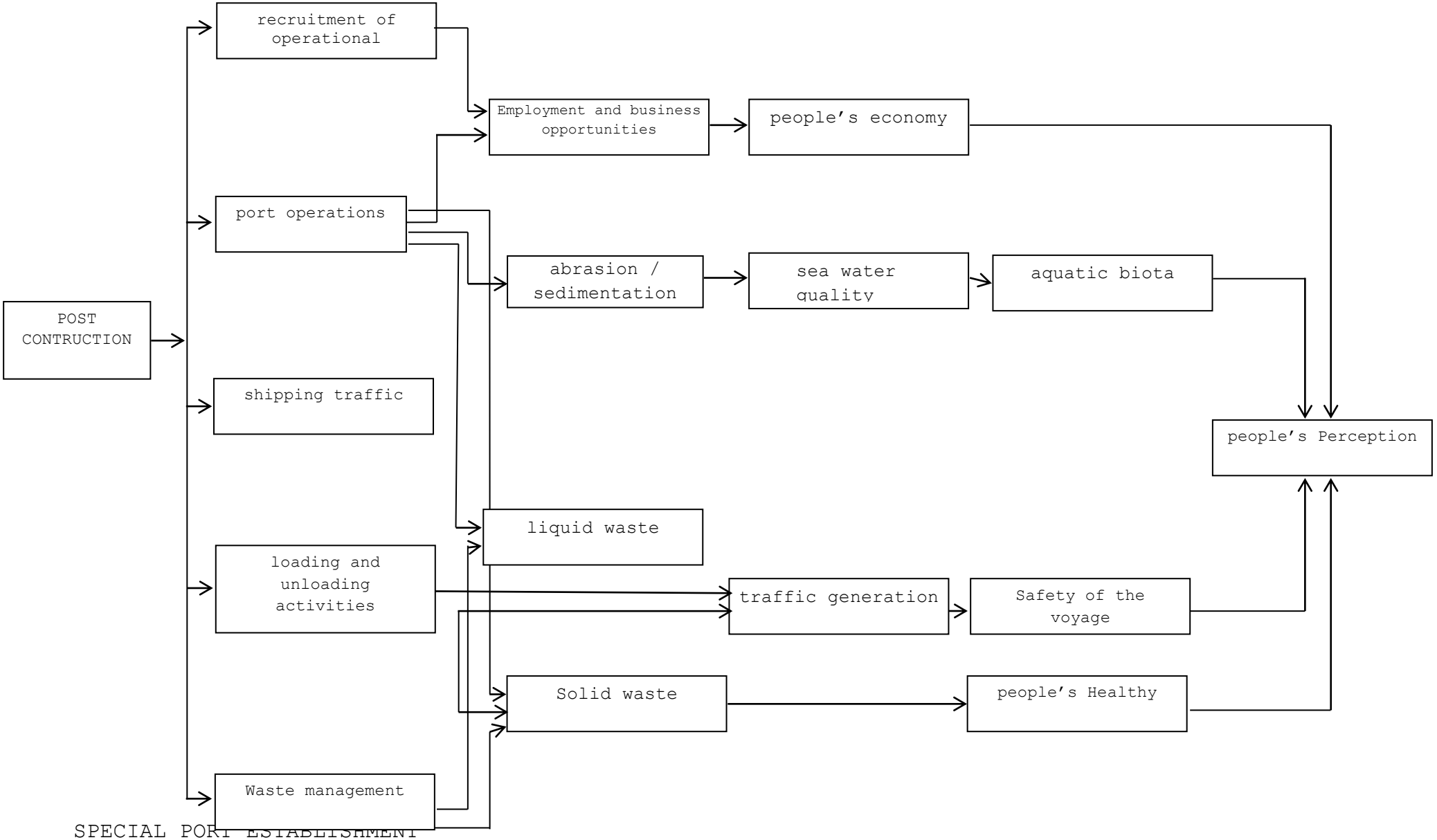


Figure 6.2 Flow Chart of Impact Forecast of Dedicated Ports Development Construction Stages



SPECIAL PORT ESTABLISHMENT

Figure 6.3. Flow Chart of Impact Forecast of Dedicated Port Post-Construction Stages



6.1 IMPACT FORECASTS AT THE PRE-CONSTRUCTION STAGES

Theses stages include activities: Provision of land, Preliminary Survey, Bathymetry Survey & soil investigation as well as technical planning preparation activities. Impacts forecasting at the activity stages are:

6.1.1 people's perception

Based on the results of interviews at the time of socialization with the community in Talang Village, Medang Deras Sub-district, especially the community around the location of the dedicated Ports development activities and from the questionnaire data distributed to the community, it can be seen that widespread information about the development plan of the dedicated port and all respondents know the information (100%).

From the existing number of respondents, 100% agree with the dedicated port construction with reason of employment availability for the surrounding community, the possibility of opening a business, reducing the unemployment rate, increasing public income and making the area more

crowded. The community also does not feel to be disturbed by the existence of project activities, this is possible the distance is not too close and the construction activity is not yet running. The community's hope is that they are included in project activities, and after the operational period. Regarding the issue of land acquisition, there are no obstacles because the land has long been purchased by PT. Sarana Industama Perkasa from the surrounding community with an appropriate and mutually beneficial compensation process.

In the land measurement activities, it needs to be socialized to the community, especially those whose land is directly adjacent to the project land, because if it is ignored could cause **negative impact** (-) to the measurement of land boundaries. From land provisioning activities, land measurement and other pre-construction activities will be socialized to the surrounding community and because activities are short, impacts can be categorized as **unimportant Impact** (1). So the provision of land, preliminary survey, Bathymetry Survey & soil investigation

and preparation of technical planning will potentially lead to **Negative (-) Unnecessary** Impact (1) on the activities.

6.2 IMPACT FORECAST AT THE CONSTRUCTION STAGE

In the construction stage, the major and important impacts estimated is as follows:

6.2.1. **Quality Air**

During land preparation/clearing activities, it will be predicted causing dust from open areas after land clearing, also from foundation activities, and soil compaction. This will be greater if it is implemented during the dry season and is supported by relatively high temperatures and wind speeds in the area of dedicated port development projects. While the construction activity that is making of the jetty and supporting buildings, it is estimated will arise emissions from heavy equipment vehicle such as dump truck, truck mixer which is operated for the construction implementation will release the exhaust gas accumulated with soil material scattered in the air is be in form of gas parameters such as CO, NO2 and SO_2.

A number of emissions for each pollutant and its source come from Environmental Data Book, 1992 and Zears Zemanshy, 1976 as presented in the following table:

Table 6.2. Air Pollutant Emissions derived from Heavy Equipment

NO	type of heavy equipment	emission factor (lb/hour)			
		CO	NO2	SO2	Particulate
1	Tractor	2,150	0,994	0,690	0,136
2	Bulldozer	0,793	5,050	0,384	0,165
3	Scapper	1,460	6,220	0,463	0,406
4	motor grader	9,215	1,050	0,086	0,061
5	Truck	1,340	7,630	0,454	0,256
6	etc	0,414	2,270	0,143	0,139
	Total (lb/hour)	6,318	23,214	1,584	1,519

Data source: Environmental Data Book, 1992

Based on the results of the air quality analysis at the initial environmental level, the air quality at the project site location still exists in the uncontaminated state.

Therefore with the addition of gas emission load from heavy equipment for parameter N02, S02 and particulate are expected to air quality ambient in the project site area will be close to NAB as required in Government Regulation no. 41 of 1999 on the Control of Air Pollution at a radius of 60 meters of heavy equipment emissions and at distances greater than 60 meters will be neutralized naturally.

With the intensity of emissions of these pollutants and heavy equipment in operation, foundation work, soil excavation, and building construction are expected to cause **negative impacts** on ambient air quality.

From a number of truck exhaust gas pollutant that will have an impact due to their level in the initial environmental hue is relativity low and not exceeding the required NAV in Government Regulation no. 41 of 1999 on the Control of Air Pollution. Therefore, if the road density is coupled with truck transporting urban soil materials and other materials and mixer trucks transporting fresh concrete with high intensity during the construction period,

this is categorized as the **Large Impact (5).** Humans expected to be affected relatively little are workers and residents with a proportion of < 5 percent of the population in the study area, however, the magnitude of the impact of air quality degradation is due to increased air pollutants and the loss of pollutant (plant) penetration capability. the magnitude of tree level plant transparency can absorb air pollutants by 29,0% until 78,5%. then the impact of equipment and material mobilization activities on air quality degradation can be categorized as the Important (5). So, heavy equipment mobilization activities, transportation of materials. foundation work, soil excavation, and the construction of the building are expected to cause a **Large** (5) and (5) **Negative (-) Impact** (5) on ambient air quality.

6.2.1. Noise

Increased noise during the construction stage comes from the transportation activities of dock material by road, heavy equipment mobilization activities, foundation work, soil

excavation and construction activities from noise sources:

1. Heavy equipment activities (bulldozer, loader, generator), transportation activities of dump trucks transporting material and trucking vehicles, mixers, with emissions for each pollutant and their sources from environmental Data Book 1992 and Zears Zemanshy, 1976 as presented in the following Table:

Table 6.3.Sound Emissions from Heavy Equipment and Generator set

NO	Type of heavy equipment	Noise level at distance (dBA)				
		10m	20m	30m	40m	50m
1.	Truck Isuzu	78	74	71	68	64
2.	Loader Komatsu D3	70	68	61	61	58
3.	Bulldozer Caterpilar	80	70	69	65	60
4.	Generator Yanmar 5KA	68	62	58	50	45

Data source: Zears Zemanshy, 1976

2. Equipment used for development of the main and supporting facilities, concrete mixer ground equipment, compactor and bulduzer, where the noise source generated on the equipment ranges from 77 to 90 dBA.

The estimated noise level on the project site during the building's physical development is analogous to the sound source of equipment ranging from 70 dBA to 110 dBA, as shown in the Table 6.3 of sounds characteristic generated from the construction equipment (USEPA, 1978).

From the noise level generated by the equipment, it can be estimated the noise level based on the distance (location) of the sound source between 50 to 200 meters of calculation approach as follows:

$$\mathbf{SL_i - SL_s - 20 \log (L_2/L_i)}$$

where:

$SL_i - SL_s$ = Source of contamination at a certain distance

$L_2 - Li$ = Distance that want to be knowed the noise value

Table 6.4 Noise Levels Generated from Construction Equipment

No	Equipment	noise level (dBA) at distance 20 m						
		60		70	80	90	100	110
1.	Compactor, Roller							
2.	Backhoe							
3.	Scraper, grader							
4.	Tracktor							
5.	Truck							
6.	Mixer Beton							
7.	Mobiling Crane							
8.	Stationer Crane							
9.	Pump							
10.	Generator							
11.	Compressor							
12.	Jack Hammer							
13.	Compact Pile Driver							

Data Source: Usepa, 1978

Example: SL_i Min = 70 dBA

Max = 107 dBA

L_2 = 100 meter

SL_2 Min = 70-20 Log 100

= 70-40

= 30 dBA

SL_2 Max = 107 - 20 Log 100

= 107-40 = 67 dBA

When using the equation, the contour of noise value can be estimated as follows :

Table 65. Noise value Contour

SLi (dBA)		Distance reviewed		
Min	Max	(m)	Min	Max
70	107	200	24	61
		150	26	63
		100	30	67
		50	36	73

Data Source : The Consultant Calculation Result, 2003

The noise level caused by above equipment shows that a fairly high noise levels occur in the project footprint. The high noise levels can be a disruption to the health of workers whose subsequent impacts are in the form of psychological and physiological disorders so that this impact can be categorized **negative impact (-).**

The Increased noise levels occur in the project footprint and the surrounding areas. Noise level will increase mainly from activities of soil installation, pile installation, the heavy equipment and materials transportation then the impacts are categorized as **Large Impact (5).**

The noise impact is caused by the piling activities. Data obtained from the measurement results of the noise in residential areas before any activity is of 35 - 45 dBA.

At the time of the trestle and jetty piling carried out are estimated the increased noise about 70 dB for location around the activity (on land), this value is still below the environmental quality standard threshold of 70 dB. For noise at the piling site at the time of the pole piling, the estimated noise will increase to > 70 dB. In accordance with the way of working pile driver which lasts 2 seconds and repeated every 10 seconds. This value is above the environmental quality standard threshold so that it may cause health disorder against the piling operator. Although

the project site is relatively far from the settlement, pole piling activity of the jetty allegedly still provide disruption to the community especially if the piling activities are carried out in hours of rest.

Humans expected will be affected relatively small i.e the workers and surrounding communities, however the magnitude of the impact of increased noise due to the increasing voices of heavy equipment and this is because of the loss of the ability of the penetration of pollutants (plant). The magnitude of plant transfarence of tree level can absorbs noise from 25% to 80% then the impact of the equipment and material mobilization activities to increased noise can be categorized is **important (5)**. Thus, the heavy equipment mobilization activities, transportation of materials, Foundation works, soil excavation, and building construction expected will cause **large** (5) **Negative** (-) and important (5) **Impact** against the noise intensity.

6.2.3. Seawater quality

activities that are predicted to contribute to changes in water quality are the pile piling and the development of jetty structures.

The activities of pile piling with a size of 50 cm x 50 cm to the bottom of the waters with with mud and

sand bottom with a thickness of a mud layer of 0 - 0.4 meters will not supposedly cause the waters bottom churning so it does not give a significant contribution especially on increasing metallic element in the waters. Allegedly the metal element in the waters is still below the environmental quality standard threshold. The activity of pile diver including the rotation of ship and barges propellers are expected to contribute to an increase turbidity in deep waters of initial hue mentioned that the suspended solids in water range from 96 mg / l - 100 mg / l. This pile piling activity will increase the suspended solids but still below 200 mg / 1 with relatively wide spread (centered on the piling area). In addition, equipment and barges activities operated in the piling area has the potential to cause oil spills in the waters, the spills can be large in case of work accidents that cause oil spills in the waters.

Also for development activities of the jetty contruction that give the greatest contribution to the impact on water quality are the operational activities of the equipment (tug boat, barge and floating crane) operated in the waters surrounding

the construction site. The water quality parameter changing is the increased suspended solids and turbidity as well as the oil and fat content in waters. The increased suspended solids and turbidity are caused by the agitation of the waters bottom by the ship's propellers with a relatively small intensity. Increased oil content in water are caused by oil spills that may enter into the water body of ship and equipment fuel operating on the project site (under normal conditions the oil content in the water has exceeded the environmental quality standard threshold of 53-224 mg / l). In the event of an accident then the oil spill that enters the water body can become large thus exceeding the environmental quality standard.

