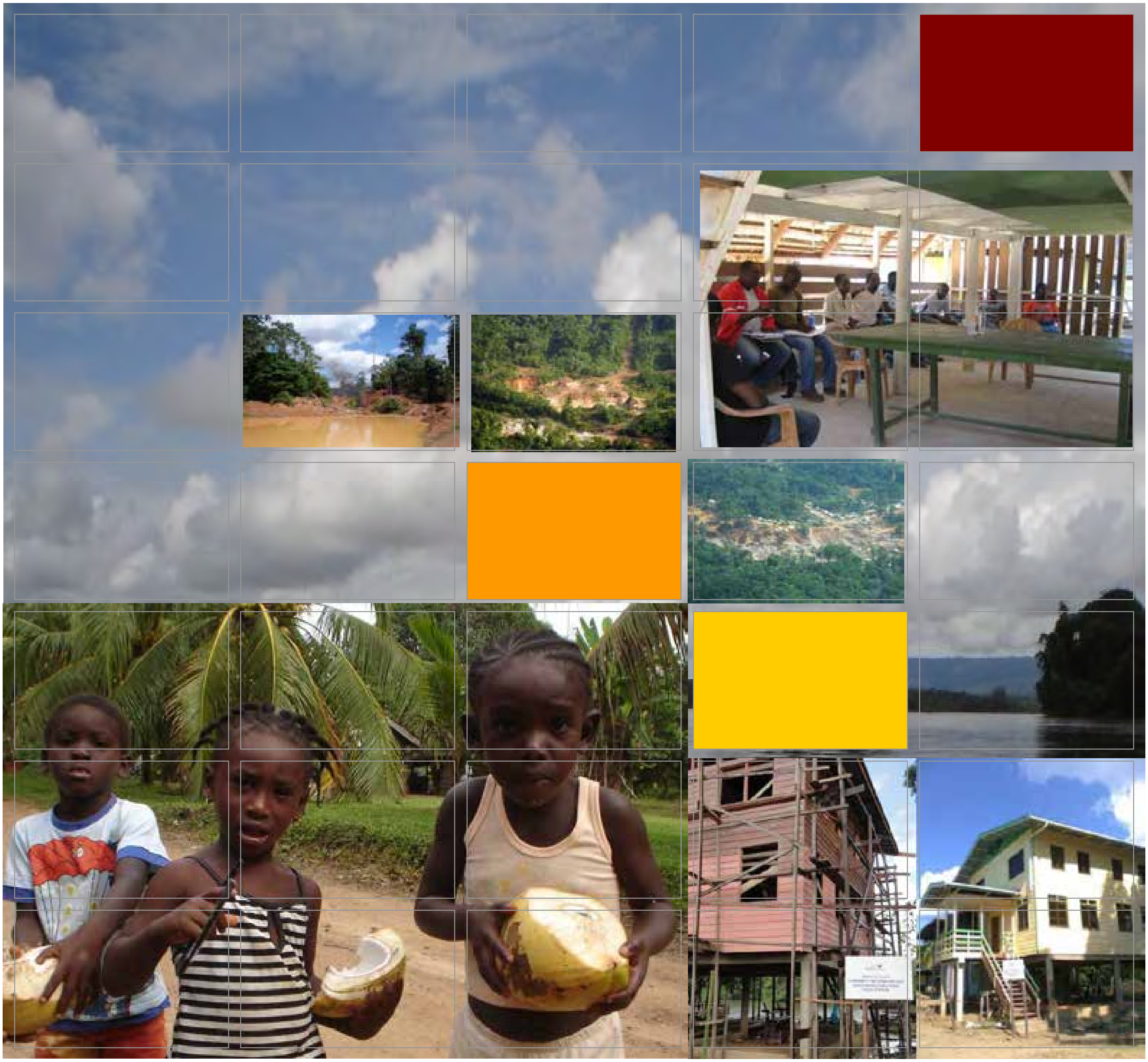

Merian Project Revised ESIA
Volume III-C Appendices

19 November 2012

Environmental Resources Management
One Beacon Street
5th Floor
Boston, MA
www.erm.com

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VOLUME III

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Appendix 10-A

Traffic Study, Traffic Count Data

Location : West of Abadu Kondre along the Paramaribo-Moengo road							
Date: Saturday(10th of September)							
Time Period	Traffic Volumes	Cars	Light Trucks	Heavy Trucks	Other (Pedestrian, bicycle, motorcycle)	Total	Total, Hourly
0600h-0629h	Direction A	4	3	2	0	9	
	Direction B	4	1	1	1	7	
	A+B	8	4	3	1	16	
0630h-0659h	Direction A	11	9	7	0	27	
	Direction B	10	2	1	1	14	
	A+B	21	11	8	1	41	57
0700h-0729h	Direction A	9	3	1	0	13	
	Direction B	12	2	1	1	16	
	A+B	21	5	2	1	29	70
0730h-0759h	Direction A	6	3	1	0	10	
	Direction B	14	0	1	0	15	
	A+B	20	3	2	0	25	54
0800h-0829h	Direction A	8	3	2	0	13	
	Direction B	22	2	3	0	27	
	A+B	30	5	5	0	40	65
0830h-0859h	Direction A	15	2	3	0	20	
	Direction B	19	0	1	0	20	
	A+B	34	2	4	0	40	80
0900h-0929h	Direction A	9	8	0	0	17	
	Direction B	17	1	2	0	20	
	A+B	26	9	2	0	37	77
0930h-0959h	Direction A	5	1	0	1	7	
	Direction B	12	5	1	0	18	
	A+B	17	6	1	1	25	62
1000h-1029h	Direction A	12	6	5	0	23	
	Direction B	9	6	2	0	17	
	A+B	21	12	7	0	40	65
1030h-1059h	Direction A	13	2	0	0	15	
	Direction B	8	3	1	0	12	
	A+B	21	5	1	0	27	67
1100h-1129h	Direction A	14	3	3	0	20	
	Direction B	11	2	0	0	13	
	A+B	25	5	3	0	33	60
1130h-1159h	Direction A	10	4	0	0	14	
	Direction B	10	3	4	0	17	
	A+B	20	7	4	0	31	64
1200h-1229h	Direction A	15	12	4	0	31	
	Direction B	12	8	0	0	20	
	A+B	27	20	4	0	51	82
1230h-1259h	Direction A	20	4	1	1	26	
	Direction B	9	4	2	0	15	
	A+B	29	8	3	1	41	92
1300h-1329h	Direction A	20	4	3	0	27	
	Direction B	9	1	1	0	11	
	A+B	29	5	4	0	38	79
1330h-1359h	Direction A	22	5	10	0	37	
	Direction B	10	4	2	0	16	
	A+B	32	9	12	0	53	91
1400h-1429h	Direction A	26	3	2	0	31	
	Direction B	8	4	1	1	14	
	A+B	34	7	3	1	45	98
1430h-1459h	Direction A	16	3	5	0	24	
	Direction B	16	10	8	0	34	
	A+B	32	13	13	0	58	103
1500h-1529h	Direction A	24	10	1	0	35	
	Direction B	9	4	4	0	17	
	A+B	33	14	5	0	52	110
1530h-1559h	Direction A	23	3	3	0	29	
	Direction B	17	4	2	0	23	
	A+B	40	7	5	0	52	104
1600h-1629h	Direction A	30	1	1	0	32	
	Direction B	19	8	1	0	28	
	A+B	49	9	2	0	60	112
1630h-1659h	Direction A	35	2	5	0	42	74
	Direction B	11	9	6	0	26	54
	A+B	46	11	11	0	68	128
1700h-1729h	Direction A	30	4	1	0	35	
	Direction B	14	5	2	0	21	
	A+B	44	9	3	0	56	124
1730h-1759h	Direction A	16	5	1	0	22	
	Direction B	16	2	2	0	20	
	A+B	32	7	3	0	42	98
1800h-1829h	Direction A	10	5	3	0	18	
	Direction B	18	1	1	0	20	
	A+B	28	6	4	0	38	80
1830h-1859h	Direction A	10	1	1	0	12	
	Direction B	12	4	0	0	16	
	A+B	22	5	1	0	28	66
1900h-1929h	Direction A	9	4	0	0	13	
	Direction B	18	3	1	0	22	
	A+B	27	7	1	0	35	63
1930h-1959h	Direction A	6	4	0	0	10	
	Direction B	10	7	2	0	19	
	A+B	16	11	2	0	29	64

Location: North of Mora Kondre (and south of Moengo) along the Moengo-Langa Tabiki raod
Date: Saturday 10th of september

Time Period	Traffic Volumes	Cars	Light Trucks	Heavy Trucks	Other (Pedestrian, bicycle, motorcycle)	Total	Total, Hourly
0600h-0629h	Direction A	0	0	0	0		
	Direction B	1	0	3	0		
	A+B	1	0	3	0	4	
0630h-0659h	Direction A	0	0	0	1		
	Direction B	1	0	0	0		
	A+B	1	0	0	1	2	6
0700h-0729h	Direction A	2	0	0	0		
	Direction B	5	0	1	1		
	A+B	7	0	1	1	9	11
0730h-0759h	Direction A	0	1	4	0		
	Direction B	1	1	3	3		
	A+B	1	2	7	3	13	22
0800h-0829h	Direction A	1	1	1	0		
	Direction B	2	2	1	3		
	A+B	3	3	2	3	11	24
0830h-0859h	Direction A	1	2	2	1		
	Direction B	7	2	3	0		
	A+B	8	4	5	1	18	29
0900h-0929h	Direction A	1	2	2	0		
	Direction B	2	0	1	0		
	A+B	3	2	3	0	8	26
0930h-0959h	Direction A	1	0	1	1		
	Direction B	7	2	1	1		
	A+B	8	2	2	2	14	22
1000h-1029h	Direction A	2	0	1	0		
	Direction B	4	0	2	0		
	A+B	6	0	3	0	9	23
1030h-1059h	Direction A	2	0	2	0		
	Direction B	5	2	1	0		
	A+B	7	2	3	0	12	21
1100h-1129h	Direction A	4	1	1	1		
	Direction B	2	0	1	0		
	A+B	6	1	2	1	10	22
1130h-1159h	Direction A	0	0	2	0		
	Direction B	7	0	2	0		
	A+B	7	0	4	0	11	21
1200h-1229h	Direction A	4	1	3	1		
	Direction B	1	1	2	0		
	A+B	5	2	5	1	13	24
1230h-1259h	Direction A	2	0	1	0		
	Direction B	5	0	0	0		
	A+B	7	0	1	0	8	21
1300h-1329h	Direction A	3	0	0	0		
	Direction B	3	0	0	0		
	A+B	6	0	0	0	6	14
1330h-1359h	Direction A	5	3	4	1	13	13
	Direction B	2	0	0	1	3	3
	A+B	7	3	4	2	16	22
1400h-1429h	Direction A	2	2	3	0	7	20
	Direction B	4	0	2	1	7	10
	A+B	6	2	5	1	14	30
1430h-1459h	Direction A	4	0	0	0		
	Direction B	6	0	1	0		
	A+B	10	0	1	0	11	25
1500h-1529h	Direction A	1	1	0	0		
	Direction B	0	1	2	0		
	A+B	1	2	2	0	5	16
1530h-1559h	Direction A	5	0	3	0		
	Direction B	3	2	2	0		
	A+B	8	2	5	0	15	20
1600h-1629h	Direction A	2	2	1	1		
	Direction B	0	0	1	0		
	A+B	2	2	2	1	7	22
1630h-1659h	Direction A	3	0	2	0		
	Direction B	1	1	3	1		
	A+B	4	1	5	1	11	18
1700h-1729h	Direction A	4	0	2	0		
	Direction B	1	0	1	0		
	A+B	5	0	3	0	8	19
1730h-1759h	Direction A	5	0	0	2		
	Direction B	1	0	1	0		
	A+B	6	0	1	2	9	17
1800h-1829h	Direction A	5	0	0	1		
	Direction B	3	1	0	0		
	A+B	8	1	0	1	10	19
1830h-1859h	Direction A	4	1	2	0		
	Direction B	2	0	0	0		
	A+B	6	1	2	0	9	19
1900h-1929h	Direction A	3	0	0	0		
	Direction B	3	1	2	0		
	A+B	6	1	2	0	9	18
1930h-1959h	Direction A	2	0	0	0		
	Direction B	4	0	2	0		
	A+B	6	0	2	0	8	17

Location: Tamanredjo at the major cross roads
Date: Saturday 10th of september

Time Period	Traffic Volumes	Cars	Light Trucks	Heavy Trucks	Motorcycle	Ped/ Bike	Other (Pedestrian, bicycle, motorcycle)	Total, Veh Only
0600h-0629h	Direction A	7	1	1	5	1	6	
	Direction B	2	1	0	0	0	0	
	Direction C	1	1	0	1	0	1	
	A+B+C	10	3	1	6	1	7	20
	Direction D	0	0	0	0	0	0	0
	Direction E	2	1	0	0	0	0	3
	Direction F	2	1	1	0	1	1	4
	D+E+F	4	2	1	0	1	1	7
0630h-0659h	Direction A	11	1	0	2	0	2	14
	Direction B	0	0	1	1	0	1	2
	Direction C	1	1	0	2	0	2	4
	A+B+C	12	2	1	5	0	5	20
	Direction D	3	0	0	2	2	4	5
	Direction E	0	0	0	0	0	0	0
	Direction F	2	1	1	0	1	1	4
	D+E+F	5	1	1	2	3	5	9
0700h-0729h	Direction A	15	0	3	3	1	4	21
	Direction B	3	0	0	1	0	1	4
	Direction C	5	1	0	2	1	3	8
	A+B+C	23	1	3	6	2	8	33
	Direction D	6	1	0	2	4	6	9
	Direction E	3	0	0	0	1	1	3
	Direction F	5	1	1	2	3	5	9
	D+E+F	14	2	1	4	8	12	21
0730h-0759h	Direction A	26	2	0	4	1	5	32
	Direction B	2	0	1	2	1	3	5
	Direction C	5	4	0	3	1	4	12
	A+B+C	33	6	1	9	3	12	49
	Direction D	6	0	0	4	6	10	10
	Direction E	1	0	2	0	1	1	3
	Direction F	6	0	2	2	3	5	10
	D+E+F	13	0	4	6	10	16	23
0800h-0829h	Direction A	18	4	0	3	1	4	25
	Direction B	3	0	1	0	0	0	4
	Direction C	14	4	0	11	4	15	29
	A+B+C	35	8	1	14	5	19	58
	Direction D	8	0	0	4	5	9	12
	Direction E	1	0	0	1	2	3	2
	Direction F	5	3	0	0	1	1	8
	D+E+F	14	3	0	5	8	13	22
0830h-0859h	Direction A	12	0	1	2	1	3	15
	Direction B	2	3	1	1	0	1	7
	Direction C	10	1	0	5	1	6	16
	A+B+C	24	4	2	8	2	10	38
	Direction D	8	1	0	2	3	5	11
	Direction E	6	1	0	0	0	0	7
	Direction F	3	0	0	3	5	8	6
	D+E+F	17	2	0	5	8	13	24
0900h-0929h	Direction A	14	3	1	2	1	3	20
	Direction B	3	0	0	2	0	2	5
	Direction C	12	2	0	5	2	7	19
	A+B+C	29	5	1	9	3	12	44
	Direction D	9	1	0	2	3	5	12
	Direction E	3	0	0	0	1	1	3
	Direction F	7	3	0	1	1	2	11
	D+E+F	19	4	0	3	5	8	26
0930h-0959h	Direction A	15	3	0	1	0	1	19
	Direction B	4	2	1	0	0	0	7
	Direction C	11	3	0	8	2	10	22
	A+B+C	30	8	1	9	2	11	48
	Direction D	5	1	0	2	2	4	8
	Direction E	3	0	0	0	1	1	3
	Direction F	6	1	0	1	1	2	8
	D+E+F	14	2	0	3	4	7	19
1000h-1029h	Direction A	11	0	0	3	1	4	14
	Direction B	6	3	1	2	1	3	12
	Direction C	10	0	1	2	1	3	13
	A+B+C	27	3	2	7	3	10	39
	Direction D	8	2	0	1	2	3	11
	Direction E	1	2	0	2	2	4	5
	Direction F	3	1	0	1	2	3	5
	D+E+F	12	5	0	4	6	10	21
1030h-1059h	Direction A	9	1	0	2	0	2	12
	Direction B	7	0	0	2	0	2	9
	Direction C	9	0	1	1	0	1	11
	A+B+C	25	1	1	5	0	5	32
	Direction D	3	1	0	1	2	3	5
	Direction E	3	0	0	2	3	5	5
	Direction F	3	1	0	2	2	4	6
	D+E+F	9	2	0	5	7	12	16
1100h-1129h	Direction A	7	3	1	1	0	1	12
	Direction B	2	1	0	0	0	0	3
	Direction C	12	1	0	5	1	6	18
	A+B+C	21	5	1	6	1	7	33
	Direction D	6	1	1	4	5	9	12
	Direction E	2	1	0	0	1	1	3
	Direction F	3	0	0	1	1	2	4
	D+E+F	11	2	1	5	7	12	19

1130h-1159h	**Direction A**	3	0	0	0	0	0	3
	Direction B	2	0	0	1	0	1	3
	Direction C	14	0	1	4	1	5	19
	A+B+C	19	0	1	5	1	6	25
	Direction D	10	4	0	2	3	5	16
	Direction E	5	0	1	7	11	18	13
	Direction F	11	2	0	5	8	13	18
	D+E+F	26	6	1	14	22	36	47
1200h-1229h	**Direction A**	10	4	0	2	0	2	16
	Direction B	8	0	0	1	0	1	9
	Direction C	9	1	0	4	1	5	14
	A+B+C	27	5	0	7	1	8	39
	Direction D	10	3	0	2	2	4	15
	Direction E	4	1	0	0	1	1	5
	Direction F	1	0	0	0	1	1	1
	D+E+F	15	4	0	2	4	6	21
1230h-1259h	**Direction A**	5	3	0	0	0	0	8
	Direction B	3	1	0	1	0	1	5
	Direction C	6	2	0	2	1	3	10
	A+B+C	14	6	0	3	1	4	23
	Direction D	4	0	0	1	1	2	5
	Direction E	2	0	0	0	0	0	2
	Direction F	6	0	0	2	3	5	8
	D+E+F	12	0	0	3	4	7	15
1300h-1329h	**Direction A**	9	3	0	3	1	4	15
	Direction B	4	0	0	0	0	0	4
	Direction C	7	2	0	2	1	3	11
	A+B+C	20	5	0	5	2	7	30
	Direction D	2	0	0	0	1	1	2
	Direction E	2	0	0	2	2	4	4
	Direction F	1	1	0	0	1	1	2
	D+E+F	5	1	0	2	4	6	8
1330h-1359h	**Direction A**	10	2	1	1	0	1	14
	Direction B	1	2	1	0	0	0	4
	Direction C	4	0	0	1	0	1	5
	A+B+C	15	4	2	2	0	2	23
	Direction D	7	1	0	1	2	3	9
	Direction E	1	1	1	0	0	0	3
	Direction F	2	2	0	0	1	1	4
	D+E+F	10	4	1	1	3	4	16
1400h-1429h	**Direction A**	6	3	0	2	0	2	11
	Direction B	2	1	1	2	0	2	6
	Direction C	6	3	0	2	1	3	11
	A+B+C	14	7	1	6	1	7	28
	Direction D	8	2	0	4	7	11	14
	Direction E	5	3	0	1	1	2	9
	Direction F	1	0	1	0	1	1	2
	D+E+F	14	5	1	5	9	14	25
1430h-1459h	**Direction A**	11	5	0	1	0	1	17
	Direction B	0	0	0	2	0	2	2
	Direction C	4	1	0	0	0	0	5
	A+B+C	15	6	0	3	0	3	24
	Direction D	4	0	0	4	6	10	8
	Direction E	1	1	0	1	1	2	3
	Direction F	4	0	0	0	0	0	4
	D+E+F	9	1	0	5	7	12	15
1500h-1529h	**Direction A**	9	2	0	2	0	2	13
	Direction B	2	0	0	0	0	0	2
	Direction C	2	1	0	1	0	1	4
	A+B+C	13	3	0	3	0	3	19
	Direction D	12	3	0	2	3	5	17
	Direction E	1	0	0	1	2	3	2
	Direction F	6	4	1	1	1	2	12
	D+E+F	19	7	1	4	6	10	31
1530h-1559h	**Direction A**	9	1	0	1	0	1	11
	Direction B	4	0	0	1	0	1	5
	Direction C	4	1	0	1	0	1	6
	A+B+C	17	2	0	3	0	3	22
	Direction D	5	2	0	1	2	3	8
	Direction E	7	0	0	0	1	1	7
	Direction F	0	0	0	0	0	0	0
	D+E+F	12	2	0	1	3	4	15
1600h-1629h	**Direction A**	11	2	1	1	0	1	15
	Direction B	6	2	0	2	1	3	10
	Direction C	7	0	0	2	1	3	9
	A+B+C	24	4	1	5	2	7	34
	Direction D	9	0	0	2	4	6	11
	Direction E	3	1	0	2	2	4	6
	Direction F	4	0	1	1	1	2	6
	D+E+F	16	1	1	5	7	12	23
1630h-1659h	**Direction A**	17	4	0	1	0	1	22
	Direction B	2	0	0	1	0	1	3
	Direction C	6	2	0	1	0	1	9
	A+B+C	25	6	0	3	0	3	34
	Direction D	11	2	0	4	5	9	17
	Direction E	4	2	0	0	1	1	6
	Direction F	3	0	0	1	1	2	4
	D+E+F	18	4	0	5	7	12	27
1700h-1729h	**Direction A**	14	3	0	1	0	1	18
	Direction B	3	0	0	4	1	5	7
	Direction C	7	0	1	2	0	2	10
	A+B+C	24	3	1	7	1	8	35
	Direction D	17	0	0	1	2	3	18
	Direction E	7	1	0	0	0	0	8
	Direction F	2	0	1	2	3	5	5
	D+E+F	26	1	1	3	5	8	31

1730h-1759h	Direction A	12	3	1	0	0	0	16
	Direction B	7	1	0	2	1	3	10
	Direction C	6	3	0	5	1	6	14
	A+B+C	25	7	1	7	2	9	40
	Direction D	18	1	0	4	6	10	23
	Direction E	7	2	1	3	4	7	13
	Direction F	5	0	0	1	1	2	6
	D+E+F	30	3	1	8	11	19	42
1800h-1829h	Direction A	20	1	0	3	1	4	24
	Direction B	7	1	0	3	1	4	11
	Direction C	16	0	0	3	1	4	19
	A+B+C	43	2	0	9	3	12	54
	Direction D	13	1	0	4	6	10	18
	Direction E	8	0	0	3	4	7	11
	Direction F	5	0	0	1	2	3	6
	D+E+F	26	1	0	8	12	20	35
1830h-1859h	Direction A	9	2	0	1	0	1	12
	Direction B	8	0	2	1	0	1	11
	Direction C	5	0	0	3	1	4	8
	A+B+C	22	2	2	5	1	6	31
	Direction D	14	0	0	3	4	7	17
	Direction E	6	0	0	1	2	3	7
	Direction F	6	2	0	3	5	8	11
	D+E+F	26	2	0	7	11	18	35
1900h-1929h	Direction A	16	5	0	2	1	3	23
	Direction B	9	0	0	2	1	3	11
	Direction C	12	3	0	2	0	2	17
	A+B+C	37	8	0	6	2	8	51
	Direction D	15	1	0	4	7	11	20
	Direction E	10	3	1	1	2	3	15
	Direction F	10	0	1	3	4	7	14
	D+E+F	35	4	2	8	13	21	49
1930h-1959h	Direction A	26	1	0	3	1	4	30
	Direction B	10	0	0	2	0	2	12
	Direction C	8	1	0	2	1	3	11
	A+B+C	44	2	0	7	2	9	53
	Direction D	12	0	0	5	8	13	17
	Direction E	7	2	1	1	1	2	11
	Direction F	8	0	0	1	1	2	9
	D+E+F	27	2	1	7	10	17	37

Location: Tamanredjo at the major cross roads
Date: Saturday 10th of september

Time Period	Traffic Volumes	Cars	Light Trucks	Heavy Trucks	Motorcycle	Ped/ Bike	Other (Pedestrian, bicycle, motorcycle)	Total, Veh Only
0600h-0629h	Direction G	0	2	0	0	0	0	
	Direction H	12	3	1	0	0	0	
	Direction I	0	1	0	0	0	0	
	G+H+I	12	6	1	0	0	0	19
	Direction J	0	0	0	0	0	0	0
	Direction K	3	1	2	5	1	6	11
	Direction L	0	0	0	0	0	0	0
	J+K+L	3	1	2	5	1	6	11
0630h-0659h	Direction G	0	0	0	0	1	1	0
	Direction H	10	3	4	1	3	4	18
	Direction I	4	1	1	0	1	1	6
	G+H+I	14	4	5	1	5	6	24
	Direction J	3	2	0	0	0	0	5
	Direction K	11	1	2	2	1	3	16
	Direction L	2	0	0	0	0	0	2
	J+K+L	16	3	2	2	1	3	23
0700h-0729h	Direction G	0	1	0	0	1	1	1
	Direction H	25	9	2	1	3	4	37
	Direction I	7	2	0	0	0	0	9
	G+H+I	32	12	2	1	4	5	47
	Direction J	2	0	0	0	0	0	2
	Direction K	22	3	4	7	2	9	36
	Direction L	2	0	0	5	1	6	7
	J+K+L	26	3	4	12	3	15	45
0730h-0759h	Direction G	0	0	1	0	0	0	1
	Direction H	23	10	1	1	2	3	35
	Direction I	6	2	0	1	3	4	9
	G+H+I	29	12	2	2	5	7	45
	Direction J	7	1	0	2	1	3	10
	Direction K	22	2	2	11	4	15	37
	Direction L	5	1	0	1	0	1	7
	J+K+L	34	4	2	14	5	19	54
0800h-0829h	Direction G	3	0	0	1	1	2	4
	Direction H	23	5	4	2	5	7	34
	Direction I	8	1	2	1	2	3	12
	G+H+I	34	6	6	4	8	12	50
	Direction J	11	2	1	1	0	1	15
	Direction K	37	3	7	6	2	8	53
	Direction L	2	0	0	2	0	2	4
	J+K+L	50	5	8	9	2	11	72
0830h-0859h	Direction G	0	0	0	0	1	1	0
	Direction H	25	4	7	2	3	5	38
	Direction I	9	3	1	0	1	1	13
	G+H+I	34	7	8	2	5	7	51
	Direction J	6	1	0	2	1	3	9
	Direction K	31	2	1	1	0	1	35
	Direction L	4	0	0	0	0	0	4
	J+K+L	41	3	1	3	1	4	48
0900h-0929h	Direction G	4	2	0	0	1	1	6
	Direction H	36	11	7	1	2	3	55
	Direction I	11	2	1	1	1	2	15
	G+H+I	51	15	8	2	4	6	76
	Direction J	17	1	0	0	0	0	18
	Direction K	34	3	3	2	0	2	42
	Direction L	5	0	0	2	0	2	7
	J+K+L	56	4	3	4	0	4	67
0930h-0959h	Direction G	9	2	0	1	1	2	12
	Direction H	33	7	5	0	1	1	45
	Direction I	12	4	1	0	1	1	17
	G+H+I	54	13	6	1	3	4	74
	Direction J	9	1	1	0	0	0	11
	Direction K	42	8	5	3	1	4	58
	Direction L	0	0	0	0	0	0	0
	J+K+L	51	9	6	3	1	4	69
1000h-1029h	Direction G	8	2	0	1	1	2	11
	Direction H	26	4	4	0	1	1	34
	Direction I	3	1	1	0	1	1	5
	G+H+I	37	7	5	1	3	4	50
	Direction J	6	3	0	3	1	4	12
	Direction K	32	6	1	3	1	4	42
	Direction L	1	1	0	0	0	0	2
	J+K+L	39	10	1	6	2	8	56
1030h-1059h	Direction G	5	1	0	0	1	1	6
	Direction H	32	6	5	1	3	4	44
	Direction I	10	2	1	0	1	1	13
	G+H+I	47	9	6	1	5	6	63
	Direction J	10	1	0	2	0	2	13
	Direction K	29	6	6	1	0	1	42
	Direction L	2	1	0	0	0	0	3
	J+K+L	41	8	6	3	0	3	58
1100h-1129h	Direction G	2	0	0	0	0	0	2
	Direction H	34	11	9	2	6	8	56
	Direction I	9	0	1	1	1	2	11
	G+H+I	45	11	10	3	7	10	69
	Direction J	6	1	0	1	0	1	8
	Direction K	26	3	2	5	1	6	36
	Direction L	2	0	0	1	0	1	3
	J+K+L	34	4	2	7	1	8	47

