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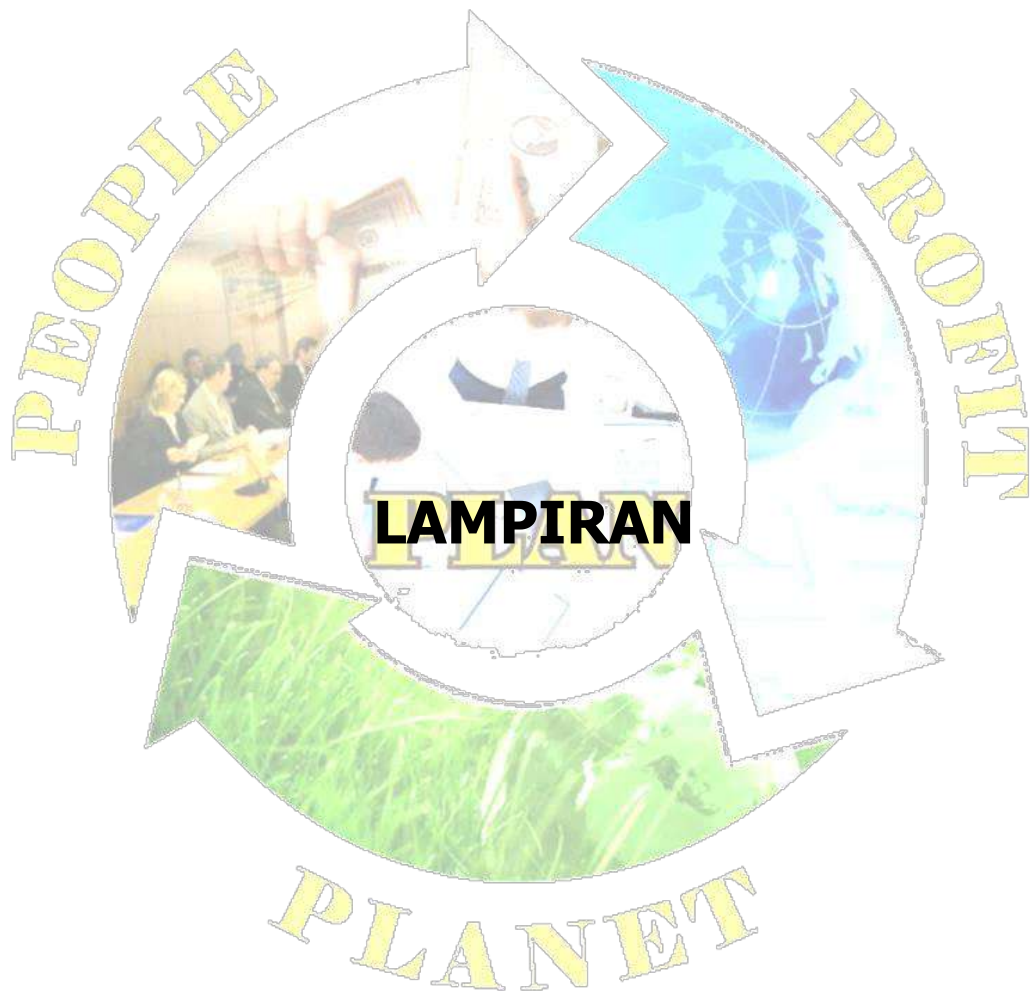


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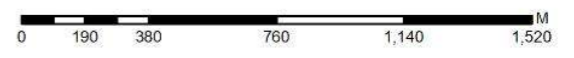
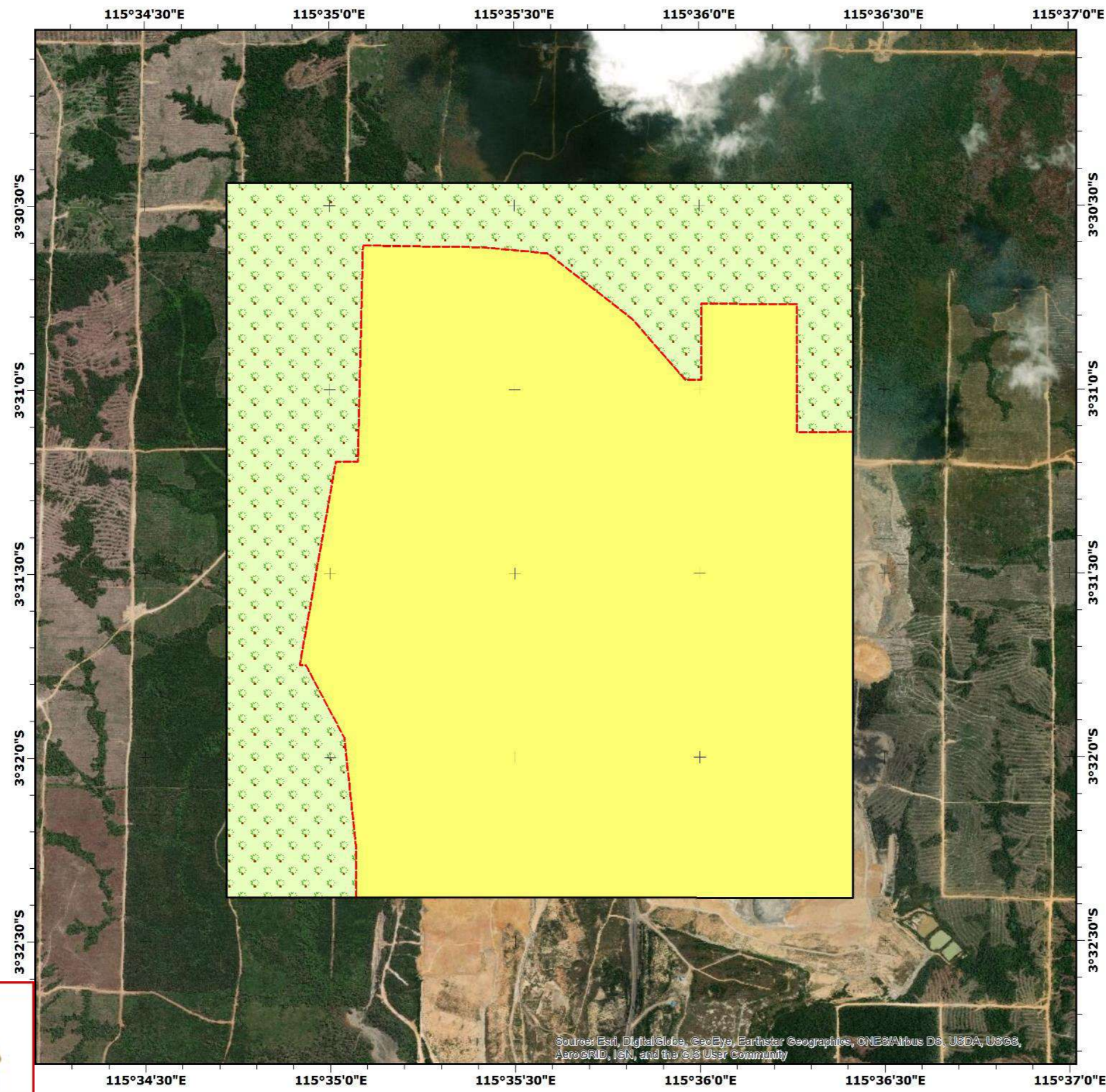
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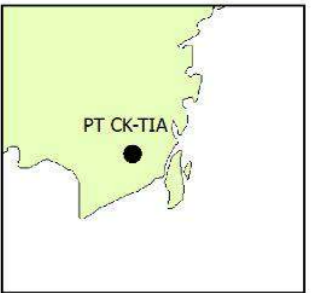
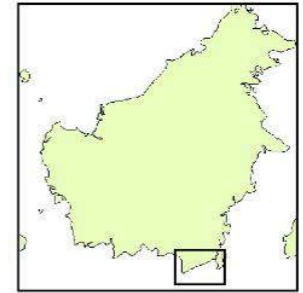
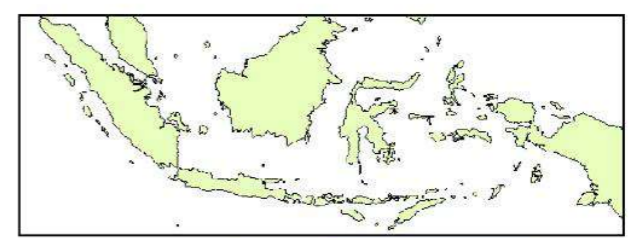