Another activity at this stage which is the impact source is land maturation that will be done covering an area of ± 18,344 m^2 with excavation and landfill activities. This activity is expected to affect water quality changes specially in the rainy season, because it brings soil material of splash erosion which carried the surface water flow and entered the water body of the receiving river. The mud particles in the water may increase the suspension material,

colloidal colors and vice versa decreases the dissolved oxygen, a number of dissolved solids, suspended solids, so the impact it has on the surface water quality change is **Negative (-).**

The impact that will occur is estimated relatively large, because the used area of ± 18,344 m2 and the length of activity for physical development that is only at construction stage, this impact is not reversed because the land has been covered from waterproof buildings and is cumulative so that the impact is **large (5).**

In the land maturation activities, if there is rain then the excavation and backfilling soil will be brought rainwater to the existing lower areas and drainage channels then towards the industrial area drainage channel. Thus it will change the water quality of the channel especially the value of turbidity and suspended solids then the impact is classified as **Important (5).** So from the land excavation and landfill activities and the building construction cause a **large (5) negative (-)** and **important (5)** impact on the quality of surface water.

6.2.4. Decline in Aquatic Productivity (Aquatic Biota)

A decrease in aquatic productivity is a further impact of the declining water quality due to the carried mud sediments into the water bodies during land clearing activities. The process of decreasing aquatic productivity is the accumulation of food chain disruption, either directly or indirectly. In the initial hue, it was found that at the study location there is sedimentation throughout the year both in the northwest of the dedicated Port of PT. Sarana Industama Perkasa and in the southeast of PT. Sarana Industama Perkasa, dedicated Port Development activities of PT. Sarana Industama Perkasa with a pole design for its trestle and jetty allegedly did not alter the flow direction along the coast and mass sediment transport carried. In other words the existence of dedicated Port of PT. Sarana Industama Perkasa that uses the pile for its trestle does not alter the existing sedimentation rate. Sedimentation rates occurring in the waters to the northwest of the jetty and the southeast of the jetty are allegedly still the same with the initial hue of 328.5 ton / year for the northwest of the dedicated

Port of PT. Sarana Industama Perkasa and 182.5 - ton / year for the southeast of DUKS.

At first the activities of the land maturation in the existing condition is the plantations leading soil conditions that were stable into the open and the soil particles to be more easily separated because of the bond between the soil becomes unstable, the impact of this derivative is the **Negative (-)** Impact.

This condition causes the soil particles to be transported through the surface water stream and contaminate the aquatic bodies both in TDS and TSS forms, which affects directly covering the pores of the existing biota in the aquatic bodies, thus interfering with the respiratory, transpiration process as well as its impact on sedimentation, so that the large (5) impact. While the indirect impact is the down sun intensity because of the increased turbidity. As known that the sun intensity into the aquatic body is closely related to the primary productivity of the water. Thus, if the situation impact continues, it will lead to a decrease in the quality of the affected waters, which will have a **important (5)** impact.

6.2.5. Employment and Business Opportunities

The recruitment activities of construction workers allegedly will provide the employment opportunities for Lalang's peoples and surrounding villages. Local workers who can be recruited for construction work are estimated at 88 people. Most of the workforce, including the executive staff in the field, is the experienced workforce in the field of construction and bonded with some contractor. Thus, the workforce is mobilized from outside the study area, even based on experience so far they are also imported from outside the region. It means that employment opportunities for local communities are very small. When looking at educational qualifications and experience, the community in the study area especially in the location of respondents said that the employment opportunity is available as a field worker.

The number of people wishing and willing to work in the project as many as ± 35 people. If the contractor takes the potential of local personnel available around the project site, it is expected to generate a **Positive(+)** Impact on employment opportunities. Looking at the number of people

willing to work on a relatively large project, it is estimated at more than 10% of the total needs of the field workforce and generating an increase in the local economy and incomes, the resulting impact is categorized as **Large (5) Impact**. Recruitment and mobilization of this workforce will involve the number of people expected to receive greater benefits when compared to those who do not enjoy the benefits of construction activities, the impact lasts for a long time ie during the construction activities so that the impact is categorized as **Important (P) Impact**. Thus the Manpower Acceptance and Mobilization activities will potentially lead to a **Large (5) and Important (5) Positive (+) Impact** to work Opportunity if the initiator provides employment opportunities for local communities.

6.2.6. Increased Revenue / Economy

The labor Recruitment and mobilization activities are expected to increase the impact of business opportunities for local people around the project. The anticipated business opportunity will be the rental of lodging / housing by residents who live around the project site to the project workforce. In addition, it will also increase trading activities

around the project site such as food stalls, shops selling project work need. With the opening of this business opportunity it can be said that The labor Recruitment and mobilization activities will n-cause **Pasitive (+) Impact**.

If you look at the number of people who are expected to receive a potentially large impact, that is more than 50% of the total population. then the resulting impact is categorized as **Large (5) Impact**. When looking at the duration of impacts during construction activities and even possibly progressing to the operational stage if the field worker still lives in the homes of the people, and produce secondary impacts, the increase in the economy of the community which will further improve the welfare of the population, which are expected to occur are categorized as **important (5) Impact**. So the activities of Labor Acceptance and Mobilization give rise to **Large(5) and Important (5) Positive (+) Impacts** on the Business Opportunities.

6.2.7. Traffic Generation

At the time of the construction stage, the activity of material and heavy equipment mobilization is estimated to have the potential to generate the

impact of land traffic generation. Especially if it is known that most of the equipment and materials imported from outside the project site area, namely from Asahan and surrounding areas. The materials transportation disruption and the materials per day reaches ± 8 times. This may have a derived impact on air quality (dust), noise and also public health impacts. From these activities, it is estimated that impacts are classified as **Medium (3) Impact.** When looking at the duration of the impact takes place during the construction activities of ports / temporary, then it can be said that the impact arising is categorized as **Important**(3) **Impact.** So shipping activities have, **medium (3) and Quite Important (3) Negative (-) impact.**

6.2.8. Safety of Shipping

The jetty development location is adjacent to DUKS PT Multimas Nabati Asahan and Kuala Tanjung Public Port. Although the jetty does not interfere with the existing cruise lines, barges and vessels working on pole piling and jetty construction have the potential to cause crash accidents. To prevent any crash accident is anticipated by the installation of signs on the territorial waters of the project work

area. Installation of construction work beacons is intended to indicate that there are construction works in the area. These beacons are installed in the area where construction work is underway and on the ship that is carrying out construction work. The installation of these beacons is coordinated with Adpel Kuala Tanjung so it is expected to meet the standard of security procedures for the construction in the sea.

With the activity of ship arrival at dedicated Port of PT. Sarana Industama Perkasa is predicted to have an impact on the shipping safety considering that the waters around the jetty is a busy traffic lane where there are Kuala Tanjung Public Port and PT Multimas Dock. Besides, considering that the ship leaning back is a large-capacity ships that require good safety facilities. From these activities it is estimated that the impacts are classified as **Medium (3) Impact.** If, look at the duration of the impact that occurs when the construction of the arrival of the ship is only temporary, that is when the transportation disruptions of materials and heavy equipment imported from Jakarta, it can be said that the impact arising is categorized quite **important**

(3) impacts. So shipping activities have **Medium(3) and Quite important(3) Negative(-) Impact.**

6.2.9. Public Perception

Activities at the construction stage will generate public perceptions of labor mobilization, heavy equipment mobilization, foundation work, soil excavation, building construction, mechanical don electrical, utility, testing and operator training activities. The existence of work opportunities in the event, the acceptance of labor as a building construction worker as well as the operator generating a positive impact for the community because in addition to providing the work opportunities.

But the emergence of negative impacts such as decreased air quality, increasing noise intensity, the presence of liquid waste that also affects the community health and the neglect of the demand for the community to become a dedicated port construction work caused a negative (-) perception of the community to the activity. This negative perception will be widespread if no socialization is done to the community about the activities to be undertaken so that the impact is classified as

Medium (3). And because the duration of the construction activity is long enough then the impact is **quite Important** (3).

6.2.10. Public health

Activities in the construction phase such as labor mobilization activities, heavy equipment mobilization, foundation work, soil excavation, and construction of buildings, potentially impact on air quality (dust), increasing noise intensity. Also, potentially have negative impacts of liquid waste affecting public health also result in negative (-) perceptions of the community towards such activities. This negative impact will be widespread if no socialization is made to the community about the planned activities and management efforts to be undertaken so that the impact is classified as Medium (3). And because the duration of construction activity is quite long (about 6 months) then the impact is **quite Important** (3).

6.3. IMPACT FORECAST ON POST CONSTRUCTION STAGE

In the post-construction / operational stage, major and important impacts are predicted to arise as follows:

6.3.1. Air Quality

The dedicated port operational activities potentially cause the impact of air quality degradation, which is derived from the loading and unloading transportation activities by operating heavy equipment driven by fuel motor. In addition, the existence of the operation of generators to supply electrical energy so that production is not stopped. The operation of such equipment and generators potentially generate exhaust gases into the air which can reduce air quality.

From a number of exhaust gas pollutant parameters that will have an impact on the content at the initial environmental hue are relatively low and have not exceeded the NAV required in Government Regulation no. 41 of 1999 on the Control of Air Pollution. Therefore, if the traffic generation with sufficiently high intensity during the port operates, then it is categorized as **Large (5) Impact.** Humans expected to be affected relatively little are workers and residents with a proportion of < 5 percent of the population in the study area, but the magnitude of the impact of air quality degradation due to increased air

pollutants and the loss of pollutant penetration ability (plant), then the impact of the activity on air quality degradation can be categorized as Important (5). Thus, the dedicated port operating and loading and unloading activities are expected to generate a **Large (5) and important (5) Negative (5) Impact** on ambient air quality.

6.3.2. Noise

Increased noise at the operational stage of the port comes from transportation activities and loading and unloading activities. The noise level generated by the above material loading and unloading heavy equipment shows that a high level of noise occurs within the project footprint. This high level of noise can be a disruption to the workers health whose subsequent impact is a physiological and psychological disorder so that the impact can be categorized **Negative (-) Impact.**

The increased noise levels occur in the project site and surrounding areas, then the impact is categorized as **Large (5) Impact.** The data obtained from the result of noise measurement in the resident population before the activity is 35 - 45

dBA. At the time of the operational activity of the port is expected to increase the noise around 70 dB for the location around the activity (on land), this value is still below the environmental quality standard threshold of 70 dB. For the noise at the port location, it is estimated the noise will increase to > 70 dB. This value is above the environmental quality standard threshold so it can cause health problems to the heavy equipment operator. Although the location of this project is relatively far from residential activities allegedly still provide disturbance to the community, especially if the loading and unloading activities performed at break / night time.

Humans expected to be affected relatively little are workers and local communities, but the magnitude of the impact of increased noise due to increased noise from heavy equipment and this is due to the loss of pollutant (plant) penetration capability, the impact of mobilization activities on loading and unloading equipment and transportation of product materials to the increased noise can be categorized as **Important (5)**. Thus, the mobilization activities of loading

and unloading equipment are expected to generate a **large (5) and important (5) Negative Impact.**

6.3.3. Sea Water Quality

Activities forecasted to contribute to sea water quality change are port operating activities, shipping traffic and loading and unloading of goods to and from the vessel.

Port operational activities produce waste in the form of solid and liquid waste, aquatic traffic potentially produce waste from the vessel, as well as loading and unloading activities potentially generate waste in the form of transport material spills. These activities will contribute to increased turbidity and other parameters in the waters including oil spills.

The increased suspended solids and turbidity are caused by the presence of aquatic stirring by ship propellers with relatively small intensities. Increased levels of oil in water are caused by oil spills that may enter the water bodies of the ship's fuel and equipment operating on the project site (under normal conditions the oil content in the water already exceeds the environmental

quality standard threshold of 53-241 mg / l). In the event of an accident, the oil spills entering the water body can become large, thus exceeding the environmental quality standard.

Thus, it will change the sea water quality and the duration of impacts during port operations so that the impact is **important (5)**. So, port operational activities, shipping traffic and loading / unloading mobilization resulted in a **Large (5) and Important (5) Negative (-) Impact** on seawater quality.

6.3.4. Decline in Aquatic Productivity (Aquatic Biota)

Decline in Aquatic productivity is a further impact of the declining quality of seawater. The process of declining aquatic productivity is the accumulation of food chain disruption, either directly or indirectly. The operational activities of dedicated port that produce waste water discharged into the sea will affect the penetration of sunlight so as to decline the primary productivity of the waters in this case the plankton organism and cause disruption to the growth and development of phytoplankton itself, such as zooplankton, benthos and nekton (fish).

Benchmark on the impact used is the diversity index of plankton and benthos. The Diversity Index value > 0.80 indicates that the water is still stable.

This condition causes contaminated surface water in both TDS and TSS forms, where it directly affects the pores of the biota present in the aquatic bodies, thus interfering with the respiratory, transpiration process and also its impact on sedimentation so that the impact is **Large** (5). The indirect impact is the decline in the intensity of the sun due to increased turbidity. As known that the intensity of the sun entering the water body is closely related to the primary productivity of the water. Thus, if the impact of the situation continues, it will lead to a decline in the quality of the affected waters, which will have an **important impact (5).**

6.3.5. Employment and Business Opportunities

The recruitment of port operational workforce, in this case laborers of loading and unloading, security personnel and port managers are expected to provide employment opportunities for the villagers of Lalang and surrounding areas. Local

laborers who can be recruited in construction work are estimated at 60 people. Most of the workforce comes from around the study area. It means that the opportunity to work for local people is very big. When looking at the educational and experience qualifications of the community in the study area, especially in the location of respondents can be said that the available job opportunities are as a field worker.

If the port manager takes the potential of local personnel available around the project site, it is expected to generate a Positive (+) Impact on employment opportunities. When looking at the number of people willing to work on a relatively large project that is estimated to account for more than 50% of the total needs of the field workforce and lead to an increase in the local economy and incomes, the impact is categorized as **Large (5) Impact.** This activity of recruitment and mobilization of labor will involve the number of people expected to receive greater benefits when compared to those who do not enjoy the benefits of port operations activities, the impact is long enough that is during dedicated port operations so

that the impacts are categorized as important (P) Impacts. Thus the activities of Labor Acceptance and Mobilization will potentially lead to a **Large (5) and important (5) Positive (+) Impact** on employment opportunity if the initiator provides employment opportunities for local communities.

6.3.6. Increased Revenue / Economy

Recruitment and labor mobilization activities are expected to have an impact on business opportunities for people around the project site. The anticipated business opportunity will be the rental of lodging / housing by residents who live around the project site to the project workforce. In addition, there will be increased trading activities around the project sites such as food stalls, shops selling the needs of project workers. With the opening of this business opportunity, it can be said that the activity of acceptance and mobilization of labor will cause **Positive (+) Impact** on the economic condition of the surrounding community.