1130h-1159h	Direction G	3	1	1	0	1	1	5
	Direction H	28	7	5	2	3	5	42
	Direction I	16	1	1	0	0	0	18
	G+H+I	47	9	7	2	4	6	65
	Direction J	8	1	0	3	1	4	12
	Direction K	19	4	2	2	1	3	27
	Direction L	1	0	0	0	0	0	1
	J+K+L	28	5	2	5	2	7	40
1200h-1229h	Direction G	8	0	1	0	0	0	9
	Direction H	41	5	6	0	0	0	52
	Direction I	10	3	0	1	1	2	14
	G+H+I	59	8	7	1	1	2	75
	Direction J	6	2	0	3	1	4	11
	Direction K	33	12	5	2	0	2	52
	Direction L	1	2	0	2	0	2	5
	J+K+L	40	16	5	7	1	8	68
1230h-1259h	Direction G	8	2	0	0	1	1	10
	Direction H	46	4	7	1	1	2	58
	Direction I	5	2	0	0	0	0	7
	G+H+I	59	8	7	1	2	3	75
	Direction J	7	0	0	3	1	4	10
	Direction K	20	5	3	1	0	1	29
	Direction L	1	0	0	0	0	0	1
	J+K+L	28	5	3	4	1	5	40
1300h-1329h	Direction G	5	0	0	0	0	0	5
	Direction H	41	9	6	0	1	1	56
	Direction I	11	2	0	0	1	1	13
	G+H+I	57	11	6	0	2	2	74
	Direction J	3	1	0	2	0	2	6
	Direction K	7	3	0	1	0	1	11
	Direction L	2	2	0	2	0	2	6
	J+K+L	12	6	0	5	0	5	23
1330h-1359h	Direction G	1	0	1	0	0	0	2
	Direction H	33	4	2	1	1	2	40
	Direction I	14	5	0	1	3	4	20
	G+H+I	48	9	3	2	4	6	62
	Direction J	8	4	0	1	0	1	13
	Direction K	28	6	5	0	0	0	39
	Direction L	3	1	0	2	1	3	6
	J+K+L	39	11	5	3	1	4	58
1400h-1429h	Direction G	3	0	0	0	0	0	3
	Direction H	33	6	6	2	4	6	47
	Direction I	11	4	0	1	2	3	16
	G+H+I	47	10	6	3	6	9	66
	Direction J	3	3	0	4	1	5	10
	Direction K	18	6	5	1	0	1	30
	Direction L	1	0	0	0	0	0	1
	J+K+L	22	9	5	5	1	6	41
1430h-1459h	Direction G	2	0	0	2	3	5	4
	Direction H	27	5	3	1	1	2	36
	Direction I	14	1	0	1	1	2	16
	G+H+I	43	6	3	4	5	9	56
	Direction J	7	2	8	1	0	1	18
	Direction K	15	0	0	0	0	0	15
	Direction L	0	0	0	0	0	0	0
	J+K+L	22	2	8	1	0	1	33
1500h-1529h	Direction G	2	1	1	1	3	4	5
	Direction H	44	3	4	1	1	2	52
	Direction I	19	3	0	2	6	8	24
	G+H+I	65	7	5	4	10	14	81
	Direction J	7	0	0	0	0	0	7
	Direction K	21	7	4	1	0	1	33
	Direction L	1	1	0	0	0	0	2
	J+K+L	29	8	4	1	0	1	42
1530h-1559h	Direction G	3	0	0	0	0	0	3
	Direction H	44	5	2	2	3	5	53
	Direction I	13	2	1	1	2	3	17
	G+H+I	60	7	3	3	5	8	73
	Direction J	11	1	0	0	0	0	12
	Direction K	22	1	5	2	0	2	30
	Direction L	2	1	0	2	0	2	5
	J+K+L	35	3	5	4	0	4	47
1600h-1629h	Direction G	5	0	1	1	1	2	7
	Direction H	41	7	1	2	5	7	51
	Direction I	15	1	0	0	0	0	16
	G+H+I	61	8	2	3	6	9	74
	Direction J	8	11	0	3	1	4	22
	Direction K	22	10	4	3	1	4	39
	Direction L	0	0	0	1	0	1	1
	J+K+L	30	21	4	7	2	9	62
1630h-1659h	Direction G	5	0	0	0	0	0	5
	Direction H	28	3	0	2	4	6	33
	Direction I	13	3	0	2	5	7	18
	G+H+I	46	6	0	4	9	13	56
	Direction J	11	4	2	3	1	4	20
	Direction K	25	11	8	2	0	2	46
	Direction L	3	0	0	2	0	2	5
	J+K+L	39	15	10	7	1	8	71
1700h-1729h	Direction G	6	0	1	1	1	2	8
	Direction H	29	10	0	2	4	6	41
	Direction I	11	4	1	2	5	7	18
	G+H+I	46	14	2	5	10	15	67
	Direction J	7	3	0	4	1	5	14
	Direction K	36	6	6	2	0	2	50
	Direction L	1	0	0	0	0	0	1
	J+K+L	44	9	6	6	1	7	65
1730h-1759h	Direction G	7	0	0	1	2	3	8

	Direction H	30	4	1	2	4	6	37
	Direction I	17	4	1	1	1	2	23
	G+H+I	54	8	2	4	7	11	68
	Direction J	20	3	0	1	0	1	24
	Direction K	28	5	1	2	1	3	36
	Direction L	7	1	0	2	0	2	10
	J+K+L	55	9	1	5	1	6	70
1800h-1829h	**Direction G**	4	0	0	1	2	3	5
	Direction H	30	2	2	3	6	9	37
	Direction I	15	1	1	0	1	1	17
	G+H+I	49	3	3	4	9	13	59
	Direction J	15	1	0	0	0	0	16
	Direction K	29	11	2	5	1	6	47
	Direction L	9	0	0	1	0	1	10
	J+K+L	53	12	2	6	1	7	73
1830h-1859h	**Direction G**	11	1	1	0	0	0	13
	Direction H	26	1	2	2	5	7	31
	Direction I	22	1	0	0	0	0	23
	G+H+I	59	3	3	2	5	7	67
	Direction J	19	0	0	0	0	0	19
	Direction K	31	5	6	4	1	5	46
	Direction L	1	0	0	2	0	2	3
	J+K+L	51	5	6	6	1	7	68
1900h-1929h	**Direction G**	8	3	0	0	1	1	11
	Direction H	29	3	2	2	4	6	36
	Direction I	19	0	0	1	2	3	20
	G+H+I	56	6	2	3	7	10	67
	Direction J	15	5	1	1	0	1	22
	Direction K	29	2	7	3	1	4	41
	Direction L	5	1	0	1	0	1	7
	J+K+L	49	8	8	5	1	6	70
1930h-1959h	**Direction G**	13	0	0	1	1	2	14
	Direction H	23	2	2	1	2	3	28
	Direction I	21	4	0	2	4	6	27
	G+H+I	57	6	2	4	7	11	69
	Direction J	15	2	0	4	1	5	21
	Direction K	38	5	1	8	3	11	52
	Direction L	5	1	0	1	0	1	7
	J+K+L	58	8	1	13	4	17	80

Paramaribo-Moengo Road east of the bridge over the Suriname river (Bosje brug)
Date: Saturday 10th of September

Time Period	Traffic Volumes	Cars	Light Trucks	Heavy Trucks	Motorcycle	Ped/Bike	Other (Pedestrian, bicycle, motorcycle)	Total	Total, Hourly	Total, Veh Only
0600h-0629h	Direction A	24	8	7	3	0	3			
	Direction B	54	1	4	4	1	5			
	A+B	78	9	11	7	1	8	106		
0630h-0659h	Direction A	62	15	2	9	2	11			
	Direction B	81	10	8	8	2	10			
	A+B	143	25	10	17	4	21	199	305	300
0700h-0729h	Direction A	63	21	4	10	2	12			186
	Direction B	110	14	8	12	3	15			251
	A+B	173	35	12	22	5	27	247	446	437
0730h-0759h	Direction A	62	22	7	21	4	25			210
	Direction B	167	11	7	24	6	30			353
	A+B	229	33	14	45	10	55	331	578	563
0800h-0829h	Direction A	131	31	5	14	2	16			293
	Direction B	203	22	9	37	9	46			480
	A+B	334	53	14	51	11	62	463	794	773
0830h-0859h	Direction A	106	28	10	13	2	15			338
	Direction B	171	17	11	27	7	34			497
	A+B	277	45	21	40	9	49	392	855	835
0900h-0929h	Direction A	100	44	7	19	3	22			327
	Direction B	154	19	6	19	5	24			424
	A+B	254	63	13	38	8	46	376	768	751
0930h-0959h	Direction A	143	36	6	16	3	19			371
	Direction B	163	24	5	13	3	16			403
	A+B	306	60	11	29	6	35	412	788	774
1000h-1029h	Direction A	171	31	8	15	3	18			426
	Direction B	167	24	5	14	3	17			415
	A+B	338	55	13	29	6	35	441	853	841
1030h-1059h	Direction A	151	32	5	12	2	14			425
	Direction B	172	25	5	8	2	10			420
	A+B	323	57	10	20	4	24	414	855	845
1100h-1129h	Direction A	160	25	3	10	2	12			398
	Direction B	157	21	2	10	2	12			400
	A+B	317	46	5	20	4	24	392	806	798
1130h-1159h	Direction A	196	30	6	9	2	11			439
	Direction B	137	26	3	8	2	10			364
	A+B	333	56	9	17	4	21	419	811	803
1200h-1229h	Direction A	199	24	7	13	2	15			484
	Direction B	110	27	4	10	3	13			325
	A+B	309	51	11	23	5	28	399	818	809
1230h-1259h	Direction A	210	37	8	10	2	12			508
	Direction B	107	23	7	19	5	24			307
	A+B	317	60	15	29	7	36	428	827	815
1300h-1329h	Direction A	194	25	4	25	4	29			513
	Direction B	128	29	6	36	9	45			355
	A+B	322	54	10	61	13	74	460	888	868
1330h-1359h	Direction A	248	27	7	20	3	23			550
	Direction B	124	25	7	18	5	23			373
	A+B	372	52	14	38	8	46	484	944	923
1400h-1429h	Direction A	223	26	7	20	4	24			578
	Direction B	135	22	3	14	4	18			348
	A+B	358	48	10	34	8	42	458	942	926
1430h-1459h	Direction A	224	24	2	17	3	20			543
	Direction B	132	25	4	10	3	13			345
	A+B	356	49	6	27	6	33	444	902	888
1500h-1529h	Direction A	219	21	4	23	4	27			534
	Direction B	159	30	6	13	3	16			379
	A+B	378	51	10	36	7	43	482	926	913
1530h-1559h	Direction A	177	24	2	14	2	16			484
	Direction B	101	22	9	10	2	12			350
	A+B	278	46	11	24	4	28	363	845	834
1600h-1629h	Direction A	141	17	5	17	3	20			397
	Direction B	129	21	3	5	1	6			300
	A+B	270	38	8	22	4	26	342	705	697
1630h-1659h	Direction A	180	27	6	20	3	23			413
	Direction B	143	23	4	5	1	6			333
	A+B	323	50	10	25	4	29	412	754	746
1700h-1729h	Direction A	168	23	7	16	3	19			447
	Direction B	156	30	14	13	3	16			388
	A+B	324	53	21	29	6	35	433	845	835
1730h-1759h	Direction A	178	17	2	21	4	25			432
	Direction B	147	25	3	18	5	23			406
	A+B	325	42	5	39	9	48	420	853	838
1800h-1829h	Direction A	206	23	4	19	3	22			470
	Direction B	193	32	3	12	3	15			433
	A+B	399	55	7	31	6	37	498	918	903
1830h-1859h	Direction A	162	22	18	17	3	20			471
	Direction B	180	32	2	13	3	16			467
	A+B	342	54	20	30	6	36	452	950	938
1900h-1929h	Direction A	185	17	5	15	3	18			441
	Direction B	205	26	9	17	4	21			484
	A+B	390	43	14	32	7	39	486	938	925
1930h-1959h	Direction A	186	17	2	18	3	21	226		445
	Direction B	203	27	2	14	3	17	249		503
	A+B	389	44	4	32	6	38	475	961	948

Location: Paramaribo-Moengo Road, east of the bridge over the Suriname river (Bosje brug)										
Date: Tuesday 13th of September										
Time Period	**Traffic Volumes**	**Cars**	**Light Trucks**	**Heavy Trucks**	**Motorcycle**	**Ped/ Bike**	**Other (Pedestrian, bicycle, motorcycle)**	**Total**	**Total, Hourly**	**Total, Vehicles Only**
0600h-0629h	**Direction A**	46	7	11	10	2	12			
	Direction B	94	6	9	8	2	10			
	A+B	140	13	20	18	4	22	195		
0630h-0659h	**Direction A**	37	21	6	14	3	17			
	Direction B	198	7	8	22	6	28			
	A+B	235	28	14	36	9	45	322	517	504
0700h-0729h	**Direction A**	48	16	8	16	3	19			166
	Direction B	220	4	8	38	10	48			505
	A+B	268	20	16	54	13	67	371	693	671
0730h-0759h	**Direction A**	76	14	10	22	4	26			210
	Direction B	230	6	6	52	13	65			564
	A+B	306	20	16	74	17	91	433	804	774
0800h-0829h	**Direction A**	88	24	7	26	4	30			267
	Direction B	204	6	9	37	9	46			550
	A+B	292	30	16	63	13	76	414	847	817
0830h-0859h	**Direction A**	101	16	8	15	3	18			285
	Direction B	190	15	13	31	8	39			505
	A+B	291	31	21	46	11	57	400	814	790
0900h-0929h	**Direction A**	95	30	18	5	1	6			288
	Direction B	137	12	10	12	3	15			420
	A+B	232	42	28	17	4	21	323	723	708
0930h-0959h	**Direction A**	123	29	16	3	1	4			319
	Direction B	190	15	13	14	3	17			403
	A+B	313	44	29	17	4	21	407	730	722
1000h-1029h	**Direction A**	112	21	16	12	2	14			332
	Direction B	155	7	9	18	5	23			421
	A+B	267	28	25	30	7	37	357	764	753
1030h-1059h	**Direction A**	114	26	9	16	3	19			326
	Direction B	151	7	19	11	3	14			377
	A+B	265	33	28	27	6	33	359	716	703
1100h-1129h	**Direction A**	126	30	14	13	2	15			348
	Direction B	135	10	8	6	2	8			347
	A+B	261	40	22	19	4	23	346	705	695
1130h-1159h	**Direction A**	150	26	9	14	2	16			382
	Direction B	127	9	11	7	2	9			313
	A+B	277	35	20	21	4	25	357	703	695
1200h-1229h	**Direction A**	117	19	9	5	1	6			349
	Direction B	142	9	11	7	2	9			323
	A+B	259	28	20	12	3	15	322	679	672
1230h-1259h	**Direction A**	119	24	11	7	1	8			311
	Direction B	113	3	13	8	2	10			306
	A+B	232	27	24	15	3	18	301	623	617
1300h-1329h	**Direction A**	124	25	10	4	1	5			324
	Direction B	125	5	5	13	3	16			285
	A+B	249	30	15	17	4	21	315	616	609
1330h-1359h	**Direction A**	133	23	9	9	2	11			337
	Direction B	107	10	8	2	0	2			275
	A+B	240	33	17	11	2	13	303	618	612
1400h-1429h	**Direction A**	154	21	11	7	1	8			367
	Direction B	133	9	18	7	2	9			294
	A+B	287	30	29	14	3	17	363	666	661
1430h-1459h	**Direction A**	142	25	10	9	2	11			379
	Direction B	105	7	15	10	2	12			304
	A+B	247	32	25	19	4	23	327	690	683
1500h-1529h	**Direction A**	159	24	12	23	4	27			404
	Direction B	112	11	6	5	1	6			271
	A+B	271	35	18	28	5	33	357	684	675
1530h-1559h	**Direction A**	160	27	4	20	4	24			429
	Direction B	110	6	12	4	1	5			266
	A+B	270	33	16	24	5	29	348	705	695
1600h-1629h	**Direction A**	180	35	12	24	4	28			462
	Direction B	120	6	16	10	3	13			284
	A+B	300	41	28	34	7	41	410	758	746
1630h-1659h	**Direction A**	188	30	7	36	6	42			512
	Direction B	142	13	11	13	3	16			331
	A+B	330	43	18	49	9	58	449	859	843
1700h-1729h	**Direction A**	188	20	11	48	9	57			528
	Direction B	150	13	10	20	5	25			372
	A+B	338	33	21	68	14	82	474	923	900
1730h-1759h	**Direction A**	190	28	10	31	6	37			526
	Direction B	147	4	13	20	5	25			377
	A+B	337	32	23	51	11	62	454	928	903
1800h-1829h	**Direction A**	200	21	4	25	4	29			509
	Direction B	176	9	15	15	4	19			399
	A+B	376	30	19	40	8	48	473	927	908
1830h-1859h	**Direction A**	160	23	6	22	4	26			461
	Direction B	160	10	4	10	2	12			399
	A+B	320	33	10	32	6	38	401	874	860
1900h-1929h	**Direction A**	140	14	2	13	2	15			380
	Direction B	152	6	6	19	5	24			367
	A+B	292	20	8	32	7	39	359	760	747
1930h-1959h	**Direction A**	110	20	1	14	2	16	147		314
	Direction B	185	2	4	8	2	10	201		382
	A+B	295	22	5	22	4	26	348	707	696

Location: Tamanredjo at the major cross roads

Date: Tuesday 13th of September

Time Period	Traffic Volumes	Cars	Light Trucks	Heavy Trucks	Motorcycle	Ped/ Bike	Other (Pedestrian, bicycle, motorcycle)	Total, Veh Only	Hourly (rolling)
0600h-0629h	Direction A	22	0	0	5	2	7		
	Direction B	2	2	3	0	0	0		
	Direction C	2	1	1	0	0	0		
	A+B+C	26	3	4	5	2	7	38	38
	Direction D	2	0	0	0	1	1	2	
	Direction E	0	0	0	0	0	0	0	
	Direction F	8	0	0	1	2	3	9	
	D+E+F	10	0	0	1	3	4	11	11
0630h-0659h	Direction A	12	1	1	4	1	5	18	
	Direction B	6	1	0	1	0	1	8	
	Direction C	5	1	0	7	2	9	13	
	A+B+C	23	3	1	12	3	15	39	77
	Direction D	0	0	1	4	5	9	5	
	Direction E	4	0	0	1	2	3	5	
	Direction F	7	0	1	2	4	6	10	
	D+E+F	11	0	2	7	11	18	20	31
0700h-0729h	Direction A	25	1	2	14	5	19	42	
	Direction B	5	0	0	11	3	14	16	
	Direction C	10	3	1	6	2	8	20	
	A+B+C	40	4	3	31	10	41	78	117
	Direction D	9	0	0	3	4	7	12	
	Direction E	6	0	0	2	2	4	8	
	Direction F	12	0	0	4	6	10	16	
	D+E+F	27	0	0	9	12	21	36	56
0730h-0759h	Direction A	10	0	1	8	3	11	19	61
	Direction B	4	1	0	2	1	3	7	23
	Direction C	15	1	1	5	2	7	22	42
	A+B+C	29	2	2	15	6	21	48	126
	Direction D	8	0	0	2	3	5	10	22
	Direction E	4	0	0	1	1	2	5	13
	Direction F	7	0	1	2	2	4	10	26
	D+E+F	19	0	1	5	6	11	25	61
0800h-0829h	Direction A	16	3	0	2	0	2	21	
	Direction B	2	1	0	3	1	4	6	
	Direction C	9	0	0	2	0	2	11	
	A+B+C	27	4	0	7	1	8	38	86
	Direction D	8	0	0	0	0	0	8	
	Direction E	1	1	0	1	2	3	3	
	Direction F	8	0	0	1	2	3	9	
	D+E+F	17	1	0	2	4	6	20	45
0830h-0859h	Direction A	13	0	0	0	0	0	13	
	Direction B	2	0	0	1	0	1	3	
	Direction C	9	0	1	5	1	6	15	
	A+B+C	24	0	1	6	1	7	31	69
	Direction D	9	0	1	2	2	4	12	
	Direction E	1	0	0	0	0	0	1	
	Direction F	5	0	0	0	0	0	5	
	D+E+F	15	0	1	2	2	4	18	38

0900h-0929h	**Direction A**	9	1	1	2	0	2	13	
	Direction B	0	0	0	0	0	0	0	
	Direction C	9	3	0	8	3	11	20	
	A+B+C	18	4	1	10	3	13	33	64
	Direction D	7	2	1	0	1	1	10	
	Direction E	0	0	0	0	1	1	0	
	Direction F	3	0	0	0	1	1	3	
	D+E+F	10	2	1	0	3	3	13	31
0930h-0959h	**Direction A**	7	2	0	2	1	3	11	
	Direction B	0	0	0	0	0	0	0	
	Direction C	8	3	0	4	1	5	15	
	A+B+C	15	5	0	6	2	8	26	59
	Direction D	7	0	0	0	0	0	7	
	Direction E	0	0	0	0	0	0	0	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	7	0	0	0	0	0	7	20
1000h-1029h	**Direction A**	12	2	1	1	0	1	16	
	Direction B	0	0	0	0	0	0	0	
	Direction C	10	1	1	1	0	1	13	
	A+B+C	22	3	2	2	0	2	29	55
	Direction D	11	1	3	1	2	3	16	
	Direction E	0	0	0	0	0	0	0	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	11	1	3	1	2	3	16	23
1030h-1059h	**Direction A**	12	0	0	1	0	1	13	
	Direction B	0	0	0	0	0	0	0	
	Direction C	5	3	0	2	1	3	10	
	A+B+C	17	3	0	3	1	4	23	52
	Direction D	6	3	1	1	1	2	11	
	Direction E	0	0	0	0	0	0	0	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	6	3	1	1	1	2	11	27
1100h-1129h	**Direction A**	6	2	0	2	0	2	10	
	Direction B	0	0	0	0	0	0	0	
	Direction C	7	1	0	5	2	7	13	
	A+B+C	13	3	0	7	2	9	23	46
	Direction D	13	0	1	1	2	3	15	
	Direction E	0	0	0	0	0	0	0	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	13	0	1	1	2	3	15	26
1130h-1159h	**Direction A**	5	0	0	2	0	2	7	
	Direction B	0	0	0	0	0	0	0	
	Direction C	6	0	0	0	0	0	6	
	A+B+C	11	0	0	2	0	2	13	36
	Direction D	6	2	0	1	1	2	9	
	Direction E	0	0	1	0	0	0	1	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	6	2	1	1	1	2	10	25
1200h-1229h	**Direction A**	10	0	1	2	0	2	13	
	Direction B	0	0	0	0	0	0	0	
	Direction C	9	5	1	2	1	3	17	
	A+B+C	19	5	2	4	1	5	30	43
	Direction D	5	0	1	1	2	3	7	
	Direction E	2	0	1	0	0	0	3	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	7	0	2	1	2	3	10	20
1230h-1259h	**Direction A**	9	4	0	2	1	3	15	
	Direction B	0	0	0	0	0	0	0	
	Direction C	7	5	3	5	2	7	20	
	A+B+C	16	9	3	7	3	10	35	65
	Direction D	6	1	0	3	4	7	10	
	Direction E	1	1	0	0	1	1	2	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	7	2	0	3	5	8	12	22
1300h-1329h	**Direction A**	3	4	1	0	0	0	8	
	Direction B	0	0	0	0	0	0	0	
	Direction C	12	2	0	0	0	0	14	
	A+B+C	15	6	1	0	0	0	22	57
	Direction D	2	2	0	0	0	0	4	
	Direction E	0	2	0	0	0	0	2	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	2	4	0	0	0	0	6	18
1330h-1359h	**Direction A**	4	2	1	0	0	0	7	
	Direction B	1	0	0	0	0	0	1	
	Direction C	4	0	0	2	1	3	6	
	A+B+C	9	2	1	2	1	3	14	36
	Direction D	3	0	1	0	0	0	4	
	Direction E	1	0	0	0	1	1	1	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	4	0	1	0	1	1	5	11
1400h-1429h	**Direction A**	3	2	2	0	0	0	7	
	Direction B	1	1	0	2	1	3	4	
	Direction C	6	3	0	0	0	0	9	
	A+B+C	10	6	2	2	1	3	20	34
	Direction D	3	0	1	0	1	1	4	
	Direction E	1	2	0	0	1	1	3	
	Direction F	2	0	0	1	1	2	3	
	D+E+F	6	2	1	1	3	4	10	15
1430h-1459h	**Direction A**	2	3	0	0	0	0	5	
	Direction B	2	1	0	0	0	0	3	
	Direction C	5	2	1	1	0	1	9	
	A+B+C	9	6	1	1	0	1	17	37
	Direction D	2	0	0	3	4	7	5	

	Direction E	2	2	0	1	2	3	5	
	Direction F	0	0	0	1	2	3	1	
	D+E+F	4	2	0	5	8	13	11	21
1500h-1529h	**Direction A**	8	1	0	2	0	2	11	
	Direction B	3	1	0	2	0	2	6	
	Direction C	4	1	0	2	1	3	7	
	A+B+C	15	3	0	6	1	7	24	41
	Direction D	4	2	0	2	3	5	8	
	Direction E	1	0	0	0	1	1	1	
	Direction F	0	0	0	0	1	1	0	
	D+E+F	5	2	0	2	5	7	9	20
1530h-1559h	**Direction A**	3	2	0	2	0	2	7	
	Direction B	4	3	0	4	1	5	11	
	Direction C	4	1	0	3	1	4	8	
	A+B+C	11	6	0	9	2	11	26	50
	Direction D	3	0	0	2	3	5	5	
	Direction E	1	0	0	0	0	0	1	
	Direction F	2	0	1	0	0	0	3	
	D+E+F	6	0	1	2	3	5	9	18
1600h-1629h	**Direction A**	7	2	1	2	0	2	12	
	Direction B	1	1	0	2	0	2	4	
	Direction C	2	1	0	0	0	0	3	
	A+B+C	10	4	1	4	0	4	19	45
	Direction D	5	1	1	0	1	1	7	
	Direction E	3	0	1	2	2	4	6	
	Direction F	3	1	0	1	1	2	5	
	D+E+F	11	2	2	3	4	7	18	27
1630h-1659h	**Direction A**	3	1	0	2	0	2	6	
	Direction B	3	2	0	4	1	5	9	
	Direction C	9	2	0	2	0	2	13	
	A+B+C	15	5	0	8	1	9	28	47
	Direction D	8	1	0	1	1	2	10	
	Direction E	0	1	0	0	1	1	1	
	Direction F	4	0	0	0	0	0	4	
	D+E+F	12	2	0	1	2	3	15	33
1700h-1729h	**Direction A**	10	1	1	1	0	1	13	
	Direction B	6	1	1	4	1	5	12	
	Direction C	5	3	0	2	0	2	10	
	A+B+C	21	5	2	7	1	8	35	63
	Direction D	6	3	1	1	2	3	11	
	Direction E	1	0	0	0	0	0	1	
	Direction F	2	1	0	0	1	1	3	
	D+E+F	9	4	1	1	3	4	15	30
1730h-1759h	**Direction A**	5	1	0	2	1	3	8	
	Direction B	7	0	0	1	0	1	8	
	Direction C	6	0	0	4	1	5	10	
	A+B+C	18	1	0	7	2	9	26	61
	Direction D	14	2	0	3	4	7	19	
	Direction E	0	1	0	1	1	2	2	
	Direction F	6	0	0	1	1	2	7	
	D+E+F	20	3	0	5	6	11	28	43
1800h-1829h	**Direction A**	3	0	0	0	0	0	3	
	Direction B	13	1	0	7	2	9	21	
	Direction C	8	0	0	2	1	3	10	
	A+B+C	24	1	0	9	3	12	34	60
	Direction D	8	0	2	2	2	4	12	
	Direction E	7	0	1	2	4	6	10	
	Direction F	4	0	1	1	2	3	6	
	D+E+F	19	0	4	5	8	13	28	56
1830h-1859h	**Direction A**	5	1	0	1	0	1	7	
	Direction B	8	0	0	2	1	3	10	
	Direction C	8	1	0	3	1	4	12	
	A+B+C	21	2	0	6	2	8	29	63
	Direction D	11	2	0	1	2	3	14	
	Direction E	7	1	0	2	2	4	10	
	Direction F	0	0	0	0	0	0	0	
	D+E+F	18	3	0	3	4	7	24	52
1900h-1929h	**Direction A**	11	2	1	3	1	4	17	
	Direction B	8	1	0	4	1	5	13	
	Direction C	8	2	1	5	1	6	16	
	A+B+C	27	5	2	12	3	15	46	75
	Direction D	8	3	0	1	2	3	12	
	Direction E	0	2	0	1	1	2	3	
	Direction F	4	0	0	0	0	0	4	
	D+E+F	12	5	0	2	3	5	19	43
1930h-1959h	**Direction A**	10	1	0	2	1	3	13	30
	Direction B	6	0	0	5	2	7	11	24
	Direction C	10	0	0	0	0	0	10	26
	A+B+C	26	1	0	7	3	10	34	80
	Direction D	7	0	1	1	1	2	9	21
	Direction E	4	1	0	1	2	3	6	9
	Direction F	5	0	0	0	0	0	5	9
	D+E+F	16	1	1	2	3	5	20	39