Legenda

- - - Izin Pinjam Pakai Kawasan Hutan
- Perkebunan
- Wilayah Penambangan

Informasi Kartografi:
 Proyeksi: UTM, Zona 50 S
 Datum Unit WGS-84



**DEPARTEMEN TEKNIK PERTAMBANGAN
 FAKULTAS TEKNIK
 UNIVERSITAS HASANUDDIN
 2020**

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LOKASI PENELITIAN

**PT CIPTA KRIDATAMA SITE TIA
 Provinsi Kalimantan Selatan**

LAMPIRAN A	HALAMAN 56
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

PDF

Optimization Software:
www.balesio.com



Tabel B. Waktu Edar Alat Angkut

Date	Digger Class	Hauler Class	CE	CO	Material	Distance (m)	Loading (s)	Travel Load (s)	Speed Load (s)	Dumping Spotting (s)	Dumping (s)	Travel Empty (s)	Speed Empty (s)	Queuing (s)	Spotting (s)	Avg CT (s)
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	138.94	380.87	14.18	15.95	32.05	341.12	15.83	75.50	27.00	1,011.43
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	224.64	371.02	14.55	27.78	38.28	228.71	23.61	0.00	29.00	919.43
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	226.15	362.15	14.91	22.35	37.25	248.90	21.70	44.11	21.59	962.50
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	166.17	385.43	14.01	21.59	44.11	161.14	33.51	60.94	33.39	872.77
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	170.22	347.72	15.53	16.14	31.89	244.25	22.11	0.00	25.94	836.16
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	223.19	420.70	12.84	32.77	30.25	255.23	21.16	152.01	19.51	1,133.66
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	139.24	360.02	15.00	22.09	28.29	220.33	24.51	129.95	37.38	937.30
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	144.54	391.98	13.78	20.07	27.38	226.06	23.89	129.94	34.29	974.26
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	173.88	339.51	15.91	17.97	18.22	302.03	17.88	60.85	27.09	939.55
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	135.00	354.00	15.25	24.31	22.66	210.00	25.71	107.28	39.20	892.45
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	184.94	346.31	15.59	20.13	20.12	270.62	19.95	94.36	31.12	967.60
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	161.71	351.94	15.34	14.63	32.27	240.88	22.42	157.83	37.40	996.66
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	128.33	300.00	18.00	13.37	30.81	188.50	28.65	103.00	35.48	799.49
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	169.10	331.99	16.27	12.33	22.82	222.30	24.29	57.30	45.21	861.05
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	148.20	335.82	16.08	27.21	33.29	191.00	28.27	76.88	29.72	842.12
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	160.32	310.63	17.38	10.20	31.06	200.00	27.00	0.00	23.00	735.21
05/12/2019	100T	70T	CE148	CO236	Ripping	1,500	146.94	356.30	15.16	21.32	29.44	123.57	43.70	36.85	23.42	737.84
05/12/2019			CE148	CO236	Ripping	1,500	185.92	380.03	14.21	23.27	20.07	119.89	45.04	31.53	32.42	793.13
05/12/2019			CE148	CO236	Ripping	1,500	161.43	345.81	15.62	5.22	25.27	240.18	22.48	0.00	16.61	794.52
05/12/2019			CE148	CO236	Ripping	1,500	240.39	352.93	15.30	13.65	29.03	116.24	46.46	49.72	34.70	836.66
05/12/2019			CE148	CO236	Ripping	1,500	105.87	346.50	15.58	15.11	29.45	312.00	17.31	311.85	20.50	1,141.28
05/12/2019			CE148	CO236	Ripping	1,500	108.00	347.36	15.55	24.37	24.99	114.10	47.33	61.29	37.34	717.45
05/12/2019			CE148	CO236	Ripping	1,500	152.65	402.33	13.42	11.83	17.45	136.56	39.54	42.85	34.02	797.69



Tabel B. Lanjutan Waktu Edar Alat Angkut

<i>Date</i>	<i>Digger Class</i>	<i>Hauler Class</i>	<i>CE</i>	<i>CO</i>	<i>Material</i>	<i>Distance (m)</i>	<i>Loading (s)</i>	<i>Travel Load (s)</i>	<i>Speed Load (s)</i>	<i>Dumping Spotting (s)</i>	<i>Dumping (s)</i>	<i>Travel Empty (s)</i>	<i>Speed Empty (s)</i>	<i>Queuing (s)</i>	<i>Spotting (s)</i>	<i>Avg CT (s)</i>
05/12/2019	100T	70T	CE148	CO236	<i>Ripping</i>	1,500	124.46	361.73	14.93	17.17	28.64	132.34	40.80	121.90	16.05	802.29
05/12/2019	100T	70T	CE148	CO236	<i>Ripping</i>	1,500	149.19	370.23	14.59	18.05	21.72	133.23	40.53	120.28	51.66	864.36
05/12/2019	100T	70T	CE148	CO236	<i>Ripping</i>	1,500	157.47	372.12	14.51	12.07	18.22	204.66	26.39	86.83	23.42	874.79
05/12/2019	100T	70T	CE148	CO236	<i>Ripping</i>	1,500	168.75	360.13	14.99	16.65	31.18	248.13	21.76	60.00	29.76	914.60
05/12/2019	100T	70T	CE148	CO236	<i>Ripping</i>	1,500	148.32	148.32	36.41	17.27	32.43	135.56	39.83	32.93	17.29	532.12
05/12/2019	100T	70T	CE148	CO236	<i>Ripping</i>	1,500	163.91	163.91	32.94	17.90	37.45	120.03	44.99	33.05	30.31	566.56
05/12/2019	100T	70T	CE148	CO236	<i>Ripping</i>	1,500	147.42	160.00	33.75	18.00	37.00	124.00	43.55	34.52	15.72	536.66
<i>Average</i>							161.05	339.28	16.99	18.33	28.86	197.42	30.65	74.94	29.17	849.05
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	102.40	280.42	14.12	10.68	30.08	240.29	16.48	130.00	35.93	829.80
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	151.48	269.00	14.72	7.07	34.74	115.79	34.20	134.15	11.23	723.46
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	153.70	305.00	12.98	10.20	32.17	192.59	20.56	120.72	18.85	833.23
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	127.00	252.77	15.67	30.00	30.02	174.01	22.76	120.30	12.85	746.95
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	132.00	361.00	10.97	30.09	30.14	175.64	22.55	152.33	11.92	893.12
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	150.00	158.35	25.01	13.34	17.20	125.91	31.45	123.40	29.63	617.83
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	242.81	161.20	24.57	26.10	29.25	122.89	32.22	123.34	21.75	727.34
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	162.02	138.11	28.67	17.53	33.09	135.72	29.18	69.04	35.39	590.90
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	134.00	125.60	31.53	18.90	30.10	129.57	30.56	135.70	28.56	602.43
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	141.34	180.65	21.92	17.20	28.87	142.01	27.89	188.10	28.31	726.48
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	138.35	187.58	21.11	21.02	32.98	152.00	26.05	60.30	25.20	617.43
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	162.00	152.21	26.02	20.03	32.65	152.03	26.05	75.08	11.04	605.04
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	172.00	172.31	22.98	20.01	31.05	133.69	29.62	60.00	17.54	606.60
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	160.37	161.00	24.60	18.23	30.65	133.48	29.67	92.51	46.32	642.56
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	146.50	150.00	26.40	17.29	21.10	163.85	24.17	211.40	17.52	727.66



Tabel B. Lanjutan Waktu Edar Alat Angkut

<i>Date</i>	<i>Digger Class</i>	<i>Hauler Class</i>	<i>CE</i>	<i>CO</i>	<i>Material</i>	<i>Distance (m)</i>	<i>Loading (s)</i>	<i>Travel Load (s)</i>	<i>Speed Load (s)</i>	<i>Dumping Spotting (s)</i>	<i>Dumping (s)</i>	<i>Travel Empty (s)</i>	<i>Speed Empty (s)</i>	<i>Queuing (s)</i>	<i>Spotting (s)</i>	<i>Avg CT (s)</i>
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	124.00	163.93	24.16	23.22	32.00	134.68	29.40	131.87	20.11	629.81
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	103.59	184.00	21.52	13.45	30.02	129.00	30.70	13.12	12.00	485.18
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	122.25	152.82	25.91	11.35	3.22	120.32	32.91	180.08	26.68	616.72
06/12/2019	100T	70T	CE187	CO287	<i>Ripping</i>	1,100	122.25	152.82	25.91	15.53	28.52	127.00	31.18	150.00	22.00	618.12
<i>Average</i>							143.74	192.25	22.24	17.97	28.94	148.87	27.44	120.26	22.52	674.55
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	134.56	410.02	19.32	15.53	28.54	250.00	31.68	48.00	33.68	920.33
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	135.17	388.80	20.37	20.44	30.21	261.11	30.33	67.00	33.82	936.55
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	131.99	360.92	21.94	21.82	22.03	271.21	29.20	163.24	40.15	1,011.36
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	182.79	396.95	19.95	22.32	30.31	229.09	34.57	22.52	12.03	896.01
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	112.00	400.30	19.79	20.09	30.06	266.70	29.70	0.00	15.42	844.57
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	112.47	353.11	22.43	21.72	31.03	251.11	31.54	57.00	39.12	865.56
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	100.27	295.40	26.81	18.11	32.93	263.72	30.03	87.00	33.00	830.43
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	110.05	420.33	18.84	28.32	31.03	260.00	30.46	0.00	40.22	889.95
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	114.17	66.97	118.26	32.50	29.79	272.00	29.12	0.00	37.43	552.86
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	101.27	406.47	19.48	30.03	30.20	280.00	28.29	60.00	23.00	930.97
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	80.87	420.00	18.86	17.07	30.45	265.00	29.89	65.00	17.20	895.59
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	120.11	402.00	19.70	18.72	30.12	240.14	32.98	86.34	48.44	945.87
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	120.31	419.11	18.90	19.22	33.40	264.11	29.99	71.20	11.00	938.35
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	111.22	179.00	44.25	20.21	30.30	293.90	26.95	0.00	11.23	645.86
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	129.29	398.00	19.90	20.42	31.30	245.00	32.33	0.00	12.14	836.15
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	119.99	413.92	19.13	33.67	33.67	249.00	31.81	90.09	40.51	980.85
07/12/2019	100T	70T	CE159	CO221	<i>Ripping</i>	2,200	79.75	400.20	19.79	22.62	22.62	255.03	31.06	0.00	39.00	819.22
<i>Average</i>							117.43	360.68	27.51	22.52	29.88	259.83	30.58	48.08	28.67	867.09