If you look at the number of people expected to receive a potentially large impact, ie more than 50% of the total population, then the resulting

impact is categorized as **Large Impact (5)**. When looking at the duration of the impact takes place during the operation of a dedicated port operation if the field worker still lives in the people's homes, and improves the society's economy which will further improve the welfare of the population, the expected impact will be categorized as the **Important (5) Impact**. So the activities of Labor Acceptance and Mobilization give rise to Large (5) Positive (+) and Important (5) Impacts.

6.3.7. Safety of Shipping

The jetty development location is adjacent to DUKS PT Multimas Nabati Asahan and Kuala Tanjung Public Port. Although the existence of the jetty does not interfere with the existing shipping lanes, barges and ships traffic that will dock at a dedicated port have the potential to cause a cruise accident. To prevent any crash accident is anticipated by the installation of signs on the territorial waters of the project work area. The installation of a navigation beacon is intended to provide a sign for the ship to be anchored. These signs are installed on a dedicated port and

adjacent to the specified shipping lanes. The installation of these signs is coordinated with Adpel Kuala Tanjung so that it is expected to meet the standard of traffic safety procedures at sea.

With the activity of ship arrival at dedicated Port of PT. Sarana Industama Perkasa is predicted to have an impact on the shipping safety considering that the waters around the jetty are a busy traffic route where there is Kuala Tanjung Public Port and PT Multimas Jetty. Besides, considering that the ship that will lean is a large-capacity ships that require good safety facilities. It is estimated that there will be additional vessels leaning in DLKP Kuala Tanjung (Kapal that leaned on the Dedicated Port of PT Sarana Industama Perkasa) for 4 ships per month. From these activities it is estimated that the impacts are classified as Large (5) Impact. When looking at the duration of the impacts that take place during the port activities operate, causing the impact of derivatives in the form of disruption of public convenience, it can be said that the impacts arising are categorized as important (5) impacts. So, the shipping activities

have **Large (5) and Important (5) Negative (-) Impact.**

6.3.8. Public Perception

Activities at the port operational stage will generate public perceptions of the operational activities of dedicated ports, shipping traffic, recruitment of operational personnel, loading and unloading activities and waste management. The existence of job opportunities in the recruitment of employment as port employee as well as the loading and unloading employee that raise positive impact for the people because in addition to providing new job opportunities can also increase the income of the community when getting the job.

However, the negative impacts such as decreasing air quality, increasing noise intensity, the presence of liquid waste that also affects the health of the community and the neglect of public demand to become a dedicated port labor cause a negative (-) perception of community to the activity. This negative perception will be widespread if no socialization is done to the community about the activities to be undertaken so that the impact is classified as large (5) impact.

And because of the length of activity that is during the dedicated port operates then the impact is **Important (5).**

6.3.9. Public health

Activities at the operational stage of the port will lead to a declining public health on the activities of loading and unloading, port operations and waste management potentially impacting degradation of air quality (dust), the increased noise intensity. Also, potential negative impacts of liquid waste affecting public health also result in negative perceptions (-) of the community towards such activities. This negative impact will be widespread if no socialization is made to the community about the planned activities and management efforts to be undertaken so that the impact is classified as large (5) impact. And because of the length of activity that is during the dedicated port operates then the impact is classified as **Important (5).**

From the overall forecasted impacts, it is summarized in the impact forecast matrix in the Table 6.6 below:

Table 6.6 Forecasts Matrix of Large Impact and Important Impacts on Pre-Construction, Construction and Post-Construction Stage of Dedicated Ports Activities Plan

Activities of environmental components	**Activities**																					
	Pre-construction				**Construction**													**Post-construction**				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Physical-chemical components																						
1. Ambient air quality	0	0	0	0	0	-5/5	-5/5	-3/3	-5/5	-5/5	-5/5	-5/5	0	0	0	0	0	0	0	0	0	0
2. Noise	0	0	0	0	0	-5/5	-5/5	-5/5	-5/5	-5/5	-5/5	-5/5	0	0	0	0	0	0	0	0	0	0
3. Liquid waste	0	0	0	0	0	0	0	0	0	-3/3	0	0	0	0	0	0	0	0	0	0	0	-3/3
4. Solid waste	0	0	0	0	0	0	0	0	0	-3/3	0	0	0	0	0	0	0	0	0	0	0	-3/3

5. Sea water quality	0	0	0	0	0	0	0	-5/5	0	-5/5	0	0	0	0	0	0	0	0	-5/5	0	0	0
6. Abrasion / sedimentation	0	0	0	0	0	0	0	-3/3	0	-3/3	0	0	0	0	0	0	0	0	-3/3	0	0	0
7. Safety of the voyage	0	0	0	0	0	0	-5/5	-5/5	0	-5/5	0	0	0	0	0	0	0	0	-5/5	0	-5/5	0
8. Traffic Generation	0	0	0	0	-3/3	-3/3	-3/3	0	0	-3/3	0	-3/3	0	0	0	0	0	0	-3/3	0	-3/3	0
Biological components																						
1. vegetation and land animals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. aquatic	0	0	0	0	0	0	0	-	0	-5/5	0	0	0	0	0	0	0	0	-5/5	0	0	0

biota								5/5														
Socio economic components																						
1. People's economy	0	0	0	0	+5/5	0	0	0	0	+5/5	0	0	0	0	0	0	0	0	+5/5	0	0	0
2. Employment and Business Opportunities	0	0	0	0	+5/5	0	0	0	0	+5/5	0	0	+5/5	0	0	+5/5	+5/5	+5/5	+5/5	0	0	0
3. people's perception	-1/1	-1/1	-1/1	-1/1	0	0	0	0	0	-3/3	0	0	0	0	0	0	0	0	-5/5	0	0	-5/5
4. people’s healthy	0	0	0	0	-3/3	-3/3	0	0	0	-3/3	0	-3/3	0	0	0	0	0	0	-5/5	0	0	-5/5

Data source: Field Survey and Consultant Analysis Results, 2003-2005

PT. Sarana Industama Perkasa Early environmental color

Description :

1. land supply
2. preliminary survey
3. bathymetry survey and land investigation
4. preparation of technical planning
5. labor mobilization
6. heavy equipment mobilization
7. transportation of materials
8. Foundation work
9. soil compaction work
10. port construction
11. operational support facilities
12. material transportation
13. construction supervision
14. mechanical and electrical
15. utility
16. commitioning / testing
17. operator training
18. recruitment of operational workforce
19. port operations
20. shipping traffic
21. loading and unloading activities
22. Waste management

Large Numbers and Importance of Impact

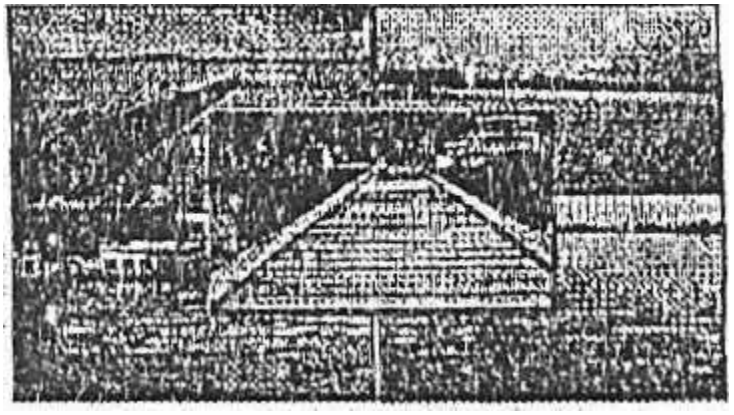
1 = Not Big and Important

3 = Quite Big and important

5 = Large and important

- = negative + = positive

SPECIAL PORT ESTABLISHMENT



CHAPTER VII

IMPACT EVALUATION

PT SARANA INDUSTAMA PERKASA

CHAPTER VII IMPORTANT IMPACT EVALUATION

Based on the description of Chapter VI on the forecasting of the impacts, it is seen that the Dedicated Port development activity is expected to have a important impact on the physical, chemical, biological and socioeconomic components both positive (+) and negative (-) In detail an evaluation of the important impacts that will occur is described below:

7.1. ENVIRONMENTAL IMPACT EVALUATION CRITERIA

Based on the identification and forecasting of impacts is performed an important impact evaluation, the important impact evaluation activities refer to Bapedal Decree No. 056 of 1994 on Guidelines Concerning Important Impact Size and Bapedal Decree No. 9 Year 2000 on the Guidelines for the Preparation of an Environmental Impact Analysis (Andal) to determine priorities for important impacts handling. Therefore, this evaluation criteria needs to be set either on the quality of environmental priorities that are expected to be affected by significant impacts,

the magnitude of the impacts, and the level of overall impact.

a. Quality Impact Criteria

To be able to evaluate the significant impacts of activities to the environment, it is necessary to assess how the quality of the existing environment both the initial environmental hue and after the Dedicated Port development project. This environmental evaluation is also intended to know the extent of the tolerance of each environmental component to the environmental changes that arise as a result of the development of the Dedicated Port.

The each environmental component is based on environmental quality standard or professional judgment. In addition to environmental quality, impact evaluation is also related to the environmental component's priorities, whose judgments are based on the magnitude of the effects of changes in environmental components generated by such activity plans in terms of the human and environmental interests.

b. Evaluation Criteria for Impact Magnitude

Criteria for the magnitude of impacts expected to occur on each environmental component, the extent of the impacts used as considerations in environmental management efforts and determination based on professional judgment refers to the magnitude of environmental component changes before and after the activity. In addition, the level of impact also refers to the environmental quality standard.

c. Evaluation Criteria for Important Impact Level

Criteria for evaluation of important impact levels refer to Head of Bapedal Decree No. 056 of 1994 on Guidelines on Important Size of Impact, where important impact levels are grouped into two categories that are important to scale 2 and are not important to scale 1.

Judgments of the impact level is important for each related element is:

1. The number of people affected by significance impact is measured and compared to the beneficiaries.
2. the area of impact distribution measured and compared to the activity area.

3. The duration of impact measured and compared with the length of pre-construction, Construction, and post Construction time.
4. The measured impact intensity to the tolerance of the affected environment, the quality standard requirements or the large or small effect on the population.
5. The many of other impacted environmental components, other than the components of the environment that are directly affected.
6. The cumulative nature of the impacts indicating the fast / slow the effect of impacts on the environment.
7. The reversed or non-reversed impact, as measured by the level of ease of control or recovery of the impact that it has.

The impact evaluation of the activity to each component of the environment is carried out on each of the elements mentioned above which then it is summarized how the degree of importance to the components of the environment as a whole.

7.2. IMPACT EVALUATION OF PRE-CONSTRUCTION STAGE

7.2.1. Impact On Public Perception

Public perception in Lalang Village, Medang Deras Sub-District especially the people around the location of the dedicated port plan from pre-construction activities covering activities: land provision, preliminary survey, bathymetry survey and land investigation, and technical planning preparation activities, it is obtained the evaluation of the impact of community perception about a dedicated port development plan begins to take place during field surveys, ie land clearing activities can have a negative impact. However, because of the small number of people affected (some houses adjacent to the site), the area of impact is relatively narrow / limited and activities are short-lived then the impact is **unimportant (TP).** This impact can be managed by socializing the dedicated Port activities plan to the surrounding community.

7.3. THE IMPACT EVALUATION OF CONSTRUCTION STAGE

7.3.1. Air quality degradation

In the forecast of the important impacts is mentioned that the air quality parameters experienced changes include NOx, SOx, CO, and airborne dust content. In accordance with the

results of analysis for all parameters of the improvement intensity is still below the environmental quality standards threshold. When it is viewed with 7 (seven important impact criteria, the number of affected people is relatively large, ie along the access road to the community around the project area and workers working on a dedicated port development project.) The impact spread is large enough to out of the project work area. The impact time is due to the duration of the construction activity, which is 1 (one) year. As a result of this air quality change there is no significant derivative impact because the intensity is still below the environmental quality standard threshold. The impact can be accumulative although the impact will decrease after the activity of the implementation of the dedicated Port development project is completed, so that the impacts are categorized as **important (P) impacts.**

This negative impact management is conducted through the involvement of the initiator in minimizing the air quality degradation, especially for the dust parameters at the project site, whether handled directly or indirectly, which is

handled by the partner company (contractor). Alternative impact mitigation measures that can be taken is isolating land clearing location, physical buildings and other activities that cause air quality degradation namely soil material, and dust that does not pollute to the surrounding environment.

7.3.2. Noise Impact

In the forecast of the significant impacts, it is mentioned that the activities that cause impact on the noise parameters include the transportation of materials and equipment to the project area. The number of people affected by noise is quite a lot, along the road trucks transporting material and equipment pass through. Distribution of the impact is large enough to get out of the project work area. The intensity incurred by the transport activity is relatively small (below the environmental quality threshold) in accordance with the noise forecast in Chapter V. The duration of impact is as long as the dedicated Port project development activities plan run for approximately 1 (one) year. Impacts can be accumulative. The impact will gradually decrease when the dedicated Port

development work is completed. From the result of laboratory analysis, it is proved that the noise intensity at the location and the settlement of the population is still below the quality standard threshold that is 59,57 dBA and 61,39 dBA according to KepmenLH No, Kep.48 / MENLH / 11/1996 about Noise Level Standard, the number of people and the area of impact spread is wide enough so that the impacts that appear are **important (P).**

7.3.3. Impact on Sea Water Quality

The water quality parameters that are allegedly affected by the trestle piling and construction activities of the dedicated Port are the increase of suspended solids (turbidity) and the oil content in the water. This activity is not expected to cause stirring of the water base so as not to increase the content of the elements in the water to exceed the environmental quality standard. With a small intensity, the impact of turbidity is also concentrated around the site of piling and construction. The timing of the impact is relatively rapid during the erection and construction works. Impacts can be accumulated and create a derivative effect on local aquatic biota.

Although the impact can be reversed when the piling and construction activities are halted (break) so as to the turbidity of the waters and the content of the elements in the water, the impact of the dedicated Port pile piling activity has an **important (P) negative impact.**

However, for the oil content in water as estimated in Chapter V it is potential to become large in case of work accidents that cause oil spills. Compared with the environmental quality standard the impact intensity can be above the environmental quality standard. The impact spreading is still within the working area, around the location of the Dedicated Ports development and may expand if the spill is large. The impact took place during the activity of the trestle piling and the construction of the dedicated Port. Compared with the overall project life, the duration of impact is relatively short. The impact on water quality has a derived impact on aquatic biota and the impact can be accumulative considering that the project area is also in the same activity. Overall the activities of trestle piling and construction of dedicated Ports have **important(P)** impacts.