Location: Tamanredjo at the major cross roads									
Date: Tuesday 13th of September									
Time Period	**Traffic Volumes**	**Cars**	**Light Trucks**	**Heavy Trucks**	**Motorcycle**	**Ped/ Bike**	**Other (Pedestrian, bicycle, motorcycle)**	**Total, Veh Only**	**Hourly (rolling)**
0600h-0629h	**Direction G**	2	0	0	0	0	0		
	Direction H	18	5	7	0	1	1		
	Direction I	2	1	0	0	1	1		
	G+H+I	22	6	7	0	2	2	35	35
	Direction J	0	1	0	0	0	0	1	
	Direction K	12	3	0	2	0	2	17	
	Direction L	0	0	0	0	0	0	0	
	J+K+L	12	4	0	2	0	2	18	18
0630h-0659h	**Direction G**	1	0	0	0	1	1	1	
	Direction H	21	7	3	2	3	5	33	
	Direction I	2	5	2	0	1	1	9	
	G+H+I	24	12	5	2	5	7	43	78
	Direction J	8	1	1	1	0	1	11	
	Direction K	18	2	0	11	3	14	31	
	Direction L	1	0	0	2	1	3	3	
	J+K+L	27	3	1	14	4	18	45	63
0700h-0729h	**Direction G**	5	1	2	1	3	4	9	
	Direction H	10	8	5	2	3	5	25	
	Direction I	4	3	0	1	1	2	8	
	G+H+I	19	12	7	4	7	11	42	85
	Direction J	2	0	0	3	1	4	5	
	Direction K	30	5	5	11	4	15	51	
	Direction L	5	0	0	2	0	2	7	
	J+K+L	37	5	5	16	5	21	63	108
0730h-0759h	**Direction G**	1	0	1	1	1	2	3	12
	Direction H	27	8	2	4	8	12	41	66
	Direction I	6	0	0	1	1	2	7	15
	G+H+I	34	8	3	6	10	16	51	93
	Direction J	5	0	0	2	1	3	7	12
	Direction K	30	1	3	8	3	11	42	93
	Direction L	2	0	0	2	0	2	4	11
	J+K+L	37	1	3	12	4	16	53	116
0800h-0829h	**Direction G**	3	0	1	0	0	0	4	
	Direction H	29	9	4	2	3	5	44	
	Direction I	7	2	1	1	2	3	11	
	G+H+I	39	11	6	3	5	8	59	110
	Direction J	8	1	0	1	0	1	10	
	Direction K	35	6	2	6	2	8	49	
	Direction L	9	2	0	0	0	0	11	
	J+K+L	52	9	2	7	2	9	70	123
0830h-0859h	**Direction G**	3	0	0	0	0	0	3	
	Direction H	25	10	5	1	1	2	41	
	Direction I	8	0	1	0	1	1	9	
	G+H+I	36	10	6	1	2	3	53	112
	Direction J	7	3	0	2	0	2	12	
	Direction K	28	6	0	2	1	3	36	
	Direction L	4	0	0	1	0	1	5	
	J+K+L	39	9	0	5	1	6	53	123

0900h-0929h	Direction G	0	0	0	0	0	0	0	
	Direction H	19	6	1	1	3	4	27	
	Direction I	4	0	1	0	0	0	5	
	G+H+I	23	6	2	1	3	4	32	85
	Direction J	2	2	0	2	0	2	6	
	Direction K	22	2	2	4	1	5	30	
	Direction L	5	0	0	0	0	0	5	
	J+K+L	29	4	2	6	1	7	41	94
0930h-0959h	Direction G	3	0	0	0	0	0	3	
	Direction H	20	13	8	2	3	5	43	
	Direction I	16	4	0	0	1	1	20	
	G+H+I	39	17	8	2	4	6	66	98
	Direction J	0	0	0	1	0	1	1	
	Direction K	1	0	3	0	0	0	4	
	Direction L	35	0	2	3	1	4	40	
	J+K+L	36	0	5	4	1	5	45	86
1000h-1029h	Direction G	0	0	0	0	0	0	0	
	Direction H	17	5	4	2	3	5	28	
	Direction I	17	5	0	0	0	0	22	
	G+H+I	34	10	4	2	3	5	50	116
	Direction J	1	0	0	0	0	0	1	
	Direction K	0	0	2	0	0	0	2	
	Direction L	38	1	2	3	1	4	44	
	J+K+L	39	1	4	3	1	4	47	92
1030h-1059h	Direction G	6	0	0	0	1	1	6	
	Direction H	28	8	6	1	3	4	43	
	Direction I	19	3	1	1	1	2	24	
	G+H+I	53	11	7	2	5	7	73	123
	Direction J	0	0	0	0	0	0	0	
	Direction K	0	1	3	1	0	1	5	
	Direction L	32	3	0	3	1	4	38	
	J+K+L	32	4	3	4	1	5	43	90
1100h-1129h	Direction G	4	0	0	0	1	1	4	
	Direction H	17	10	6	0	1	1	33	
	Direction I	19	0	0	0	1	1	19	
	G+H+I	40	10	6	0	3	3	56	129
	Direction J	3	0	0	2	0	2	5	
	Direction K	0	1	3	1	0	1	5	
	Direction L	30	3	0	2	1	3	35	
	J+K+L	33	4	3	5	1	6	45	88
1130h-1159h	Direction G	1	0	0	0	0	0	1	
	Direction H	30	5	5	1	3	4	41	
	Direction I	15	2	0	1	2	3	18	
	G+H+I	46	7	5	2	5	7	60	116
	Direction J	2	0	0	2	0	2	4	
	Direction K	0	1	2	2	0	2	5	
	Direction L	35	5	1	0	0	0	41	
	J+K+L	37	6	3	4	0	4	50	95
1200h-1229h	Direction G	0	0	0	0	0	0	0	
	Direction H	23	9	5	1	1	2	38	
	Direction I	7	2	0	1	2	3	10	
	G+H+I	30	11	5	2	3	5	48	108
	Direction J	4	2	0	0	0	0	6	
	Direction K	8	6	2	2	1	3	18	
	Direction L	17	2	1	3	1	4	23	
	J+K+L	29	10	3	5	2	7	47	97
1230h-1259h	Direction G	2	0	0	0	0	0	2	
	Direction H	28	6	5	1	2	3	40	
	Direction I	13	2	0	1	1	2	16	
	G+H+I	43	8	5	2	3	5	58	106
	Direction J	2	2	1	1	0	1	6	
	Direction K	7	5	5	2	1	3	19	
	Direction L	13	4	1	3	1	4	21	
	J+K+L	22	11	7	6	2	8	46	93
1300h-1329h	Direction G	1	0	0	0	0	0	1	
	Direction H	17	12	8	1	2	3	38	
	Direction I	8	3	2	1	1	2	14	
	G+H+I	26	15	10	2	3	5	53	111
	Direction J	5	5	0	1	0	1	11	
	Direction K	8	3	3	0	0	0	14	
	Direction L	10	7	0	1	0	1	18	
	J+K+L	23	15	3	2	0	2	43	89
1330h-1359h	Direction G	0	0	0	0	0	0	0	
	Direction H	28	7	4	1	3	4	40	
	Direction I	9	1	0	0	1	1	10	
	G+H+I	37	8	4	1	4	5	50	103
	Direction J	3	3	0	0	0	0	6	
	Direction K	3	1	0	0	0	0	4	
	Direction L	19	2	0	0	0	0	21	
	J+K+L	25	6	0	0	0	0	31	74
1400h-1429h	Direction G	2	0	0	0	1	1	2	
	Direction H	32	10	5	2	4	6	49	
	Direction I	11	3	0	1	1	2	15	
	G+H+I	45	13	5	3	6	9	66	116
	Direction J	3	1	1	2	1	3	7	
	Direction K	9	1	6	2	1	3	18	
	Direction L	3	0	0	0	0	0	3	
	J+K+L	15	2	7	4	2	6	28	59
1430h-1459h	Direction G	1	0	0	0	0	0	1	
	Direction H	30	6	1	2	6	8	39	
	Direction I	15	3	1	1	1	2	20	
	G+H+I	46	9	2	3	7	10	60	126
	Direction J	6	3	0	2	1	3	11	

	Direction K	14	5	0	1	0	1	20	
	Direction L	4	0	0	0	0	0	4	
	J+K+L	24	8	0	3	1	4	35	63
1500h-1529h	**Direction G**	0	0	0	0	0	0	0	
	Direction H	30	2	4	2	4	6	38	
	Direction I	15	1	0	0	1	1	16	
	G+H+I	45	3	4	2	5	7	54	114
	Direction J	1	3	0	0	0	0	4	
	Direction K	13	9	2	1	0	1	25	
	Direction L	4	1	0	0	0	0	5	
	J+K+L	18	13	2	1	0	1	34	69
1530h-1559h	**Direction G**	1	0	0	0	1	1	1	
	Direction H	18	2	2	1	3	4	23	
	Direction I	10	1	1	1	1	2	13	
	G+H+I	29	3	3	2	5	7	37	91
	Direction J	7	0	0	1	0	1	8	
	Direction K	12	5	7	0	0	0	24	
	Direction L	3	0	0	0	0	0	3	
	J+K+L	22	5	7	1	0	1	35	69
1600h-1629h	**Direction G**	1	0	0	0	0	0	1	
	Direction H	31	4	1	2	3	5	38	
	Direction I	14	4	1	1	2	3	20	
	G+H+I	46	8	2	3	5	8	59	96
	Direction J	5	1	0	4	1	5	10	
	Direction K	7	1	6	0	0	0	14	
	Direction L	1	0	0	3	1	4	4	
	J+K+L	13	2	6	7	2	9	28	63
1630h-1659h	**Direction G**	2	1	1	0	0	0	4	
	Direction H	38	8	2	2	4	6	50	
	Direction I	15	0	1	2	4	6	18	
	G+H+I	55	9	4	4	8	12	72	131
	Direction J	4	0	0	0	0	0	4	
	Direction K	18	12	4	0	0	0	34	
	Direction L	3	0	0	3	1	4	6	
	J+K+L	25	12	4	3	1	4	44	72
1700h-1729h	**Direction G**	3	1	0	2	4	6	6	
	Direction H	38	7	2	4	8	12	51	
	Direction I	23	0	1	3	8	11	27	
	G+H+I	64	8	3	9	20	29	84	156
	Direction J	1	0	0	0	0	0	1	
	Direction K	19	13	4	0	0	0	36	
	Direction L	5	0	0	0	0	0	5	
	J+K+L	25	13	4	0	0	0	42	86
1730h-1759h	**Direction G**	2	1	0	2	6	8	5	
	Direction H	30	5	3	3	7	10	41	
	Direction I	15	1	3	2	4	6	21	
	G+H+I	47	7	6	7	17	24	67	151
	Direction J	9	0	0	4	1	5	13	
	Direction K	22	12	5	0	0	0	39	
	Direction L	7	1	1	2	1	3	11	
	J+K+L	38	13	6	6	2	8	63	105
1800h-1829h	**Direction G**	6	0	1	1	1	2	8	
	Direction H	27	0	3	1	1	2	31	
	Direction I	13	1	1	2	4	6	17	
	G+H+I	46	1	5	4	6	10	56	123
	Direction J	10	0	0	1	0	1	11	
	Direction K	23	2	1	3	1	4	29	
	Direction L	10	0	0	5	2	7	15	
	J+K+L	43	2	1	9	3	12	55	118
1830h-1859h	**Direction G**	8	0	0	1	2	3	9	
	Direction H	21	4	2	0	1	1	27	
	Direction I	19	3	0	1	3	4	23	
	G+H+I	48	7	2	2	6	8	59	115
	Direction J	9	2	0	2	1	3	13	
	Direction K	19	4	5	2	1	3	30	
	Direction L	13	1	0	3	1	4	17	
	J+K+L	41	7	5	7	3	10	60	115
1900h-1929h	**Direction G**	10	1	1	1	1	2	13	
	Direction H	26	6	2	1	3	4	35	
	Direction I	13	0	0	0	1	1	13	
	G+H+I	49	7	3	2	5	7	61	120
	Direction J	4	0	0	0	0	0	4	
	Direction K	32	3	0	2	0	2	37	
	Direction L	5	0	0	0	0	0	5	
	J+K+L	41	3	0	2	0	2	46	106
1930h-1959h	**Direction G**	3	1	0	0	1	1	4	17
	Direction H	18	3	0	2	3	5	23	58
	Direction I	20	1	1	2	3	5	24	37
	G+H+I	41	5	1	4	7	11	51	112
	Direction J	8	3	0	5	2	7	16	20
	Direction K	30	4	2	2	0	2	38	75
	Direction L	3	0	0	3	1	4	6	11
	J+K+L	41	7	2	10	3	13	60	106

Location: North of Mora Kondre (and south of Moengo) along the Moengo-Langa Tabiki raod							
Date: Tuesday 13th of September							
Time Period	**Traffic Volumes**	**Cars**	**Light Trucks**	**Heavy Trucks**	**Other (Pedestrian, bicycle, motorcycle)**	**Total**	**Total, Hourly**
0600h-0629h	**Direction A**	3	0	0	0		
	Direction B	1	2	2	0		
	A+B	4	2	2	0	8	
0630h-0659h	**Direction A**	0	1	0	0		
	Direction B	1	0	1	3		
	A+B	1	1	1	3	6	14
0700h-0729h	**Direction A**	0	0	1	2		
	Direction B	2	4	7	0		
	A+B	2	4	8	2	16	22
0730h-0759h	**Direction A**	2	0	5	0		
	Direction B	1	1	2	0		
	A+B	3	1	7	0	11	27
0800h-0829h	**Direction A**	2	0	4	0		
	Direction B	1	1	3	0		
	A+B	3	1	7	0	11	22
0830h-0859h	**Direction A**	1	0	3	0		
	Direction B	3	1	2	0		
	A+B	4	1	5	0	10	21
0900h-0929h	**Direction A**	0	1	1	0		
	Direction B	1	2	4	0		
	A+B	1	3	5	0	9	19
0930h-0959h	**Direction A**	0	0	1	1		
	Direction B	1	4	0	0		
	A+B	1	4	1	1	7	16
1000h-1029h	**Direction A**	1	0	2	0		
	Direction B	1	2	3	1		
	A+B	2	2	5	1	10	17
1030h-1059h	**Direction A**	2	2	3	0		
	Direction B	4	2	3	0		
	A+B	6	4	6	0	16	26
1100h-1129h	**Direction A**	0	1	1	0		
	Direction B	1	1	4	1		
	A+B	1	2	5	1	9	25
1130h-1159h	**Direction A**	0	2	2	0		
	Direction B	0	0	2	0		
	A+B	0	2	4	0	6	15
1200h-1229h	**Direction A**	0	0	0	0		
	Direction B	0	1	1	0		
	A+B	0	1	1	0	2	8
1230h-1259h	**Direction A**	0	1	0	0		
	Direction B	2	2	2	0		
	A+B	2	3	2	0	7	9
1300h-1329h	**Direction A**	0	3	1	0		
	Direction B	3	4	2	0		
	A+B	3	7	3	0	13	20
1330h-1359h	**Direction A**	0	0	3	0		
	Direction B	0	2	1	0		
	A+B	0	2	4	0	6	19
1400h-1429h	**Direction A**	1	2	8	1	12	
	Direction B	2	1	2	1	6	
	A+B	3	3	10	2	18	24
1430h-1459h	**Direction A**	2	1	2	0	5	17
	Direction B	3	1	3	0	7	13
	A+B	5	2	5	0	12	30
1500h-1529h	**Direction A**	1	2	0	1		
	Direction B	3	2	1	0		
	A+B	4	4	1	1	10	22
1530h-1559h	**Direction A**	3	0	0	0		
	Direction B	1	5	1	0		
	A+B	4	5	1	0	10	20
1600h-1629h	**Direction A**	2	8	1	0		
	Direction B	0	1	1	1		
	A+B	2	9	2	1	14	24
1630h-1659h	**Direction A**	0	2	0	0		
	Direction B	0	0	2	0		
	A+B	0	2	2	0	4	18
1700h-1729h	**Direction A**	3	1	1	1		
	Direction B	1	2	0	2		
	A+B	4	3	1	3	11	15
1730h-1759h	**Direction A**	1	1	0	0		
	Direction B	2	1	1	0		
	A+B	3	2	1	0	6	17
1800h-1829h	**Direction A**	1	3	0	0		
	Direction B	2	1	0	0		
	A+B	3	4	0	0	7	13
1830h-1859h	**Direction A**	1	1	0	1		
	Direction B	2	2	0	3		
	A+B	3	3	0	4	10	17
1900h-1929h	**Direction A**	4	2	0	1		
	Direction B	1	1	0	0		
	A+B	5	3	0	1	9	19
1930h-1959h	**Direction A**	2	4	0	0		
	Direction B	0	0	0	0		
	A+B	2	4	0	0	6	15

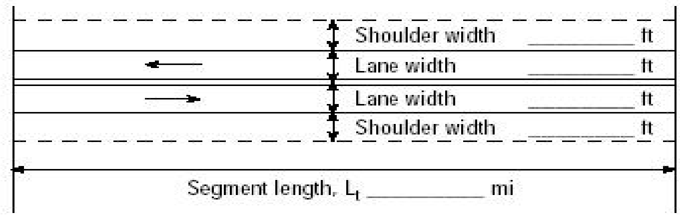
Location : West of Abadu Kondre along the Paramaribo-Moengo road							
Date: Tuesday 13th of September							
Time Period	Traffic Volumes	Cars	Light Trucks	Heavy Trucks	Other (Pedestrian, bicycle, motorcycle)	Total	Total, Hourly
0600h-0629h	Direction A	5	2	1	\		
	Direction B	6	0	0	0		
	A+B	11	2	1	#VALUE!	#VALUE!	
0630h-0659h	Direction A	3	6	5	0		
	Direction B	12	2	1	0		
	A+B	15	8	6	0	29	
0700h-0729h	Direction A	9	3	3	0		
	Direction B	4	0	1	0		
	A+B	13	3	4	0	20	49
0730h-0759h	Direction A	9	2	5	1		
	Direction B	9	2	2	1		
	A+B	18	4	7	2	31	51
0800h-0829h	Direction A	6	4	2	0		
	Direction B	15	3	0	0		
	A+B	21	7	2	0	30	61
0830h-0859h	Direction A	7	9	3	0		
	Direction B	25	1	0	0		
	A+B	32	10	3	0	45	75
0900h-0929h	Direction A	6	1	1	0		
	Direction B	12	1	0	0		
	A+B	18	2	1	0	21	66
0930h-0959h	Direction A	5	4	1	0		
	Direction B	8	4	2	0		
	A+B	13	8	3	0	24	45
1000h-1029h	Direction A	11	1	2	0		
	Direction B	14	4	0	0		
	A+B	25	5	2	0	32	56
1030h-1059h	Direction A	6	2	1	0		
	Direction B	7	4	1	0		
	A+B	13	6	2	0	21	53
1100h-1129h	Direction A	8	2	1	0		
	Direction B	8	6	2	0		
	A+B	16	8	3	0	27	48
1130h-1159h	Direction A	6	3	1	1		
	Direction B	6	0	1	0		
	A+B	12	3	2	1	18	45
1200h-1229h	Direction A	11	8	6	0		
	Direction B	4	5	2	0		
	A+B	15	13	8	0	36	54
1230h-1259h	Direction A	11	5	9	0		
	Direction B	9	5	1	0		
	A+B	20	10	10	0	40	76
1300h-1329h	Direction A	3	2	1	0		
	Direction B	7	5	1	0		
	A+B	10	7	2	0	19	59
1330h-1359h	Direction A	11	3	3	0		
	Direction B	11	7	2	0		
	A+B	22	10	5	0	37	56
1400h-1429h	Direction A	11	3	3	0	17	
	Direction B	10	7	7	0	24	
	A+B	21	10	10	0	41	78
1430h-1459h	Direction A	9	6	3	0	18	35
	Direction B	11	5	2	0	18	42
	A+B	20	11	5	0	36	77
1500h-1529h	Direction A	13	8	3	0		
	Direction B	4	5	2	0		
	A+B	17	13	5	0	35	71
1530h-1559h	Direction A	10	7	2	0		
	Direction B	11	1	2	0		
	A+B	21	8	4	0	33	68
1600h-1629h	Direction A	7	4	6	0		
	Direction B	5	5	0	0		
	A+B	12	9	6	0	27	60
1630h-1659h	Direction A	7	3	1	0		
	Direction B	14	4	2	0		
	A+B	21	7	3	0	31	58
1700h-1729h	Direction A	6	7	1	0		
	Direction B	15	5	3	0		
	A+B	21	12	4	0	37	68
1730h-1759h	Direction A	17	3	1	0		
	Direction B	7	2	4	0		
	A+B	24	5	5	0	34	71
1800h-1829h	Direction A	17	3	1	1		
	Direction B	10	4	0	0		
	A+B	27	7	1	1	36	70
1830h-1859h	Direction A	8	1	1	0		
	Direction B	11	3	0	0		
	A+B	19	4	1	0	24	60
1900h-1929h	Direction A	8	2	1	0		
	Direction B	13	4	0	0		
	A+B	21	6	1	0	28	52
1930h-1959h	Direction A	9	1	0	0		
	Direction B	3	2	1	0		
	A+B	12	3	1	0	16	44

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*Near Bosje Brug*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*9/10/2011, 1900h - 2000h*	Analysis Year	*2011*

Project Description: *Newmont Merian*

Input Data



Class I highway ☑ Class II highway Class III highway

Terrain ☑ Level Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*445*veh/h
Opposing direction vol., V_o	*503*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*1.0*
Peak-hour factor, PHF	*0.94*
No-passing zone	*0*%
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0*%
Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*	*0.996*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*475*	*537*

Free-Flow Speed from Field Measurement

Mean speed of sample[3], S_{FM}	
Total demand flow rate, both directions, *v*	
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$	
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*

Estimated Free-Flow Speed

Base free-flow speed[4], BFFS	*55.0 mi/h*
Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.4 mi/h*
Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*41.8 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*473*	*535*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*49.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*56.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.33*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1693*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*473.4*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.27*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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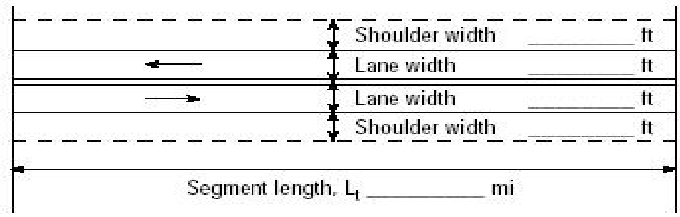
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*Near Bosje Brug*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2013 weekend 1900h - 2000h*	Analysis Year	*2013 Construction Peak*

Project Description: *Newmont Merian*

Input Data



Analysis direction vol., V_d *453*veh/h

Opposing direction vol., V_o *513*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *1.0*

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.94*

No-passing zone *0%*

% Trucks and Buses , P_T *2* %

% Recreational vehicles, P_R *0%*

Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.996*	*0.996*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*484*	*548*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*50.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*41.6 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*482*	*546*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*50.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*57.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.34*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1693*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*481.9*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.28*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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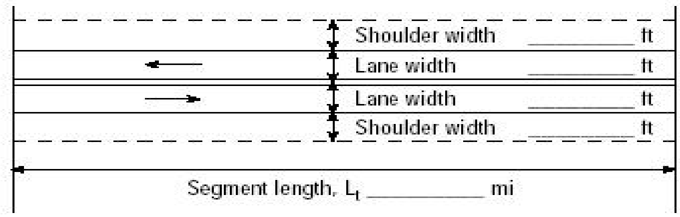
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*Near Bosje Brug*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2026 weekend 1900h - 2000h*	Analysis Year	*2026 Operations Peak*

Project Description: *Newmont Merian*

Input Data



Analysis direction vol., V_d	*522*veh/h
Opposing direction vol., V_o	*590*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*1.0*

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.94*
No-passing zone	*0%*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.998*	*0.998*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*556*	*629*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.4 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*40.6 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*555*	*628*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*56.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.4*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*62.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.39*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1697*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*555.3*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.35*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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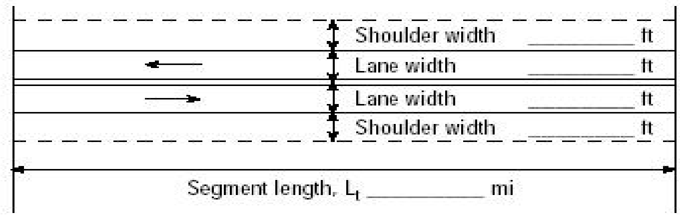
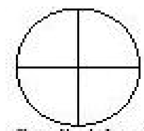
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*Near Bosje Brug*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*9/13/2011, 1730h - 1830h*	Analysis Year	*2011*

Project Description: *Newmont Merian*

Input Data





Analysis direction vol., V_d	*509* veh/h	Class I highway ☐ Class II highway ☑ Class III highway ☐	
Opposing direction vol., V_o	*399* veh/h	Terrain	Level ☑ Rolling ☐
Shoulder width ft	*2.0*	Grade Length mi	Up/down
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.89*
Segment Length mi	*1.0*	No-passing zone	*0*%
		% Trucks and Buses , P_T	*5* %
		% Recreational vehicles, P_R	*0*%
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.995*	*0.985*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*575*	*455*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*41.4 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*572*	*448*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*55.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.6*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*63.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.34*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*571.9*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.12*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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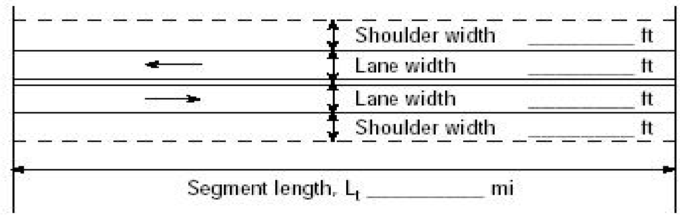
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*Near Bosje Brug*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2013 weekday 1700h - 1800h*	Analysis Year	*2013 Construction Peak*

Project Description: *Newmont Merian*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*537*veh/h
Opposing direction vol., V_o	*399*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*1.0*
Peak-hour factor, PHF	*0.87*
No-passing zone	*0%*
% Trucks and Buses , P_T	*6* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/\ (1+ P_T\ (E_T -1)+P_R\ (E_R -1)\ )$	*0.994*	*0.988*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*621*	*464*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*41.0 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/\ (1+ P_T(E_T-1)+P_R(E_R-1)\ )$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*617*	*459*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*57.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*64.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*617.2*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.44*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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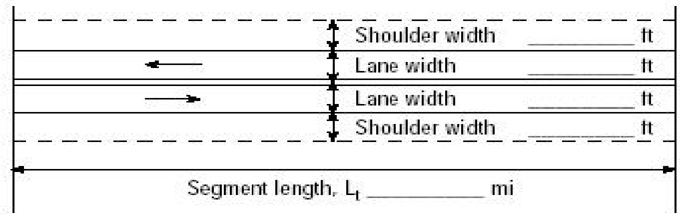
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*Near Bosje Brug*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2026 weekday 1630h - 1730h*	Analysis Year	*2026 Operations Peak*

Project Description: *Newmont Merian*

Input Data



Analysis direction vol., V_d	*634*veh/h	Class I highway ☐ Class II highway ☑ Class III highway ☐	
Opposing direction vol., V_o	*467*veh/h	Terrain ☑ Level ☐ Rolling	
Shoulder width ft	*2.0*	Grade Length mi Up/down	
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.87*
Segment Length mi	*1.0*	No-passing zone	*20%*
		% Trucks and Buses , P_T	*6* %
		% Recreational vehicles, P_R	*0%*
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.994*	*0.988*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*733*	*543*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.4 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*39.7 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*729*	*537*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*64.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*21.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*77.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.43*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*78.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*728.7*
Effective width, Wv (Eq. 15-29) ft	*14.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.53*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Ben Sussman*
Agency/Co.	*ERM*
Date Performed	*4/9/2012*
Analysis Time Period	*9/10/2011, 1900h - 2000h*

Site Information

Intersection	*Tamanredjo*
Jurisdiction	*Suriname*
Analysis Year	*2011*

Project Description *Newmont Merian (note, UK-style road, directions reversed)*

East/West Street: *Paramaribo-Moengo Road* North/South Street: *Alkmaar Road*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*25*	*64*	*47*	*43*	*93*	*14*
Peak-Hour Factor, PHF	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*
Hourly Flow Rate, HFR (veh/h)	*25*	*64*	*47*	*43*	*93*	*14*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*37*	*26*	*23*	*53*	*23*	*28*
Peak-Hour Factor, PHF	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*
Hourly Flow Rate, HFR (veh/h)	*37*	*26*	*23*	*53*	*23*	*28*
Percent Heavy Vehicles	*0*	*8*	*4*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*25*	*43*		*86*			*104*	
C (m) (veh/h)	*1440*	*1469*		*589*			*578*	
v/c	*0.02*	*0.03*		*0.15*			*0.18*	
95% queue length	*0.05*	*0.09*		*0.51*			*0.65*	
Control Delay (s/veh)	*7.5*	*7.5*		*12.2*			*12.6*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay (s/veh)	--	--	*12.2*			*12.6*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Ben Sussman*
Agency/Co.	*ERM*
Date Performed	*4/9/2012*
Analysis Time Period	*2013 weekend 1900h - 2000h*

Site Information

Intersection	*Tamanredjo*
Jurisdiction	*Suriname*
Analysis Year	*2013 Construction Peak*