Tabel B. Lanjutan Waktu Edar Alat Angkut

Date	Digger Class	Hauler Class	CE	CO	Material	Distance (m)	Loading (s)	Travel Load (s)	Speed Load (s)	Dumping Spotting (s)	Dumping (s)	Travel Empty (s)	Speed Empty (s)	Queuing (s)	Spotting (s)	Avg CT (s)	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	132.80	450.56	16.78	16.72	36.26	311.79	24.25	0.00	17.20	965.33	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	140.72	475.52	15.90	26.85	47.35	304.72	24.81	0.00	13.35	1,008.51	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	149.44	465.00	16.26	21.63	40.17	260.60	29.01	0.00	21.67	958.51	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	171.35	458.80	16.48	40.92	38.24	293.38	25.77	13.00	40.82	1,056.51	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	147.79	440.56	17.16	19.00	41.07	290.88	25.99	114.82	93.69	1,147.81	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	124.19	460.23	16.43	17.95	35.32	290.15	26.06	100.44	25.58	1,053.86	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	140.80	443.00	17.07	18.00	37.00	288.00	26.25	111.20	26.00	1,064.00	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	143.00	411.00	18.39	24.00	36.00	289.00	26.16	99.00	28.00	1,030.00	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	134.00	429.00	17.62	26.00	37.00	279.00	27.10	89.00	30.00	1,024.00	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	139.24	430.01	17.58	23.58	38.32	307.56	24.58	87.00	23.00	1,048.71	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	175.56	435.23	17.37	24.01	40.00	262.86	28.76	56.00	63.00	1,056.66	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	141.47	462.50	16.35	25.47	39.89	227.26	33.27	98.00	60.80	1,055.39	
09/12/2019	90T	60T	CE164	CO179	Ripping	2,100	127.90	442.66	17.08	20.10	39.72	240.53	31.43	109.05	20.72	1,000.68	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	128.00	415.74	18.18	18.18	40.22	240.00	31.50	15.00	40.86	898.00	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	113.70	439.00	17.22	20.12	40.00	288.00	26.25	0.00	25.20	926.02	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	110.53	448.44	16.86	21.30	37.37	300.00	25.20	0.00	18.61	936.25	
09/12/2019	90T	60T	CE164	CO179	Freedig	2,100	139.64	480.00	15.75	20.22	38.03	280.00	27.00	0.00	28.96	986.85	
<i>Freedig Average</i>								135.77	454.13	16.68	23.24	39.71	284.81	26.72	3.50	25.83	967.00
<i>Ripping</i>								141.55	439.35	17.23	22.01	38.26	275.03	27.73	96.06	41.20	1,053.46
10			CE161	CO262	Ripping	900	161.20	205.00	15.80	19.41	45.00	101.51	31.92	0.00	17.20	549.32	
10			CE161	CO262	Ripping	900	154.00	182.00	17.80	27.00	36.00	121.21	26.73	0.00	37.00	530.21	
10			CE161	CO262	Ripping	900	155.00	190.00	17.05	27.93	46.00	128.58	25.20	0.00	39.00	586.51	
10			CE161	CO262	Ripping	900	168.00	200.00	16.20	23.93	51.00	120.03	26.99	0.00	34.00	596.96	



Tabel B. Lanjutan Waktu Edar Alat Angkut

Date	Digger Class	Hauler Class	CE	CO	Material	Distance (m)	Loading (s)	Travel Load (s)	Speed Load (s)	Dumping Spotting (s)	Dumping (s)	Travel Empty (s)	Speed Empty (s)	Queuing (s)	Spotting (s)	Avg CT (s)
10/12/2019	100T	70T	CE161	CO262	Ripping	900	178.00	198.00	16.36	20.00	40.00	162.00	20.00	0.00	4.00	602.00
10/12/2019	100T	70T	CE161	CO262	Ripping	900	148.00	220.00	14.73	21.00	34.00	151.43	21.40	0.00	41.00	615.43
10/12/2019	100T	70T	CE161	CO262	Ripping	900	156.00	190.00	17.05	22.00	36.00	144.00	22.50	0.00	44.00	592.00
10/12/2019	100T	70T	CE161	CO262	Ripping	900	106.00	183.00	17.70	24.98	37.00	110.72	29.26	0.00	45.76	507.46
10/12/2019	100T	70T	CE161	CO262	Ripping	900	120.00	175.00	18.51	20.00	38.00	111.10	29.16	0.00	46.00	510.10
10/12/2019	100T	70T	CE161	CO262	Ripping	900	145.00	182.35	17.77	21.00	36.80	110.16	29.41	0.00	32.00	527.31
10/12/2019	100T	70T	CE161	CO262	Ripping	900	146.00	180.00	18.00	21.00	30.00	120.00	27.00	0.00	30.00	527.00
10/12/2019	100T	70T	CE161	CO262	Ripping	900	149.00	187.00	17.33	21.00	32.00	119.00	27.23	0.00	32.00	540.00
10/12/2019	100T	70T	CE161	CO262	Ripping	900	89.93	175.00	18.51	22.00	53.00	110.71	29.27	103.15	34.00	587.79
10/12/2019	100T	70T	CE161	CO262	Ripping	900	153.00	182.06	17.80	34.37	45.00	129.16	25.09	0.00	33.00	576.59
10/12/2019	100T	70T	CE161	CO262	Ripping	900	150.60	204.00	15.88	16.30	45.67	106.28	30.49	65.00	36.00	623.85
10/12/2019	100T	70T	CE161	CO262	Ripping	900	156.00	182.00	17.80	36.69	34.50	118.98	27.23	0.00	39.00	567.17
10/12/2019	100T	70T	CE161	CO262	Ripping	900	172.85	217.48	14.90	30.00	39.00	132.00	24.55	0.00	23.00	614.33
10/12/2019	100T	70T	CE161	CO262	Ripping	900	133.96	182.62	17.74	32.30	37.00	124.00	26.13	0.00	25.80	535.68
10/12/2019	100T	70T	CE161	CO262	Ripping	900	160.00	172.65	18.77	34.00	38.00	135.00	24.00	0.00	17.20	556.85
10/12/2019	100T	70T	CE161	CO262	Ripping	900	134.67	182.35	17.77	30.00	35.00	123.00	26.34	15.49	32.00	552.51
10/12/2019	100T	70T	CE161	CO262	Ripping	900	130.20	192.00	16.88	40.40	34.00	107.59	30.11	0.00	21.00	525.19
10/12/2019	100T	70T	CE161	CO262	Ripping	900	157.00	175.20	18.49	42.30	36.00	112.52	28.79	0.00	22.00	545.02
10/12/2019	100T	70T	CE161	CO262	Ripping	900	152.00	164.00	19.76	23.00	38.00	112.44	28.82	0.00	26.00	515.44
10/12/2019	100T	70T	CE161	CO262	Ripping	900	165.00	182.30	17.77	39.00	38.40	115.78	27.98	0.00	36.20	576.68
10/12/2019	100T	70T	CE161	CO262	Ripping	900	132.00	193.00	16.79	47.00	45.00	123.55	26.22	0.00	27.00	567.55
10/12/2019	100T	70T	CE161	CO262	Ripping	900	162.00	200.01	16.20	34.00	46.00	123.00	26.34	0.00	26.00	591.01
10/12/2019	100T	70T	CE161	CO262	Ripping	900	170.00	185.60	17.46	45.00	44.00	124.65	25.99	0.00	25.60	594.85
10/12/2019	100T	70T	CE161	CO262	Ripping	900	165.00	187.23	17.30	47.60	43.54	134.00	24.18	0.00	24.00	601.37