7.3.4. Impact on decline of Aquatic Productivity (Aquatic Biota)

Evaluation of the significance of the impacts of the trestle piling and the construction activities of the dedicated Ports on aquatic biota is as follows: Impacts on aquatic biota are the impacts of a decline in water quality caused by increased oil content in water. a large oil intensity such as work accidents resulted in the occurrence of oil spills in the water will have a large impact on water biota, especially for plankton and bathos, for nekton who have the ability to move will find another place more comfortable. The spread of impact can exceed the boundaries of the working area. Impacts can last for a long time where scattered oils leave residues. There is a derivative impact on fishermen whose job of finding fish and shrimp on the beach will lose their catch results. The number of people affected is many fishermen catching fish and shrimp in the project site area. Impacts can be cumulative with other impacts of similar activities around them.

Based on the evaluation of the impact level, the activity of trestle poles piling and the

development of dedicated Ports on aquatic biota, they are classified as **important negative (-P)** impacts.

7.3.5. The Impact of Employment and Business Opportunities

Meeting the needs of some workers (50% of local workers) from Medang Deras Sub-district is a very significant employment opportunity for the people of Lalang and surrounding villages, especially those who have profession in accordance with the needs of construction activities, namely the profession of construction workers. Lalang villagers who have a profession of labor is quite a lot, that is 250 people (16% of the population of the workforce). Thus from the size of the number of affected people and from the size of the intensity of the impact, the impacts includes positive significance. From the size of the duration of impacts, impacts are also important because they last for 1 (one) year of construction. Then from the size of the number of other impacted environmental components, the impacts are also positively important. This is because the impact of employment opportunity generates a derivative

impact on increasing revenue, so the impact is **Positive Significant (+ P).**

7.3.6. Impact of Increased Revenue / Economy

Recruitment and labor mobilization activities are expected to have an impact on business opportunities around the project site. The anticipated business opportunity will be the rental of lodging / housing by residents who live around the project site to the project workforce. In addition, there will be increased trading activities around the project sites such as food stalls, shops selling the needs of project workers. The number of people affected is quite large. The area of impact distribution is in Lalang and surrounding villages. The duration of impact is during the construction stage which is approximately 1 (one) year. Another component that is affected is the business opportunity for the community around the port to try / sell to the workers who will also improve the economy of the community. Thus, if the significance level of the impact of the business opportunity for people around the project site is including the **Positive Important (+ P)** impact.

7.3.7 Impact of Traffic Increase

At the time of construction stage, that is the activity of material and heavy equipment mobilization is estimated potentially causing the impact of land traffic Increase. Especially, it is known that most of the equipment and materials imported from outside the project area site, namely from the Asahan region and surrounding. The material transportation interruption per day reaches ± 8 times, this can cause the derivatives impact on air quality (dust), noise and also public health impact. When looking at the duration of the impact that is taking place during the construction activities of the port / temporary, it can be said that the impacts are categorized **Negative Important (-P)** Impact.

7.3.8 Impact on Shipping Safety

The activities of the trestle pole piling and the construction of the Dedicated Port will affect the shipping safety in the waters surrounding the Dedicated Port development of PT. Sarana Industama Perkasa.

The number of affected people is quite large considering the many fishermen and also large ships that cross the waters in front of the Dedicated port development site to the General Port Kuala Tanjung. The impact spreading is at the development site of the Dedicated Port. The duration of the impact is during the development activities of the Dedicated Port still underway. The impact is not accumulative. There is a derivative impact of human safety that uses water. The impact can be reversed. As a whole it is said that the trestle pole piling and construction development of the Dedicated Port on shipping safety have a Important **negative (-P)** impact.

7.3.9. Impact of Public Perception

From the interviews results, it seems like the community wants to be accepted to work on the project. So that the labor absorption of 58 of all labor involved in the construction stage is predicted to give positive perception to the project presence. The number of people affected is

quite a lot of those who work on projects and their families. The impact lasts approximately 1 year during the construction stage. Spread of impact is in Lalang and surrounding villages. So overall the impact of local employment recruitment to community perceptions is a **Positively Important (+P).**

7.3.10. Public health impact

The public health impact is a derivative of the impact to the physical, chemical and biological environment as well as the socio-cultural impact. The number of people affected is quite a lot of those who work on projects and their families. The impacts are temporary during the dedicated port construction stage. The impact spreading includes only construction workers, so that the overall impact of derivatives from construction and operation of dedicated ports to public health is **not-important negative (-TP).**

7.4. IMPACT EVALUATION OF POST CONSTRUCTION STAGE

7.4.1 Air quality degradation

In accordance with the results of analysis for all intensity parameters of the improvement is still below the threshold Environmental quality standards. When viewed with 7 (seven) important impact criteria, the number of affected people is relatively large, ie along the roads from the access Inalum Road to communities around the project area and workers working in dedicated ports. The impact spreading is quite extensive to the outside of the project work area. The timing of impact is as long as the dedicated port operates. As a result of these air quality changes there is no significant derivative impact because the intensity is still below the environmental quality standard. The impacts can be accumulative, so that the impacts are categorized as **important Negative (-P)** impacts.

7.4.2 Noise Impact

In the forecast of the significant impacts is mentioned that the activities that cause

impact to the noise parameters include port operations and loading and unloading activities. The number of people affected by the noise is pretty much that is along the road of Inalum Road and access to a dedicated port through which carrier trucks pass through. The impact spread is large enough to get out of the project work area. The intensity incurred by transport activities is relatively small (below environmental quality standards threshold) in accordance with noise forecasts in Chapter V. The period of immediate impact is when the Dedicated Port operates. Impacts can be accumulative. Although the results of laboratory analysis is proved that the intensity of noise at the site and residential population is still below the quality standard threshold that is equal to 59,57 dBA and 61,39 dBA according KepmenLH No. Kep.48 / MENLH / 11/1996 on Noise Level Standards, but if unmanaged, increases in noise intensity may cause a derivative impact of discomfort disturbance to the surrounding community so that the impacts may include **significant negative (-P).**

7.4.3 Impact to Sea Water Quality

The water quality parameters that are suspected to be affected by the operational activities of the dedicated port are the increase of suspended solids (turbidity). Metal parameters and oil content in water according to parameters in quality standard of sea water quality KepMENLH No. 51 Year 2004 for port activities. This activity is not expected to cause stirring of the waters bottom so as not to increase the content of the elements in the water until it exceeds the environmental quality standard. With a small intensity of turbidity impact spread is also concentrated in the port area. The duration of the long-standing impact that is during the dedicated port operates. The impact can be accumulated. It is predicted that it can cause a derivative impact to the aquatic biota ecosystem. The impact cannot be reversed, so that against the waters turbidity and the elements content in the water, the impact of dedicated Port operational activities have **important negative (-P)** impacts.

7.4.4 Impact to Declining Aquatic Productivity (Aquatic Biota)

The impact to aquatic biota is a derivative impact of water quality degradation caused by increasing sea water quality parameters such as turbidity, garbage, oils and fats. The large oil intensity is due to the occurrence of work accidents that cause the occurrence of oil spills in the water will have a large impact to water biota, especially for plankton and bethos, for nekton who have the ability to move will find another comfortable place. The impact spreading may exceed the boundary of the working area. The impact can last for a long time where scattered oils leave residues. There is a derivative impact to fishermen whose job is to catch fish and shrimp along the coast will lose their catch. The number of affected people is as much as the fishermen who catch the fish and shrimp in the project site area. Impacts can be cumulative with other impacts of similar activities around them.

Based on the evaluation of the significance level of the impacts, the trestle pole piling and the dedicated Port development activities to the

aquatic biota are classified as **important negative (-P) impact.**

7.4.5 The Impact of Employment and Business Opportunities

Fulfill the needs of some workers (50% local workers) from the Medang Deras Sub-district is a very significant employment opportunity for Lalang and surrounding villagers, especially those who have professions in accordance with the needs of port operational activities, ie employees of port managers and loading and unloading workers. The Lalang villagers who have a lot of labor profession, ie 250 people (16% of the working population). Thus, from the size of the number of affected people and from the size of the impact intensity, impacts include important positive. From the size of the impacts duration, impacts are also important as they last for a dedicated port operates. Then from the size of the number of other affected environmental components, the impact also includes an important positive. This is because the impact of employment opportunity generates a derivative impact on increasing revenue, so the impact is **Important Positive (+ P).**

7.4.6 Impact of Increased Revenue / Economy

Acceptance and mobilization of the workforce is expected to have an impact on business opportunities for residents around the project site. The anticipated business opportunity will be the rental of lodging / housing by residents who live around the project site to the project workforce. In addition, there will be increased trading activities around the project sites such as food stalls, shops selling the needs of project workers. The number of people affected is quite large. The area of impact spread is in Lalang and surrounding villages. The duration of impact is as long as the port operates. Another component affected is the business opportunity for the community around the port to try / sell to the workers who will also improve the economy of the community. This has an impact on the economic level of the community. So if it is seen that the important level of the impact of employment and business opportunities to economic level for the people around the project site is the **Important Positive (+ P)** impact.

7.4.7 Impact on Shipping Safety

The dedicated Port operational activities potentially impact to the shipping safety in the waters around the Dedicated Port

development of PT. Sarana Industama Perkasa. Viewed from the number of affected people is quite large considering the many fishermen and also large ships that cross the waters in front of the dedicated Port development site to the General Port of Kuala Tanjung. The impact spreading is at the dedicated Port location. The duration of impact is as long as the dedicated port operates. The impact is not accumulative. There is a derivative impact of security and order of waters. The impact can be reversed, so overall it is said that the operational activities of the dedicated Port to shipping safety have an **important negative (-P)** impact.

7.4.8 Impact of Public Perception

Labor absorption of 60 of all labor involved in dedicated port operations (not including additional labor) is expected to provide a positive perception of the project attendance. The number of people affected is quite a lot of those who work on projects and their families. Impacts take place as long as the port operates. The impact spreading is in Lalang and surrounding villages. So, overall

the impact of local employment recruitment to community perceptions is **important Positive (+ P).**

7.4.9 Public health impact

The public health impact is a derivative of the impact to the physical, chemical and biological environment as well as the socio-cultural impact. The number of people affected is quite a lot of those who work on projects and their families. Impacts take place during dedicated port operates. The impact Spreading is in Lalang and surrounding villages (Pagurawan urban village). So, overall impact of the derivatives of the construction and dedicated port operational activities to public health is **important Negative (-P).**

From the evaluation of existing impacts, it can be presented in matrix form in Table 7.1

Table 7.1 Matrix of Large and Important Impacts Evaluation On Pre-Construction, Construction and Post-Construction Stage of Dedicated Port Activities Plan

Activities of environmental components	**Activities**																					
	Pre-construction				**Construction**													**Post-construction**				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Physical-chemical components																						
1. Ambient air quality	0	0	0	0	0	-P	-P	-P	-P	-P	-P	-P	0	0	0	0	0	0	0	0	0	0
2. Noise	0	0	0	0	0	-P	-P	-P	-P	-P	-P	-P	0	0	0	0	0	0	0	0	0	0
3. Liquid waste	0	0	0	0	0	0	0	0	0	-1P	0	0	0	0	0	0	0	0	0	0	0	-1P
4. Solid waste	0	0	0	0	0	0	0	0	0	-1P	0	0	0	0	0	0	0	0	0	0	0	-1P
5. Sea water quality	0	0	0	0	0	0	0	-P	0	-P	0	0	0	0	0	0	0	0	-P	0	0	0
6. Abrasion / sedimentation	0	0	0	0	0	0	0	-1P	0	-1P	0	0	0	0	0	0	0	0	-1P	0	0	0
7. Safety of the voyage	0	0	0	0	0	0	-P	-P	0	-P	0	0	0	0	0	0	0	0	-P	0	-P	0
8. Traffic Generation	0	0	0	0	-1P	-1P	-1P	0	0	-1P	0	-1P	0	0	0	0	0	0	-1P	0	-1P	0

Biological components																						
1. vegetation and land animals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. aquatic biota	0	0	0	0	0	0	0	-P	0	-P	0	0	0	0	0	0	0	0	-P	0	0	0
Socio economic components																						
1. People's economy	0	0	0	0	+P	0	0	0	0	+P	0	0	0	0	0	0	0	0	+P	0	0	0
2. Employment and Business Opportunities	0	0	0	0	+P	0	0	0	0	+P	0	0	+P	0	0	+P	+P	+P	+P	0	0	0
3. people's perception	9	-1P	-1P	-1P	0	0	0	0	0	-1P	0	0	0	0	0	0	0	0	-P	0	0	-P
4. people’s healthy	0	0	0	0	-1P	-1P	0	0	0	-1P	0	-1P	0	0	0	0	0	0	-P	0	0	-P

Data source: Field Survey and Consultant Analysis Results, 2003

Description :

1. land supply
2. preliminary survey
3. bathymetry survey and land investigation
4. preparation of technical planning
12. material transportation
13. construction supervision
14. mechanical and electrical
15. utility

SPECIAL PORT ESTABLISHMENT

5. labor mobilization
6. heavy equipment mobilization
7. transportation of materials
8. Foundation work
9. soil compaction work
10. port construction
11. operational support facilities
16. commitioning / testing
17. operator training
18. recruitment of operational workforce
19. port operations
20. shipping traffic
21. loading and unloading activities
22. Waste management

Large Numbers and Importance of Impact

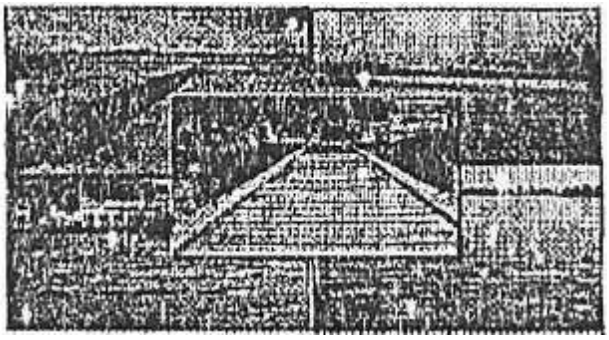
1 = Not Big and Important

3 = Quite Big and important

5 = Large and important

- = negative + = positive

SPECIAL PORT ESTABLISHMENT



CHAPTER VII

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PT. SARANA INDUSTAMA PERKASA

CHAPTER VII

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CHAPTER IX

APPENDIX

PT. SARANA INDUSTAMA PERKASA

CHAPTER IX APPENDIX

Appendix 1 Permit Letter

SPECIAL PORT ESTABLISHMENT

Appendix 2 Soil Investigation Result and Geological Profile

Appendix 3 Society Socialization Items

Appendix 4 Laboratory Analysis Result

Appendix 5 Engineering Design Detail of Dedicated Port

Appendix 6 Data of AMDAL (environmental impact assessment) Author

Appendix 1

Permit Letter

PT. SARANA INDUSTAMA PERKASA

NORTH SUMATRA PROVINCIAL GOVERNMENT

DISTRICT ENVIRONMENTAL IMPACT MANAGEMENT AGENCY

Jln. T. Daud No. 5 Phone (061) 4537050 Fax. (061) 4537060

MEDAN

SPECIAL PORT ESTABLISHMENT

DECREE

HEAD OF DISTRICT ENVIRONMENTAL IMPACT MANAGEMENT AGENCY

NORTH SUMATRA PROVINCE

NUMBER: 268/BPDL-SU/BTL YEAR 2005

ABOUT

AGREEMENT ON REFERENCE FRAMEWORK OF ENVIRONMENTAL IMPACT ASSESSMENT REPORT (KA – ANDAL)
DEDICATED PORT CONSTRUCTION IN LALANG VILLAGE - MEDANG DERAS SUBDISTRICT - ASAHAN DISTRICT - NORTH SUMATRA PROVINCE

HEAD OF DISTRICT ENVIRONMENTAL IMPACT MANAGEMENT AGENCY

NORTH SUMATRA PROVINCE

Considering: a. that the business and/or activity of the Dedicated port Construction in Lalang Village - Medang Deras Subdistrict - Asahan District is a business and/or activity that requires the Environmental Impact Assessment.

b. that the Reference Framework of Environmental Impact Assessment Report

(ANDAL) for Dedicated port Construction in Lalang Village - Medang Deras Subdistrict - Asahan District as part of Environmental Impact Assessment is required to get the Agreement Decree based on assessment result of Provincial AMDAL Assessor Commission;

c. that based on the letters a and b above, it is necessary to stipulate the Decree of the Head of District Environmental Impact Management Agency of North Sumatra Province, about the Agreement on Reference Framework of Environmental Impact Assessment Report (KA-ANDAL) for Dedicated port Construction in Lalang Village - Medang Deras Subdistrict - Asahan District.