Project Description *Newmont Merian (note, UK-style road, directions reversed)*

East/West Street: *Paramaribo-Moengo Road* | North/South Street: *Alkmaar Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*25*	*66*	*47*	*43*	*95*	*14*
Peak-Hour Factor, PHF	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*
Hourly Flow Rate, HFR (veh/h)	*25*	*66*	*47*	*43*	*95*	*14*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*37*	*26*	*23*	*54*	*23*	*28*
Peak-Hour Factor, PHF	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*
Hourly Flow Rate, HFR (veh/h)	*37*	*26*	*23*	*54*	*23*	*28*
Percent Heavy Vehicles	*0*	*8*	*4*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*25*	*43*		*86*			*105*	
C (m) (veh/h)	*1438*	*1466*		*587*			*573*	
v/c	*0.02*	*0.03*		*0.15*			*0.18*	
95% queue length	*0.05*	*0.09*		*0.51*			*0.67*	
Control Delay (s/veh)	*7.5*	*7.5*		*12.2*			*12.7*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay (s/veh)	--	--		*12.2*			*12.7*	
Approach LOS	--	--		*B*			*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Ben Sussman*
Agency/Co.	*ERM*
Date Performed	*4/9/2012*
Analysis Time Period	*2026 weekend 1900h - 2000h*

Site Information

Intersection	*Tamanredjo*
Jurisdiction	*Suriname*
Analysis Year	*2026 Operations Peak*

Project Description *Newmont Merian (note, UK-style road, directions reversed)*

East/West Street: *Paramaribo-Moengo Road* — North/South Street: *Alkmaar Road*

Intersection Orientation: *East-West* — Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	31	76	56	51	113	16
Peak-Hour Factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Hourly Flow Rate, HFR (veh/h)	31	76	56	51	114	16
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	44	30	28	63	27	33
Peak-Hour Factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Hourly Flow Rate, HFR (veh/h)	44	30	28	63	27	33
Percent Heavy Vehicles	0	7	4	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	31	51		102			123	
C (m) (veh/h)	1403	1443		530			511	
v/c	0.02	0.04		0.19			0.24	
95% queue length	0.07	0.11		0.71			0.93	
Control Delay (s/veh)	7.6	7.6		13.4			14.3	
LOS	A	A		B			B	
Approach Delay (s/veh)	--	--	13.4			14.3		
Approach LOS	--	--	B			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Ben Sussman*	Intersection	*Tamanredjo*
Agency/Co.	*ERM*	Jurisdiction	*Suriname*
Date Performed	*4/9/2012*	Analysis Year	*2011*
Analysis Time Period	*9/13/2011, 0700h - 0800h*		

Project Description *Newmont Merian (note, UK-style road, directions reversed)*

East/West Street: *Paramaribo-Moengo Road* | North/South Street: *Alkmaar Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*12*	*66*	*15*	*12*	*93*	*11*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*13*	*73*	*16*	*13*	*103*	*12*
Percent Heavy Vehicles	*3*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*22*	*13*	*26*	*61*	*23*	*42*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*24*	*14*	*28*	*67*	*25*	*46*
Percent Heavy Vehicles	*0*	*0*	*4*	*5*	*0*	*5*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*13*	*13*		*66*			*138*	
C (m) (veh/h)	*1424*	*1479*		*681*			*662*	
v/c	*0.01*	*0.01*		*0.10*			*0.21*	
95% queue length	*0.03*	*0.03*		*0.32*			*0.78*	
Control Delay (s/veh)	*7.6*	*7.5*		*10.9*			*11.9*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay (s/veh)	--	--	*10.9*			*11.9*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Ben Sussman*
Agency/Co.	*ERM*
Date Performed	*4/9/2012*
Analysis Time Period	*2013 weekday 0700h - 0800h*

Site Information

Intersection	*Tamanredjo*
Jurisdiction	*Suriname*
Analysis Year	*2013 Construction Peak*

Project Description *Newmont Merian (note, UK-style road, directions reversed)*

East/West Street: *Paramaribo-Moengo Road* | North/South Street: *Alkmaar Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*12*	*67*	*15*	*12*	*95*	*11*
Peak-Hour Factor, PHF	*0.91*	*0.91*	*0.91*	*0.91*	*0.91*	*0.91*
Hourly Flow Rate, HFR (veh/h)	*13*	*73*	*16*	*13*	*104*	*12*
Percent Heavy Vehicles	*25*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*22*	*13*	*26*	*62*	*23*	*42*
Peak-Hour Factor, PHF	*0.91*	*0.91*	*0.91*	*0.91*	*0.91*	*0.91*
Hourly Flow Rate, HFR (veh/h)	*24*	*14*	*28*	*68*	*25*	*46*
Percent Heavy Vehicles	*0*	*0*	*4*	*5*	*0*	*5*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*13*	*13*		*66*			*139*	
C (m) (veh/h)	*1300*	*1479*		*680*			*660*	
v/c	*0.01*	*0.01*		*0.10*			*0.21*	
95% queue length	*0.03*	*0.03*		*0.32*			*0.79*	
Control Delay (s/veh)	*7.8*	*7.5*		*10.9*			*11.9*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay (s/veh)	--	--		*10.9*			*11.9*	
Approach LOS	--	--		*B*			*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Ben Sussman*
Agency/Co.	*ERM*
Date Performed	*4/9/2012*
Analysis Time Period	*2026 weekday 0700h - 0800h*

Site Information

Intersection	*Tamanredjo*
Jurisdiction	*Suriname*
Analysis Year	*2026 Operations Peak*

Project Description *Newmont Merian (note, UK-style road, directions reversed)*

East/West Street: *Paramaribo-Moengo Road* | North/South Street: *Alkmaar Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*13*	*86*	*18*	*14*	*112*	*12*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*14*	*96*	*20*	*15*	*125*	*13*
Percent Heavy Vehicles	*23*	--	--	*17*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*27*	*15*	*30*	*73*	*27*	*50*
Peak-Hour Factor, PHF	*0.89*	*0.89*	*0.89*	*0.90*	*0.89*	*0.89*
Hourly Flow Rate, HFR (veh/h)	*30*	*16*	*33*	*81*	*30*	*56*
Percent Heavy Vehicles	*0*	*0*	*3*	*4*	*0*	*4*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*14*	*15*		*79*			*167*	
C (m) (veh/h)	*1266*	*1340*		*607*			*588*	
v/c	*0.01*	*0.01*		*0.13*			*0.28*	
95% queue length	*0.03*	*0.03*		*0.45*			*1.16*	
Control Delay (s/veh)	*7.9*	*7.7*		*11.8*			*13.5*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay (s/veh)	--	--	*11.8*			*13.5*		
Approach LOS	--	--	*B*			*B*		

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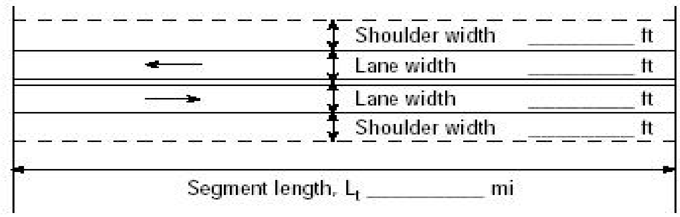
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*West of Abadu Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*9/10/2011, 1600h-1700h*	Analysis Year	*2011*

Project Description: *Newmont Merian*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*74*veh/h
Opposing direction vol., V_o	*54*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.0*
Peak-hour factor, PHF	*0.94*
No-passing zone	*0*%
% Trucks and Buses , P_T	*10* %
% Recreational vehicles, P_R	*0*%
Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.855*	*0.855*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*137*	*100*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*50.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.3 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.917*	*0.917*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*118*	*86*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*13.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*10.7*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*19.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.10*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1139*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*78.7*
Effective width, Wv (Eq. 15-29) ft	*22.82*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.12*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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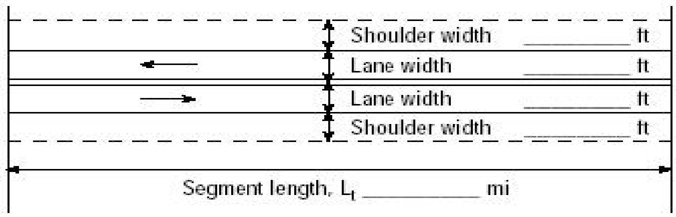
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*West of Abadu Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2013 weekend 1600h-1700h*	Analysis Year	*2013 Construction Peak*

Project Description: *Newmont Merian*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Analysis direction vol., V_d	*76*veh/h
Opposing direction vol., V_o	*70*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*20.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.86*
No-passing zone	*0%*
% Trucks and Buses , P_T	*20* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/ (1+ P_T (E_T -1)+P_R (E_R -1))$	*0.746*	*0.746*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*177*	*163*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/ f_{HV,ATS})$		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS} + v_{o,ATS}) - f_{np,ATS}$	*46.9 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.847*	*0.847*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}* f_{g,PTSF})$	*143*	*132*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*16.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*11.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} *(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*22.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.13*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1099*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*93.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*88.4*
Effective width, Wv (Eq. 15-29) ft	*22.68*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*8.89*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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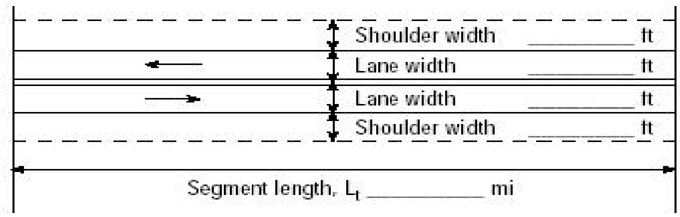
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*West of Abadu Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2026 weekend 1600h-1700h*	Analysis Year	*2026 Operations Peak*

Project Description: *Newmont Merian*

Input Data



Analysis direction vol., V_d	*88*veh/h	Class I highway ☐ Class II highway ☑ Class III highway ☐	
Opposing direction vol., V_o	*86*veh/h	Terrain	Level ☐ Rolling ☑
Shoulder width ft	*2.0*	Grade Length mi	Up/down
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.86*
Segment Length mi	*0.0*	No-passing zone	*0%*
		% Trucks and Buses , P_T	*20* %
		% Recreational vehicles, P_R	*0%*
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.746*	*0.746*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*205*	*200*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*45.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*40.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*36.4 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.8*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.862*	*0.847*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*163*	*162*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*18.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*24.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.14*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1128*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*102.3*
Effective width, Wv (Eq. 15-29) ft	*21.84*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*9.16*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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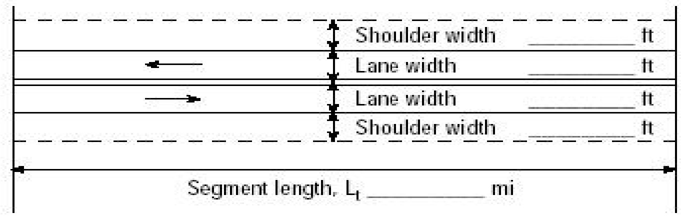
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*West of Abadu Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*9/10/2011, 1400h-1500h*	Analysis Year	*2011*

Project Description: *Newmont Merian*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*35*veh/h
Opposing direction vol., V_o	*42*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.0*
Peak-hour factor, PHF	*0.94*
No-passing zone	*0%*
% Trucks and Buses , P_T	*20* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.746*	*0.746*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*74*	*89*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*50.4 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.9 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.847*	*0.847*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*60*	*72*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*7.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*9.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*11.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.07*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*850*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1052*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*37.2*
Effective width, Wv (Eq. 15-29) ft	*25.55*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*8.47*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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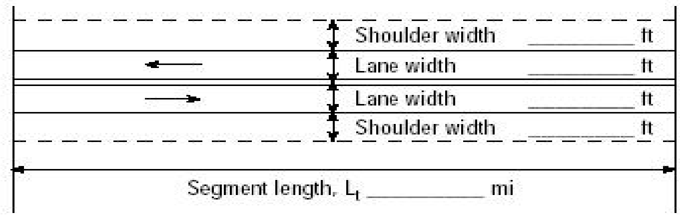
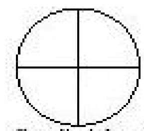
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*West of Abadu Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2013 weekday 1630h - 1730h*	Analysis Year	*2013 Construction Peak*

Project Description: *Newmont Merian*

Input Data





Class I highway ☐ Class II highway ☑ Class III highway ☐

Terrain Level ☐ Rolling ☑

Analysis direction vol., V_d	*25*veh/h
Opposing direction vol., V_o	*59*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.89*
No-passing zone	*0*%
% Trucks and Buses , P_T	*27* %
% Recreational vehicles, P_R	*0*%
Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.685*	*0.685*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i / (PHF^* f_{g,ATS} * f_{HV,ATS})$	*61*	*144*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/ f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.4 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS} + v_{o,ATS}) - f_{np,ATS}$	*48.1 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.805*	*0.805*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*48*	*113*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*5.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*9.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} *(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*8.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.11*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*807*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1035*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*28.1*
Effective width, Wv (Eq. 15-29) ft	*26.25*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*11.85*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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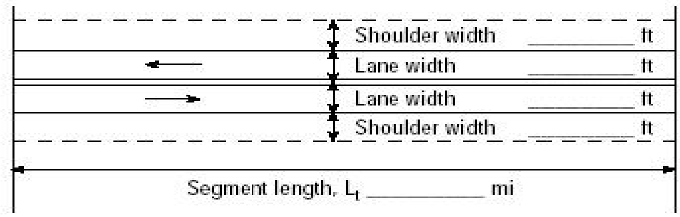
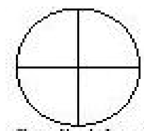
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Paramaribo-Moengo Road*
Agency or Company	*ERM*	From/To	*West of Abadu Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2026 weekday 1630h - 1730h*	Analysis Year	*2026 Operations Peak*

Project Description: *Newmont Merian*

Input Data





Analysis direction vol., V_d	*29*veh/h	Class I highway; ☑ Class II highway; Class III highway	
Opposing direction vol., V_o	*74*veh/h	Terrain	☑ Level; Rolling
Shoulder width ft	*2.0*	Grade Length mi	Up/down
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.90*
Segment Length mi	*0.0*	No-passing zone	*0*%
		% Trucks and Buses, P_T	*27* %
		% Recreational vehicles, P_R	*0*%
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.805*	*0.805*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*40*	*102*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*45.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*40.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.1 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*39.2 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.974*	*0.974*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*33*	*84*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*4.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*9.7*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*6.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.05*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1369*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1655*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*32.2*
Effective width, Wv (Eq. 15-29) ft	*25.97*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*13.08*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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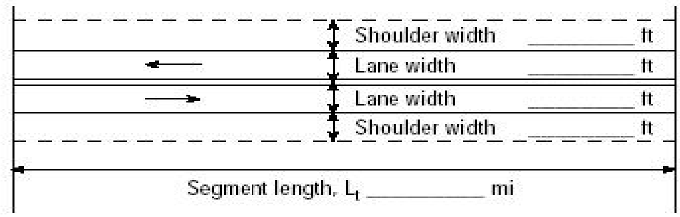
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Langatabiki Road*
Agency or Company	*ERM*	From/To	*South of Mora Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*9/10/2011, 1330h-1430h*	Analysis Year	*2011*

Project Description: *Newmont Merian*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Analysis direction vol., V_d	*20*veh/h
Opposing direction vol., V_o	*10*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.94*
No-passing zone	*0%*
% Trucks and Buses , P_T	*30* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*4*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.662*	*0.662*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*48*	*24*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*1.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*51.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.3 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.6 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.787*	*0.787*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*37*	*19*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*4.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*10.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*11.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.04*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*977*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*98.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*21.3*
Effective width, Wv (Eq. 15-29) ft	*26.60*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*15.06*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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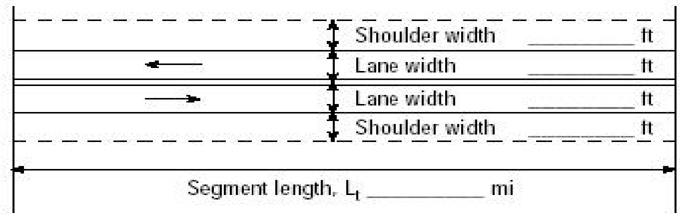
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Langatabiki Road*
Agency or Company	*ERM*	From/To	*South of Mora Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2013 weekend 1500h - 1600h*	Analysis Year	*2013 Construction Peak*

Project Description: *Newmont Merian*

Input Data



Class I highway ☐ Class II highway ☑ Class III highway ☐

Terrain Level ☐ Rolling ☑

Analysis direction vol., V_d	*26*veh/h
Opposing direction vol., V_o	*10*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.86*
No-passing zone	*0%*
% Trucks and Buses , P_T	*64* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*4*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.479*	*0.479*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*94*	*36*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*1.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.3 mi/h*	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*51.4 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.1 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.635*	*0.635*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*65*	*25*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*7.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*9.7*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*14.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.08*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*787*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*30.2*
Effective width, Wv (Eq. 15-29) ft	*26.18*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*55.10*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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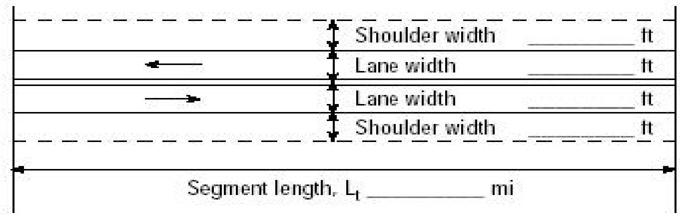
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Langatabiki Road*
Agency or Company	*ERM*	From/To	*South of Mora Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2026 weekend 1500h - 1600h*	Analysis Year	*2026 Operations Peak*

Project Description: *Newmont Merian*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Analysis direction vol., V_d	*31*veh/h
Opposing direction vol., V_o	*12*veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.90*
No-passing zone	*0%*
% Trucks and Buses , P_T	*66* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*4*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.471*	*0.471*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*109*	*42*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*1.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.4 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.9 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.627*	*0.627*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*75*	*29*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*8.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*9.7*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*15.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.10*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*779*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*34.4*
Effective width, Wv (Eq. 15-29) ft	*25.83*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*58.40*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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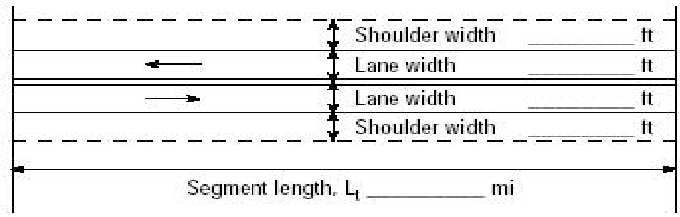
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Langatabiki Road*
Agency or Company	*ERM*	From/To	*South of Mora Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*9/13/2011, 1400h-1500h*	Analysis Year	*2011*

Project Description: *Newmont Merian*

Input Data



Analysis direction vol., V_d *18*veh/h

Opposing direction vol., V_o *13*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *0.0*

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.83*

No-passing zone *0%*

% Trucks and Buses , P_T *50* %

% Recreational vehicles, P_R *0%*

Access points *mi* *4*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.541*	*0.541*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*60*	*43*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*1.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*51.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.3 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.3 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.690*	*0.690*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*43*	*31*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*5.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*10.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*11.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.05*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*856*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*21.7*
Effective width, Wv (Eq. 15-29) ft	*26.74*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*35.54*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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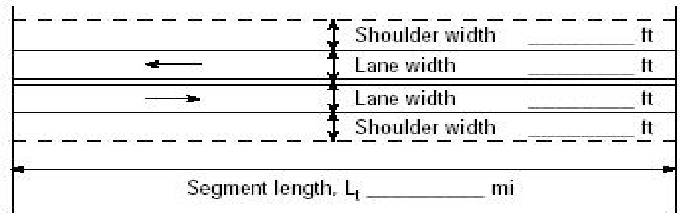
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Langatabiki Road*
Agency or Company	*ERM*	From/To	*South of Mora Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2013 weekday 0700h - 0800h*	Analysis Year	*2013 Construction Peak*

Project Description: *Newmont Merian*

Input Data



Analysis direction vol., V_d 8veh/h

Opposing direction vol., V_o 33veh/h

Shoulder width ft 2.0

Lane Width ft 12.0

Segment Length mi 0.0

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.76*

No-passing zone *0%*

% Trucks and Buses , P_T *76* %

% Recreational vehicles, P_R *0%*

Access points *mi* *4*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.436*	*0.436*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*36*	*149*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*1.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.4 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.2 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.594*	*0.594*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*24*	*100*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*3.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*8.7*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*4.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.14*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*497*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*737*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*10.5*
Effective width, Wv (Eq. 15-29) ft	*27.44*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*73.98*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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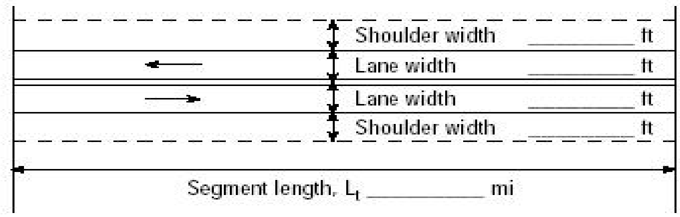
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*Ben Sussman*	Highway / Direction of Travel	*Langatabiki Road*
Agency or Company	*ERM*	From/To	*South of Mora Kondre*
Date Performed	*4/9/2012*	Jurisdiction	*Suriname*
Analysis Time Period	*2026 weekday 0700h - 0800h*	Analysis Year	*2026 Operations Peak*

Project Description: *Newmont Merian*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*11* veh/h
Opposing direction vol., V_o	*38* veh/h
Shoulder width ft	*2.0*
Lane Width ft	*12.0*
Segment Length mi	*0.0*
Peak-hour factor, PHF	*0.79*
No-passing zone	*0%*
% Trucks and Buses , P_T	*73* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*4*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.446*	*0.446*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*47*	*161*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*1.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.4 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.9 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.604*	*0.604*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*32*	*109*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*4.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*9.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*6.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.14*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*516*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*794*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*13.9*
Effective width, Wv (Eq. 15-29) ft	*27.23*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*68.95*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Appendix 14 - A

National and Regional Social Summary

1.0 GOVERNANCE AND ADMINISTRATION

The government system of Suriname is a presidential model based on the election of President and Vice-President by the National Assembly. The President (at time of writing Desire Bourtese) is elected by a required two thirds majority from the National Assembly, while the Vice President needs a simple majority in the National Assembly. Where a majority is not reached to elect a President a People's Assembly is formed from the National Assembly delegates and regional and municipal representatives (District/ Resort Councils). A People's Assembly requires a simple majority agreement to select a President [(1)].

The President is advised by a 15 member State Advisory Council, eleven of which are allotted by proportional representation of National Assembly political parties, with the remaining seats allotted to representatives of labor organizations (two) and employers' organizations (two) [(2)] .

Suriname is divided into 10 Districts administered by District Commissioners, appointed by the President. Districts are divided into Resorts administered by a Resort Council, elected by the Resort population.

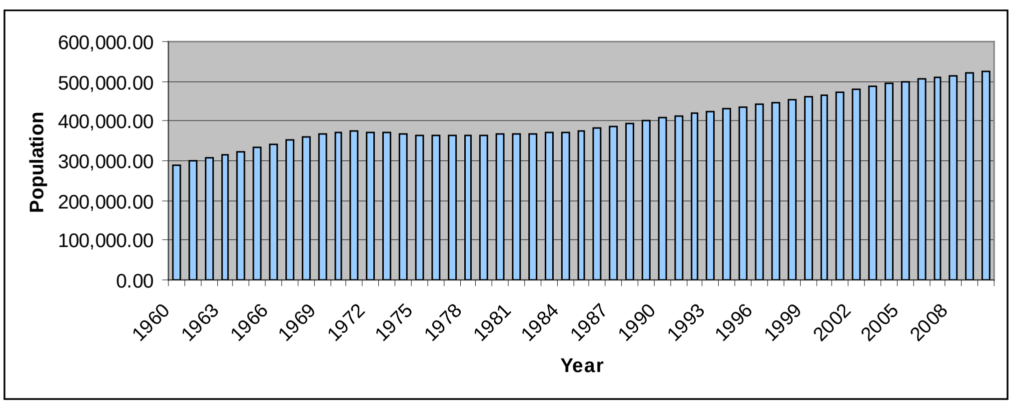
(1) US Department of State, 2011
(2) Ibid.

2.0 DEMOGRAPHY

Historical population trends in Suriname show a period of decrease or very small increase (less than 0.5%) in population between 1971 and 1983, potentially associated with unrest and civil strife in the period previous to and during independence and the Interior War. More recently the most recent five year average for the rate of population increase is reported as approximately 0.99%; meaning an estimate of 2011 and 2012 populations as 529,805 and 534,880 respectively [(1)] .

According to the 2004 Census the age distribution of the population reflects a comparatively young population with 29.7% 0-14 years of age, 60.8% for ages 15-59 and 8.6% for ages 60 and older.

In 2004 the ABS reports the total population for Suriname to be 492,829; according to World Bank World Development Indicators databank estimates this has increased to 524,636 by 2010 (the last date for which data was available). *Figure 2.1* demonstrates population growth from 1960 until 2010 based on World Bank statistics.



Source: World Bank World Development Indicators databank

Figure 2-1 Population of Suriname

Suriname has a crude birth rate (per 1,000 people) of 18.7 in 2009 and a crude death rate (per 1,000 people) of 7.22 representing a potential increase in population of 1.14%. This is higher than the actual reported increase in population in 2010 (0.91%) representing an estimated and calculated outmigration of population of approximately 0.23%, or 1,216 people[2].

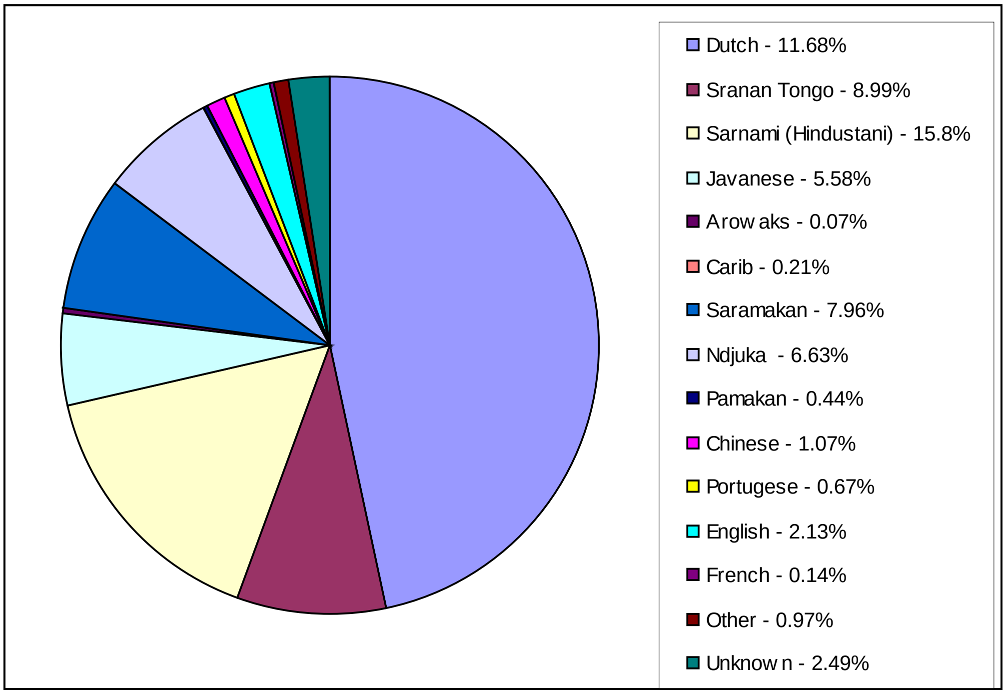
(1) World Bank World Development Indicators databank
(2) Estimated and calculated numbers based on statistics from World Bank World Development Indicators databank

Suriname covers a total area of approximately 163,820 km^2 with a population density of approximately 3.0. This makes Suriname one of the least densely populated countries in the world, approximately equivocal to Iceland (3.2), Australia (2.9) and Mauritania (3.4). This absence of population density can be explained by the comparatively uninhabited and densely forested areas of the Interior, which tend to be populated by Maroon and Amerindian groups only.

Reliable data is not available within the census regarding the distribution of ethnic groups nationally. However based on anecdotal evidence the predominant groups listed in approximate size order include:

- Hindustanis; descendants of migrant/ indentured laborers from northern India (at the time under British colonial rule), typically in the late nineteen century;
- Creoles; descendants of emancipated slaves of mixed racial descent, sometimes referred to locally as ‘city negroes’;
- Javanese; descendants of south-east Asian workers who typically moved to the country during Dutch or English colonial rule;
- Maroons; descendants of escaped slaves who fled from plantations into the jungle interior , sometimes referred to locally as ‘bush negroes’;
- Chinese; immigrants to Suriname from throughout China; and
- Amerindians; the indigenous population of the country including Carib and Arawak.

The ethnic diversity of Suriname is reflected in the distribution of the main languages spoken in the household illustrated in *Figure 2.2*.