Tabel B. Lanjutan Waktu Edar Alat Angkut

Date	Digger Class	Hauler Class	CE	CO	Material	Distance (m)	Loading (s)	Travel Load (s)	Speed Load (s)	Dumping Spotting (s)	Dumping (s)	Travel Empty (s)	Speed Empty (s)	Queuing (s)	Spotting (s)	Avg CT (s)	
10/12/2019	100T	70T	CE161	CO262	Ripping	900	170.00	192.30	16.85	21.00	37.00	102.32	31.67	0.00	25.00	547.62	
10/12/2019	100T	70T	CE161	CO262	Ripping	900	185.00	194.32	16.67	10.23	39.00	100.34	32.29	91.00	17.19	637.08	
10/12/2019	100T	70T	CE161	CO262	Ripping	900	154.00	187.65	17.27	12.34	32.51	122.00	26.56	107.28	27.00	642.78	
10/12/2019	100T	70T	CE161	CO262	Ripping	900	114.56	193.40	16.75	20.43	35.70	134.20	24.14	67.00	21.00	586.29	
10/12/2019	100T	70T	CE161	CO262	Ripping	900	163.88	160.71	20.16	23.19	40.02	94.97	34.12	99.00	18.18	599.95	
<i>Average</i>								150.57	187.65	17.41	26.94	39.17	122.28	26.98	14.81	29.07	569.76
11/12/2019	100T	60T	CE148	CO047	Freedig	3,600	134.00	448.38	28.90	32.64	51.70	558.00	23.23	0.00	20.34	1,245.06	
11/12/2019	100T	60T	CE148	CO047	Freedig	3,600	132.00	426.87	30.36	22.08	37.41	613.49	21.13	0.00	24.00	1,255.85	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	110.00	633.58	20.46	26.25	30.22	425.84	30.43	112.00	48.84	1,386.73	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	143.60	620.00	20.90	28.49	30.28	478.34	27.09	90.95	55.21	1,446.87	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	138.03	566.00	22.90	38.29	36.00	475.00	27.28	198.00	49.00	1,500.32	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	142.00	672.46	19.27	23.20	47.71	513.00	25.26	0.00	27.20	1,425.57	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	120.00	700.00	18.51	14.03	52.77	521.00	24.88	0.00	53.20	1,461.00	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	118.00	685.00	18.92	32.00	52.30	506.20	25.60	0.00	42.40	1,435.90	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	119.00	680.00	19.06	32.00	54.00	507.00	25.56	0.00	40.00	1,432.00	
11/12/2019	100T	60T	CE148	CO047	Ripping	3,600	155.90	657.87	19.70	33.62	50.20	512.40	25.29	0.00	30.80	1,440.79	
<i>Freedig Average</i>								133.00	437.63	29.63	27.36	44.56	585.75	22.18	0.00	22.17	1,250.46
<i>Ripping Average</i>								130.82	651.86	19.97	28.49	44.19	492.35	26.43	50.12	43.33	1,441.15
12/12/2019			CE222	CO182	Freedig	3,600	140.00	470.00	27.57	23.00	36.22	346.24	37.43	244.96	39.00	1,299.42	
12/12/2019			CE222	CO182	Freedig	3,600	154.52	473.89	27.35	22.26	37.38	353.00	36.71	208.00	40.00	1,289.05	
12/12/2019			CE222	CO182	Freedig	3,600	142.70	520.00	24.92	30.20	34.00	330.00	39.27	200.75	30.00	1,287.65	
12/12/2019			CE222	CO182	Freedig	3,600	142.20	440.50	29.42	32.70	35.00	355.43	36.46	347.00	25.00	1,377.83	




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Tabel B. Lanjutan Waktu Edar Alat Angkut

Date	Digger Class	Hauler Class	CE	CO	Material	Distance (m)	Loading (s)	Travel Load (s)	Speed Load (s)	Dumping Spotting (s)	Dumping (s)	Travel Empty (s)	Speed Empty (s)	Queuing (s)	Spotting (s)	Avg CT (s)	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	146.00	420.00	30.86	46.47	43.21	475.00	27.28	0.00	27.00	1,157.68	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	150.00	430.00	30.14	19.00	34.04	445.00	29.12	0.00	20.00	1,098.04	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	130.00	435.00	29.79	37.28	33.16	470.00	27.57	0.00	25.00	1,130.44	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	146.00	447.00	28.99	25.60	37.70	375.00	34.56	0.00	27.00	1,058.30	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	180.00	370.10	35.02	18.87	33.00	390.00	33.23	0.00	17.00	1,008.97	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	110.00	425.00	30.49	20.95	32.00	362.00	35.80	172.00	55.00	1,176.95	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	146.00	482.80	26.84	21.00	33.00	353.00	36.71	240.00	20.00	1,295.80	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	141.00	475.00	27.28	32.00	25.00	325.00	39.88	202.00	22.00	1,222.00	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	143.00	435.00	29.79	30.00	24.00	320.00	40.50	200.00	23.00	1,175.00	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	140.00	444.00	29.19	31.00	23.00	321.00	40.37	180.00	22.00	1,161.00	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	145.00	458.00	28.30	32.00	23.00	322.00	40.25	189.00	20.00	1,189.00	
12/12/2019	90T	60T	CE222	CO182	Freedig	3,600	140.00	450.00	28.80	30.00	24.00	319.00	40.63	180.00	21.00	1,164.00	
<i>Average</i>								144.50	446.93	29.19	27.84	32.10	372.77	33.95	159.22	27.05	1,210.40
13/12/2019	90T	60T	CE222	CO275	Freedig	3,700	170.00	456.80	29.16	34.87	35.41	431.00	30.90	25.24	26.11	1,179.43	
13/12/2019	90T	60T	CE222	CO275	Freedig	3,700	130.00	444.50	29.97	19.00	41.00	458.00	29.08	18.19	34.00	1,144.69	
13/12/2019	90T	60T	CE222	CO275	Freedig	3,700	140.00	509.43	26.15	20.19	51.80	432.00	30.83	0.00	17.68	1,171.10	
13/12/2019	90T	60T	CE222	CO275	Freedig	3,700	154.00	490.51	27.16	31.97	31.70	450.00	29.60	0.00	25.00	1,183.18	
13/12/2019			CE222	CO275	Freedig	3,700	131.00	488.00	27.30	32.00	21.00	443.32	30.05	71.00	30.00	1,216.32	
13/12/2019			CE222	CO275	Freedig	3,700	147.00	478.00	27.87	25.00	32.50	448.57	29.69	30.00	34.00	1,195.07	
13/12/2019			CE222	CO275	Freedig	3,700	130.00	484.00	27.52	21.00	37.79	530.67	25.10	120.00	35.00	1,358.46	
13/12/2019			CE222	CO275	Freedig	3,700	147.00	460.00	28.96	22.67	39.00	487.70	27.31	180.00	32.00	1,368.37	
13/12/2019			CE222	CO275	Freedig	3,700	115.00	450.00	29.60	19.47	40.00	432.56	30.79	0.00	33.00	1,090.03	
<i>Average</i>								140.44	473.47	28.19	25.13	36.69	457.09	29.26	49.38	29.64	1,211.85



Tabel B. Lanjutan Waktu Edar Alat Angkut

Date	Digger Class	Hauler Class	CE	CO	Material	Distance (m)	Loading (s)	Travel Load (s)	Speed Load (s)	Dumping Spotting (s)	Dumping (s)	Travel Empty (s)	Speed Empty (s)	Queuing (s)	Spotting (s)	Avg CT (s)	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	135.47	402.00	19.25	28.77	31.00	296.00	26.15	0.00	23.00	916.24	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	90.00	425.00	18.21	23.00	31.00	316.00	24.49	0.00	32.00	917.00	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	83.00	421.00	18.38	28.00	32.00	348.00	22.24	87.00	40.00	1,039.00	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	88.00	409.95	18.88	38.00	34.60	299.00	25.89	0.00	42.00	911.55	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	119.00	417.00	18.56	30.28	40.00	301.00	25.71	90.20	73.00	1,070.48	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	121.00	450.00	17.20	20.00	38.00	294.00	26.33	168.00	13.38	1,104.38	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	151.33	420.00	18.43	15.91	40.00	300.00	25.80	0.00	16.93	944.17	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	142.00	405.54	19.09	20.58	38.00	278.27	27.81	0.00	43.54	927.93	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	136.50	411.80	18.80	20.46	41.66	248.00	31.21	130.00	16.30	1,004.72	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	136.45	360.00	21.50	22.87	47.72	250.00	30.96	50.10	9.00	876.14	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	129.00	400.00	19.35	11.50	29.00	302.00	25.63	45.00	15.00	931.50	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	230.00	420.00	18.43	12.00	30.00	300.00	25.80	0.00	16.00	1,008.00	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	132.00	419.00	18.47	14.00	32.00	311.00	24.89	14.00	17.00	939.00	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	134.00	424.00	18.25	20.00	31.00	310.00	24.97	9.00	15.00	943.00	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	129.00	427.71	18.10	25.80	38.18	332.00	23.31	26.00	16.00	994.69	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	170.00	414.51	18.67	27.30	37.80	330.00	23.45	0.00	14.00	993.61	
14/12/2019	90T	60T	CE222	CO331	Freedig	2,150	168.00	400.36	19.33	13.95	38.20	267.91	28.89	128.65	15.00	1,032.07	
<i>Average</i>								134.99	413.40	18.76	21.91	35.89	299.01	26.09	44.00	24.54	973.73
16			CE159	CO245	Ripping	1,700	175.00	319.00	19.18	15.65	41.42	200.52	30.52	23.00	35.00	809.59	
16			CE159	CO245	Ripping	1,700	143.00	352.00	17.39	16.00	35.44	218.00	28.07	76.00	29.00	869.44	
16			CE159	CO245	Ripping	1,700	142.00	368.00	16.63	20.90	36.00	221.43	27.64	25.00	32.75	846.08	
16			CE159	CO245	Ripping	1,700	152.00	359.00	17.05	19.57	24.50	221.50	27.63	57.00	33.00	866.57	
16			CE159	CO245	Ripping	1,700	150.00	393.45	15.55	14.79	35.00	225.00	27.20	55.00	32.00	905.24	