In view of:

1. Law No. 24 of 1992 on Spatial Planning (State Gazette of the Republic of Indonesia of 1992 No. 115, Supplementary State Gazette of the Republic of Indonesia No. 3501);
2. Law No. 23 of 1997 on Environmental Management (State Gazette of the Republic of Indonesia No. 3699);

3. Government Regulation No. 27 of 1999 on Environmental Impact Assessment (State Gazette of the Republic of Indonesia of 1999 No. 59, Supplementary State Gazette of the Republic of Indonesia No. 3838);
4. Decree of State Minister of Environment No. 2 of 2000 on Assessment Manual of Environmental Impact Assessment Document;
5. Decree of State Minister of Environment of the Republic of Indonesia No. 40 of 2000 on Working Procedure Guidelines for Assessor Commission of Environmental Impact Assessment;
6. Decree of the Head of Environmental Impact Management Agency No. 08 of 2000 on Community Involvement and Information Disclosure in AMDAL process;
7. Decree of the Head of Environmental Impact Management Agency No. 09 of 2000 on Preparation Guidelines of Environmental Impact Assessment;

8. Decree of State Minister of Environment No. 17 of 2001 on Type of Business and/or Activity that Requires the Environmental Impact;
9. Decree of North Sumatra Governor No. 050/285/K/Year 2002 on AMDAL Process Management in North Sumatra Province.

Noticing: - Meeting Result of Technical Team and Provincial AMDAL Assessor Commission in Medan on 23 April 2004 regarding the Assessment for Draft of Reference Framework of Environmental Impact Assessment Report (KA-ANDAL) of Dedicated port Construction in Lalang Village - Medang Deras Subdistrict - Asahan District.

D E C I D E S

To stipulate :

FIRST : Decree of the Head of District Environmental Impact Management Agency of North Sumatra Province about the Agreement on Reference Framework of Environmental Impact Assessment Report

(KA-ANDAL) for Dedicated port Construction in Lalang Village - Medang Deras Subdistrict - Asahan District.

SECOND : Decree on the Agreement of Reference Framework of Environmental Impact Assessment Report (KA-ANDAL) for Dedicated port Construction (DUKS) in Lalang Village - Medang Deras Subdistrict - Asahan District, As referred to in the FIRST dictum, means that the scope and depth of Environmental Impact Assessment (AMDAL) for the activity of Dedicated port Construction in Lalang village - Medang Deras Subdistrict - Asahan District by PT Sarana Industama Perkasa are as stated in the document of Reference Framework of Environmental Impact Assessment Report (KA-ANDAL) attached.

THIRD : Reference Framework of Environmental Impact Assessment Report (KA-ANDAL) for Dedicated port Construction in Lalang Village - Medang Deras Subdistrict - Asahan District by PT. Sarana Industama Perkasa is a reference in the

implementation of the next Environmental Impact Assessment Report (ANDAL).

FOURTH : Steps of physical development activity of Dedicated port Project (DUKS) in Lalang Village - Medang Deras Subdistrict - Asahan District should not be done until the issuance of Environmental Feasibility Decree based on the results of Environmental Impact Assessment Report (ANDAL), Environmental Management Plan (RKL), and Environmental Monitoring Plan (RPL).

FIFTH : Any negligence and/or deviation committed outside the Decree on Agreement may be subject to sanction in accordance with applicable regulations.

Stipulated in : Medan

On : 26 April 2005

HEAD OF DISTRICT ENVIRONMENTAL IMPACT MANAGEMENT AGENCY OF NORTH SUMATRA PROVINCE

Signed and stamped

Prof. H. SYAMSUL ARIFIN, SH, MH

Senior Administrator

ID No.: 130809985

This decree is submitted to:

1. Minister of Home Affairs in Jakarta
2. State Minister of Environment in Jakarta
3. North Sumatra Governor in Medan (as report)
4. AMDAL Assessor Commission of North Sumatra Province in Medan
5. Asahan Regent
6. Director of PT. Sarana Industama Perkasa
7. Archive

REGENT OF ASAHAN

DECREE OF ASAHAN REGENT

Number: 10.UBPN/2003

ABOUT

SPECIAL PORT ESTABLISHMENT

GRANT OF LOCATION PERMIT FOR THE DEVELOPMENT OF PALM KERNEL, OLEOCHEMICAL, AND JETTY INDUSTRIES

PT. SAWIT MAS AGRO PRIMA

REGENT OF ASAHAN

: Application letter dated 26 September 2002 No. 020/SAP/SK/IX/02 from Yusuf S. W. as the Director of PT. SAWIT MAS AGRO PRIMA located in Jalan Raya Tembung – Medan which contains location permit application of the land area of ± 70 ha located in Lalang Village - Medang Deras Subdistrict - Asahan District, North Sumatra Province.

Considering :

1. That based on field review by Coordination Meeting Team, the use of ± 70 ha land area requested consists of bushes and coconut palms.
2. That in Coordination Meeting dated 11 November 2002, location permit for the Development of Palm Kernel, Oleochemical, and Jetty Industries is approved.

3. That in accordance with General Spatial Plan (RUTR) of Asahan District and Regional Regulation No. 1 of 1995 on Asahan District Spatial Plan, the requested location is located in Medang Deras Subdistrict for the purpose of industrial estate.
4. That after obtaining the Location Permit, the Company of PT SAWIT MAS AGRO PRIMA is required to prepare Environmental Management Efforts and Environmental Monitoring Efforts.

In view of:

1. Emergency Law No. 7 of 1956 on Formation of District-City Autonomous Regions in North Sumatra Provincial Environment (State Gazette of 1956 No. 58);
2. Law No. 5 of 1960 on Basic Agrarian Principles (State Gazette of 1961 No. 101);
3. Law No. 23 of 1977 on Basic Provisions of Environmental Management (State Gazette of 1977 No. 08);
4. Law No. 24 of 1992 on Spatial Planning;

5. Law No. 22 of 1999 on Regional Government (State Gazette of 1999 No. 60);
6. Presidential Decree of the Republic of Indonesia No. 97 of 1993 on Capital Investment Procedures as changed by Presidential Decree No. 115 of 1998;
7. Regulation of the State Minister of Agrarian Affairs/Head of National Land Agency No. 2 of 1999 on Location Permit;
8. Regional Regulation of Asahan District No. 3 of 1995 on Asahan District Spatial Plan;

Noticing:

1. Deed of Establishment of Limited Liability Company from Notary Ika Azniga Lokman, SH., residing in Medan, No. 13 dated 17 Juni 2002;
2. Field Review Report dated 6 November 2002 and Minutes of Coordination Meeting dated 11 November 2002 about the approval for the Grant of Location Permit for the Development of Palm

Kernel, Oleochemical, and Jetty Industries.

D E C I D E S

To stipulate :

FIRST : To grant the Location Permit to PT. SAWIT MAS AGRO PRIMA located in Jalan Raya Tembung – Medan, for ± 70 ha land area located in Lalang Village, Medang Deras Subdistrict, Asahan District, North Sumatra Province as contained in Land Location Map in the appendix of this decree with the following terms:

1. Before the relevant land is acquired by the location permit holder, all interests of other parties already existing on the relevant land are not diminished and recognized, including the legal authority of the Land Title Holder to obtain the proof of Title or Certificate, the authority to use and utilize for personal or business purposes pursuant to

applicable Spatial Plan, and the authority to assign the title to other parties;

2. The land shall be acquired within 24 (twenty four) months from the date of stipulation of this Decree which can be extended for a maximum of 12 (twelve) months if the acquired land reaches more than 50% of the land area designated in Location Permit and the acquired land can request the Right of Building Utilization in Land Registry Office of Asahan District;
3. Location permit holder shall respect the interests of other parties on the land which has not been acquired, shall not diminish the community accessibility around the location, and shall maintain and protect the public interest;
4. Maintain and protect the green line of the periphery of Sumatra Strait by planting mangroves and similar

plants and building coastal protection wall;

5. Location permit holder is not allowed to transfer/trade the location permit and shall use the land in accordance with the purpose of the business of palm kernel, oleochemical, and jetty industries;
6. The company is obliged to prioritize the utilization of manpower of local community and the community around the location;
7. Industrial/Factory development business permit is granted in accordance with applicable regulations;
8. The company shall meet the other requirements which have been established in accordance with applicable laws and regulations;

SECOND : 1. Implementation of the provisions of this Decree shall be supervised by the Asahan Regent;

2. Location permit holder must report periodically every 3 (three) months

to Land Registry Office regarding the implementation of land acquisition and land use;

THIRD : This decree is valid for 12 (twelve) months from the date of its stipulation and upon the request of location permit holder, it may be extended 1 (one) time for 12 (twelve) months if the location permit holder meets the requirements as determined in this Decree;

FOURTH : illegible

STIPULATED IN : KISARAN

ON : 11 March 2003

ASAHAN REGENT

Signed and stamped

Drs. H. RISUDDIN

PT. SAWIT MAS AGRO PRIMA

Jalan Raya Tembung, in Medan.

This decree is submitted to:

1. illegible National Land Agency in Jakarta.
2. illegible North Sumatra in Medan.
3. illegible North Sumatra Province in Medan.

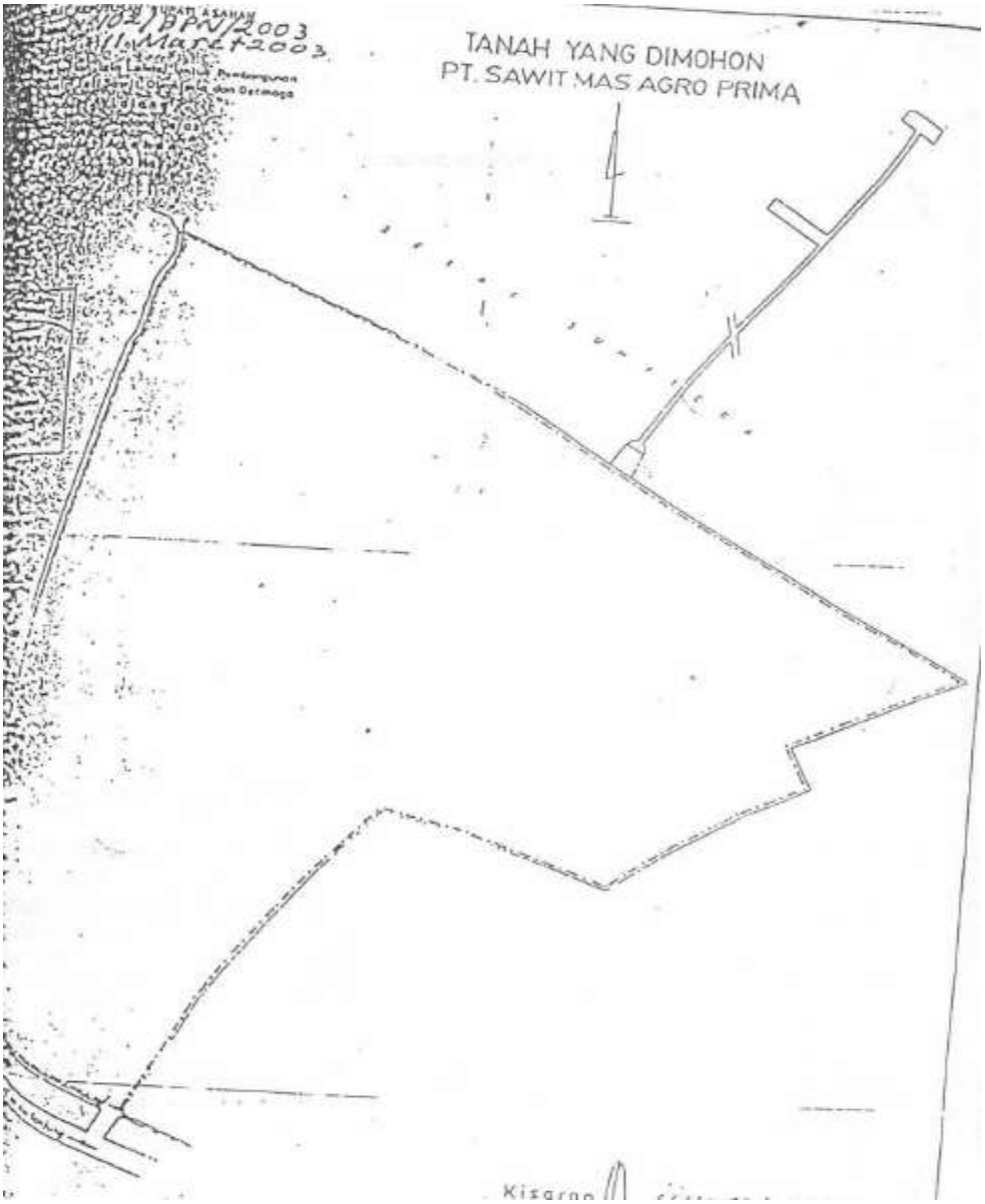
SPECIAL PORT ESTABLISHMENT

4. illegible National Land Agency of North Sumatra Province in Medan.
5. illegible Asahan District in Kisaran.