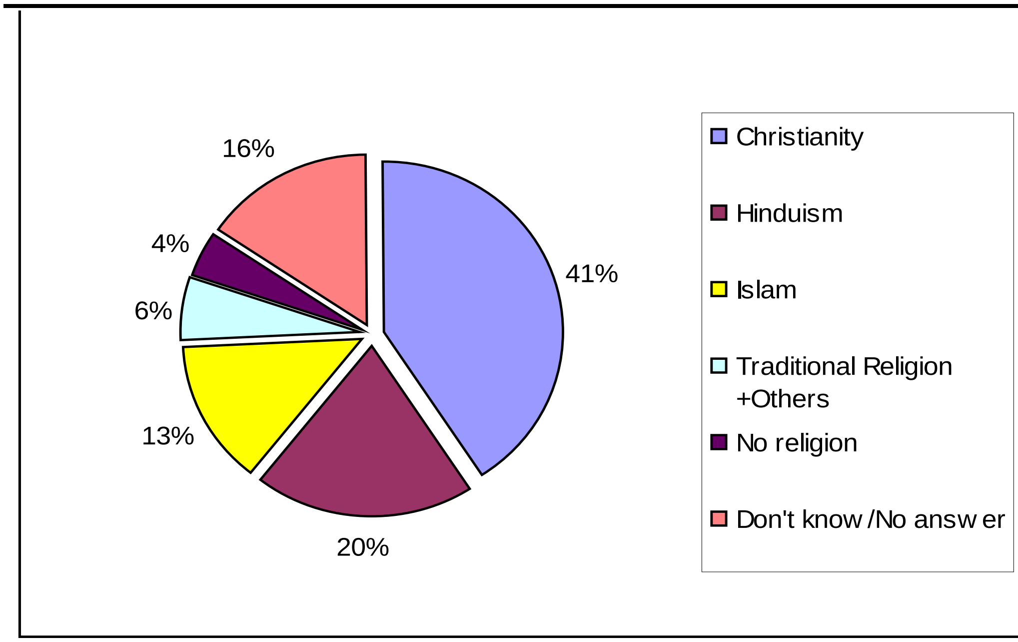
Source: General Bureau of Statistics, General Population and Housing Census in Suriname. October 2006

Figure 2-2 Predominant Language Spoken in the Household

The predominant languages, besides Dutch which is the official national languages, and the *lingua franca* Sranan Tongo(1) (literally Surinamer Tongue), are Hindustani and Javanese and a series of Maroon languages including, Saramaka, Ndjuka and Pamaka. This reflects the most common ethnic groups within the country. The prevalence of Portuguese, French and English as common languages may be explained by the borders shared with Brazil, French and British Guiana. Portuguese migrants are typically associated with the Artisanal and Small-Scale Mining (ASM) industry throughout the Interior of the country, however anecdotal evidence discusses ASM-migrant Brazilians bringing their families to Suriname, diversifying livelihoods and establishing viable Brazilian communities throughout the country. Viable Brazilian neighbourhoods exist within Paramaribo where Portuguese is the most common language.

Figure 2.3 demonstrates the distribution of religious groups nationally. The largest religious group was reported to be Christianity followed by Hinduism and Islam. As with common language this reflects the common ethnic groups within the country. Maroons and Creoles tend to share Christian and traditional beliefs, while Hindustani and Javanese groups tend to have Hindu and Islamic beliefs.

(1) Sranan Tongo originated as the pidgin spoken by African slaves of different ethnic groups to each other and to slave-masters. Primarily based on English, Dutch, Portuguese and Central and West African languages it is widely spoken to some degree by a large proportion of the population.



Source: General Bureau of Statistics, General Population and Housing Census in Suriname. October 2006

Figure 2-3 Distribution of Religious Beliefs in Suriname

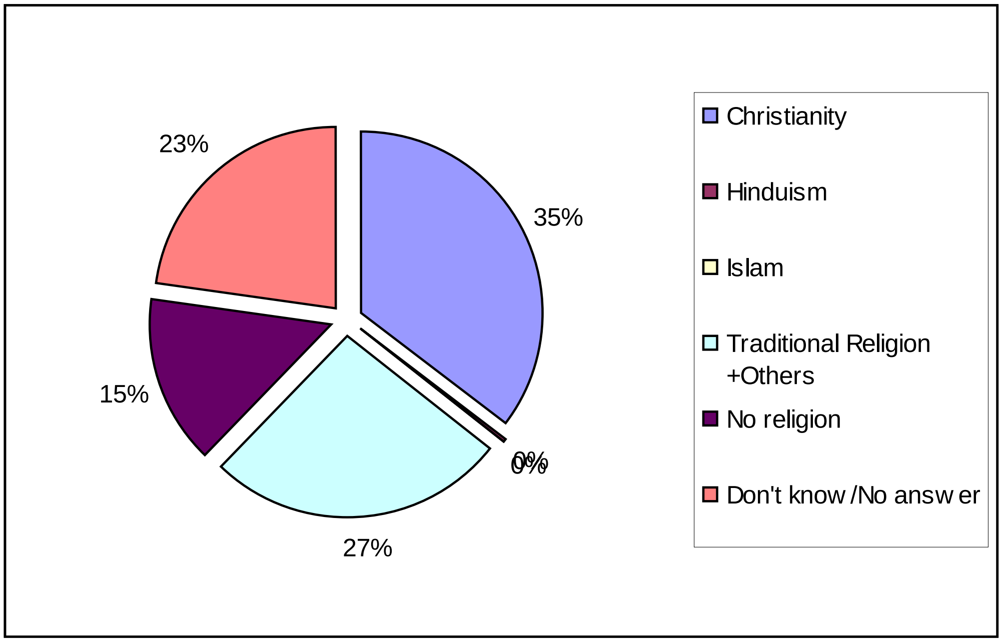
Demography in the Sipaliwini District

The Sipaliwini District covers an area of 130,567 km^2, approximately 80% of the total area of Suriname. According to the National Census (2004-2005) the Sipaliwini District population numbered approximately 34,136, approximately 7% of the total national population[1]. According to these statistics the Sipaliwini District is home to approximately 0.26 people per km^2 reflecting the least densely populated area in the country.

The Sipaliwini District is predominantly Maroon (57%), followed by Amerindian (12%) and others (31%) such as, Creole, Hindustani, Javanese and Chinese[2]. This change from the national average is mirrored in the religious data as illustrated in *Figure 2.4*.

1 General Bureau of Statistics, District Results. Volume V. Marowijne, Brokopondo and Sipaliwini. Seventh General Population and Housing Census in Suriname. October 2006.

2 Ibid.



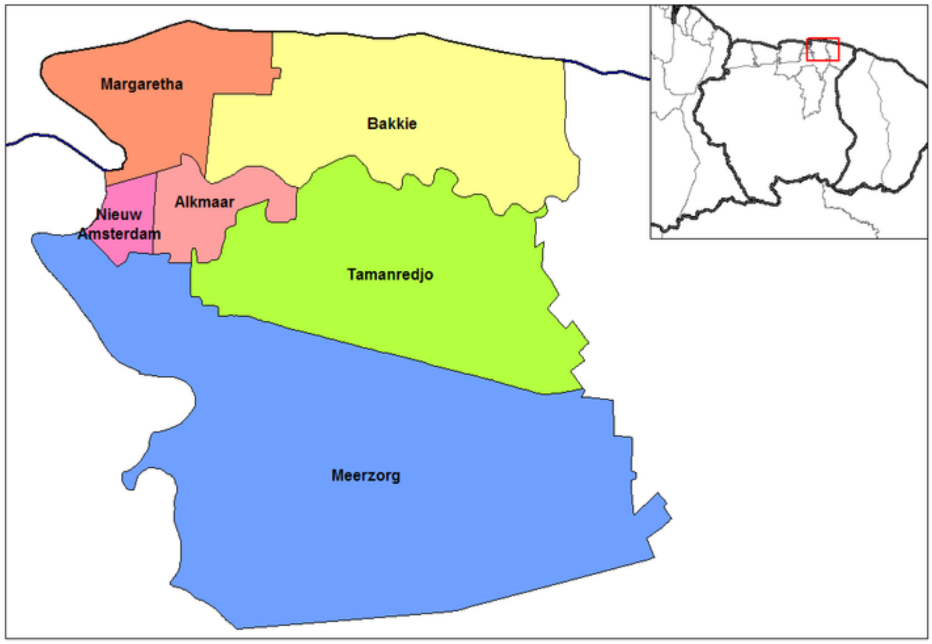
Source: General Bureau of Statistics, General Population and Housing Census in Suriname. October 2006

Figure 2-4 Distribution of Religious Beliefs in Sipaliwini District

The large drop in Hinduism and Islam (19.9% and 13.5% dropping to 0.4% and 0.1%) may reflect the change in the ethnic distribution within the Interior. Interestingly the percentage of respondents who classified themselves as Christian also dropped (from 40.7% to 35.2%) with increases in traditional beliefs, unreligious people and non-respondents making up the difference. This change reflects the absence of formal religions' penetration into much of the Interior, where Christian missionaries are the only religious groups who have historically evangelized within Sipaliwini.

DEMOGRAPHY ALONG THE TRANSPORTATION CORRIDOR

The transportation corridor falls within the Districts of Marowijne and Commewijne including the resorts of Moengo (Marowijne), Tamaredjo, Alkmaar and Nieuw Amsterdam (Commewijne). *Figure 2.5* shows the distribution of Resorts within the Commewijne District and *Figure 2.6* shows the divisions of Resorts within Marowijne District.

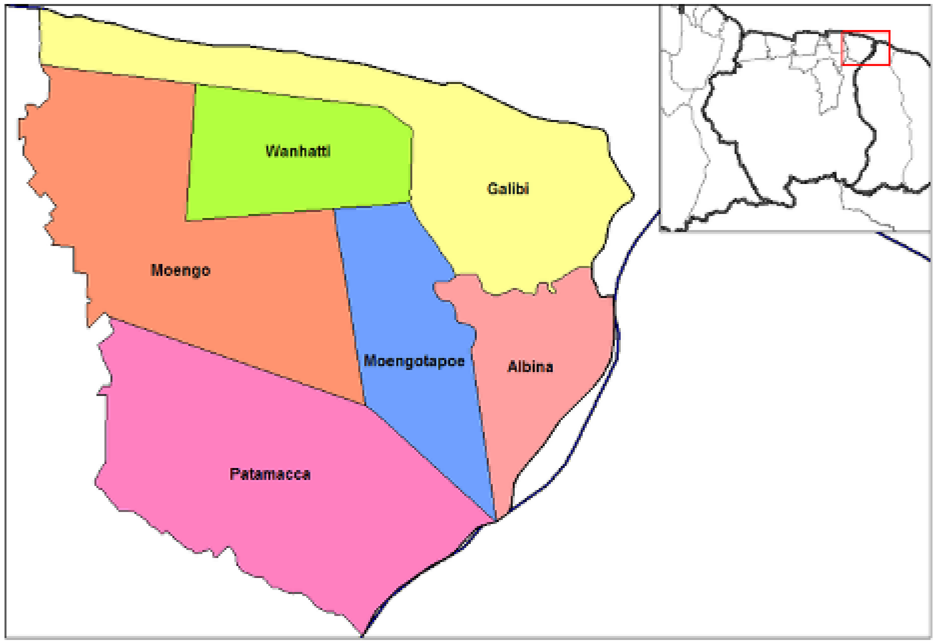


Source: Wikipedia, Commewijne Resorts http://en.wikipedia.org/wiki/File:Commewijne_resorts.png

Figure 2-5 The Resorts within the Commewijne District

DEMOGRAPHY IN THE MOENGO AREA

The town of Moengo is part of the Marowijne District and a resort within the Marowijne District. The resort directly south of Moengo is Patamaka. *Figure 2.6* shows the divisions of Resorts within Marowijne District.

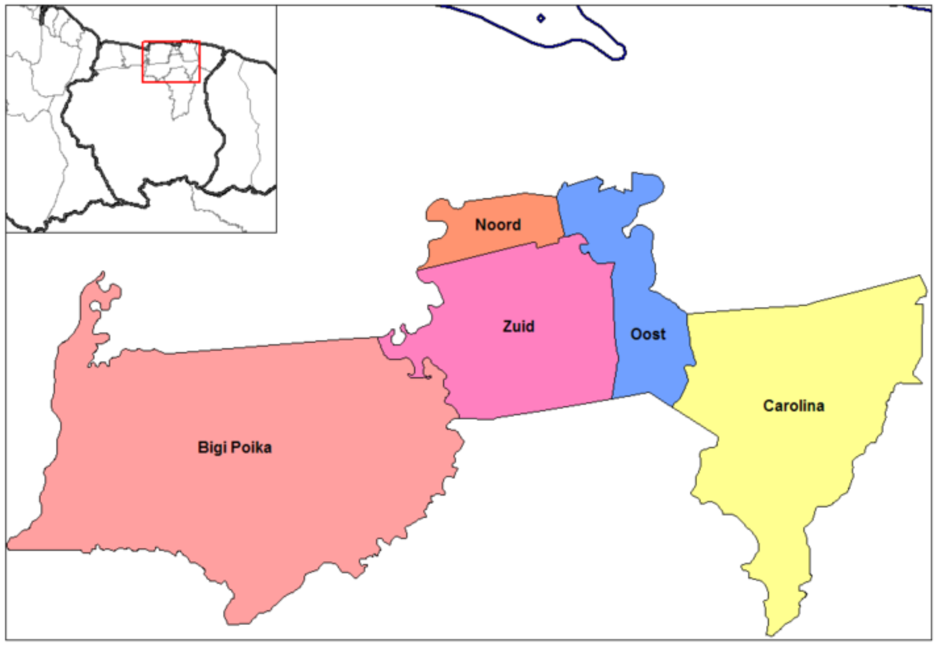


Source: Wikipedia, Marowijne Resorts http://en.wikipedia.org/wiki/File:Marowijne_resorts.png

Figure 2-6 The Resorts within Marowijne District

DEMOGRAPHY IN THE COMMEWIJNE AND TEMPATI AREA

The Commewijne and Tempati area is divided across several resorts as the channel flows north including the Patamaka Resort of Sipaliwini District, the Carolina Resort of Para District and the Meerzord Resort of the Commewijne Districts. *Figure 2.5* shows the distribution of resorts in the Commewijne District and *Figure 2.7* shows the distribution of Resorts in the Para District.



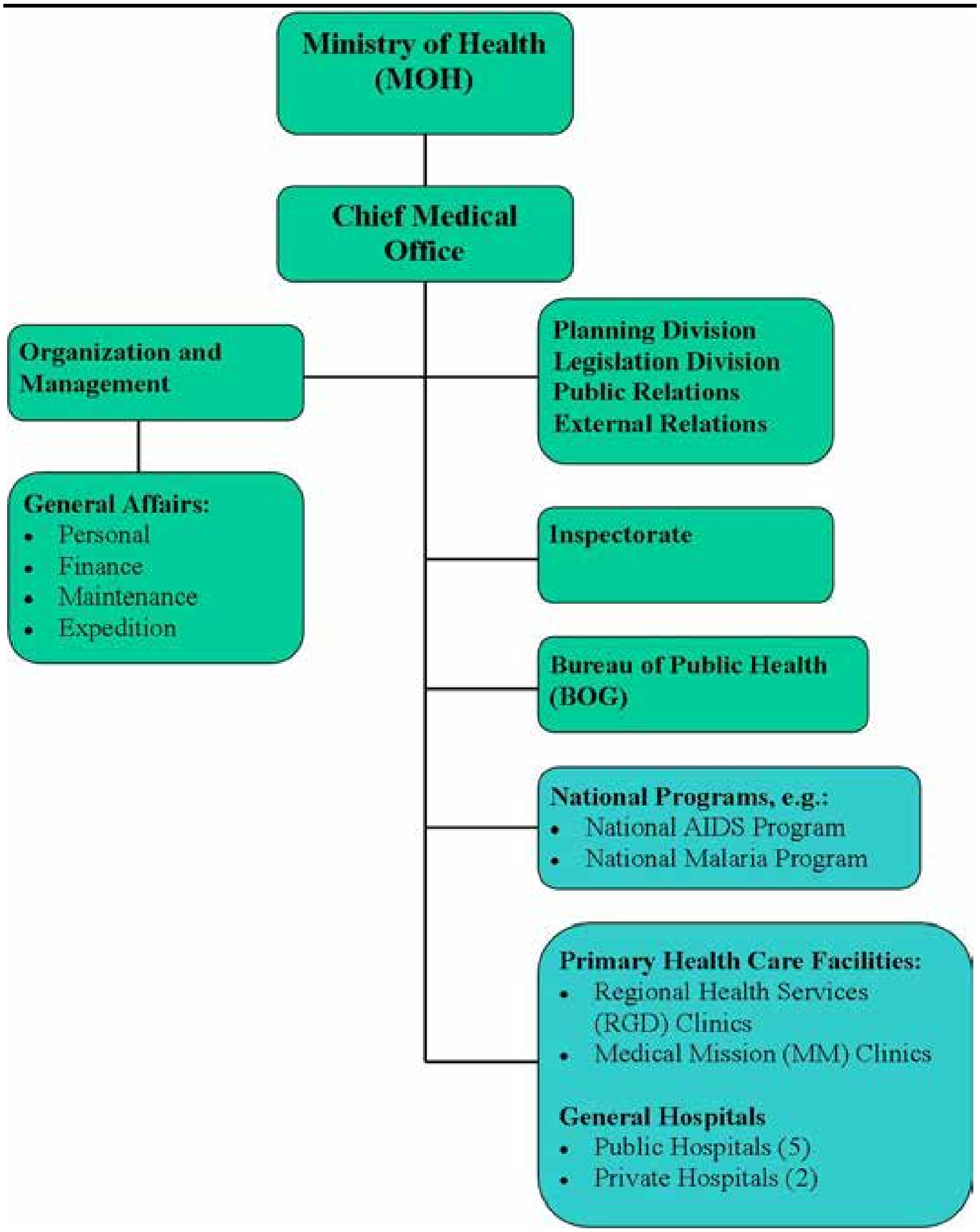
Source: Wikipedia, Para Resorts http://en.wikipedia.org/wiki/File:Para_resorts.png

Figure 2-7 Resorts within the Para District

3.0 *COMMUNITY HEALTH AND STATUS*

The Ministry of Public Health is responsible for the health of the Surinamese people and has authority and coordinates with a number of health units and institutions [(1)] . Within the Ministry, the Bureau of Public Health (BOG) is responsible for monitoring, preventing and controlling diseases. The National Health Information System Unit is responsible for official national health data collected through hospital registrations and surveillance reports of the Bureau of Public Health, Regional Health Service (RGD), Medical Mission (MM), professional health associations and other sources.

(1) PAHO and Suriname Ministry of Health, 2007. Health Information Systems Assessment of Suriname. Accessed on 31 March 2011 at www.paho.org/English/DD/AIS/surreport.pdf



Source: Adapted from PAHO and Suriname MOH, 2007

Figure 3-1 Suriname Healthcare Infrastructure

Monitoring of communicable disease morbidity is done through weekly hospital surveillance, sentinel telephone surveillance in 27 clinics of the Regional Health Services, and occasionally through physicians and outbreak reporting. Hospital surveillance includes dengue, leptospirosis, shigella, salmonella and malnutrition cases.

Primary health level services are provided by RGD, MM, several hospitals, policlinics and private practitioners. Of the seven hospitals in Suriname (five public and two private), six are located in the capital Paramaribo and one is located in the western district of Nickerie. The psychiatric hospital is also located in the capital. The private Diakonessen Hospital, through an agreement with the MM, includes care to patients from the interior. The Academic Hospital, the largest public hospital, operates the country's main emergency room department.

The RGD, a state foundation, and the Medical Mission, an NGO, are the public providers of health care and subsidized by the Government. The RGD is a direct service of the Ministry of Health and provides services, mainly to the poor and near-poor in the coastal area through 50 clinics, serving approximately 100,000 patients of generally lower socioeconomic means [1] .

The Medical Mission provides curative and preventative health services, free of charge, to the interior Maroon and Amerindian population through 57 health clinics and health posts, serving around 60,000 patients and managed by a deputy director and five physicians. Regular communications are maintained by all health facilities by radio or telephone. Available roads in the area are limited; therefore, travel by boat is the most common means of transportation, while air transportation is often used for emergency patients. Insurance is not an issue for citizens as all health care is provided free of charge. Non-citizens, such as Brazilian small scale miners, must pay a small fee for care.

Compared to the average for The Americas Region, Suriname has substantially less availability of healthcare providers (physicians and nurses/ midwives) for the size of the country's population. This is demonstrated in *Table 3.1*.

Table 3-1 Suriname Health Care Providers Density Ratios

Health Indicator (data year)	*Suriname*	*The Americas Region*
Physicians per 10,000 population (2000)	4.5	22.5
Nurses and midwives per 10,000 population (2000)	16.2	61.5

Source: WHO Global Health Observatory Data Repository, 2011

According to ERM interviews with the RDG, MM and Academic Hospital, the directors of the major health service providers in the country all face challenges obtaining sufficient numbers of qualified health care providers, physicians and nurses, and this shortage is a major barrier to providing quality health services to the population.

(1) PAHO and Suriname Ministry of Health, 2007. Health Information Systems Assessment of Suriname.

MOH's National Malaria Program

In 2009, the MOH's National Malaria Program initiated a five year malaria control and awareness program called *Looking for Gold, Finding Malaria*, which targets the small-scale gold mining sector in the interior. The program's main activities include:

- Conducting entomology studies on the behavior and lifecycle of the mosquito vector;
- Mapping of the small-scaling mining camps to help assess logistics needs and to closely track movement and locations of the camp;
- Recruiting and training of Malaria Service Delivery (MSD) volunteers in the small-scale gold mining camps (e.g., bar managers, brothel owners, shop owners) to administer rapid malaria diagnostic testing and alert MOH of possible outbreaks;
- Administering free malaria medications and treatments; and
- Raising awareness and education on malaria prevention and control.

The Program is in the process of identifying and signing Memorandums of Understanding (MOUs) with concession holders, camp bosses, mining companies, etc. that can coordinate with the MOH's Malaria Program in controlling and preventing malaria. The MOUs will provide permission to the MOH's Malaria Program to access the concession areas when requested, such as during the need to deliver free malaria treatment medications in response to a confirmed malaria incidence. The Program is also working towards technical trans-boundary cooperation with neighbouring French Guiana in malaria control.

MOH's National AIDS Program (NAP)

The current HIV response in Suriname is guided by the second National Strategic Plan for a multi-sectoral approach for HIV/ AIDS, 2009-2013, and covers five priority areas:

1. National coordination, policy and capacity building;
2. Prevention of further spread of HIV;
3. Treatment, care and support;
4. Reduction of stigma and discrimination of people living with HIV; and
5. Strategic information for policy development and service provision.

In the last decade, Suriname has seen some progress in combating HIV/ AIDS. For example, the annual deaths from AIDS decreased from 2006 to 2008, attributed to the increase of early diagnostics and the wider availability of

Antiretroviral Therapy (ART) and increased coverage [1] . According to ERM interviews with the MOH one of the main challenges in improving early access to treatment for people living with HIV is that the HIV-infected persons often enter the health care system during late stages of HIV, making treatment less effective.

Currently, NAP does not yet have a focused program for monitoring and addressing HIV/AIDS in the small-scale goldmine communities of the interior. Efforts are limited to distributing free condoms at the gold mining camps through the National Malaria Program's *Looking for Gold, Finding Malaria* field teams. According to interviews with the MOH, NAP plans to send personnel with HIV/AIDS expertise as part of the National Malaria Program's field team into the small-scaling mining areas.

NAP is currently planning to conduct a behavioral surveillance survey (BSS) among sex workers in gold mining areas, as part of a regional study on HIV and migrants. A 2010 BSS study in Nickerie and Marowijne, both border districts in eastern Suriname, show that only 13% of the researched sex workers were Surinamese. Dominant groups among sex workers are Brazilian, Guyanese and Dominican.

Suriname Business Council against HIV/AIDS

The Suriname Business Coalition (SBC) Against HIV/AIDS is a membership organization established in December 2005 under the Suriname Trade and Industry Association (VSB). SBC was formed on the recognition that the active involvement of the private sector and trade unions is an important strategy in the response against HIV, particularly given the labor force in the private sector accounts for the majority of the national population [2] .

Currently, twelve medium-large companies have joined the SBC, representing several major sectors, including mining, agriculture, and enterprises. According to interviews conducted with the SBC, all member companies adopt an HIV workplace policy, a Drugs & Alcohol Policy, and an Occupational Safety, Health and Environmental Policy. Newmont is undergoing negotiations with the government to be part of the trade association, with potential to become a member of the SBC in the future.

The SBC works closely with the government ministries (e.g., MOH, Ministry of Labour), Global Fund and the ILO Program on HIV/ AIDS. Using KAPB surveys and guided by international standards and specific Surinamese experience, the SBC works with the member company to develop HIV workplace policy that can be integrated into the company's existing Human Resources (HR) policy.

(1) MOH, 2010. Suriname Country Report on the Ungass on HIV/AIDS: Jan 2008

(2) MOH, 2010. Suriname Country Report on the Ungass on HIV/AIDS: Jan 2008 – Dec 2009, Accessed on 27 December 2011 at http://data.unaids.org/pub/Report/2010/suriname_2010_country_progress_report_en.pdf

As part of the program, SBC's local consultants provide HIV/ AIDS awareness and peer education trainings to workers, including HR managers and Union Representatives.

In 2011, SBC began working on their next priority area - reducing and preventing Non-Communicable Diseases (NCDs) or chronic diseases among workers through the Healthy Life Style Program. The new program includes:

- Formulating a Healthy Life Style Workplace Policy;
- Setting up a 5-year Health Information System to track ncds in the workforce; and
- Developing a Plan for the Prevention of ncds.

4.0 LIVELIHOODS AND SOCIO-ECONOMICS

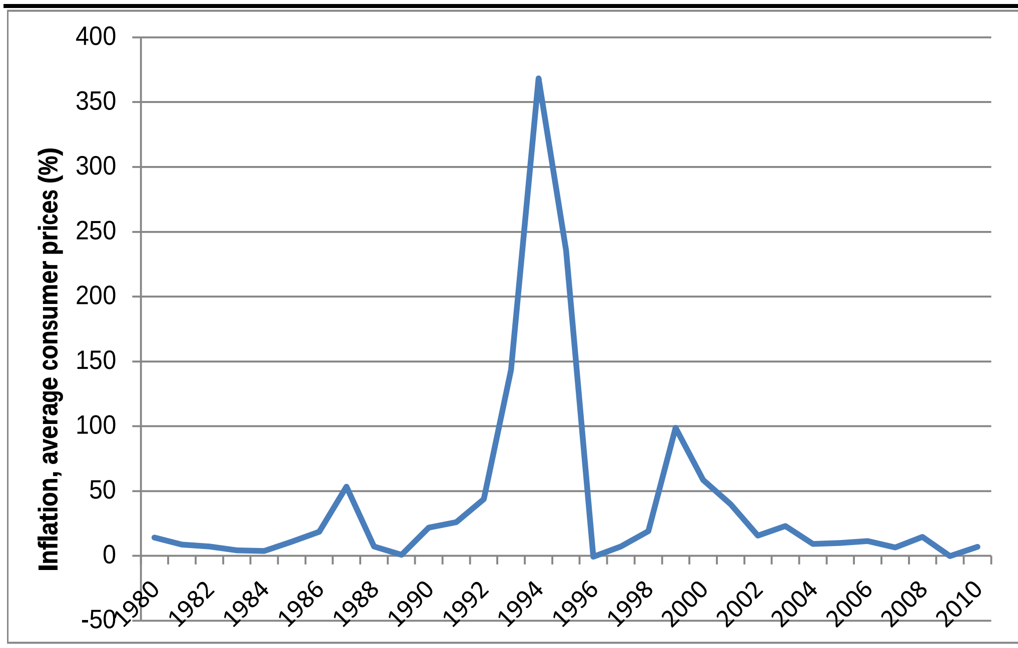
Economically Suriname appears to be dependent on the service sector where 64% of the population are reported (2004 data) to be employed, compared to 23% in industry and 8% in agriculture[1]. Despite the comparatively low prevalence of agriculture it is believed to be significant livelihood in terms of income generation and subsistence for a large number of people. The main crops include rice, fruit (including plantains and bananas) and other vegetables.

The national labor force is estimated at 192,931 made up of approximately 37% women (2009 data)[2]. Unemployment in Suriname is reported to be approximately 10% of the labor force and rises to approximately 22% of the labor force when we consider those aged between 15-24 (2004 data)[3].

Nationally 16% of the population is estimated to live on less than US $1.25 when adjusted for Purchasing Power Parity (PPP). When we consider the population living on less that USD $2.00 (again adjusted for PPP) this percentage rises to 27% (1999 data)[4].

Inflation, based on average consumer prices currently stands at 6.9% (2010 data)[5] with projections for 2011, 2012 and 2016 rising to 17.9%, 10.4% and then dropping to 4.0%[6]. *Figure 4.1* shows the annual rate of inflation based on average consumer prices from 1980.

[1] World Bank World Development Indicators databank
[2] Ibid
[3] Ibid
[4] Ibid
[5] International Monetary Fund - 2011 World Economic Outlook
[6] Ibid.