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Tabel B. Lanjutan Waktu Edar Alat Angkut

<i>Date</i>	<i>Digger Class</i>	<i>Hauler Class</i>	<i>CE</i>	<i>CO</i>	<i>Material</i>	<i>Distance (m)</i>	<i>Loading (s)</i>	<i>Travel Load (s)</i>	<i>Speed Load (s)</i>	<i>Dumping Spotting (s)</i>	<i>Dumping (s)</i>	<i>Travel Empty (s)</i>	<i>Speed Empty (s)</i>	<i>Queuing (s)</i>	<i>Spotting (s)</i>	<i>Avg CT (s)</i>
16/12/2019	100T	60T	CE159	CO245	<i>Ripping</i>	1,700	142.00	372.00	16.45	23.00	34.50	210.00	29.14	55.00	22.00	858.50
16/12/2019	100T	60T	CE159	CO245	<i>Ripping</i>	1,700	137.78	388.46	15.75	15.13	33.40	200.15	30.58	30.32	27.00	832.24
16/12/2019	100T	60T	CE159	CO245	<i>Ripping</i>	1,700	140.00	371.00	16.50	17.00	34.00	207.12	29.55	33.00	30.00	832.12
16/12/2019	100T	60T	CE159	CO245	<i>Ripping</i>	1,700	143.00	375.00	16.32	17.00	36.00	243.00	25.19	39.00	32.00	885.00
16/12/2019	100T	60T	CE159	CO245	<i>Ripping</i>	1,700	144.00	380.00	16.11	15.00	32.40	249.00	24.58	48.00	33.50	901.90
16/12/2019	100T	60T	CE159	CO245	<i>Ripping</i>	1,700	182.51	370.00	16.54	19.00	24.00	228.89	26.74	36.00	32.80	893.20
16/12/2019	100T	60T	CE159	CO245	<i>Ripping</i>	1,700	152.00	372.00	16.45	20.00	32.00	240.00	25.50	30.00	37.00	883.00
<i>Average</i>							149.16	368.08	16.67	18.30	33.42	224.87	27.35	44.70	29.50	868.04
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	132.00	287.65	16.27	27.95	31.86	161.21	29.03	120.00	28.80	789.47
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	139.00	305.79	15.30	22.24	32.00	200.00	23.40	0.00	24.41	723.44
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	141.47	310.00	15.10	15.00	34.00	174.53	26.81	73.40	33.63	782.03
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	152.50	322.71	14.50	12.27	33.00	180.00	26.00	53.09	18.99	772.56
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	136.00	312.70	14.97	36.72	35.50	157.83	29.65	20.00	27.00	725.75
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	130.00	300.00	15.60	30.40	47.00	178.00	26.29	0.00	23.00	708.40
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	131.00	312.00	15.00	28.00	32.00	200.00	23.40	0.00	28.00	731.00
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	142.00	315.26	14.84	20.00	32.90	183.55	25.50	0.00	38.00	731.71
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	141.00	330.34	14.17	25.50	36.11	192.13	24.36	29.00	33.49	787.57
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	150.44	345.00	13.57	19.75	25.63	270.00	17.33	0.00	24.91	835.73
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	144.00	346.42	13.51	10.31	30.22	188.62	24.81	38.00	37.00	794.57
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	167.00	283.00	16.54	22.50	22.63	200.00	23.40	70.00	12.00	777.13
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	135.00	293.00	15.97	23.54	34.12	169.00	27.69	0.00	21.11	675.77
17/12/2019	100T	60T	CE161	CO200	<i>Ripping</i>	1,300	134.00	340.00	13.76	16.00	32.00	190.00	24.63	39.92	22.00	773.92
<i>Average</i>							140.40	315.40	14.89	22.76	32.62	191.45	24.89	31.16	25.87	759.67



Tabel B. Lanjutan Waktu Edar Alat Angkut

Date	Digger Class	Hauler Class	CE	CO	Material	Distance (m)	Loading (s)	Travel Load (s)	Speed Load (s)	Dumping Spotting (s)	Dumping (s)	Travel Empty (s)	Speed Empty (s)	Queuing (s)	Spotting (s)	Avg CT (s)
18/12/2019	100T	60T	CE212	CO249	Ripping	1,850	136.00	410.00	16.24	25.30	35.60	245.00	27.18	36.00	31.29	919.19
18/12/2019	100T	60T	CE212	CO249	Ripping	1,850	139.00	405.00	16.44	24.43	37.14	273.00	24.40	35.00	30.00	943.57
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	138.00	410.00	16.68	26.00	39.00	260.00	26.31	60.00	40.00	973.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	134.00	435.00	15.72	24.00	34.00	267.00	25.62	43.00	31.00	968.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	130.00	408.00	16.76	23.00	38.00	289.00	23.67	45.00	35.00	968.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	137.00	410.00	16.68	22.00	36.00	250.00	27.36	56.00	29.00	940.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	136.00	403.00	16.97	29.00	37.00	280.00	24.43	54.00	30.00	969.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	134.00	405.00	16.89	23.40	38.00	278.00	24.60	46.00	32.00	956.40
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	138.00	408.00	16.76	24.00	35.00	265.00	25.81	47.00	30.00	947.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	137.00	425.00	16.09	25.00	36.00	267.00	25.62	58.00	21.00	969.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	136.00	400.00	17.10	23.00	37.00	260.00	26.31	59.00	24.00	939.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	139.00	405.00	16.89	24.00	36.00	267.00	25.62	60.00	25.00	956.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	137.00	403.00	16.97	26.00	38.00	255.00	26.82	58.00	26.00	943.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	139.00	407.00	16.81	27.00	36.00	267.00	25.62	57.00	23.00	956.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	136.00	411.00	16.64	28.00	37.00	265.00	25.81	56.00	28.00	961.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	135.00	414.00	16.52	29.00	38.00	264.00	25.91	76.00	22.00	978.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	135.00	416.00	16.44	21.00	39.00	260.00	26.31	65.00	19.00	955.00
08/01/2020	100T	60T	CE147	CO249	Ripping	1,900	148.00	413.00	16.56	24.00	36.00	265.00	25.81	34.00	30.00	950.00
Average							137.50	407.50	16.34	24.87	36.37	259.00	25.79	35.50	30.65	931.38
Average							136.81	410.81	16.66	24.90	36.88	266.19	25.73	54.63	27.81	958.03
19/01/2020			CE193	CO247	Ripping	1,550	108.37	339.27	16.45	13.58	39.11	211.95	26.33	124.41	47.00	883.69
19/01/2020			CE193	CO247	Ripping	1,550	132.00	367.00	15.20	34.30	34.00	212.65	26.24	31.24	22.00	833.19
19/01/2020			CE193	CO247	Ripping	1,550	135.00	400.07	13.95	26.00	41.39	270.00	20.67	0.00	25.00	897.46



Tabel B. Lanjutan Waktu Edar Alat Angkut

<i>Date</i>	<i>Digger Class</i>	<i>Hauler Class</i>	<i>CE</i>	<i>CO</i>	<i>Material</i>	<i>Distance (m)</i>	<i>Loading (s)</i>	<i>Travel Load (s)</i>	<i>Speed Load (s)</i>	<i>Dumping Spotting (s)</i>	<i>Dumping (s)</i>	<i>Travel Empty (s)</i>	<i>Speed Empty (s)</i>	<i>Queuing (s)</i>	<i>Spotting (s)</i>	<i>Avg CT (s)</i>
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,550	116.00	373.00	14.96	20.55	42.51	294.00	18.98	0.00	40.00	886.06
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,551	117.00	340.00	16.42	21.00	40.00	290.00	19.25	32.00	43.00	883.00
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,552	119.00	342.00	16.34	23.00	42.00	246.00	22.71	35.00	42.00	849.00
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,553	131.00	340.00	16.44	25.00	43.00	250.00	22.36	41.00	39.00	869.00
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,554	130.00	339.00	16.50	26.00	44.00	262.00	21.35	43.00	40.00	884.00
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,555	100.00	370.00	15.13	23.00	42.00	267.00	20.97	45.00	42.00	889.00
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,556	126.00	365.00	15.35	25.00	30.00	264.00	21.22	60.00	42.00	912.00
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,550	145.70	361.00	15.46	24.51	37.60	277.00	20.14	43.00	28.00	916.81
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,550	121.00	370.00	15.08	21.00	38.95	240.00	23.25	72.00	38.56	901.51
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,550	130.00	320.00	17.44	23.40	32.10	250.00	22.32	50.00	20.00	825.50
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,550	122.87	335.00	16.66	25.00	33.00	231.50	24.10	54.00	25.00	826.37
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,550	134.50	321.00	17.38	26.70	40.00	240.56	23.20	34.00	35.00	831.76
19/12/2019	100T	60T	CE193	CO247	<i>Ripping</i>	1,550	127.00	351.00	15.90	31.00	39.00	249.00	22.41	43.00	32.00	872.00
<i>Average</i>							124.86	350.69	15.97	23.95	38.10	250.70	22.49	46.96	34.86	870.12
20/21/2019	100T	60T	CE224	CO227	<i>Ripping</i>	1,100	140.00	174.51	22.69	18.15	45.00	186.07	21.28	128.00	32.00	723.73
20/21/2019	100T	60T	CE224	CO227	<i>Ripping</i>	1,100	164.00	300.00	13.20	32.00	48.00	189.00	20.95	0.00	42.00	775.00
20/21/2019	100T	60T	CE224	CO227	<i>Ripping</i>	1,100	165.00	235.00	16.85	31.00	41.00	182.85	21.66	0.00	19.80	674.65
20/21/2019			CE224	CO227	<i>Ripping</i>	1,100	130.00	225.00	17.60	33.00	40.00	190.00	20.84	0.00	22.30	640.30
20/21/2019			CE224	CO227	<i>Ripping</i>	1,100	126.00	236.48	16.75	18.00	42.00	164.11	24.13	25.37	33.93	645.89
20/21/2019			CE224	CO227	<i>Ripping</i>	1,100	121.00	256.00	15.47	25.00	38.90	170.00	23.29	0.00	32.00	642.90
20/21/2019			CE224	CO227	<i>Ripping</i>	1,100	128.00	220.66	17.95	12.43	40.38	161.00	24.60	50.00	17.00	629.47
20/21/2019			CE224	CO227	<i>Ripping</i>	1,100	129.00	234.00	16.97	18.00	39.00	162.00	24.51	0.00	21.00	603.00
20/21/2019			CE224	CO227	<i>Ripping</i>	1,100	147.00	247.00	16.09	19.00	40.00	164.00	24.23	0.00	22.00	639.00