REQUESTED LAND

PT. SAWIT MAS AGRO PRIMA

SPECIAL PORT ESTABLISHMENT



Kisaran, 11 March 2003

ASAHAN REGENT,

Signed and stamped

Drs. H. RISUDDIN

MEDAN CITY GOVERNMENT

SPECIAL PORT ESTABLISHMENT

REPUBLIC OF INDONESIA

DEPARTMENT OF INDUSTRY AND COMMERCE OF MEDAN CITY

Jalan Mangkubumi No. 4 Medan, Postal Code: 20151

Phone: 4515465 – 4145584, Fax.: 4530066

LARGE SCALE TRADING BUSINESS PERMIT (SIUP)

NUMBER: 051/02.13/PB/V/2003. Re-Registration:

0	0

illegible Regional Regulation No. 10 of 2002 on Trading Business Permit (SIUP)

Company Name	:	"PT. SARANA INDUSTAMA PERKASA"
Brand (Own/License)	:	-
Office/Company Address	:	JL. GAJAH MADA NO. 10 KEL. PETISAH TENGAH KEC. MEDAN PETISAH. Phone Number/Fax.: (061)7576035.
Name of Owner/Person in Charge	:	HORAS CHU NAGA.
Address of Owner/Person in Charge	:	JL. THAMRIN NO. 4-C, P. SIANTAR. Phone Number/Fax.: -
Taxpayer Identification Number (TIN)	:	02.094.393.2-111.000.
Value of company's	:	IDR 2,500,000,000 (TWO BILLION

SPECIAL PORT ESTABLISHMENT

entire capital and net worth excluding Land and Building	FIVE HUNDRED MILLION RUPIAH)
Business Activity	: TRADE OF GOODS AND SERVICES
Institutional	: MAIN SUPPLIER, EXPORTER, IMPORTER.
Business Sector	: LARGE DOMESTIC TRADE OF RAW MATERIALS
Type of Goods/Services of the Main Merchandise	: AGRICULTURAL PRODUCTS (512). PRODUCTS: PLANTATION, FOREST, AGRICULTURE, INDUSTRY. EQUIPMENTS: ENGINEERING, COMMUNICATION, DEVELOPER SERVICE, LEVERANSIR.

This SIUP is issued with the following provisions:

This Trading Business Permit (SIUP) applies to trading business activities in the all territories of the Republic of Indonesia as long as the company still carries out its trading business activities.

The owner/people in charge is required to report its trading business activities twice a year with the schedule for the first semester no later than 30 July and for the second semester no later than the 31 January of the following year for Medium and Large Scale SIUP or once a year for Small Scale SIUP no later than 31 January of the following year.

SPECIAL PORT ESTABLISHMENT

Not applicable for Commodity Futures Trading, Money Game, Foreign Exchange Trading, and Stock Exchange activities.

Re-register once every 3 (three) years at least 3 (three) months before 01 May 2006.

Not carrying out business activities other than those specified in this SIUP.

Photograph

Issued in : Medan

Date : 02 May 2003

THE HEAD OF DEPARTMENT OF INDUSTRY AND COMMERCE

MEDAN CITY

Signed and stamped

Drs. H. T. BASYRUL KAMALI, MM.

First Class Administrator

ID NO.: 400033286

MINISTRY OF JUSTICE AND HUMAN RIGHTS

REPUBLIC OF INDONESIA

DECREE OF THE MINISTER OF JUSTICE AND HUMAN RIGHTS

REPUBLIC OF INDONESIA

Number: C-23095 HT.01.01TH.2002

ABOUT

APPROVAL OF THE DEED OF ESTABLISHMENT OF LIMITED LIABILITY COMPANY

MINISTER OF JUSTICE AND HUMAN RIGHTS

REPUBLIC OF INDONESIA

Considering : That after reviewing the Notarial Deed Application Form of Model I and its complementary documents and Copy of Deed No. 13 dated 17 June 2002 and Copy of Deed No. 16 dated 23 September 2002 drawn up and submitted by Notary Ika Azniga Lokman, SH. and received on 2 november 2002, these have met the terms and conditions of applicable laws and regulations.

In view of : 1. Law of the Republic of Indonesia No. 1 of 1995 on Limited Liability Company (State Gazatte of the Republic of Indonesia No. 13 of 1995, Supplementary State Gazette No. 3587 of 1995).

2. Law of the Republic of Indonesia No. 8 of 1997 on Company Document (State Gazatte of the Republic of Indonesia No. 18 of 1997, Supplementary State Gazette of the Republic of Indonesia No. 3674).

3. Governmental Regulation No. 26 of 1998 on the Use of Limited Liability Company's Name (State Gazatte of the Republic of Indonesia No. 39 of 1998, Supplementary State Gazette No. 3740 of 1998).

4. Decree of the Minister of Justice and Human Rights of the Republic of Indonesia No. M.01 HT.01.01 Year 2000 on The Implementation of Legal Entity Administrative System in Directorate General of General Law

Administration of the Ministry of Justice and Human Rights of the Republic of Indonesia.

D E C I D E S :

To stipulate :

FIRST : To approve the Deed of Establishment of Limited Liability Company

PT. SARANA INDUSTAMA PERKASA

TIN: 02.094.393.2-111.000.

Located in: MEDAN, in accordance with Notarial Deed Application Form of Model I stored in the Database, Copy of Deed No. 13 dated 17 June 2002, and Copy of Deed No. 16 dated 23 September 2002 drawn up and submitted by Notary Ika Azniga Lokman, SH. residing in MEDAN.

SECOND: Decree of the Minister of Justice and Human Rights of the Republic of Indonesia is valid since the date of stipulation.

Stipulated in : Jakarta

On : 22 November 2002

On behalf of MINISTER OF JUSTICE

AND HUMAN RIGHTS

REPUBLIC OF INDONESIA

DIRECTOR GENERAL

GENERAL LAW ADMINISTRATION

Signed

ZULKARNAIN YUNUS, SH., MH.

ID No.: 040034478

C H A N G E

Number: 16.

--On this day, Monday, the twenty third day of September two thousand and two (23-09-2002).----------

--Appearing before me, IKA AZNIGA LOKMAN, Bachelor of Law, based on the Decree of the Minister of Justice of the Republic of Indonesia dated sixteenth day of April one thousand nine hundred and ninety-two (16-04-1992) number: 0-11.HT.03.01 Th.1992, notary in Medan, in the presence of witnesses, whom I, the Notary, know and shall be mentioned at the end of this deed.----------

--Mr. FERRY TANUDJAYA, private, residing in Jakarta Utara, Jalan Muara Karang K 5 T/18, Kelurahan Pluit, Kecamatan Penjaringan, the holder of ID Card of Special Capital Region of Jakarta Number: 09.5102.300353.0171, Indonesian Citizen, currently residing in Medan;----------

-according to his statement in this matter acting based on 2 (two) Power of Attorney made privately, duly stamped, both dated fourteenth day of June two thousand and two (14-06-2002) which have been attached to the original deed drawn up by me, notary, dated seventeenth day of June two thousand and two (17-06-2002) number 12, as the proxy of and therefore for and on behalf of:------

1. Mr. SUGIHARTO LIM, born in Binjai, on fourteenth day of February one thousand nine hundred and forty-nine

(14-02-1949), private, residing in Jakarta Barat, Kapuk Pulo, RT. 010 RW. 010, Kelurahan Kapuk, Kecamatan Cengkareng, the holder of ID Card of Special Capital Region of Jakarta Number: 09.5002.140249.0167, Indonesian Citizen, and;--------

2. Mr. HORAS CHU NAGA, born in Pematang Siantar, on twenty seventh day of October one thousand nine hundred and sixty-five (27-10-1965), private, residing in Pematang Siantar, Jalan Thamrin number 4-C, Kelurahann Dwikora, Kecamatan Siantar Barat, the holder of ID Card of the Republic of Indonesia issued by the Subdistrict Head of Siantar Barat on behalf of Siantar Mayor dated eighteenth day of April two thousand and one (18-04-2001) number: 02.5302.271055.0001, Indonesian Citizen.----------

--The appearer is known to me, Notary.----------

--The appearer acting in his capacity as mentioned above explains in advance:----------

-that under the deed dated seventeenth day of June two thousand and two (17-06-2002) number 13, in which the original thereof was drawn up before me, notary, the appearer, Mr. SUGIHARTO LIM and Mr. HORAS CHU NAGA have incorporated a limited liability company in the name of “PT. SAWIT MAS AGRO PRIMA”, located in Medan;----------

-that the articles of association of such limited liability company until now has not been approved by competent authority;----------

-that the shareholders have agreed to change the article 1 paragraph 1 on NAME AND DOMICILE and the article 3 on PURPOSE AND OBJECTIVE, AND BUSINESS ACTIVITIES of the company, which will be stated in this deed.----------

--The appearer acting in his capacity as aforementioned hereby makes the following changes in the company's articles of association:----------

A. -Change the article 1 of the company's articles of association, then hereafter the company's articles of association is written and read out as follows:--------

----------NAME AND DOMICILE----------

----------Article 1----------

1. This limited liability company is known as "PT. SARANA INDUSTAMA PERKASA" (hereinafter in this Articles of Association is referred to as 'Company"), having its legal domicile and head office in Medan Muticipality.----------

B. -Change the article 3 of the company's articles of association, then hereafter the company's articles of association is written and read out as follows:--------

------PURPOSE AND OBJECTIVE, AND BUSINESS ACTIVITIES-------

----------Article 3----------

1. Company's purpose and objective are to carry out the business in agricultural, industrial, trade, service, and development sectors.----------
2. To achieve this purpose and objective, the Company will perform the following business activities:----
   a. Palm oil plantation, forestry, perform businesses in the fields of agriculture, agricultural industry, agribusiness (trade of agricultural products) agro-industry, livestock, terrestrial/marine fisheries, and aquaculture;----------
   b. Industries of crude/natural rubber, forest products processing (non-industrial crops), forest products processing (industrial crops), palm oil processing, Crude Palm Oil processing;----------
   c. Carrying out businesses in the trading, export, and import fields. Including the export, import, and trade of agricultural materials, plantation products, and palm oil. Distributor, agent, and representative of legal entity, grossier, supplier, leveransir, and commision house. Trading related to real estate and property business;----------

d. Operating the businesses in service field in general, except service in law and tax fields.-

e. Performing businesses in development field, especially residential area development, acting as developer, general contractor, heavy lifting, construction of building, bridge, road, airport - dock, telecommunication contractor.----------

--All things mentioned above are stated in this deed as a proof.----------

----------IN WITNESS WHEREOF THIS DEED----------

--Was drawn up and executed in Medan.----------

TIN : 02.094.393.2-111.000.

NAME : PT. SARANA INDUSTAMA PERKASA

ADDRESS : JL. GAJAH MADA NO. 10
PETISAH TENGAH
MEDAN PETISAH
MEDAN

REGISTERED:
08-07-2002

MINISTRY OF FINANCE OF THE REPUBLIC OF INDONESIA

DIRECTORATE GENERAL OF TAXES

REGIONAL TAX OFFICE I OF NORTH SUMATRA

TAX SERVICE OFFICE OF WEST MEDAN

TAXABLE ENTREPRENEUR CONFIRMATION LETTER

NO. PEM-8416/WPJ.01/KP.0503/2002

In accordance with Article 2 paragraph (2) of Law No. 6 of 1983 on General Tax Provisions and Procedures as amended for the last time by Law No. 16 of 2000 and the Decree of the Directorate General of Taxes No. KEP-161/PJ/2001, it is hereby stated that:

Name	:	PT. SARANA INDUSTAMA PERKASA
TIN	:	02.094.393.2-111.000
Business Classification	:	31154 INDUSTRY OF COOKING OIL MADE FROM PALM OIL
Address	:	JL. GAJAH MADA NO. 10, PETISAH TENGAH – MEDAN – 20112
Brand/Acronym	:	-
Capital Status	:	DOMESTIC INVESTMENT
Business Status	:	MAIN BUSINESS

SPECIAL PORT ESTABLISHMENT

Tax Liability : ( ) Value-Added Tax (VAT)

( ) Sales Tax on Luxury Goods

Tax Invoice Serial Code : EFD F – 111

has been confirmed in our administration as Taxable Entrepreneur.

After the issuance of this letter, the Taxable Entrepreneur is required to include TIN in carrying out its rights and obligations relating to VAT and Sales Tax on Luxury Goods since 24-10-2002.