Source: International Monetary Fund - 2011 World Economic Outlook

Figure 4-1 *Inflation, average consumer prices*

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Appendix 14 -B

Data Collection Tools

1.0 SOCIAL BASELINE – INTERVIEW GUIDE DECEMBER 2011

EDUCATION

- What is the school capacity (nursery, primary, secondary) in Paramaribo / Moengo/ Pamaka?
    - Teachers
    - Students
    - Classrooms
    - Equipment (computers, sports hall, library)
    - Special needs assistance
- What is the capacity for Moengo to the educational requirements associated with an influx of migrants etc.?
- What are average class sizes - has this changed in the past three years? If yes, why?
- Please explain the different types of schools – number of primary and secondary, boarding schools, public/ private, language difference.
- What are the costs associated with attending school (fees, uniform books etc.)? How does this affect attendance?
- What is the quality of education provided – how does this differ between regions (Interior vs. other areas)?
- What is the average school leaving age – how does this differ between regions?
- What are average literacy rates – how does this differ between regions?
- What facilities are provided by schools?
- What kind of assistance is available for families to send their children to school (fees, transportation, meals, accommodation, materials) – specifically if they live in the Interior?
- Where are the schools located?
- How do children travel to school? Who pays for this?
- What is the average distance that children have to travel to school?

- Who are the main stakeholders involved in the provision of education (government, church, NGOs)?

- Can you explain the arrangement with Church groups (or others) regarding the provision of education?

- What challenges currently face the education system?

- What is the government policy regarding development of education facilities in Paramaribo/ Moengo/ Pamaka over the next five years?

- What are the main differences between school facilities between these areas?

- Are there any vocational training centres/ programs available for early school leavers? If yes, please explain.

- How do secondary schools support children from the Interior?

- How many children from the Pamaka area come to school in Moengo? Why? How do they afford it? What support do they receive?

INFRASTRUCTURE AVAILABILITY

Water and Sanitation

- What is the level of access to clean water?

- What is the capacity of the water and sewage systems?

- What is the main source of water?

- What is the capacity and quality of the sewage system?

- What are the main sources and users of water? (household, business, industry, farming – Suralco, other industry?)

- What is the cost of water and sanitation services for households/ businesses?

- When are the periods of water shortages during the year?

- Have significant changes been made to the water and sewage system in the past three years? If yes, please explain.

- What is the process required to upgrade/ expand/ improve water and sewage systems (planning permission, costs, time, partners)?

- What is the current government policy in relation to water and sanitation projects in the area?

- What capacity is there to cope with additional demand for water/ sanitation services?

Waste Management

- What is the most common practice for household waste management and disposal? (Collection, burning, dumping)?
- What is the quality and capacity of waste management facilities?
- Have levels of waste changed in the past three years?
- Are there any recycling facilities?
- What problems has waste management caused?
- What capacity is there to cope with additional demand for waste management services?

Housing

- What is the level of access to adequate housing?
- What amount of housing is available?
- What is the general quality and type of housing (description of housing stock available)?
- What has the average rate of build of new housing been over the past 5 years?
- What materials are used in housing construction?
- What is the average cost of housing?
- What are housing planning requirements?
- What are property rights? - What permissions are required for building new properties?
- What limitations exist on new house construction for migrants?

Electricity

- What is the level of access to electricity?
- What is the main source of electricity generation?
- What is the cost of electricity?
- What is the capacity of current power generation?
- What is the frequency of power cuts?

- What is the cost of connecting to the national grid?
- Who is the main electricity provider/ regulator?

Emergency Services

- What is the size and jurisdiction of the ambulance and fire services?
- What resources do the ambulance and fire services have?
- What are the most common types of accident?
- What are the costs associated with calling emergency services?
- What is the average response time to an emergency call?
- Have there been any changes to the numbers of accidents in the past three years?
- Which areas are most prone to accidents (e.g. any particular stretch of road)?

Transportation

- What public transportation facilities exist? Please explain frequency, cost, usage, capacity, routes etc.?
- What is the main mode of transportation in this area?
- How many people own cars?
- Who are the main road users?
- What are the busiest roads?
- What are the busiest times for traffic?
- Are there many road accidents? What do you think are the main reasons for this? Increasing/ decreasing?
- Where do children/ adults learn about road safety?
- How frequently is transportation infrastructure repaired/ maintained? Who is responsible for this?
- How much does it currently cost to maintain transportation infrastructure?
- What do you think would be the impact of increased traffic load in this area?
- What is the plan for development of road/ transportation networks over the next five years?

Communications

- How many people own mobile phones, computers with internet, TV; how does this differ between different areas/ age groups/ ethnic groups?
- What is the capacity of the telephone/ internet/ postal services?

- Who are the main communications service providers (public/private)?
- What are average costs for mobile phone use, internet, and television?
- Which areas have mobile phone coverage?
- Are there frequent/ regular disruptions to communications services?
- What are the plans for upgrading/ expanding communications services over the next five years?

Other

- What additional goods/ services are provided by local government?
- How are these services paid for?
- Who has access to these services?
- What additional goods/ services are provided by the private sector?
- How many churches/ religious institutions are there?
- What other groups/ associations are present in the town (e.g. church groups, farmers groups, women's groups)?
- What has been the effect of Suralco in Moengo? Positive/ negative? How has this changed?

SOCIOECONOMICS

- Has the standard of living changed (better or worse) in the past three years?
- What aspects have changed and what are the reasons for this?
- What is the average cost of a basket of goods (Paramaribo, Moengo) – which is more expensive? Why?
- What is average household income and expenditure?
- What is the level of poverty?
- What areas are the poorest and why?
- What areas are the most affluent and why?
- What are the most vulnerable groups?
- Who suffers from food shortages and when?
- How has this changed (all)?

JUSTICE AND POLICE

Crime

- What is the crime rate (petty theft, violent crime, rape, murder)?

- What are the size and jurisdiction of the police services (number of police officers per 1000 population)?
- What are the most common types of crime?
- What areas have the highest crime rates?
- How has this changed in the past three years?
- Who are the most common perpetrators/victims of crime?
- What are the periods of the year/ month/ week/ day that have above average crime rates?

Policing

- What resources does the police service have?
- What do you think are the main causes of crime?
- What do you think is needed to lower crime rates?

Courts and sentencing

- Where are suspects tried and held?
- What are typical punishments according to crimes (fines, prison sentences, community service)?
- Where are prisoners held?
- What is the prison capacity?
- What is the population of the prison?
- What is the demographic profile of the prison population?
- Has this changed in the past three years? How and why?
- What is the capacity of the courts (number of judges, size of jury, lawyers)?
- What is the average waiting time before trial?
- Who administers justice amongst Maroon communities living in Paramaribo/Moengo? (traditional authority v. formal government) How is this decided?

Conflict and conflict resolution

- Are there any conflicts in the town/area?
- What is the nature of these conflicts and who are they between?
- Who is responsible for resolving these conflicts?
- Have there been any problems of integration between newcomers to Paramaribo or Moengo and existing communities previously?

- Have the nature/ scale of conflicts changed in the past three years? If yes, how?

DEMOGRAPHICS

Population

- What is the total population of the area?
- What is the population distribution (age, ethnicity, gender, income level)?
- What is the population of each ethnic group?
- On average, how many children do women have? Does this vary between ethnic groups?
- What is the number of householders?
- What is the average number of people per household?
- What is the population growth rate? Has this changed significantly in the past three to five years?
- Has this changed in the past three to five years? If yes, how?
- What are the main languages spoken?

Migration

- What is the historical/ current level of migration?
- Where do most migrants travel from/ to?
- What is the main demographic group of immigrants (age, gender, ethnicity)?
- Do the rights of migrants differ from those already living in a community?
- What is the process for registering in a new area (doctors, schools, taxes, welfare benefits etc)?
- What support structures exist for recently arrived migrants?
- What are the main reasons for migration?
- Have migration patterns changed significantly in the past three to five years?
- Do you foresee any changes to migration patterns in the next three to five years? If yes, what and why?
- Is there any seasonal migration? If yes, please expand.

NGOs/CBOs

- What kind of services does your organization provide?
- How long has your organization been established/ operational in this area?

- What were the motivations for working here?
- What are the biggest development needs in this area? In what way could these issues be tackled?
- Examples of past/ongoing projects and their impacts.
- Where projects have not succeeded, what do you think the main reasons for this were?
- What are the biggest challenges of working in this area?
- Who else do you work with (partners, funders, government)?
- How many people work for your organization?
- How many people benefit from your work?
- Has your level of funding changed in the past five years?
- Has demand for your services changed in the past five years?
- How do you think PK activity benefits/harms local communities?
- What experience/ knowledge do you have of PK activities?

OTHER MINING COMPANIES

- How long have you been working in the area?
- When did your community engagement activities begin?
- What have been the biggest challenges to your projects?
- What have been the impacts of those challenges?
- What have been the biggest successes in terms of community engagement?
- Lessons learned?
- What is your current community engagement policy?
- In your view, what are the biggest development challenges in the Marowijne and Moengo areas?
- What are the biggest regulatory and governance challenges in the area?
- Have you undertaken any community investment programmes? What has the result of these been (response from communities, developmental impacts, benefits to the company)?
- Have you partnered with NGOs, government, CBOs or other mining companies for any of your community development work?

FOCUS GROUPS – SHOPS/LOCAL BUSINESSES

- What types of businesses operate in this area?
- How often do people use this service?

- Average number of customers per day
- When are the busiest periods of business (year, month, week, day)?
- How do customers access the business (on foot, car, bus)?
- Where do people come from to use this business?
- Who are the main customers (local residents, long distance road users, car/truck drivers, other businesses (what type of business))?
- How do you get to work?
- How far do you travel to get to work and how long does it take?
- What time do you come to/ leave work?

PROJECT IMPACTS

- How will the project affect your community?
- What are your main concerns about this project?
- Who in this community would least be able to cope with the changes
- What should be done to make sure the project does not affect your community?
- How would you feel about more industrial development in this area?
- How would their presence affect you?
- Any other comments/ questions?

2.0 QUALITATATIVE DATA COLLECTION PRO FORMA – OCTOBER 2011

Upon arrival perform transect walk through village to familiarize with the size, location, etc. Ask local Basha, Captain or Head Captain to show you around and to explain the history of the village while you walk.

INTRODUCTION

Introduce the group; name and company of each person.

Explain the reason that the team have come to the villages:

- Surgold are carrying out a study trying to maximize any positive effects of their project and avoid or minimize any negative effects. In order to do this we need to understand how people live and work in the Pamaka area at the moment.

- Our team are independent group of specialists who have come to try and understand the Pamaka people so that we can carry out the ESIA study on the Surgold Project. We are separate from the Government and separate from the company. We have come to listen to you so that we can change the way the Surgold project develops so that it is more positive and less negative for the Pamaka people.

FOCUS GROUP

Community Map

Start by asking men to draw a map of this village and where it belongs in reference to the Pamaka territory and the surrounding area.
Ask participants to draw a map of the village, specifics to include are:

- Roads, rivers, paths etc.;
- Village boundaries;
- Other villages (?);
- Natural resource areas (wood, water, fish, medicines, forest products);
- Areas for gathering forest products;
- Agricultural sites;
- PK areas;
- Sacred or cultural sites (churches, grave yards);
- Health (traditional healers and formal) and education facilities; and
- Other important areas.

During (and after) the development of the map ask the following questions:

<u>Village Infrastructure</u>
What infrastructure is there in the village?
What are the water sources available - Number and quality of communal wells/pipe stands – and any other sources of water?
What is the quality of the water available is there enough for everyone?
What is the main source of electricity? (grid, generator, battery)
What is the main source of fuel for cooking? Where does it come from?
Where are the recreational activities?
Where are the restaurants and the shops?

- *Number of restaurants/food sellers*
- *Village shops (types of goods sold)*
- *Permanent Market*

What is the most import infrastructure in the village? Why?
Where does the village suffer from shortages?

<u>Cultural and Sacred Sites</u>
What are the sacred sites in and around the village?
Where are the religious buildings / shrines
How are these accessed and how often are they visited?
Who is forbidden from visiting them? Why? Whem?

<u>Land Tenure and Land Use</u>
Who does the land here belong to?
Who is not allowed to own land?
Who are the biggest land owners in the village?
How do you get land?
Who is forbidden from inheriting land?
How has land use changed?

<u>Livelihoods</u>
Where do people go to practice the main livelihoods?
What are the major livelihoods?
Where do people practice?

- *Farming*
- *Fishing*
- *Trading*
- *Hunting*
- *Small scale mining*
- *Commercial activities*
- *Formal employment*

Which is the best or most preferable livelihood? Why?
Which ones to most people do? Why?
Who is not allowed to do certain livelihoods? Why?
How has this changed in the last 1,3,5 years?

Generally what are the roles of men?
Generally what are the roles of women?
What is the gender balance? How has this changed in the past three years?

<u>Transportation and Communication</u>
How is the village connected to other towns/villages (quality/type of roads/telecommunications)
What is the purpose/frequency of travel outside the village?
How many people have moved into/out of the village in the past three years?
What are the reasons for this?
When do people move to and from... French Guiana, Parbo, etc.?
How long do people stay in FG?

<u>Education</u>
School location? How do students travel to school?
Which students cannot get to school? Why?
How do children get education in villages without schools?
Who provides education? (state/village?)
What is the cost of education? (uniform, books/materials, fees, travel)
What is the quality of education in this village?
How useful is it? Is it the same for girls and boys?
What training is available for people? Where etc?

COMMUNITY LEADERSHIP & NETWORKS

How do the Pamaka people make decisions?
- household, village and territory level?
What is the relationship between the formal government and the traditional authority?
How do the Pamaka people administer justice? What crimes do the traditional authority decide / police decide?
How is corruption a problem with police, military, formal gov, and traditional authority?

What are the roles of men, women, youth elders in the village?

What groups/associations exist in the community?
What is the purpose/influence of these groups?
What groups are you involved in? What do they do?
Who is forbidden from joining these groups?

What conflict exists within the village? and with other villages?
Who is responsible for resolving conflict?
Which villages are this village close to / far away from?

Vulnerable Groups

Who is most vulnerable in the community?
Who is forbidden from helping with decision making?
Which groups struggle the most?
(ie. women, children, women in informal marriages, young pregnant girls)?
Who looks after these individuals? Do Elders get involved? What is the process?

HEALTH

What does it mean to be healthy? What are the main challenges to staying healthy in this community?

What are the most common health problems men in the community suffer from? Has this changed in the past five years?

What are the most common accidents and injuries that occur in the community? What group of people suffer from this injury the most?

What are the most common reasons for seeking care at the local health post? At the hospital in Paramaribo? At a health centre in French Guiana?

What are the most common reasons to seek care from a traditional healer? Why do you see the traditional healer or the medical centre?

When do you go to the health centre and when do you go to the healer?

What is the quality of care received?

What problems in the area that make people in the community feel unsafe? Has this changed over the past five years?

How do PKs affect the community's health?

STANDARD OF LIVING

What is a good standard of living (which factors are most important)?
Is your standard of living in this village the same, better or worse than it was three years ago?
What are the reasons for this (ie. more people working, less people working, better infrastructure etc)?
Who are the poorest and richest groups? Why? How does this affect decision making in the village etc?
Who is in charge of managing savings / money in the house? How do people save money?
Has the cost of living changed in the past three years? If yes why do you think this is?

Household Food Security

When are there shortages of food?
Why do you sometimes NOT produce enough food?
Usually, when does the food run out?
How can you predict food shortages expected?

PROJECT IMPACTS

What are your concerns about the project and how it will impact your village?
What are the positive impacts of the project on your village?
What are your expectations of the project? How do you think it can benefit/harm you?
How can the Pamaka community help maximize any benefits themselves?
What would you like to know about?

ANY QUESTIONS?

Appendix 14 -C

Health Interview Guide

Objectives

1. To collect local surveillance data on main causes of mortality and morbidity in the local area; and
2. To understand the current capacity and challenges of the health care resources in the local area.

Data Collection

Semi-structured interviews with key Health Personnel in Pamaka Region using the following tools:

Tool 1 - Semi-structured Interview Guide
Tool 2 - Health Facility Profile Questionnaire

In addition to the above tools, please request any available and relevant health documents and reports. Typical data collected from clinic records (in-patient and out-patient) include:

- Number of patients per diagnosis (over the past month, year, etc);
- Number of patient admissions;
- Causes of admissions; and
- Length of patient stay.

Depending on the diagnostic testing available, the following types of data can be collected from laboratory records:

- Number of positive blood smear tests for malaria (over the past month, year, etc); and
- Number of positive rapid diagnostic tests for STIs and HIV (over the past month, year, etc).

Health personnel at the following health facilities should be consulted during this field visit (as schedule permits).

	Stakeholder	*Name of Informant(s)*
1.	Langatibiki MM Health Post	
2.	Nason MM Health Post	

TOOL 1 - SEMI-STRUCTURED INTERVIEW GUIDE

1. Common Causes of Death

a. What are the most common causes of death in the local area?
b. For each main cause of death, explore any differences in death rates among groups of people in the local area (men, women, children, older people, illegal Brazilian miners, Amerindians, Maroons, etc). Why?
c. Has the main causes of death changed in the past five years? Why or why not?

2. Common Illnesses and Injuries

a. What are the most ***common illnesses*** treated at this health post? Has this changed in the past five years? Who (men, women, children, older people) suffer most often from the illness? Why?
b. What are the most ***common types of injuries*** that are treated at this health post? Who (men, women, children, older people) suffer most often from this type of injury? Why?

3. Malaria

a. During what time of the year do you see the highest number of positive malaria cases (as indicated by malaria smear readings)[1]?
b. Over the years, have you seen any changes in the number of patients (or positive cases) with this illness (increasing, decreasing, same)*?* If so, what are the possible reasons?
c. Have there been any recent outbreaks of malaria?
d. What group of people are most at risk for malaria?
e. Explore the main factors for malaria transmission in the local area. Probe on the following issues:
   - Illegal artisanal mining community[2]
   - People traveling to and from highly endemic areas (e.g., French Guiana)
   - Access to malaria prevention methods and malaria control campaigns (availability and effectiveness)[3]
   - Others?

4. Diarrheal Diseases

a. During what time of the year do you see the highest number of diarrheal cases[4]?
b. Over the years, have you seen any changes in the number of patients with this illness (increasing, decreasing, same)*?* If so, what are the possible reasons?
c. Have there been any recent outbreaks of diarrheal diseases?

[1] Past consultation with Langatibiki MM Health Post indicated that more malaria cases were reported during the dry season.
[2] In 2003, a malaria outbreak occurred in eastern Maraowijne region and was associated with influx into illegal gold mining areas.
[3] In 2004, MM implemented malaria control program for the interior, in areas where the highly mobile population of illegal gold miners is interacting with the local population, including Nassau and Langatibiki areas.
[4] Past consultation with Langatibiki MM Health Post indicated that more malaria cases were reported during the dry season.

d. What group of people are most at risk for diarrheal diseases?
e. Explore the main factors for diarrheal diseases in the local area. Probe on the following issues:
   - Access to clean drinking water and proper sanitation
   - Delayed medical attention (i.e., oral rehydration therapy) to prevent diarrheal related deaths
   - Any current efforts to improve water and sanitation infrastructure
   - Others?

5. Chronic Diseases

a. Explore to what extent chronic diseases affect the local population and any trends observed over the past years. Probe on the following issues:
   - Childhood asthma
   - High blood pressure
   - Cancers (including cervical cancer among women)
   - Heart diseases
   - Others?
b. Are there any current health prevention programs to address chronic diseases? If so, who sponsors or funds them? How effective are they?

6. Sexually Transmitted Infections (including HIV/AIDS)

a. What are the most common Sexually Transmitted Infections (STIs) treated at this health post? Has this changed in the past five years?
b. What group of people are most at risk for the STI? Why?
c. Explore the main factors for STI transmission in the local area. Probe on the following issues:
   - Prostitution and illegal artisanal mining community[1]
   - Access to STI and HIV/AIDS educational and prevention campaigns in the local area (availability and effectiveness)
   - Others?

7. Disease Outbreaks

a. Have there been any disease outbreaks in study area settlements in recent years?
b. How was it managed? Disease tracking, response, coordination among depts.?
c. What plans are in place to handle such an outbreak in the future?
d. Do you believe the area is at risk for such an outbreak again? why?

8. Public Safety

a. What are the major safety and security issues in the local area? Probe on the following issues:
   - Traffic accidents/road safety

[1] Prostitution and illegal mining activities have been observed in the Nassau mine area and are considered a high risk group for STI and HIV/AIDS.

- Crime (drug trafficking)
- Violence and conflict
- Prostitution
- Alcohol/drug use
- Influx of newcomers (e.g., illegal mining)
- Others?

9. Challenges to Staying Healthy

a. What are the top 3-4 health risk factors that have the greatest influence on the health of general population? Probe on the following issues:
   - Poor living conditions (or poverty/vulnerability more generally)
   - Access to medical care
   - Prostitution and/or high prevalence of unprotected sex
   - Prevalence of tobacco use/alcohol/drug use
   - Access to clean water source and safe sanitation
   - Mental health problems (depression, anxiety, stress)
   - Others?

10. Industrial Development and Health

a. Are there any changes to the health or safety of the local community associated with the mining industry in the region? (Explore both potential positive and negative effects).
b. Have there been specific conditions or visible increase in any health or safety conditions that could be linked to an increase in industrial activity?
c. What is the community perception about concerns about industrial activity in the local area?
d. Have efforts by government or industry been made to address any of these issues?

11. **Cost of Health Care**

a. Residents in the interior receive free medical services through the health post. Is there a limit to the free health care provided?
b. Explore what is covered for free and what is not. Probe on the following issues:
   - Types of treatment service
   - Types of preventative care (including pre-natal care, immunizations)
   - Medicines
   - Transportation to/from health facility (ambulance)
   - Others?

12. Access to Health Care

a. Explore what the main barriers to accessing quality health care are for the local population.

Explore:

- Cost of care; cost of medicines; transportation (or lack of facility close to home)
- Lack of most needed health services; quality of existing health services; lack of available medicines; lack of doctors/nurses
- Constraints on health personnel
- Others?

13. Current Challenges

a. What are the current challenges facing the health post? Are there plans to address these challenges?
b. To what extent has influx of artisanal miners and agricultural families in the past affected the capacity of the health post? Were there any constraints on the staff and resources?

14. Traditional Medicine

a. How common is the use of traditional medicine among the local population?
b. Who are the traditional healers and practitioners? (locally)
c. Are there particular diseases for which traditional medicine would be used versus standard medicine?

15. Additional Health Stakeholders

a. Are there any other individuals/organizations that you would advise us to speak with to gather more information for this study?

TOOL 3 – HEALTH FACILITY PROFILE QUESTIONNAIRE

HEALTH FACILITY PROFILE – *Complete for health facilites (i.e., health centers, clinics, hospitals, etc.)*								
Health Facility · Name of Facility · Name of Medical Director · Name of Nursing Director · Hours and days of operation	Location · Address · Description of location · Communities within service area (population size) *[Obtain GPS coordinates]*	Type of Facility · Hospital/ clinic etc? · Government or Private? · Funding source	Services · Type of primary care services provided? *[Explain in detail]* · Type of specialized services provided? · Types of other services provided to community (e.g.,school nurse)?	Ptients · Where are patients coming from? · Number of patients seen weekly (or monthly or annually) · Number overnight patients weekly (or monthly or annually)	Beds · # of beds · # wards	Staff ¨ Total number of staff attending patients during a single shift: · Doctors · Nurses · Other medical and support staff · Total number of staff working at the facility · Doctor per patient ratio; and nurse per patient ratio · What is the training and background of staff? What capacity gaps exist? · Who is responsivble for recruiting MD and RN's and what is their typical rotation?	Resources: · Physical conditions of building (how old is it? is it in need of repair?) · Does the hospital have uninterrupted source of running water? Is this water reliably potable? · Does the hospital have uninterrupted sources of electricity? · Does the facility have a pharmacy? Where do they get drugs/medical materials? How often are drugs/medical materials re-stocked? Are there shortages? How well does the supply delivery system function? · How does it manage waste and sanitation? How about biomedical waste? · What is the quality of the medical equipment? Laboratory equipment? Diagnostic testing equipment? · Is it sufficiently well stocked in supplies and medicines to meet demand? · Does the facility have transportation (ie ambulance or other) for patients? · How effective is the communication system with the on-call Doctor?	Needs: · What is the facility in greatest need of to better serve its patients? *[Explore whether facility has plans to upgrade or renovate etc]*

Appendix 14 -D

Questionnaire Household Survey Pamaka Area

Socio-Economic Questionnaire

Introduction of the surveyor: My name is ________________________________ and I am working on behalf of ERM who have been commissioned by Surgold to conduct a socio-economic survey of the communities surrounding Monego or along side the Moengo – Pamaka road (Patamaka area). The survey is being carried out to assess current socio-economic conditions of the affected people and communities.

COMMUNITY:--- RESORT ---

INTERVIEWER:---DATE:--

TIME OF INTERVIEW: START……………………..…………….FINISH………………………………..………………………………

NAME OF RESPONDENT:-- Male ☐ Female ☐

If not head of household, Name of head of Household ___________________________________

If not head of household, Relation to Head of Household _________________________________

If not head of household, where is head of household ____________________________________

Survey ID Number:(fill in at the end of each day) ……………………….

A. HOUSEHOLD DEMOGRAPHICS - Members

	A1	A2	A3	A4	A5
Per-son	List the first names and surnames of the persons who live in this house, starting with the head of household.	Sex 1. Male 2. Female	What is the relationship to head of household? 1. Head 2. Wife/husband 3. Child 4. Adopted child 5. Grandchild 6. Great grandchild 7. Niece/nephew 8. Father/mother 9. Sister/brother 10. Son/daughter-in-law 11. Grandfather/mother 12. Father/mother-in-law 13. Other relative 14. Servant 15. Tenant 16. Uncle/Aunt 17. Other (Specify)	How old is (…..)?	What is the present marital status of (…..)? 1. Married 2. Divorced 3. Separated 4. Widow/ Widower 5. Living together (Informal marriage) 6. Single/not married **999 for those under 15**
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A. HOUSEHOLD DEMOGRAPHICS- Ethnicity, Language and Religion

	A6	A7	A8	A9	A10
Per-son	What is the religion/ religious belief of this person? 1. Roman Catholic 2. Moravian Church 3. Lutheran 4. Evangelist Church 5. Adventist 6. Other Christian Church 7. Hindu (Sanatan) 8. Hindu (Arya) 9. Hindu (Other) 10. Jehovas Witness 11. Bahai 12. Islam 13. Traditional Religion 14. Other 15. No religion	What ethnicity is this person? 1. Indigenous/ Amerindian 2. Maroon/ Bushnegro 3. Creole 4. Hindostani 5. Javanese 6. Chinese 7. Caucasian/ White 8. Mixed 9. Other 10. Don't know 11. no answer	If indigenous, to which indigenous tribe does this person belong? 1. Arowakken 2. Caraiben 3. Wajana's 4. Trio's 5. Akurio's 6. Other 7. None 8. Don't know 9. No answer	If Maroon/ Bushnegro, to which maroon tribe does this person belong? 1. Saramaccaners 2. Aukaners/ Ndjukas 3. Matuariers 4. Paramaccaners 5. Bonni's/ Aloekoes 6. Kwinti's 7. Other 8. None 9. Don't know 10. no answer	What language(s) does this person speak? 1. Dutch 2. Sranan tongo 3. Samami 4. Javanese 5. Arowaks 6. Caraib 7. Saramaccaans 8. Aucaans 9. Paramaccaans 10. Chinese 11. Portugues 12. English 13. French 14. Other 15. Don't know 16. No answer

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A. HOUSEHOLD DEMOGRAPHICS – Residence and Migration

	A11	A12	A13	A14	A15
Per-son	Where was this person born? 1. In this community (specify) 2. Elsewhere in Sipaliwini (specify) 3. Paramaribo 4. Wanica 5. Nickerie 6. Coronie 7. Saramacca 8. Commewijne 9. Marowijne 10. Para 11. Brokopondo 12. Buitenland 13. District of Suriname 14. Anders 15. Don't know	If not born in this community, how many years ago did this person move to the community? 1. born in the community 2. arrived 1 year ago 3. arrived 2 years ago 4. arrived 3 years ago 5. arrived 4 years ago 6. arrived 5 years ago 7. arrived 6-10 years ago 8. arrived 11-15 years ago 9. arrived 16-20 years ago 10. arrived more than 20 years ago	For how long during the past 12 months has (….) been present in the household? 1. Year-round resident 2. Present for up to 3 months 3. Present for up to 6 months 4. Present for up to 9 months 5. Non-resident visiting 6. Other	For those who have not been present for more than three months of the last year, where have they been? 1. Elsewhere in Sipaliwini (specify) 2. Paramaribo 3. Wanica 4. Nickerie 5. Coronie 6. Saramacca 7. Commewijne 8. Marowijne 9. Para 10. Brokopondo 11. Buitenland 12. District of Suriname 13. Anders 14. Don't know	For those who have not been present for more than three months of the last year, what was the primary motivation for leaving the community? 1. Employment 2. Education 3. Familial Relations 4. Heath 5. Other (Specify)

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B. EMPLOYMENT

	B1	B2	B3	B4	B5.	B6
Per-son	Is this person employed/ have a job? 1. Yes 2. No	What type of job/ employment is the primary occupation? 1. Subsistence agriculture 2. Agricultural worker (including animal husbandry and fisheries) 3. Owner of commercial enterprise 4. Worker at commercial enterprise 5. Worker at 6. Home economics or craft 7. Small scale mining 8. Forestry 9. Odd jobs 10. Other (specify)	Define type of occupation (write response)	What is the secondary occupation of this person	Did this person seek work in the last three months? 1. Yes 2. No 3. Don't know 4. No Answer	If this person is not employed, why don't they seek work? 1. Is a pensioner or elderly person 2. Is a student 3. Because of family reasons 4. Is unfit for work 5. Does not have the necessary skills/ capacity 6. Has sought work but cannot find work 7. Does not want to 8. Other
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B7. What is the household's Primary source of income?	1. Salaried employment 2. Wage employment 3. Profit from agriculture 4. Operating own business	
B8. What is the household's Secondary source of income?	1. Salaried employment 2. Wage employment 3. Profit from agriculture 4. Operating own business	
B9. How has the employment opportunities available to members of your household changed in the last three years?	1. More employment opportunities. 2. Stayed the same. 3. Less employment opportunities.	