Tabel B. Lanjutan Waktu Edar Alat Angkut

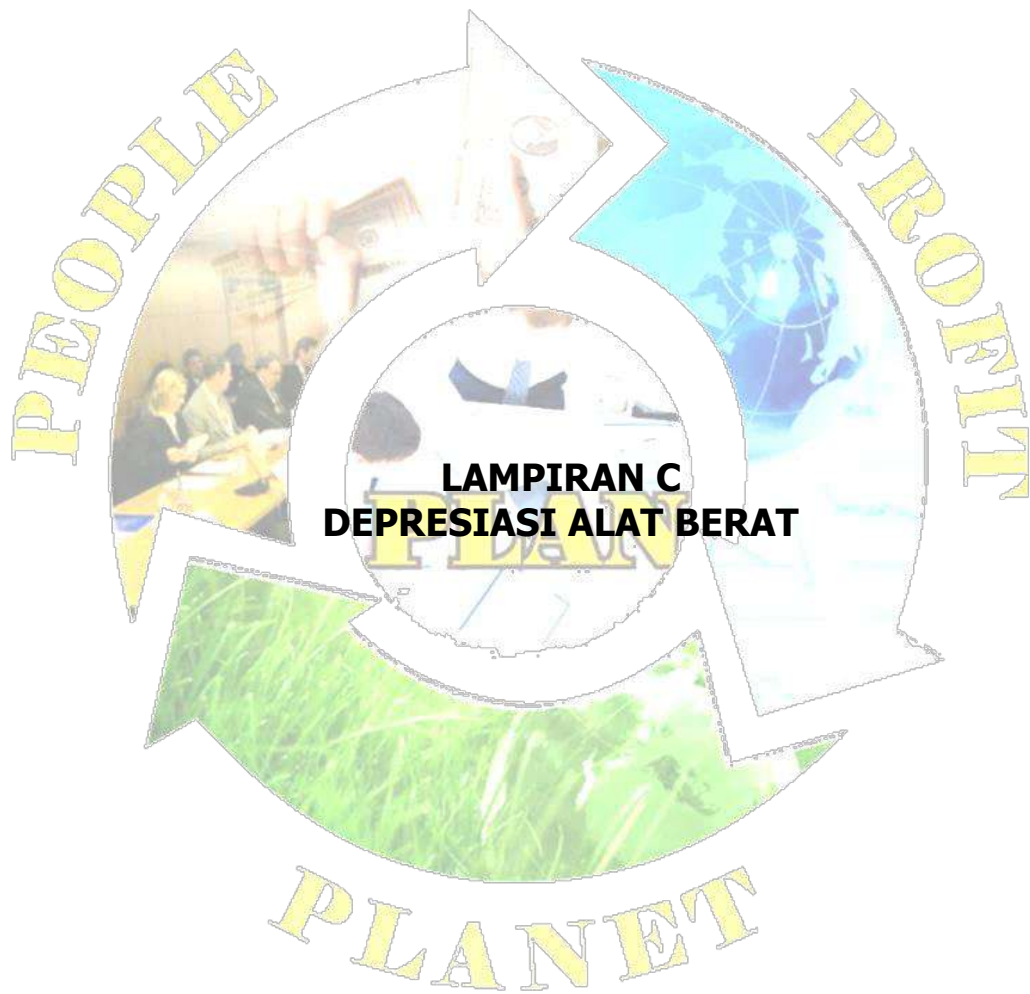
<i>Date</i>	<i>Digger Class</i>	<i>Hauler Class</i>	<i>CE</i>	<i>CO</i>	<i>Material</i>	<i>Distance (m)</i>	<i>Loading (s)</i>	<i>Travel Load (s)</i>	<i>Speed Load (s)</i>	<i>Dumping Spotting (s)</i>	<i>Dumping (s)</i>	<i>Travel Empty (s)</i>	<i>Speed Empty (s)</i>	<i>Queuing (s)</i>	<i>Spotting (s)</i>	<i>Avg CT (s)</i>
20/21/2019	100T	60T	CE224	CO227	<i>Ripping</i>	1,100	130.00	260.00	15.23	13.00	39.30	166.68	23.76	59.16	25.56	693.70
20/21/2019	100T	60T	CE224	CO227	<i>Ripping</i>	1,100	146.00	255.59	15.49	20.20	39.43	192.20	20.60	42.76	26.77	722.95
20/21/2019	100T	60T	CE224	CO227	<i>Ripping</i>	1,100	132.00	209.00	18.95	43.32	39.60	188.00	21.06	79.93	25.50	717.35
20/21/2019	100T	60T	CE224	CO227	<i>Ripping</i>	1,100	110.00	250.00	15.84	38.45	38.70	168.84	23.45	20.00	25.00	650.99
<i>Average</i>							141.60	239.55	16.76	23.30	40.69	173.78	22.91	34.01	25.52	678.46
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	131.00	338.23	17.03	34.09	32.05	176.09	32.71	48.57	34.00	794.03
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	130.00	347.00	16.60	18.57	30.54	161.44	35.68	56.34	28.17	772.06
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	134.00	365.00	15.78	22.57	44.41	181.00	31.82	60.00	26.10	833.08
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	135.00	334.37	17.23	23.00	42.00	182.00	31.65	64.00	27.43	807.80
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	137.00	347.00	16.60	14.00	29.03	187.17	30.77	23.00	32.00	769.20
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	138.00	305.00	18.89	16.38	26.98	176.62	32.61	90.00	26.24	779.22
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	139.00	359.00	16.04	15.00	29.94	160.64	35.86	51.56	24.00	779.14
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	131.00	390.00	14.77	18.00	26.08	182.00	31.65	62.00	32.92	842.00
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	132.00	333.00	17.30	13.39	29.69	180.00	32.00	32.00	30.00	750.08
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	134.00	240.00	24.00	20.00	30.00	81.00	71.11	30.00	30.00	565.00
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	130.00	238.00	24.20	21.00	22.00	179.00	32.18	32.00	24.00	646.00
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	132.00	350.00	16.46	19.00	40.82	182.00	31.65	63.00	32.00	818.82
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	137.00	314.80	18.30	22.21	30.00	195.00	29.54	63.00	40.59	802.60
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	130.00	350.00	16.46	14.73	32.00	194.00	29.69	90.00	15.00	825.73
21/12/2019	100T	60T	CE212	CO276	<i>Freedig</i>	1,600	132.00	314.80	18.30	19.53	30.00	200.00	28.80	102.00	22.00	820.33
<i>Average</i>							133.47	328.41	17.86	19.43	31.70	174.53	34.51	57.83	28.30	773.67



Tabel B. Lanjutan Waktu Edar Alat Angkut

	<i>Digger Class</i>	<i>Hauler Class</i>	<i>Material</i>	<i>Loading (s)</i>	<i>Travel Load (s)</i>	<i>Speed Load (s)</i>	<i>Dumping Spotting (s)</i>	<i>Dumping (s)</i>	<i>Travel Empty (s)</i>	<i>Speed Empty (s)</i>	<i>Queuing (s)</i>	<i>Spotting (s)</i>	<i>Avg CT (s)</i>
<i>AVERAGE CYCLE TIME</i>	100T	60T	<i>Freedig</i>	133.41	341.26	19.25	20.36	33.21	222.91	33.06	51.03	27.58	829.76
	90T	60T	<i>Freedig</i>	139.24	441.57	23.56	24.66	35.37	349.27	29.88	77.00	26.48	1,093.59
	100T	70T	<i>Ripping</i>	146.97	260.66	19.86	21.89	32.64	171.58	28.72	58.62	27.74	719.89
	100T	60T	<i>Ripping</i>	137.27	367.51	16.51	23.34	37.10	247.71	24.77	42.99	30.23	886.14
	90T	60T	<i>Ripping</i>	141.55	439.35	17.23	22.01	38.26	275.03	27.73	96.06	41.20	1,053.46