MEDAN, 24 October 2002

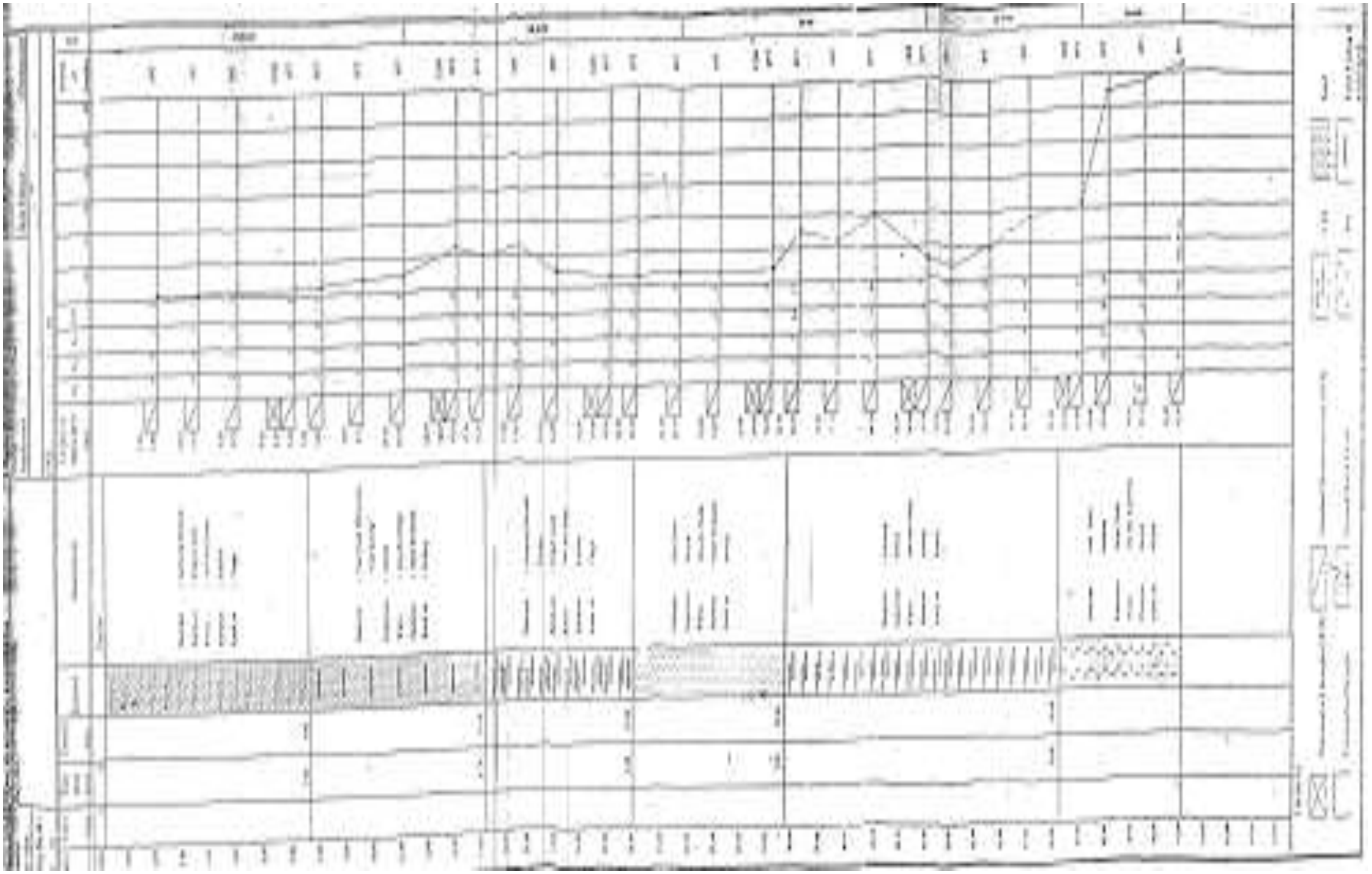
On behalf of the Head of Regional Tax Office

The Head of Extra Money Supply (TUP) Section

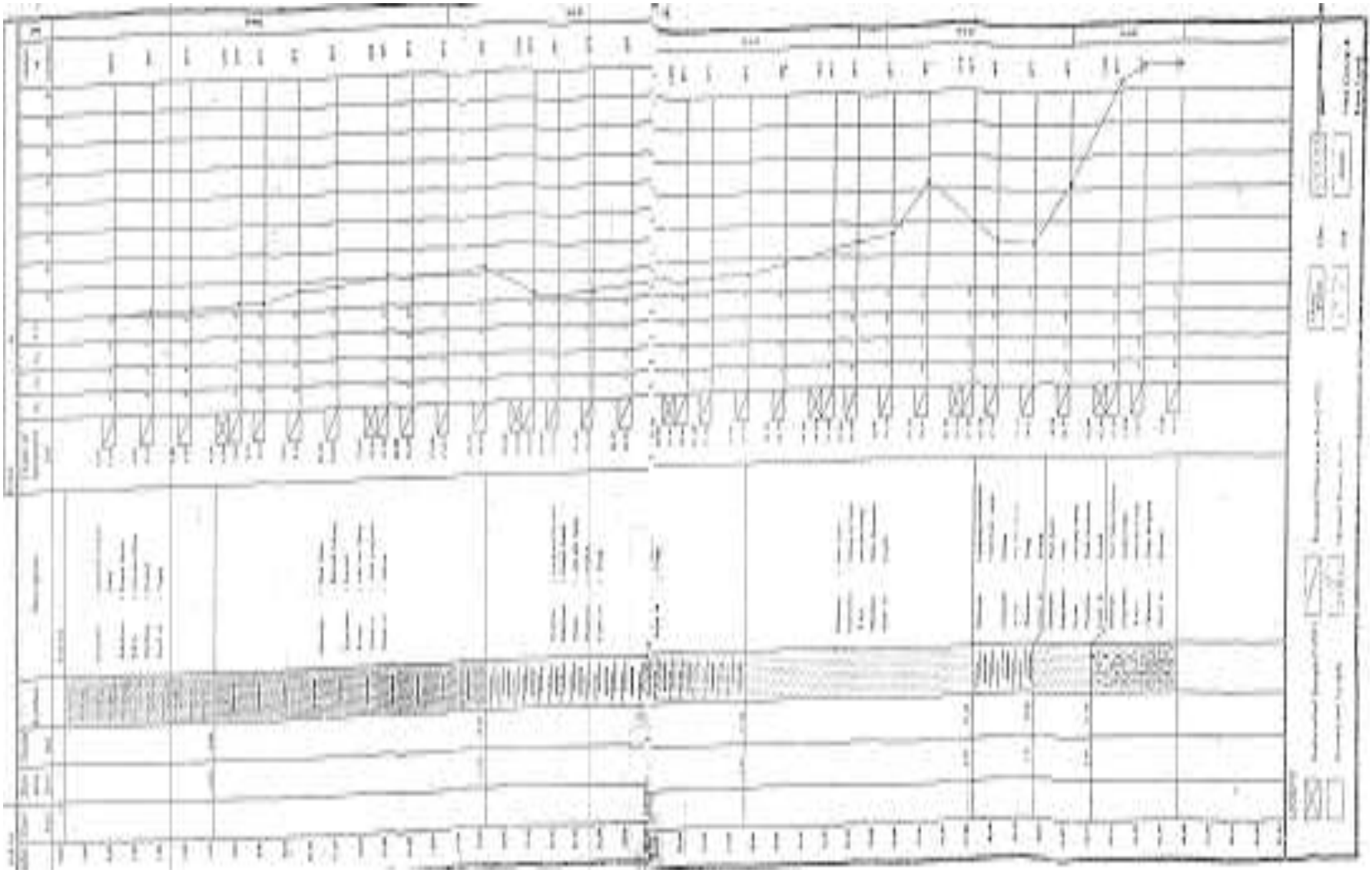
Signed and stamped

KARSIMAN SARAGIH, SE. AK.

ID No.: 060092901



SPECIAL PORT ESTABLISHMENT



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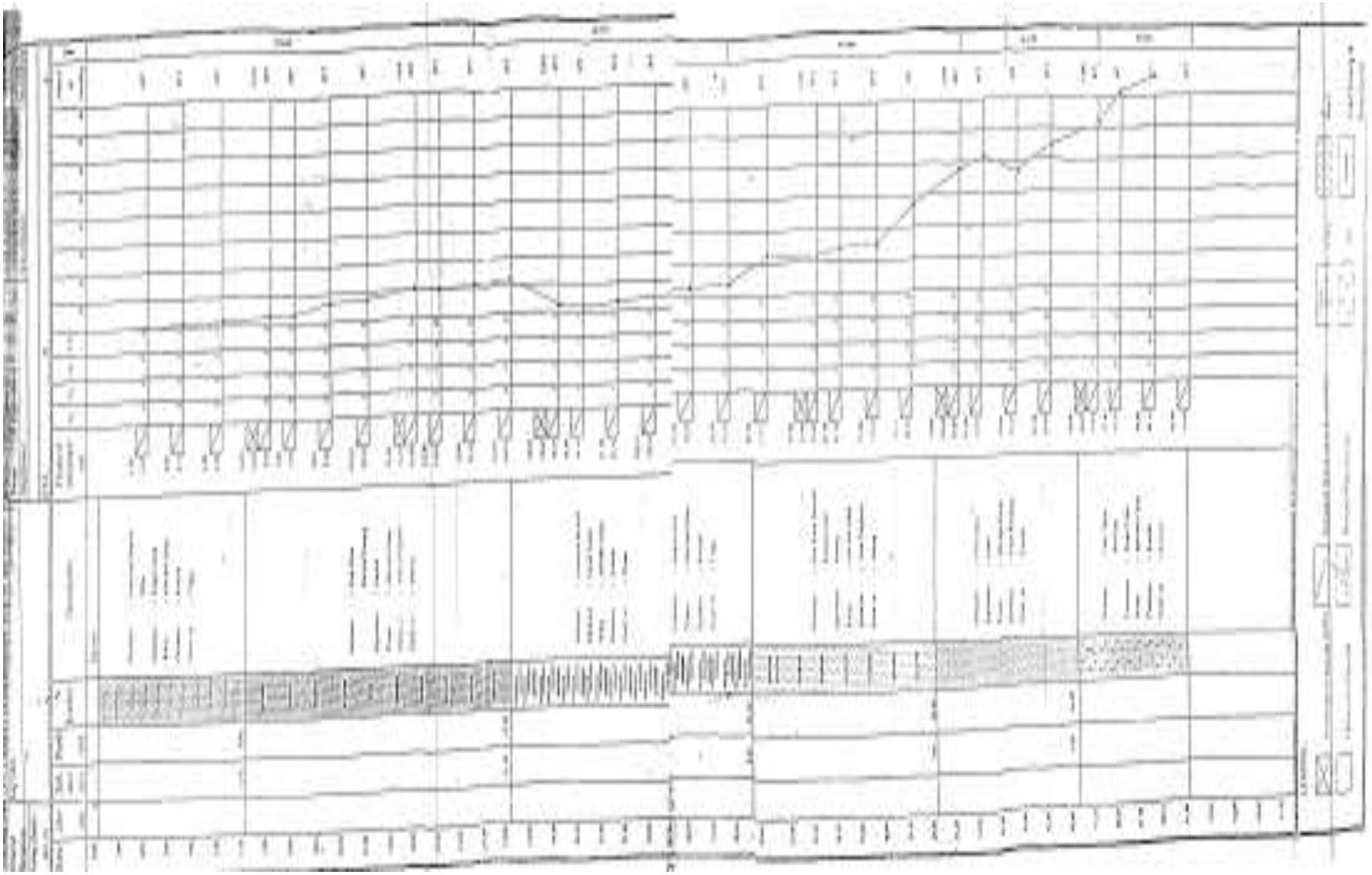

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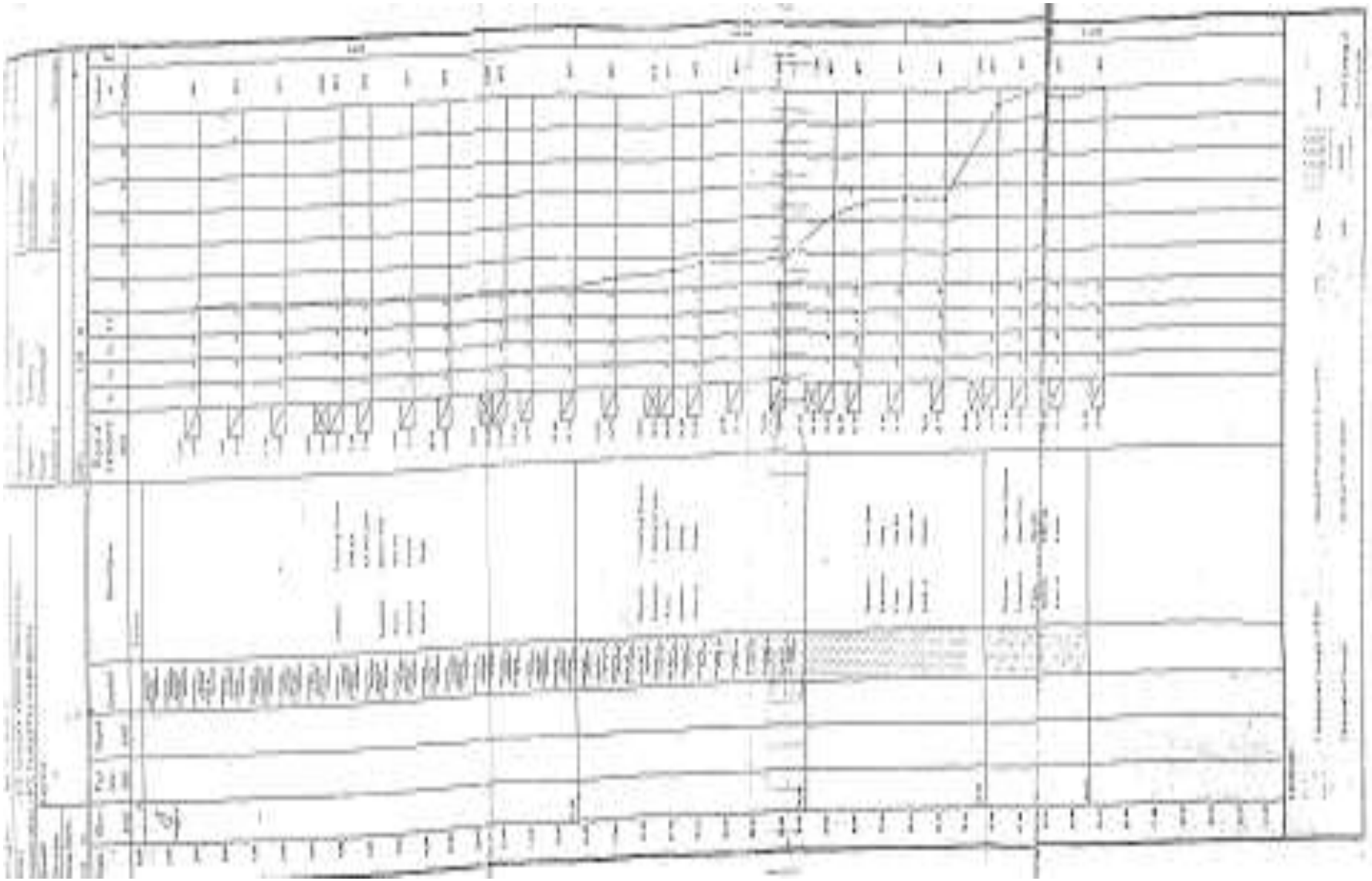