C. EDUCATION

	C1	C2	C3	C4	C5	C6.	C7
Per-son	Is this person of school going age? 1. Yes 2. No	Is this person enrolled in school? 1. Yes 2. No	If YES, what is the type of school? 1. kindergarten 2. primary 3. secondary 4. College/ University 5. Other	Where is the school located?	If this person is of school going age but not enrolled in school, what is the primary reason for this? 1. Lack of adequate educational facilities 2. Difficult access to educational facilities 3. High cost of education 4. Lack of interest 5. Need to work/ help with family 6. Other	If this person is no longer in school what is the highest level they completed? 1. Still in school. 2. None attended. 3. Kindergarten 4. Special Education 5. Primary School 6. Secondary School 7. Junior College 8. Higher Vocational Education 9. University/ higher education 10. Other (please specify)	Can this person read and write? (Is this person literate) – *only answer for individuals more than 10 yrs old.*
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D. HEALTH – Individual

	D1	D2	D3	D4	D5	D6	D7
Per-son	Has anyone in the household suffered from a sickness or injury in the last year? 1. Yes 2. Now	If yes, what condition has this person suffered from? 1. Fever/ malaria 2. Diarrhea/ intestinal condition 3. Eye condition 4. Skin condition 5. Ear, nose or throat condition 6. Dental 7. Accident 8. Sexually transmitted disease 9. Birth complication 10. Hernia 11. Waste pain 12. Other (specify)	Does this person suffer from a chronic or other disease? 1. Yes 2. No	If yes, what chronic disease does this person suffer from? 1. Cancer 2. Diabetes 3. High Blood Pressure 4. Asthma 5. Epilepsy 6. Rheumatism 7. Kidney problems 8. HIV/AIDS 9. other 10. don't know	How many days of school or work did this person miss because of any type of illness or injury?	Has this person sough medical attention in the last year? 1. Yes 2. No	What kind of health provider did the sick or injured member see? 1. Private dispensary/ hospital 2. District dispensary/ hospital 3. Missionary hospital/ dispensary 4. Community health center 5. Private doctor/ dentist 6. Traditional healer/ neighbor 7. Regional hospital 8. Traditional Midwife 9. Pharmacy/ chemist 10. Self Treatment 11. Other Specify
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D. HEALTH – Household

D.8	When you or someone in your household gets sick, where would you commonly **first** go to for treatment?	1. Self Medicate 2. Spiritualist 3. Herbalist 4. Clinic/Hospital 5. Pharmacist 6. Other (Specify)	What is the name of the clinic or hospital?
D.9	If the initial treatment does not work, where would you go to **next**? *(Pick one and identify name and distance from home)*	1. Self Medicate 2. Spiritualist 3. Herbalist 4. Clinic/Hospital 5. Pharmacist 6. Other (Specify)	What is the name of the clinic or hospital?
D.10	What is the distance from your place of residence to the point where medical attention is sought?	In minutes	
D.11	Over the past three years, do you think that the following problems are affecting more people, less people, or staying the same in your community?	a. Malaria b. Dengue fever c. Stomach problems d. Sexually transmitted diseases e. Respiratory problems f. Alcohol and illegal drug use g. Crime and violence h. Traffic accidents and injuries	For each: 1. less people affected than before 2. staying the same 3. more people affected than before 4. staying the same
D.12	How are medical costs covered?	1. State Health Insurance, government employees 2. State Health Insurance, private employees 3. Medical Mission 4. Ministry of Social Affairs, "onvermogen"	5. Ministry of Social affairs, "Minvermogen" Private business 6. Insurance company 7. Own Payment 8. Other

D.13	What is your perception of the costs of medical care?	1. Too high, prevents me from accessing available care 2. High, but I am able to access care 3. Regular 4. Too low, service is insufficient	
D.14	What would you say are the main difficulties to being healthy and staying healthy in this community? (Check all that apply)	1. Cost of health services 2. Cost of medicine 3. Inadequate health facilities nearby 4. Transportation to health facilities is expensive	5. Lack of qualified providers (doctors, nurses, dentists) 6. Pollution to natural environment 7. Lack of clean drinking water 8. Other (specify)
D.15	If members of your household are sick but do not seek medical care what are the primary reasons for not accessing medical care?	1. No need 2. Too expensive 3. Too far 4. Used herbs/ home remedy	5. Poor quality/service of healthcare facilities 6. Other (specify)
D.16	What is the **main** preventive measures do you take to combat malaria?	1. Bed nets 2. Insect Spray/coils 3. Netting on windows 4. Weeding around the house	5. Draining stagnant water 6. Burning orange peels and other 7. Other
D.17	Has the health of the people in your household generally improved, stayed the same or worsened over the past three years?	1. Improved 2. Stayed the same	3. Worsened 4. Don't know
D.18	In the last five years, have the adults in your household received educational information or materials about how to prevent Sexually Transmitted Illnesses (e.g., HIV/AIDS)?	1. Yes 2. No 3. Don't know	

D. HEALTH – Pregnancy and Maternal Health

<table>
<tr><td>D.19</td><td colspan="2">Have any members of your household given birth to a child in the last year.
If so, specify how many children were born.</td><td colspan="2">Number of births _________</td><td></td></tr>
<tr><td>D.20</td><td colspan="2">If you or someone in the household is a mother of a child(ren) under 5, where did you (she) give birth?</td><td colspan="2">1. At home
2. Local health clinic (specify name and distance)
3. Hospital (specify name and distance)
4. Other (specify name and distance)</td><td></td></tr>
<tr><td>D.21</td><td colspan="2">Did the member receive pre-natal care during the pregnancy?</td><td colspan="2">1. Yes 2. No</td><td></td></tr>
<tr><td>D.22</td><td colspan="2">Who in the household received pre-natal care during pregnancy?</td><td colspan="2">1. Female spouse
2. Female relative over 18
3. Female child under 17
4. Other female under 17
5. Female relative under 17
6. Other female over 18</td><td></td></tr>
<tr><td rowspan="3">D.23</td><td colspan="2" rowspan="3">What type of pre natal care did person receive?
1. Traditional Midwife
2. Hospital/clinic pre natal care</td><td colspan="2" rowspan="3">D.23a Why did they choose this option? (Yes or No)</td><td>Availability</td></tr>
<tr><td>Price</td></tr>
<tr><td>Quality</td></tr>
<tr><td>D.24</td><td colspan="2">Did the baby receive immunizations in the first year after birth?</td><td colspan="2">1. Yes
2. No
3. Don’t know</td><td></td></tr>
</table>

E. VULNERABLE GROUPS

<table>
<tr><td>E.1</td><td colspan="2">Is this a woman headed household?

1. Yes or 2. No</td><td colspan="2">E.1 b. If yes, is this a teenage mother?

1. Yes 2. No</td></tr>
<tr><td>E.2</td><td colspan="4">Is this household headed by teenage parents?

1. Yes
2. No</td></tr>
<tr><td>E.3</td><td>Are there any people over 60?

1. Yes 2.No</td><td></td><td>D6 What is the number of people over 60 who live in the house?</td><td></td></tr>
<tr><td>E.4</td><td colspan="4">Does anyone in the household have any disabilities that in anyway affect or prevent activities or work?

1. Yes ☐ 2. No ☐</td></tr>
<tr><td>E.5</td><td colspan="2">If yes, how many?
1. 1
2. 2
3. 3
4. 4
5. More than 4

List names, if necessary</td><td>E.6 a For each household member with disability, record the relation to household head: (As used in A3)

List below:</td><td>E6. b. Please state the disability of person

1. Blind
2. Deaf
3. Dumb
4. Physically handicapped (polio stricken, paralytic, maimed arms or legs)
5. Mentally challenged
6. Others (please specify)</td></tr>
<tr><td></td><td colspan="2"></td><td>1.</td><td></td></tr>
<tr><td></td><td colspan="2"></td><td>2.</td><td></td></tr>
<tr><td></td><td colspan="2"></td><td>3.</td><td></td></tr>
<tr><td></td><td colspan="2"></td><td>4.</td><td></td></tr>
<tr><td></td><td colspan="2"></td><td></td><td></td></tr>
</table>

F. HOUSING AND HOUSEHOLD ASSETS

F1	What type of dwelling is this? (observation)	1. Shack (0-30 m^2) 2. Low income housing (30-60 m^2) 3. Middle Class (60-100 m^2) 4. Luxury residence (above 120 m^2) 5. Shared dwelling 6. Other	
F2	What is the type of ownership of the dwelling?	1. Owner occupied 2. Rental 3. Ancestral estate 4. Sub-rental 5. Other	
F3	How many rooms does this dwelling have? (Do not count bathrooms, storage rooms, balconies/ patios)	Write number:	
F4	How many rooms are used for sleeping?	Write number	
F5	Condition of the dwelling according to the respondent	1. Good 2. Reasonable 3. Needs improvement 4. Poor	
F6	Materials of the walls and flooring	1. Dirt/mud 2. Concrete 3. Concrete Block 4. Wood 5. Other	
F7	Roofing Material	1. Thatch 2. Aluminum 3. Wood Shingles 4. Other	
F8	Main source of drinking water for the household	1. Piped, in the house 2. Piped, outside the house less than 200 m away 3. Piped, outside the house more than 200	5. Well, at a distance of 200 m or less 6. Well, at more than 200 m 7. Creek or river

		meters 4. rainwater collection tanks or drums	8. buy bottled water 9. Other (specify)
F9	Which type of toilet facility is mainly used by the household?	1. Water closet (flush toilet and septic tank) 2. Outhouse 3. River or Creek	4. Open pit or hole in the ground 5. no toilet facilities, on the ground 6. other (specify)
F10	Which is the main source of electricity, if any?	1. No electricity 2. Electricity connection to electricity company (EBS) 3. Electricity connection to Min NH and RO (Gov) 4. Electricity through neighbors 5. Own electricity generator 6. other (specify	
F11	If no electricity, what is the main source of lighting in the household?	1. Kerosene 2. Petro-lamp 3. Candles	4. Battery power 5. Diesel generator 6. Other
F12	What fuel do you use most for cooking?	1. Fire wood 2. Gas	3. Charcoal 4. Sawdust
F13	If firewood is used, do you buy it or collect/gather it one your own?	1. Buy 2. Collect/ gather	

F14 Do you have any of the following items

	1. Yes 2. No		1. Yes 2. No
a. Cell phone/mobile phone		l. TV	
b. Radio		m. Bicycle	
c. Tape recorder		n. Motorcycle	
d. Machete		o. Car	
e. Hoe		p. Truck	
f. Wheelbarrow		q. Bus	
g. Bed		r. Agricultural equipment	
h. Mattress		s. Other…	
i. Plastic furniture			
j. Wooden furniture			
k. Refrigerator			

F.15. On a regular basis, what are the top three most common ways your household gets around your community? (Pick three only)	1. By foot 2. Ride bicycle 3. Pay a boatman 4. Use my own boat	5. public bus 6. car 7. motorcycle 8. other

G AGRICULTURE

G1	Does the household have agricultural land and or is engaged in crop farming activities?	1. Yes 2. No **If NO, please SKIP this section and go directly to next section**
G2	No. of fields cultivated	(Write Number) ____________________________
G3	Size of each field (in acres)	G.3.1. First field : G.3.2 Second field : G.3.3 Third field : G.3.4 Fourth field :
G4	Location of each field (location, distance and time from household, neighbors)	G.4.1 First field G.4.2 Second field G.4.3 Third field G.4.4 Fourth field
G5	What are your land arrangements?	1. Family owns all land 2. Family owns some land, rents some 3. Rent the land for cash 4. Tenant farmer 5. Use the land for free (indicates that it is owned by an individual or family) 6. Community owned land 7. Other
G6	ONLY ANSWER THIS QUESTION IF THE LAND IS FAMILY OWNED If the land is shared with another household, do you	1. Share some land another household for free 2. Rent out all the land for cash 3. Rent out all the plot for a share of produce 4. Other (please specify 5. Does not share any land

G7	What is the primary crop your household plants?	

G. AGRICULTURE – Crops

	G8		G9		G10	G11	G12	G13
Crop code	What crops do you farm in a typical year on all your plots? 1. Yes 2. Mixed cropping		What is the average area of acres under this crop? 1. Less than 0.25 acre 2. Less than 0.5 acre 3. Less than 1 acres 4. 1-3 acres 5. 4-6 acres 6. more than 6 Productive/ not yet prod		What is the quantity of each crop that you harvest? (indicate unit of measure)	When do you plant this crop? (month)	How much of the (……) that you harvest in a year, do you normally consume? 1. All of the harvest (100%) 2. Three quarters of the harvest (75%) 3. Half of the harvest (50%) 4. Quarter of the harvest (25%) 5. Less than a quarter (10%) 6. None at all (0%) 7. Other (please specify)______________	What is the average income from the produce you sell in a month/ year? (calculate later) Rate x quantity = ___________
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18								
19								
20								
21								
22								
23								
	Total							

G. AGRICULTURE – Livestock

G14	Do you raise animals for subsistence or income? 1. Yes 2. No (IF no Skip to Next Section)				
G	G15	G16	G17	G18	
Animal code	Type of Animal	How many of each animal do you raise?	How many of the animals do you do you normally consume? 1. All of the Animals (100%) 2. Three quarters of the Animals (75%) 3. Half of the Animals (50%) 4. Quarter of the Animals (25%) 5. Less than 10% 6. None at all (0%) 7. Other (please specify)_______________	What is the average Income from the Livestock week/month? $……………… Rate x Quantity = Total	
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4					
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7					
8					
9					
10					
11					
Total	$				

G. AGRICULTURE – Technical Assistance

G19 Have you or any member of your household receive technical assistance on your farms over the past three years?	1. Yes 2. No **GO TO NEXT SECTION**	
G20 If yes, what is the nature of the technical assistance?	1. Extension services 2. Seed 3. Fertilizer 4. Credit 5. Market access 6. Other farm inputs	
G21 What organization or institution provided the technical assistance on your farm?	Name ______________	
G22. List members of your household who received technical assistance (Number should be taken from above (1=HH)	1. 2. 3. 4. 5.	
G23 How often is the technical assistance provided?	1. Regular 2. Irregular 3. A special one off package	

H. PRODUCE MARKETING AND CREDIT FACILITIES

H1	Where do you sell most of your crops/animals?	1. Not sold		
		2. Household		
		3. Nearby Market		
		4. Middleman 5. Other …………………		
H2	What is the distance between your house and where the majority of your crops/animals are sold?	1. on site		
		2. Less than ½ miles		
		3. From ½ to 1 miles		
		4. From 1 to 3 miles		
		5. From 3 to 5 miles		
		6. From 5 to 10 miles		
		7. 10 miles or more		
H3	How much time does it take you to transport your crops/animals to the place where the majority are sold?	1. Less than 5 minutes		
		2. Less than 1 hour		
		3. From 1 to 3 hours		
		4. From 3 to 6 hours		
H4	How do you transport crops/animals to where they are sold?	1. By boat		
		2. On foot		
		3. ATV		
		4. Public transportation		

		5. Truck		
		Other		
H5	During the last year how much did you pay to transport your crops/animals to the place of sale?	$……………………………		
H6	Who bought your crops from you?	1. Individuals in surrounding communities		
		2. Dock at Langatabiki or Snesi Kondre		
		3. Market outside the District		
		4. Co-operative Association (specify)		
		5. Middleman/ boatman 6. Other (specify ………………..) 7. Other (specify)………………………		
H7	Who takes your crops/animals to the place where the majority are sold?			
H8	When you sell your harvest/animals, how to you decide the price?	1. Buyers 2. Extension services 3. Radio 4. TV 5. Newspaper	6. Neighbors 7. Self/ Household members 8. Input distributor / store 9. Community members 10. Other (specify)	
H9	Does any member of the household have access to credit?	1. Yes 2. **No (skip this section)**		
H10	Who in the household has access to credit?	1. Head of household 2. Spouse 3. HH+Spouse 4. Female child 5. Male child	6. Female relative 7. Male relative 8. Other male 9. Other female 10. Other	

H11	Who has in the past has accessed credit?	1. Head of household 2. Spouse 3. HH+Spouse 4. Female child 5. Male child	6. Female relative 7. Male relative 8. Other male 9. Other female 10. Other
H12	What kind of credit did (s) he obtain?	1. Cash 2. Input credit 3. Other (specify)	
H13	From where did (s) he obtain the credit?	1. Relations/friends 2. Money lenders 3. association 4. NGO or project 5. Rural bank	6. Group saving and credit 7. Bank (not rural) 8. DA Poverty fund 9. Other
H. 14	Did someone in your household ask for a credit or a loan and did not get it?	1. Yes 2. No	
H.15	What was the reason that they were rejected?	1. too risky of a loan 2. too much money requested 3. inadequate funds available 4. other	

I. NATURAL RESOURCES: Water

I. 1	What is your source of drinking water/cooking water? (Does it differ from the dry to the rainy seasons?)	1. Rain, 2. river (name) 3. ground 4. creek water (name)	
I. 2	Do you consume it directly from the source or is there a treatment involved?	1. Direct 2. Treatment (explain)	
I.3	For what purposes do you use the other sources if it is not for drinking or cooking water?	Specify____________	
I. 4	Do you and other community members fetch water from this current source all year round?	1. Yes 2. No	
I. 5	If No which period is it not possible to fetch water from the source?	1. Feb – April (Short Dry) 2. May – July (Large Rainy)	3. Aug – October (Long Dry) Nov- Jan (Short Rainy)
I.6	Why is it not possible to get water from the source during this period?	1. Broken down equipment	3. Pollution 4. Lack of rain

		2. Not yielding water (Dry)	5. Do not know 6. Other
I.7	***If you*** answered ***3, what do you think is the source of this pollution?***	1. Animal refuse/ carcasses 2. Dust/ air pollution 3. Low water table	4. Rainy season run off 5. Small scale mining Other

I. NATURAL RESOURCES: Hunting and Fishing

I.8	Do you hunt? If so, what animals do you hunt?	Name animals_______ - - -
I.9	How often do you hunt	1. More than once a week 2. Once a week 3. Once every two weeks 4. Once a month 5. Once every three months 6. Other
I. 10	Where do you hunt?	
I.11	What do you do with the animals that you hunt?	1. consumed by household 2. sold 3. other____ specify
I.12	Are there any animals that you used to hunt that are no longer present? And Why?	
I.13	Do you fish? If so, which fish do you catch?	Name fish_______ - - -
I.14	Where do you fish?	
I.15	How often do you fish	1. More than once a week

		2. Once a week 3. Once every two weeks 4. Once a month 5. Once every three months 6. Other
I.16	What do you do with the fish that you catch?	1. consumed by household 2. sold 3. other____ specify
I.17	Are there any fish that you used to catch that are no longer present?	
I.18	How have your hunting and fishing habits changed over the last ten years?	

I. NATURAL RESOURCES: Forest Products

I.19	What products do you use from the forest? 1. Yes 2. No	Firewood		
		Wood		
		Herbs / traditional medicine		
		Mushrooms		
		Snails		
		Local sponge		
		Canes for basket weaving		
		Other		
		Other		

I.20	If you collect herbs what are the names and what are they used for?

Herbs	Used for:

I.21	Are there any forest products you used to utilize that are no longer available?	Specify_________________________
I.22	Has the quality of the environment changed over the last ten years?	1. Became better 2. Stayed the same 3. Became worse
I. 23	What forest do you collect these products from?	

J SMALL SCALE MINING

J.1	In the past year, have you seen more, the same or less small-scale mining near activities near your community?	1. More 2. The same 3. Less 4. There is none	
J.2	Has small-scale mining been beneficial or detrimental to your community?	1. Beneficial 2. Negative 3. Has not affected community	
J.3	Do you know of any problems related to small scale mining in the area? (do not prompt)	1. Contamination of rivers 2. Degradation of soil/land 3. Deforestation 4. Health risks 5. Community safety concerns 6. Safety risks to small scale miners/laborers 7. Increase of outsiders involved in mining 8. Increased social tension 9. Negative social practices (alcohol, drugs, prostitution, etc) 10. Other (specify)	
J.4	From your perspective, what are the positive aspects of small scale mining in the area? **(do not prompt)**	1. Source of income 2. Defining cultural characteristic 3. Source of livelihood/economic growth 4. Artisanal jewelry/crafting of gold 5. Set up shops 6. Other (specify)	
Additional Comments (record if any):			

K FOOD SECURITY

K.1	Do you consume any of the produce you grow?	1. Yes 2. No	
K.2	Did your last season harvest take you through the year?	1. Yes 2. No	
K.3	*WHAT WAS THE REASON WHY YOUR HARVEST DID NOT TAKE YOU THROUGH THE YEAR?*	1. Flood/heavy rains prevented early cultivation 2. Drought 3. Pest/diseases destroyed the farm 4. Bush fires destroyed crops on the field before harvest	5. For unexpected reasons farmer needed to sell crops (unable to consume). 6. Small farm size 7. Other, specify
K.4	Which period did your last season harvest run out?	1. Between Oct – Dec 2. Between Jan – Mar	3. Between Apr-June 4. Between Jul-Aug
K.5	How long will your current harvests last?	. ………… Months	
K.6	Why do you expect a food shortage?	*1. FLOOD/HEAVY RAINS MAY PREVENT EARLY CULTIVATION* 2. Drought 3. Pest/diseases may destroy the farm 4. Bush fires may destroy crops on the field before harvest 5. Inadequate Storage facilities 6. Limited land 7. Other (specify)	
K.7	Did your household buy food crops last year?	1. Yes 2. No	
K.8	If yes, how many months?	Number of Months	________________
K.9	What kind of food did your household mostly buy last year?	1. 2. 3.	4. 5. 6.
K.10	Who in the household is primarily responsible for buying the household's food crops?	1. HH 2. Spouse 3. As a household 4. Female child	6. Female relative 7. Male relative 8. Other male 9. Other female

		5. Male child	

L. TOTAL HOUSEHOLD INCOME

	Item:	Calculations	Total
Basic necessities			
L1			
L2			
L3			
L4			
L5			
L6			
L7			
L8			
L9			
L10			
L11			
L12			
L13			
L14			
L15			
L16			
L17			

L18			
L19			
L20	TOTAL		

Note: please consider ALL of the following possible sources of income: agriculture, fishing, animal husbandry, trade out of home, arts and crafts, trade, small scale mining, forestry, transportation, service industry, construction, traditional healing, performing artist, pensions, rental income, investments, wage/employment, business, or any other source of income

M. HOUSEHOLD EXPENDITURE

	Item:	Calculation	Annual
Basic necessities		(*indicate currency)*	*(indicate monthly or annually)*
M1	Water		
M2	Food		
M3	Shelter/ housing		
M4	Electricity		
M5	Cooking Fuel/Firewood		
M6	Clothing		
M7	Other		
Health			**Amount**
M8	Healthcare Services		
M9	Medicine		
M10	Transportation		
M11	Other		
Education			**Amount**
M12	Fees (tuition and boarding)		
M13	Uniforms		
M14	Stationary/ Books		
M15	Other		
Agricultural and Animal Husbandry			**Amount**
M16	Seeds		
M17	Agricultural inputs (total)		
M17a	-fertilizer		
M17b	-fungicide/insecticide		
M17c	-other		

M18	Equipment		
M19	Food for animals		
M20	Medicine for animals		
M21	Hired Labor - agricultural/ or other support (total		
M21a	Daily Wage Paid______		
M21b	# of days hired _____		
Other			**Amount**
M22	Entertainment		
M23	Loans		
M24	Associations (ie religious)		
Transportation			Amount
M25	Public		
M26	Taxi		
M27	Bicycle		
Communication			Amount
M28	Postal		
M29	Telephone		
M30	Cell phone		
Cultural Activities			Amount
M31	Birth/Funeral		
M32	Wedding		
M33	Religious		
M34	Other		
M35 TOTAL EXPENDITURE			

N SAVINGS AND FINANCIAL ASSISTANCE

N SAVINGS & FINANCIAL ASSISTANCE			
N1	Does your household have cash savings?	1. No savings. 2. Yes all in Bank none at home 3. Yes all at Home none in bank 4. Some at home, some at bank 5. Non bank financial institution e.g. NGOs, etc. 6. Other	
N2	Does your household currently have a loan? (Cash)	1. Yes 2. No	
N3	If yes, state specific facility 1. Bank 2. Private individual 3. Group membership 4. District Assembly 5. NGO (name)……………………………………………….…… 6. Other (specify please)…	……………………………….………..	

O. STANDARD OF LIVING: PUBLIC AMENITIES

O.1	Very good (1)	Good (2)	Satisfactory (3)	Not very good (4)	Very Bad (5)
a. Education: availability					
b. Education: standards					
b. Health/ Medical services: availability					
c. Health/ Medical services: quality					
d. Local transportation links: Road/ boat					
e. Local transportation links: Availability					
f. National transportation links: Road quality					
g. National transportation links: Availability)					
h. Fuel availability					
i. Electricity /other power sources availability/consistency					
j. Telecommunications					
k. Piped water					
l. Sanitation facilities (sewage, wastewater, drains etc.)					
m. Price fluctuates for basic goods					
n. Law and order					
o. Entertainment / recreation					
Comments: (record if any)					

O. STANDARD OF LIVING: Changes

O.2 In your opinion how has the standard of living for your household changed in the last three years?	1	Same	2	Better	3	Worse

O.3 Major contributing factor: where possible choose option below for the reason (improvements):	1. Change in employment 2. Harvests have increased. 3. Change in number of people working in the household 4. Medical care	5. Education 6. Access to electricity/infrastructure/ and telecom Access to water 7. Technical Assistance (previously received) 8. Others (please specify)
O.4 In your opinion, would you say that the cost of education is affordable?	1. Yes, affordable 2. No, not affordable	
O.5 In your opinion, would you say that the cost of health is affordable?	1. Yes, affordable 2. No, not affordable	
O.6 What do you most like about your neighborhood/ community?	1. The natural environment 2. Infrastructure and services 3. Location 4. Existing livelihoods 5. Existing relationships/solidarity/community networks	6. Options of income resources 7. House 8. Other (Specify)
O.7 What are your greatest concerns living in this area?	1. Employment 2. Drinking Water 3. Poor Infrastructure (Roads) 4. Poor Sanitation 5. Health services 6. Flooding 7. Land degradation	8. Pollution 9. Change in lifestyles 10. Influx of outsiders 11. Electricity 12. Crime 13. Other
O.8 What are your greatest concerns about the future of your community?	1. Land degradation 2. Pollution 3. Change in lifestyles 4. Influx of outsiders	5. Increasing cost of living 6. Employment 7. Crime 8. Other (please specify)
O.9 How has the population of your community changed over the last five years?	9. Increased Significantly 10. Slightly increased 11. Stayed the same	12. Slightly Decreased 13. Decreased significantly

P. PROJECT PERCEPTIONS

P.1	Which of the following most closely describes how Surgold's operations have affected the lives of people in the district in the last five years?	1. Substantial improvement 2. Some improvement 3. Little or no difference	4. People are a little worse off 5. People are worse off 6. Don't know
P.2	Do you know of any problems with Surgold being in the district? (do not prompt)	1. Pollution/ destruction of natural environment 2. Detracts from the beauty of the place 3. Threats to the health/safety of the workers 4. Threats to the health/safety of nearby communities 5. Noise and other discomforts 6. Displacement or relocation of residents 7. Decrease in social harmony	8. Destruction of traditional economic activities such as farming and fishing 9. Crime 10. Undesirable changes in lifestyle 11. Increased traffic 12. Deterioration of infrastructure 13. Decline in utilities 14. Too many jobs for workers from other areas 15. Other 16. No major problems 17. Don't know
P.3	What do you see as any advantages of Surgold being in the district? (do not prompt)	1. Creation of more jobs 2. New income earning opportunities for locals 3. Opportunities for locals and other nationals to acquire more skills 4. Rise in property values 5. Brighten up/ modernize the appearance of the place 6. Introduce new populations or neighborhoods that would increase social prestige	7. Opportunity for displaced persons to achieve a higher accommodation standard 8. Communities benefit from infrastructure improvements 9. Communities benefit from improvements in utilities 10. Companies' assistance to local communities 11. Benefits to national economy 12. Other 13. None 14. Don't know
P.4	Do you or other family members use the area proposed for the mine site for any reason?	1. Agriculture 2. Hunting 3. Fishing	4. Small scale mining Cultural activities? 5. Other

P.5	When it comes to the protection of your interests where major companies are involved, which organizations or agencies do you have confidence in?	1. District Government 2. Other governmental agencies 3. Local representatives/ captains	4. Environmentalist groups 5. Existing community organizations 6. Courts of Law 7. Other
P.6	Do you or any of your family work or have worked for Surgold?(specify details) Name ______________ Period ______________ Are you still employed (yes or no) ______________ ______________ ______________ ______________		
P.7	What concerns do you have specifically about the Project? *(if possible code responses later)*		
P.8	What has been the history of the interaction of your neighborhood/ community with Surgold? 1. Surgold has invested in community development projects here ______________ □ 2. The community appreciates the development projects ______________ □ 3. We have had little or no interaction with Surgold over the years ______________ □ 4. Any other: ______________		
P.9	What recommended actions would you want the company (Surgold) to take to address your concerns, meet your expectations? 1.Provide information and advice to residents on potential opportunities for jobs or providing services □ 2. More communication with the residents □ 3. Train community members to take advantage of income-earning opportunities (jobs and services) □ 4. Assist in the construction and maintenance of community facilities □		

	5. Provide other community services □ : ____ 6. Provide relevant information on how the changes in project activities affect the physical environment and the lives of the people □ 7. Meet highest standards for the protection and maintenance of the physical environment □ 8. Other □ _________________	
P.10	What is the best method Surgold can use to provide you with any information about the company itself or the proposed project activities?	1. Written handouts in the community 2. Accessible information centre in the community 3. An information hotline 4. Public meetings 5. Informal meetings with community representatives 6. Reference to website 7. Other
P.11	Have you ever submitted a grievance to Surgold?	1. Yes 2. No
P.12	If you have submitted a grievance can you tell us the nature of the grievance you submitted?	
P.13	If you have not submitted a grievance, have you ever wanted to? If so, explain. And explain why you didn't inform Surgold.	1. Yes 2. No
P.14	Do you have any other comments, questions, or concerns?	
	---If so, describe briefly __________	

Additional Comments:

Appendix 14 - E

Social Baseline Data Collection Methodology

1.0 SOCIAL DATA COLLECTION METHODOLOGY

1.1 INTRODUCTION

This section describes the methodology applied to collect data used to compile the social baseline. The social baseline has been compiled from a combination of primary and secondary data sources and this section will describe the techniques used to gather this information including:

- Quantitative data collection in including household surveys; and
- Qualitative data collection including:
  - Focus Group Discussions (FGDs);
  - Participatory Rural Appraisal (PRA) or Participatory Learning and Action techniques (PLA); and
  - Key Informant Interviews.
- Desk-top review of secondary sources.