Tabel C. Depresiasi Alat Berat

<i>Unit</i>	<i>Capital (\$)</i>	<i>Price After Used (\$)</i>	<i>Hours Meter (Hour)</i>	<i>Life Time (Year)</i>	<i>Residual Value (\$)</i>	<i>Depreciation (\$/Year)</i>	<i>Depreciation (\$/Month)</i>	<i>Depreciation (\$/Day)</i>	<i>Depreciation (\$/Hour)</i>
Liebherr	1,013,022.89	356,708.00	10,153	1.94	141,823.20	174,239.94	14,519.99	476.07	32.72
Hitachi	1,212,773.88	635,645.00	12,026	2.30	169,788.34	208,597.11	17,383.09	569.94	39.17
CAT	856,075.68	548,561.00	4,000	0.76	119,850.60	147,245.02	12,270.42	402.31	27.65
CAT 773	642,056.76	99,000.00	53,077	10.13	89,887.95	110,433.76	9,202.81	301.73	20.74
CAT 775	713,396.40	135,000.00	23,841	4.55	99,875.50	122,704.18	10,225.35	335.26	23.04
D10	856,075.68	93,974.00	23,934	4.57	119,850.60	147,245.02	12,270.42	402.31	27.65





Tabel C. *Preventive Maintenance* Alat Berat

		<i>PM Cost (\$/Month)</i>	<i>August</i>		<i>September</i>		<i>October</i>		<i>November</i>		<i>December</i>	
			3500	3750	4000	4250	4500	4750	5000	5250	5500	5750
<i>Unit</i>			B	A	E	A	B	A	C	A	B	A
HITACHI	EX-1200	<i>PARTS</i>	433.44	208.55	792.18	208.55	433.44	208.55	520.78	208.55	433.44	208.55
		<i>FLUID</i>	1280.787	1243.992	1415.778	1243.992	1280.787	1243.992	1415.778	1243.992	1280.787	1243.992
LIEBHERR	R984C	<i>PARTS</i>	418.22	288.67	2949.72	288.67	418.22	288.67	2127.99	288.67	418.22	288.67
		<i>FLUID</i>	1344.964	1307.725	1417.114	1307.725	1344.964	1307.725	1344.964	1307.725	1344.964	1307.725
CAT	390D	<i>PARTS</i>	371.9	158.05	1638.22	158.05	371.9	158.05	781.06	158.05	371.9	158.05
		<i>FLUID</i>	658.4304	563.9364	743.925	563.9364	658.4304	563.9364	658.4304	563.9364	658.4304	563.9364
CAT	773D/E	<i>PARTS</i>	599.81	191.79	2149.18	191.79	599.81	191.79	906.7	191.79	599.81	191.79
		<i>FLUID</i>	510.8589	414.9681	1226.221	414.9681	510.8589	414.9681	723.8657	414.9681	510.8589	414.9681
CAT	775F	<i>PARTS</i>	713.43	193.67	2333.16	193.67	713.43	193.67	1033.52	193.67	713.43	193.67
		<i>FLUID</i>	569.2984	473.4077	1268.027	473.4077	569.2984	473.4077	782.3053	473.4077	569.2984	473.4077
CAT	D10T	<i>PARTS</i>	821.64	207.48	1875.82	207.48	821.64	207.48	1039.17	207.48	821.64	207.48
		<i>FLUID</i>	355.3747	355.3747	897.6987	355.3747	355.3747	355.3747	750.6663	355.3747	355.3747	355.3747

<i>HM</i>	<i>Code</i>	<i>Unit</i>	<i>RM cost (\$/Month)</i>
PM 250	A	100T	3,263.17
PM 500	B	90T	1,752.32
PM 1000	C	773D/E	1,717.43
		775F	1,949.81
		D10T	1,739.87





A. Persamaan Model Dinamis *Fleet 100T/70T*

```
1 BCM Price=
2 1
3 Units: dollar/bcm
4
5 COS Digger=
6 Cost Fuel Digger+Digger Depreciation+RM Cost Digger+Operator Wages
7 Units: dollar/jam
8
9 COS Dozer D10=
10 ("Cost Fuel (Ripping) D10"+Dozer Depreciation D10+RM Cost Dozer D10+Operator Wages
11 )/2
12 Units: dollar/jam
13
14 COS Hauler=
15 (Cost Fuel+Hauler Depreciation+RM Cost Hauler+Operator Wages)
16 Units: dollar/jam
17
18 Cost Fuel=
19 "Hauler Fuel Consumption/Hour"*"Fuel Cost/liter"
20 Units: dollar/jam
21
22 "Cost Fuel (Ripping) D10"=
23 "Fuel Cost/liter"*"Dozer Fuel Consumption/jam Dozer D10"
24 Units: dollar/jam
25
26 Cost Fuel Digger=
27 "Digger Fuel Consumption/Hour"*"Fuel Cost/liter"
28 Units: dollar/jam
29
30 Cost Total=
31 Hauler Total*COS Hauler+COS Digger+COS Dozer D10
32 Units: dollar/jam
33
34 Ctr Component=
35 152.03
36 Units: detik
37
38 Cycle Time Digger=
39 29.3936
40 Units: detik
41
42 Cycle Time Hauler=
43 Loading Time+Travel Empty+Travel Load+Ctr Component
44 Units: detik
45
46 Digger Depreciation=
47 35.95
48 Units: dollar/jam
49
50 "Digger Fuel Consumption/Hour"=
51 100
52 Units: liter/jam
53
54 Digger Productivity=
55 q*3600*E*Sf/Cycle Time Digger
56 Units: BCM/Jam
57
58 Dozer Depreciation D10=
59 27.65
60 Units: dollar/jam
61
62 "Dozer Fuel Consumption/jam Dozer D10"=
63 60.08
64 Units: liter/jam
65
66 E=
67 0.8
68 Units: **undefined**
69
70 Fleet Matching=
71 Digger Productivity/Hauler Productivity
```



```

72 Units: **undefined**
73
74 "Fuel Cost/liter"=
75     0.93
76 Units: dollar/liter
77
78 Hauler Depreciation=
79     23.04
80 Units: dollar/jam
81
82 "Hauler Fuel Consumption/Hour"=
83     39.7
84 Units: liter/jam
85
86 Hauler Production=
87     Hauler Productivity
88 Units: bcm/jam
89
90 Hauler Productivity=
91     E*Vessel capacity*3600/Cycle Time Hauler
92 Units: bcm/jam
93
94 Hauler Total=
95     Fleet Matching
96 Units: **undefined**
97
98 Hauling Distance= INTEG (
99     IF THEN ELSE(Profit<=0, Hauling Distance, RANDOM 0 1()),
100     1400)
101 Units: meter
102
103 K=
104     0.8
105 Units: **undefined**
106
107 Loading Time=
108     146.97
109 Units: detik
110
111 OHD Price=
112     0.01
113 Units: dollar/jam
114
115 Operator Wages=
116     1.65
117 Units: dollar/jam
118
119 Profit=
120     Revenue Total-Cost Total
121 Units: dollar/jam
122
123 q=
124     q1 100T*K
125 Units: **undefined**
126
127 q1 100T=
128     7
129 Units: bcm
130
131 Revenue BCM=
132     Hauler Productivity*BCM Price
133 Units: dollar/jam
134
135 Revenue OHD=
136     IF THEN ELSE(Hauling Distance<=1000, 0 , (Hauling Distance-1000)/1000*OHD Price
137 *Hauler Production )
138 Units: dollar/jam
139
140 Revenue Total=
141     (Revenue BCM+Revenue OHD)*Hauler Total
142 Units: dollar/jam

```



```
143
144 RM Cost Digger=
145     7.35
146 Units: dollar/jam
147
148 RM Cost Dozer D10=
149     3.92
150 Units: dollar/jam
151
152 RM Cost Hauler=
153     4.39
154 Units: dollar/jam
155
156 Sf==
157     0.8
158 Units: **undefined**
159
160 Speed Empty=
161     28.72
162 Units: km/jam
163
164 Speed Load=
165     19.86
166 Units: km/jam
167
168 Travel Empty=
169     (Hauling Distance/1000)/Speed Empty*3600
170 Units: detik
171
172 Travel Load=
173     (Hauling Distance/1000)/Speed Load*3600
174 Units: detik
175
176 Vessel capacity=
177     28
178 Units: bcm
179
180
```