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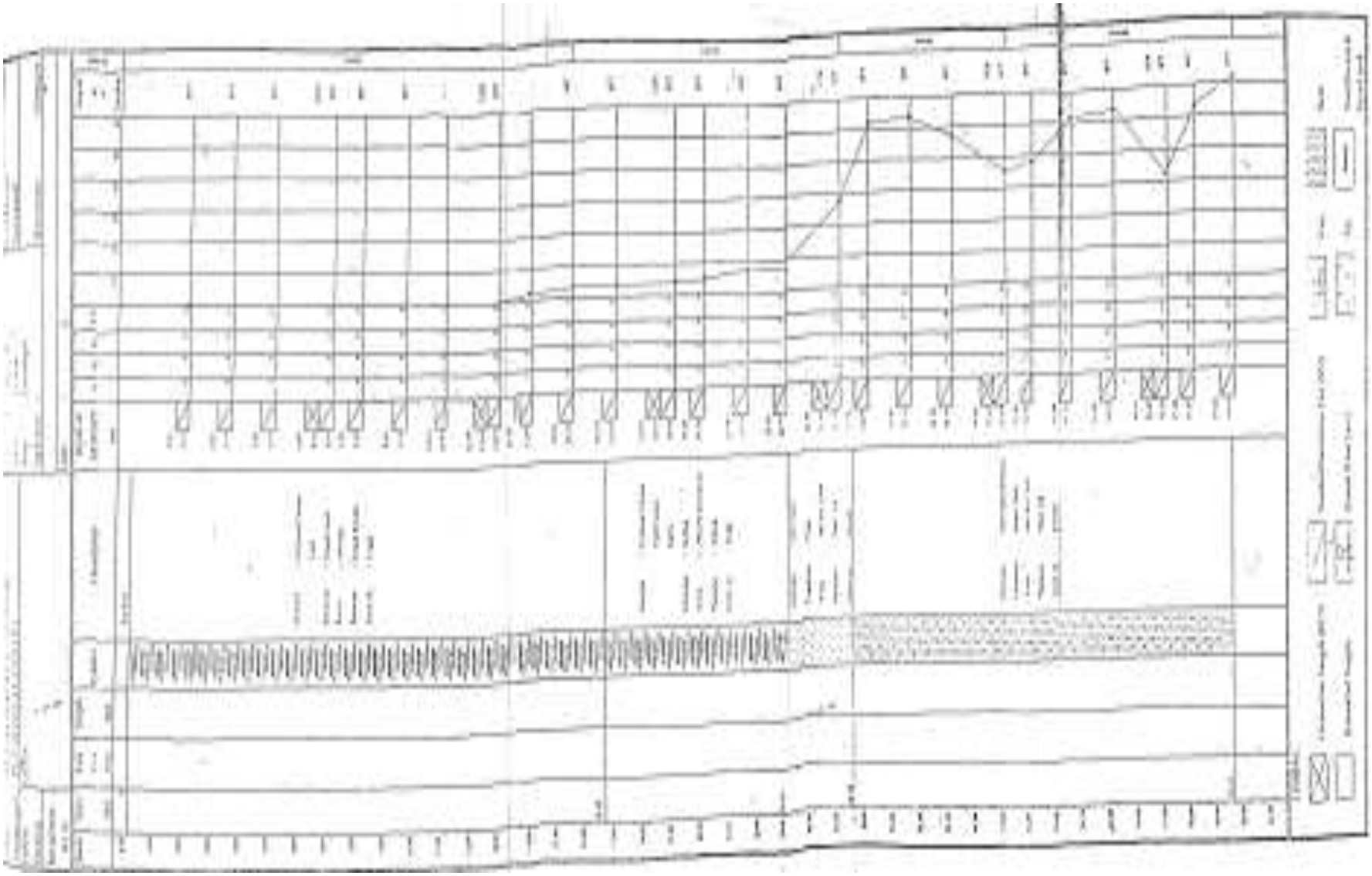

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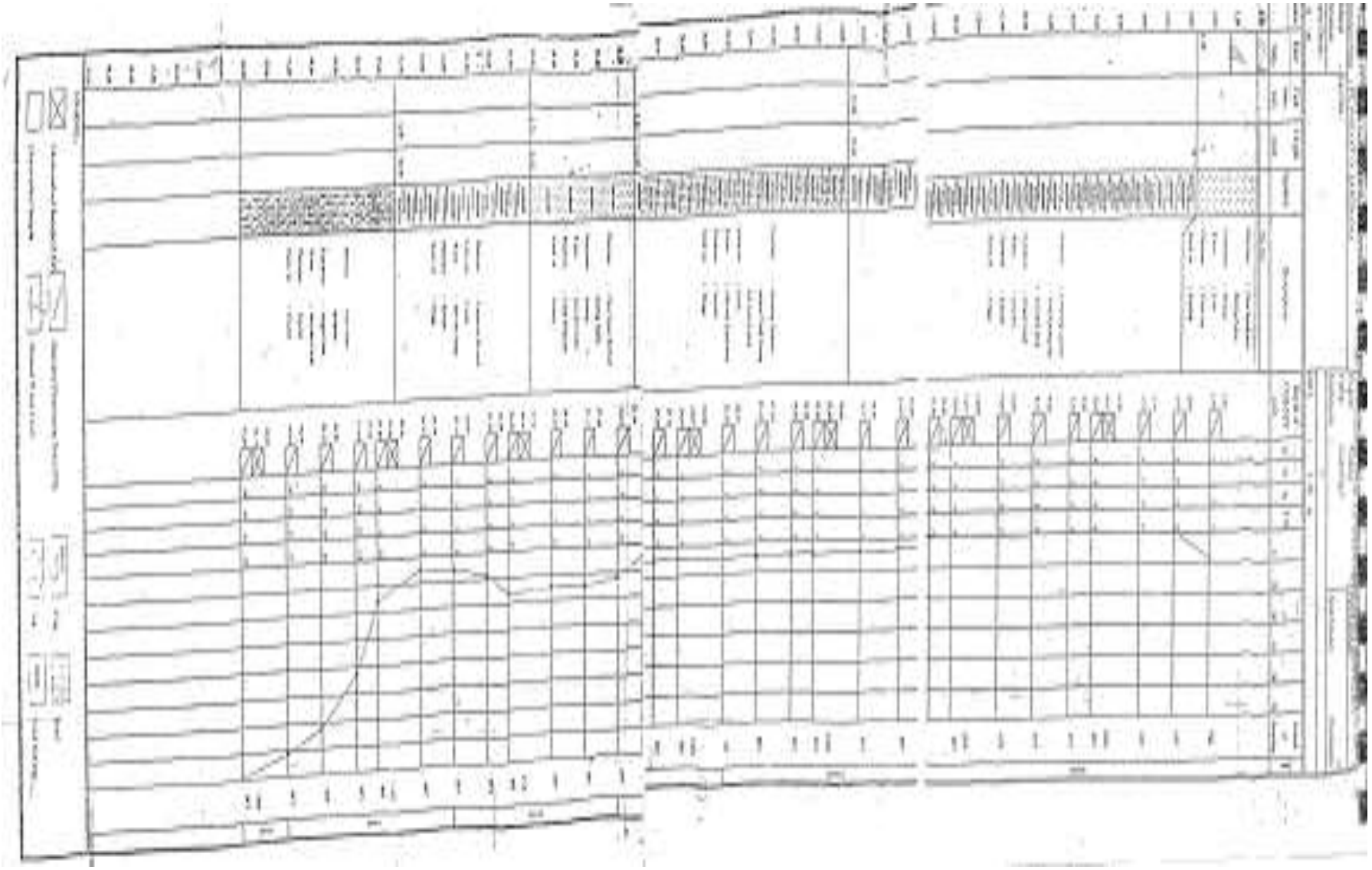

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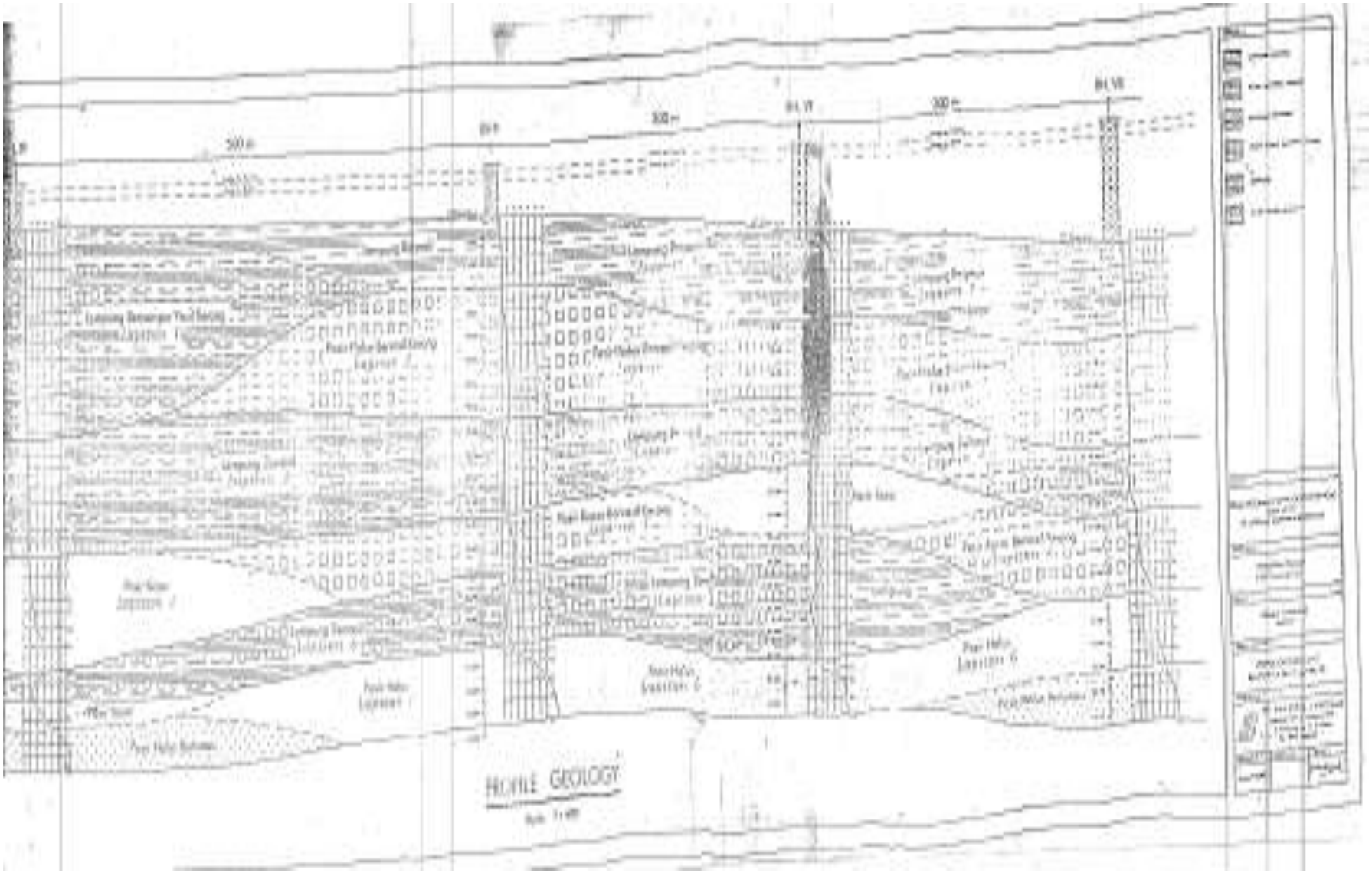
BH I
BH VII
500 m
300 m
300 m
HORIZONTAL GEOLOGY

Appendix 2

Soil and Geological Profile

PT. SARANA INDUSTAMA PERKASA

PT. SARANA INDUSTAMA PERKASA

(formerly known as PT. SAWIT MAS AGRO PRIMA)

Jl. Raya Tembung No. 23

Percut - Sei Tuan – Medan – Sumatra Utara

Phone (061) 7940033

No: 045/SAP/SK/VI/03

Medan, 11 June 2003

To.

Governor of North Sumatra Province

For attention: Head of District Environmental Impact Management Agency

Jl. Tengku Daud No. 5

In

MEDAN

Re: Request for Clarification on AMDAL Document Preparation

Dear,

We, PT. Sarana Industama Perkasa (formerly known as PT. Sawit Mas Agro Prima) intend to plan the development of kuala tanjung industrial estate located in Lalang Village,

SPECIAL PORT ESTABLISHMENT

Medang Deras Subdistrict, Asahan District, with activity type of storage tank industry and the construction of private interest jetty.

Based on the Governmental Regulation No. 27 of 1999 on AMDAL and the Decree of the State Minister of Environment of the Republic of Indonesia No. 17 of 2001 on the Type of Business and/or Activity that Requires the Environmental Impact Assessment (AMDAL), we intend to prepare AMDAL document. In relation to the location and type of activity, we request for clarification on the document type and which agency is responsible for approving the document we want to prepare.

We hereby conclude our request, thank you for the clarification.

Best regards,

PT. Sarana Industama Perkasa

(formerly known as PT. Sawit Mas Agro Prima)

Signed

PT. SARANA INDUSTAMA PERKASA

Kasan

General Manager

Carbon copy: - File

SPECIAL PORT ESTABLISHMENT

AMDAL PREPARATION PLAN ANNOUNCEMENT

DEVELOPMENT OF INDUSTRIAL ESTATE AND DEDICATED PORT

PT. SARANA INDUSTAMA PERKASA

Number: 03/SIP/VII/2003

In order to implement the Decree of the Head of Environmental Impact Management Agency No. 08 of 2000 on the community involvement in AMDAL process, through this announcement, PT. SARANA INDUSTAMA PERKASA as the initiator expects the community's suggestions, opinions, and responses as study and review sources in the next AMDAL.

It is hereby announced that:

- Company Name : **PT. SARANA INDUSTAMA PERKASA**
- Company Address : Jl. Ujung serdang Km. 11,5 No. 60
  Tanjung Marawa
  Deli Serdang
- Business Location :
  Village : Lalang
  Subdistrict : Medang Deras
  District : Asahan

Business Type : 1. Development of Industrial Estate of PT. Sarana Industama Perkasa with an area of approximately 70 ha.

2. Dedicated Port of PT. Sarana Industama Perkasa with massive construction of 2.6 km long, 4.25 km wide and the call with maximum weight of 55,000 DWT in new industrial estate.

- Impact Type :

Positive : - The availability of employment and business opportunities

– Provide contribution in order to improve the economy in Asahan District especially and North Sumatra Province in general.

– Increase country's foreign exchange.

Negative : Can affect the environmental change, soil condition, water resource, air quality,

biodiversity, and environmental comfort.

The community may provide suggestions, opinions, and responses to the Business Plan in writing with due regard to the following:

- Use good and proper Indonesian language
- Written clearly so it is easy to read
- Include the Identity Data (Name, Address)
- Submit/deliver to:

Governor of North Sumatra, For Attention: Head of District Environmental Impact Management Agency of North Sumatra Province.

Jl. Tengku Daud No. 5 Medan, Phone: 061 – 4535279 / Fax.: 4537050 with the carbon copy to the Regent of Asahan District no later than 30 (thirty) work days since the date of this Announcement.

This announcement is made for your understanding.

Medan, July 2003

PT. SARANA INDUSTAMA PERKASA

Signed and stamped

KASAN

General Manager