B. Persamaan Model Dinamis *Fleet 100T/60T*

```
1 BCM Price=
2 1
3 Units: dollar/bcm
4
5 COS Digger=
6 Cost Fuel Digger+Digger Depreciation+RM Cost Digger+Operator Wages
7 Units: dollar/jam
8
9 COS Dozer D10=
10 ("Cost Fuel (Ripping) D10"+Dozer Depreciation D10+RM Cost Dozer D10+Operator Wages
11 )/2
12 Units: dollar/jam
13
14 COS Hauler=
15 (Cost Fuel+Hauler Depreciation+RM Cost Hauler+Operator Wages)
16 Units: dollar/jam
17
18 Cost Fuel=
19 "Hauler Fuel Consumption/Hour"*"Fuel Cost/liter"
20 Units: dollar/jam
21
22 "Cost Fuel (Ripping) D10"=
23 "Fuel Cost/liter"*"Dozer Fuel Consumption/jam Dozer D10"
24 Units: dollar/jam
25
26 Cost Fuel Digger=
27 "Digger Fuel Consumption/Hour"*"Fuel Cost/liter"
28 Units: dollar/jam
29
30 Cost Total=
31 Hauler Total*COS Hauler+COS Digger+COS Dozer D10
32 Units: dollar/jam
33
34 Ctr Component=
35 152.03
36 Units: detik
37
38 Cycle Time Digger=
39 29.3936
40 Units: detik
41
42 Cycle Time Hauler=
43 Loading Time+Travel Empty+Travel Load+Ctr Component
44 Units: detik
45
46 Digger Depreciation=
47 35.95
48 Units: dollar/jam
49
50 "Digger Fuel Consumption/Hour"=
51 100
52 Units: liter/jam
53
54 Digger Productivity=
55 q*3600*E*Sf/Cycle Time Digger
56 Units: dollar/jam
57
58 Dozer Depreciation D10=
59 27.65
60 Units: dollar/jam
61
62 "Dozer Fuel Consumption/jam Dozer D10"=
63 60.08
64 Units: liter/jam
65
66 E=
67 0.8
68 Units: **undefined**
69
70 Fleet Matching=
71 Digger Productivity/Hauler Productivity
```



```

72 Units: **undefined**
73
74 "Fuel Cost/liter"=
75     0.93
76 Units: dollar/liter
77
78 Hauler Depreciation=
79     23.04
80 Units: dollar/jam
81
82 "Hauler Fuel Consumption/Hour"=
83     39.7
84 Units: liter/jam
85
86 Hauler Production=
87     Hauler Productivity
88 Units: bcm/jam
89
90 Hauler Productivity=
91     E*Vessel capacity*3600/Cycle Time Hauler
92 Units: bcm/jam
93
94 Hauler Total=
95     Fleet Matching
96 Units: **undefined**
97
98 Hauling Distance= INTEG (
99     IF THEN ELSE(Profit<=0, Hauling Distance, RANDOM 0 1()),
100     1400)
101 Units: meter
102
103 K=
104     0.8
105 Units: **undefined**
106
107 Loading Time=
108     146.97
109 Units: detik
110
111 OHD Price=
112     0.01
113 Units: dollar/jam
114 Operator Wages=
115     1.65
116 Units: dollar/jam
117
118 Profit=
119     Revenue Total-Cost Total
120 Units: dollar/jam
121
122 q=
123     q1 100T*K
124 Units: **undefined**
125
126 q1 100T=
127     7
128 Units: bcm
129
130 Revenue BCM=
131     Hauler Productivity*BCM Price
132 Units: dollar/jam
133
134 Revenue OHD=
135     IF THEN ELSE(Hauling Distance<=1000, 0 , (Hauling Distance-1000)/1000*OHD Price
136     *Hauler Production )
137 Units: dollar/jam
138
139 Revenue Total=
140     (Revenue BCM+Revenue OHD)*Hauler Total
141 Units: dollar/jam
142

```



```
143 RM Cost Digger=  
144     7.35  
145 Units: dollar/jam  
146  
147 RM Cost Dozer D10=  
148     3.92  
149 Units: dollar/jam  
150  
151 RM Cost Hauler=  
152     4.39  
153 Units: dollar/jam  
154  
155 Sf==  
156     0.8  
157 Units: **undefined**  
158  
159 Speed Empty=  
160     28.72  
161 Units: km/jam  
162  
163 Speed Load=  
164     19.86  
165 Units: km/jam  
166  
167 Travel Empty=  
168     (Hauling Distance/1000)/Speed Empty*3600  
169 Units: detik  
170  
171 Travel Load=  
172     (Hauling Distance/1000)/Speed Load*3600  
173 Units: detik  
174  
175 Vessel capacity=  
176     28  
177 Units: bcm  
178  
179
```



C. Persamaan Model Dinamis *Fleet 90T/60T*

```
1 COS Digger=
2     Cost Fuel Digger+Depresiasi Digger+RM Cost Digger+Upah Operator
3     Units: dollar/jam
4
5 COS Dozer D10=
6     ("Cost Fuel (Ripping) D10"+Depresiasi Dozer D10+RM Cost Dozer D10+Upah Operator
7     )/2
8     Units: dollar/jam
9
10 COS Hauler=
11     (Cost Fuel+Depresiasi Hauler+RM Cost Hauler+Upah Operator)
12     Units: dollar/jam
13
14 Cost Fuel=
15     "Konsumsi Fuel/jam Hauler"*"Harga Fuel/liter"
16     Units: dollar/jam
17
18 "Cost Fuel (Ripping) D10"=
19     "Harga Fuel/liter"*"Konsumsi Fuel/jam Dozer D10"
20     Units: dollar/jam
21
22 Cost Fuel Digger=
23     "Konsumsi Fuel/jam Digger"*"Harga Fuel/liter"
24     Units: dollar/jam
25
26 Cost Total=
27     Jumlah hauler*COS Hauler+COS Digger+COS Dozer D10
28     Units: dollar/jam
29
30 Cycle Time Digger=
31     23.59
32     Units: detik
33
34 Cycle Time Hauler=
35     Loading Time+Travel Empty+Travel Load+Komponen Ctr
36     Units: detik
37
38 Depresiasi Digger=
39     35.95
40     Units: dollar/jam
41
42 Depresiasi Dozer D10=
43     27.65
44     Units: dollar/jam
45
46 Depresiasi Hauler=
47     23.04
48     Units: dollar/jam
49
50 E=
51     0.8
52     Units: **undefined**
53
54 Fleet Matching=
55     Produktivitas Digger/Produktivitas Hauler
56     Units: **undefined**
57
58 Harga OHD=
59     0.01
60     Units: dollar
61
62 "Harga/bcm"=
63     1
64     Units: dollar/bcm
65
66 "Harga Fuel/liter"=
67     0.93
68     Units: dollar/liter
69
70 Hauling Distance= INTEG (
71     IF THEN ELSE(Profit<=0, Hauling Distance, RANDOM 0 1()),
```




```

72         1000)
73 Units: meter
74
75 Jumlah hauler=
76 Fleet Matching
77 Units: **undefined**
78
79 K=
80 0.8
81 Units: **undefined**
82
83 Kapasitas Vessel=
84 26
85 Units: bcm
86
87 Komponen Ctr=
88 152.03
89 Units: detik
90
91 "Konsumsi Fuel/jam Digger"=
92 100
93 Units: liter/jam
94
95 "Konsumsi Fuel/jam Dozer D10"=
96 60.08
97 Units: liter/jam
98
99 "Konsumsi Fuel/jam Hauler"=
100 39.7
101 Units: liter/jam
102
103 Loading Time=
104 141.55
105 Units: detik
106
107 Produksi Hauler=
108 Produktivitas Hauler
109 Units: bcm/jam
110
111 Produktivitas Digger=
112  $q \cdot 3600 \cdot E \cdot Sf / \text{Cycle Time Digger}$ 
113 Units: bcm/jam
114
115 Produktivitas Hauler=
116  $E \cdot \text{Kapasitas Vessel} \cdot 3600 / \text{Cycle Time Hauler}$ 
117 Units: bcm/jam
118
119 Profit=
120 Revenue Total - Cost Total
121 Units: dollar/jam
122
123 q=
124  $q1 \cdot 90T \cdot K$ 
125 Units: **undefined**
126
127  $q1 \cdot 90T =$ 
128 5
129 Units: bcm
130
131 Revenue BCM=
132 Produktivitas Hauler * "Harga/bcm"
133 Units: dollar/jam
134
135 Revenue OHD=
136 IF THEN ELSE(Hauling Distance <= 1000, 0, (Hauling Distance - 1000) / 1000 * Harga OHD
137 *Produksi Hauler )
138 Units: dollar/jam
139
140 Revenue Total=
141 (Revenue BCM + Revenue OHD) * Jumlah hauler
142 Units: dollar/jam

```



```
143
144 RM Cost Digger=
145     7.35
146 Units: dollar/jam
147
148 RM Cost Dozer D10=
149     3.92
150 Units: dollar/jam
151
152 RM Cost Hauler=
153     4.39
154 Units: dollar/jam
155
156 Sf==
157     0.8
158 Units: **undefined**
159
160 Speed Empty=
161     28.86
162 Units: km/jam
163
164 Speed Load=
165     19.14
166 Units: km/jam
167
168 Travel Empty=
169     (Hauling Distance/1000)/Speed Empty*3600
170 Units: detik
171
172 Travel Load=
173     (Hauling Distance/1000)/Speed Load*3600
174 Units: detik
175
176 Upah Operator=
177     1.65
178 Units: dollar/jam
179
180
```