The following sections outline the methodology used to gather the qualitative and quantitative data.

1.2 HOUSEHOLD SURVEY

In order to develop the social baseline for the Merian Project ERM used household survey data. Household surveys were predominantly applied in order to gather quantitative primary data regarding the demographics, socio-economics etc. of settlements affected by the Project.

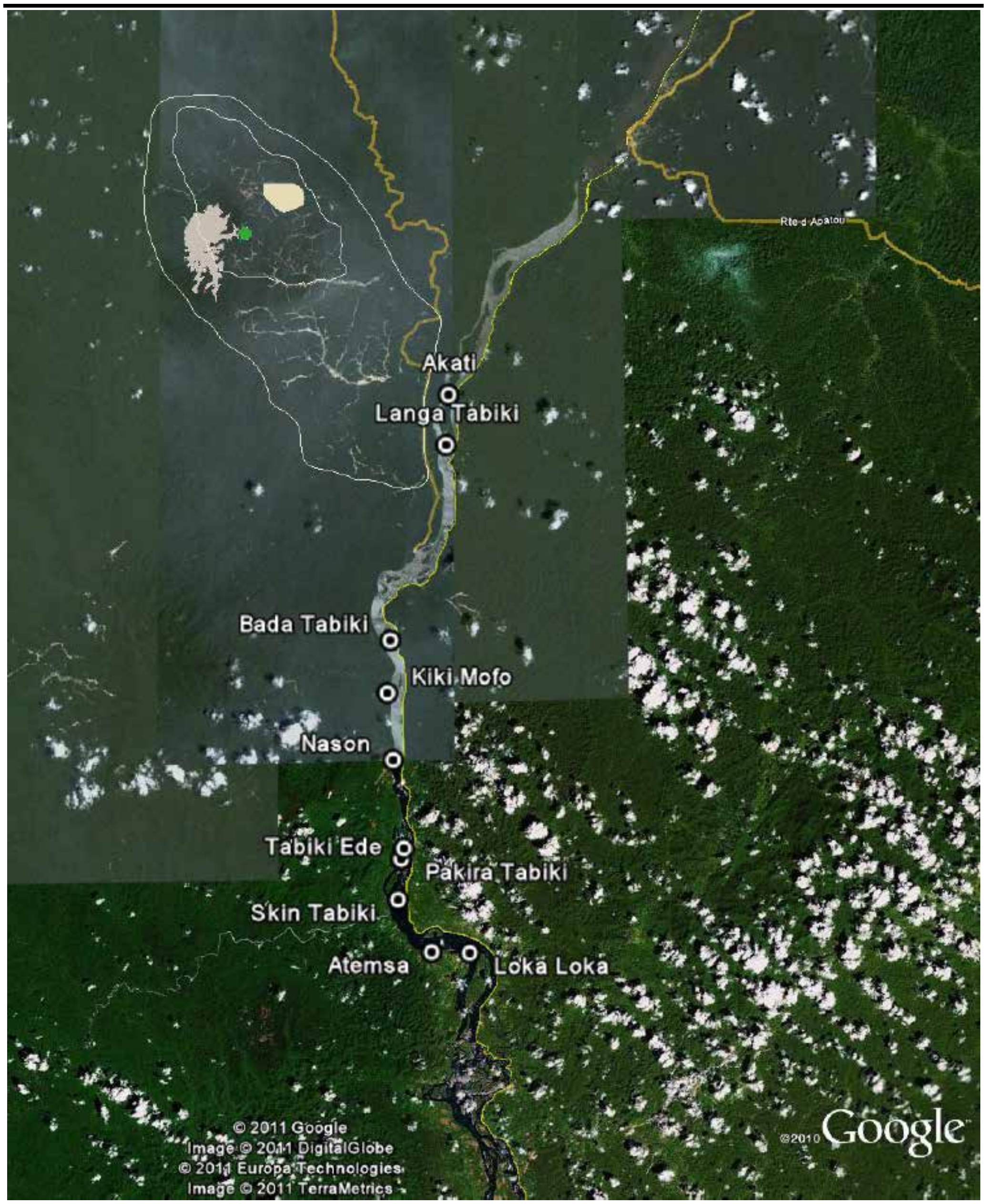
Household surveys were gathered from Pamaka communities along the Marowijne River, and in a series of small settlements surrounding the outskirts of Moengo. Household surveys were not applied in all geographic areas of impact, such as along the transportation route and within Moengo. This decision was based on the impact scoping process and the analysis of data required to assess impacts. In addition the availability of more accurate secondary data for Moengo, parts of the transport corridor and Paramaribo meant that household survey primary data collection was unnecessary.

Household surveys were applied at the following settlements along the Marowijne River in the Pamaka area:

- Akati;
- Atemsa;
- Bada Tabiki;

- Kiki Mofo;
- Langa Tabiki;
- Loka Loka;
- Nason;
- Pakira Tabiki;
- Skin Tabiki; and
- Tabiki Ede.

Figure 1-1 shows the locations of these villages in proximity to the planned minesite.



Source: Google Earth, 2011

Figure 1-1 ***Settlement in the Pamaka Area***

The household data in the Pamaka Area was collected by ERM as part of the Suralco Nassau Plateau Bauxite Project Environmental and Social Impact Assessment (ESIA) process. This data was gathered during June 2010. Suralco agreed that ERM could use the primary data from this survey for the Merian Project ESIA as the potentially impacted settlements the along the Marowijne River were the same for both project.

ERM administered a total of 136 household questionnaires in these ten villages. The household was the unit of analysis, defined in terms of the members and structures associated with one shared kitchen. This definition is the most commonly understood definition of household in the study area. One household may therefore consist of multiple structures (sleeping quarters, storage areas, sheds, and a kitchen, etc) and does not necessarily represent one nuclear family.

There are an estimated 395 household structures in the villages surveyed. An estimated 40% of the total physical household structures are abandoned or permanently non-occupied. An estimated 60% of the total physical household structures are considered to be permanently occupied[1].

The survey covered 58.8% of all permanently occupied households and covered nearly 100% of residents present on the day of the survey in each village. *Table 1-1* shows a summary of the household survey including the number of households surveyed in each settlement.

Table 1-1 Household Survey Results and Population Estimates

		Permanently Non-Occupied Household (HH) Structures		*Occupied Household Structures*	*Survey Sample Size*
Name of Village	*Estimated Total Household Structures*	*Est. Non-Resident households in the interior (5% of total HH structures)*	*Est. Non-Resident households in Paramaribo or French Guiana (35% of total HH structures)*	*(60% of total HH structures)*	*(58.8% of Occupied HH structures)*
Akaati	3	0	0	3	**3**
Atemsa	40	2	14	24	**10**
Bada Tabiki	10	1	4	5	**5**
Kiki Mofo	57	3	20	34	**16**
Langa Tabiki	90	4	32	54	**33**
Loka Loka	50	2	18	30	**20**
Nason	58	4	20	34	**24**
Pakira Tabiki	10	1	1	8	**6**
Skin Tabiki	48	7	18	23	**11**

[1] Accurate at the time of survey application

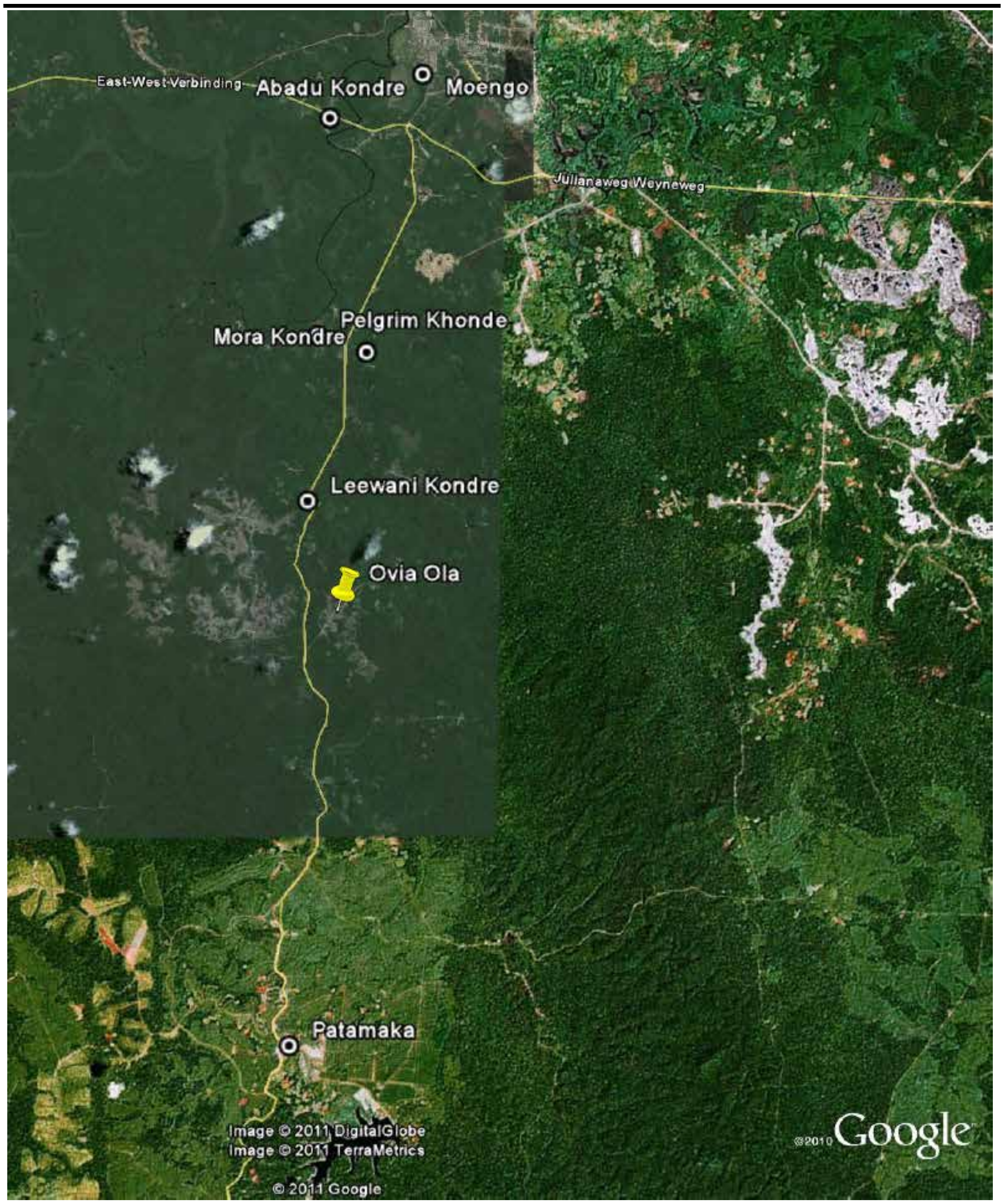
Tabiki Ede	29	1	12	16	**8**
Total	395	25	139	231	**136**

Source: ERM, 2010

In addition to the Pamaka villages along the Marowijne River the household survey was applied at the following villages south of Moengo at the junction of the Langa Tabiki – Moengo road and the Moengo – Paramaribo road:

- Mora Kondre;
- Kasaba Ondro;
- Ovia Olo;
- Kraboe Olo;
- Pilgrim Kondre; and
- Leewani Kondre.

Figure 1-2 shows the locations of these villages in proximity to the Moengo and the surrounding roads.



Source: Google Earth, 2011

Figure 1-2 *Settlements near to Moengo*

The household survey in the communities south of Moengo was undertaken between 17 September 2011 and the 27 September 2011. Upon arrival in each community the team was introduced to the village Captain to explain the purpose of their visit and seek permission to carry out the proposed activities in the village. The team's proposed activities were approved in all villages, and villages Captains and Leaders were supportive of the purpose and methodology of the study. The distribution of the household surveys is described in *Table* 1-2.

Table 1-2 Household Survey in the Moengo Area

Village	*Permanently Occupied Household Structure (Estimated)*	*Sample Size (Occupied Household)*		
		Female Headed Households	*Male Headed Households*	*Total Households*
Kasaba Ondro	7	1	1	2
Ovia Olo	35	14	2	16
Mora Kondre	22	5	0	5
Pelgrim Kondre	6	1	1	2
Kraboe Olo	16	6	1	7
Leewani Ondre	5	1	0	1
Total	**91**	**28**	**5**	**33**

A copy of the household survey applied in included in Appendix 14 -D.

QUALITATIVE DATA COLLECTION

In addition to the household survey ERM conducted a series of qualitative data collection through a variety of methodologies including:

- Focus Groups Discussions (FGDs) with specific gender groups;
- Participatory Learning and Action (PLA)/ Participatory Rural Appraisal (PRA); and
- Semi-structured Key Informant Interviews (KII) with relevant stakeholders.

The aim of this qualitative data collection was to triangulate and contextualize the quantitative data through an improved understanding of attitudes and perceptions in potentially impacted communities. *Figure 1-3* shows an example the type of participatory data collection used.

Figure 1-3 Participatory Community Mapping in Bada Tabiki

Table 1-3 and summarizes the qualitative data collection that was undertaken as part of the ESHIA.

Table 1-3 Pamaka Area Qualitative Data Collection

Location	*Data Collection Methodology*	*Stakeholders Involved*	*Date*
Akati	Focus Group Discussion	Mixed group of residents; approximately two male and one female resident	24/10/2011
Akaati	Focus Group Discussion	Elders – one woman and two men	23/10/2011
Langa Tabiki	Focus Group Discussion	Men's Group -approximately ten male residents and five female residents	23/10/2011
	Key Informant Interview	Medical staff at health post	
Bada Tabiki	Focus Group Discussion	Mixed group of approximately four men and three women	24/10/2011
Evert Kondre Porknocker Camp	Key Informant Interview	Local Captain and advisor	25/10/2011
Rene Kondre	Key Informant Interview	Local Captain	25/10/2011
Kiki Mofo	Focus Group Discussion	Mixed group of approximately five men and three women	26/10/2011

Location	*Data Collection Methodology*	*Stakeholders Involved*	*Date*
Nason	Focus Group Discussion	Mixed group of approximately four men and three women	26/10/2011
	Key Informant Interview	Medical staff at health post	
Tabiki Ede	Focus Group Discussion and Participatory Rural Appraisal	Men's Group – approximately six men Women's Group –approximately 6 women	27/10/2011
Pakira Tabiki	Focus Group Discussion	Mixed group of approximately two men and two women	27/10/2011
Skin Tabiki	Focus Group Discussion	Women's Group – approximately four women and two men	27/10/2011
Atemsa	Focus Group Discussion	Mixed group including approximately six men and four women	28/10/2011
Loka Loka	Key Informant Interview Focus Group Discussion	Local Captain and two local men Women's Group – approximately 8 women	28/10/2011
Ovia Olo	Focus Group Discussion	Women's Group	09/2011
Leewani Kondre	Focus Group Discussion	Women's Group	09/2011
Patamaka	Focus Group Discussion	Women's Group Youth Group Men's Group	09/2011
Snesi Kondre	Key Informant Interview	Police Chief	10/08/2010
Nason	Focus Group Discussion	Teachers at Nason School	08/08/2010
Paramaribo	Semi-Structured Interview	Representatives of Conservation International (CI)	12/08/2010
Paramaribo	Semi-Structured Interview	Representatives of the World Wildlife Fund (WWF)	12/08/2010 And 01/11/2011
Paramaribo	Semi-Structured Interview	Manager, Suriname Environment and Mining Foundation	01/11/2011
Paramaribo	Key Informant Interview	Independent Anthropologist	12/12/2011
Paramaribo	Key Informant Interview	Human Resources contractors	13/12/2011
Paramaribo	Key Informant Interview	Interviews with 2 independent anthropologists	14/12/2011
Moengo	Semi-structured Interviews	Interviews with two local business owners and a shop worker	14/12/2011
Moengo	Key Informant Interview	Department of Social Affairs and Housing	15/12/2011
Moengo	Semi-structured interview	Monrovian Church	15/12/2011
Commewijne	Key Informant Interview	Department of Public Works	15/12/2011
Paramaribo	Key Informant Interview	Labour Inspectorate	16/12/2011
Paramaribo	Key Informant Interview	Minister for Transport, Communications and Tourism	16/12/2011
Paramaribo	Key Informant Interview	Community Relations Superintendent, IAMGOLD	16/12/2011
Paramaribo	Key Informant Interview	Interview with 2 Captains and one community representative from the Commewijne area	17/12/2011
Paramaribo	Key Informant Interview	Minister for Regional Development	19/12/2011
Paramaribo	Semi-structured interview	Leader VSG	19/12/2011

Location	Data Collection Methodology	Stakeholders Involved	Date
Paramaribo	Key Informant Interview	Head of Interior Education	19/12/2011
Paramaribo	Semi-structured interview	Maroon Woman's Network	19/12/2011
Paramaribo	Key Informant Interview	Community Relations, Suralco	19/12/2011

An outline of the FGD and KII is templates included in Appendix 14 –B and 14-C.

Health Data Collection

Between 12 and 16 December 2011, ERM conducted key informant interviews with personnel from public health agencies, community health NGOs and healthcare facilities in order to:

- Provide an update on project and study information to stakeholders;
- Carry out focused consultations on specific health topics (e.g., public health conditions and trends, healthcare infrastructure capacity and challenges, etc) to inform and validate the baseline and identify key issues;
- Elicit stakeholder questions, concerns, and expectations around the project and the mining industry; and
- Discuss potential mitigation/ enhancement measures.

Table 1-4 provides a summary of the health field data collection conducted in Paramaribo and Moengo.

Table 1-4 ***Summary of Health Data Collection***

Location	Data Collection Methodology	Stakeholders Involved	Date
Paramaribo	Key Informant Interview	Medical Office of Labour Inspectorate,	
Ministry of Labour	12/12/11		
Technological Development and Environment Paramaribo	Key Informant Interview	Medical Mission Headquarters Administration	12/12/11
Paramaribo	Key Informant Interview	Regional Health Services (RGD) Headquarters Administration	12/12/11
Paramaribo	Key Informant Interview	Academic Hospital	12/15/11
Paramaribo	Key Informant Interview	Ministry of Health's National Malaria Program	12/15/11
Paramaribo	Key Informant Interview	Stop Violence Against Women Foundation	12/15/11
Paramaribo	Key Informant	Ministry of Health's National AIDS	12/16/11
Paramaribo	Interview	Program	12/16/11

Location	Data Collection Methodology	Stakeholders Involved	Date
	Key Informant Interview	Suriname Trade and Industry Association (VSB); Surinamese Business Coalition Against HIV/AIDS; and IAMGold	
Paramaribo	Key Informant Interview	Neuropsychologist	12/16/11
Moengo	Key Informant Interview	Regional Health Services (RGD) Clinic	12/13/11
Moengo	Key Informant Interview	Suralco Polyclinic	12/13/11
Moengo	Key Informant Interview	Moengo Police	12/13/11
Moengo	Key Informant Interview	Lobi Foundation Clinic	12/13/11

LIMITATIONS

The data collection process experienced the following limitations:

- The impartiality of the data collection team was questioned by communities in the Pamaka Area due to the fact that Surgold were providing some logistical and accommodation support for part of the fieldwork. Although this was not specifically mentioned elsewhere it may have been a concern for stakeholders. The ERM team tried to manage logistics however this was not always possible.

- Despite efforts to organize meetings in advance communities in the Pamaka area indicated that they were not informed of the dates of meetings and the turnout for meetings was low.

- A number of social studies have been undertaken in the Pamaka area over the past couple of years and research participants showed some signs of research fatigue, including a reluctance to repeat answers and discuss issues they felt had already been spoken about before.

- There may be inaccuracies in data collected due to the assumption that stakeholders consulted will have their own agenda and may amend information during the data collection to protect their own interests.

- Household survey data was collected during 2010. Since the data was collected a significant number of porknockers have left the Industrial Area (IA) within the Surgold concession, potentially affecting the socio-economic environment characterized by the baseline.

- The household survey was not applied in PK camps due to health and safety concerns and the fluid nature of their living status and the high levels of movement that are understood to exist. This may result in an inaccurate representation of certain socio-economic information.

- The census data for Suriname was collected during 2005 and has not been updated since meaning that it may no longer accurately represent the social environment in the country.

- Availability of national stakeholders, including government ministers and civil service departments, was limited during fieldwork carried out in December 2011. This was because the government was in the process of planning the national budget and was also shortly breaking for the Christmas period.

Appendix 14-F
Draft Stakeholder Engagement Plan

Draft Stakeholder Engagement Plan Merian Gold Project

Environmental Resources Management
One Beacon Street
5th Floor
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1.0 *STAKEHOLDER ENGAGEMENT PLAN*

1.1 *INTRODUCTION*

This Stakeholder Engagement Plan (SEP) has been prepared by Environmental Resources Management (ERM) for Suriname Gold Company, LLC (Surgold), a limited liability company owned by Newmont Mining Corporation and Alcoa Worldwide Alumina, LLC. Newmont is the manager of Surgold, which owns and operates the Merian Gold Project (the Project).

This SEP has been developed as part of the Environmental and Social Impact Assessment (ESIA) for the Project. This plan covers stakeholder engagement activities during the ESIA only, and is part of a wider process of stakeholder engagement that will be taken forward through Project planning, pre-production, production, and closure.

This document has been regularly updated throughout the lifetime of the ESIA process and this is the final version of the ESIA SEP.

This SEP sets out the methods that were used to develop a broad, inclusive and continuous process of engagement between Surgold and its stakeholders[1], as facilitated by ERM, throughout the lifetime of the ESIA process.

Stakeholder engagement refers to a process of sharing information and knowledge, seeking to understand and respond to the concerns of potentially impacted or affected individuals, and building relationships based on trust. As such, stakeholder engagement is essential for the successful implementation of the ESIA and the Project itself.

1.1.1 *Project Background*

The Merian Gold Project is located in the north-eastern part of Suriname, approximately 60 kilometers (km) south of the town of Moengo and about 40 km north of the Nassau Mountains. The project area is accessed by the Moengo-Langa Tabiki Road (see Figure 1-1).

The Project exists in an entirely rural environment surrounded by tropical humid rainforest. Demographically the area is majority Pamaka Maroon with some Brazilian and non-Pamaka Surinamese migrants. Nearby villages are spread along the Marowijne River. The nearest permanent population occurs on Langa Tabiki Island and numbers approximately 500 people. This settlement is roughly 15 km by road from the Project.

Please refer to Chapter 3 Project Description for a full project description.

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[1] Stakeholders include anyone who has the potential to impact or could be impacted by Newmont's activities such as shareholders, employees, local communities, contractors and suppliers, governments, non-governmental organizations, minorities, indigenous people and vulnerable groups.

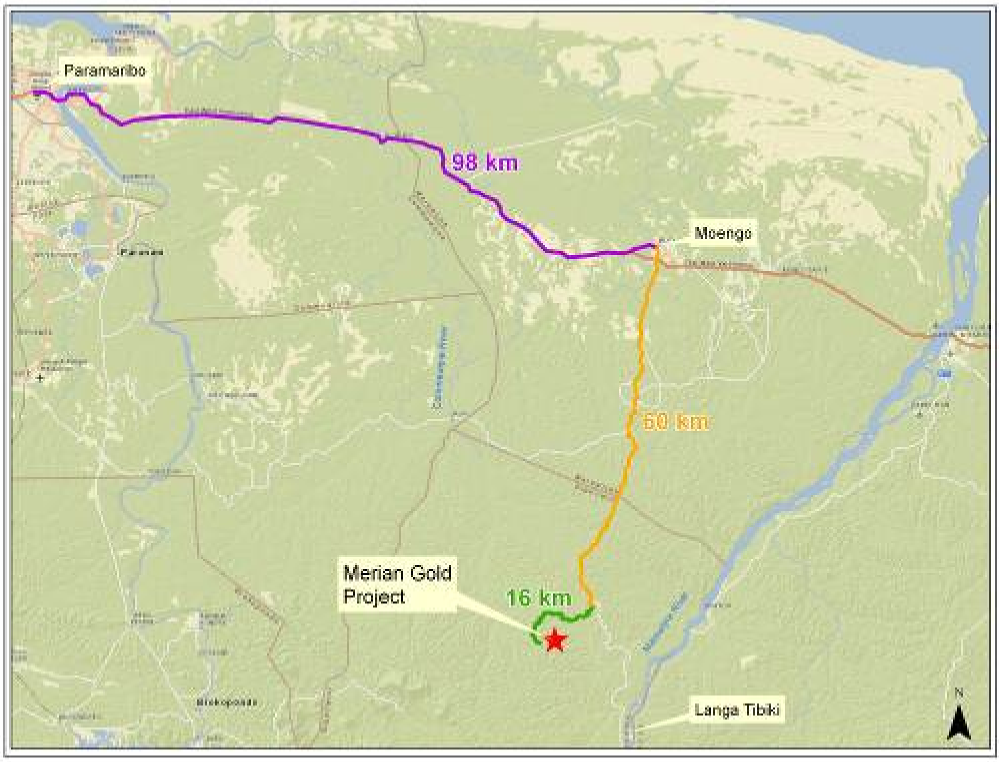

Figure 1-1 *Merian Project Location*

1.1.2 *Geographic Scope*

This section describes the geographic scope of predicted social and health impacts, which was used to inform the scope of engagement and consultation activities. The geographic scope of predicted social and health impacts is as follows:

- **National Impacts**. The Project will have some national level impacts and as such certain national and international institutions have been involved in the consultation process.

- **Pamaka Area**: This includes the area surrounding the Mine Site, the villages along the Marowijne River (the nearest permanent human settlements) and the Artisanal and Small Scale Mining (ASM) camps or mine sites within 11km of the Project Industrial Zone. This area is included based on proximity to the Industrial Zone and the prediction that human receptors in this area risk being directly affected by significant socio-economic or health related project impacts

- **Moengo Area:** This includes the town of Moengo where project related migration influx is a risk and could lead to indirect socio-economic or health impacts in the area.

- **Tempati and Commewijne Area:** This includes the river corridor downstream of the TSF including the populated areas along the Tempati

Creek[1] and Commewijne River. This area is included based on the risk of releases of tailings downstream; and

- **Transportation Corridor:** This includes the linear area along the East-West Highway between Paramaribo and Moengo and the Langa Tabiki Road that runs from Moengo to the area on the bank of the river opposite Langa Tabiki. This includes the small communities south of Moengo including the villages of Mora Kondre and Pelgrim Kondre along the Moengo - Langa Tabiki road. This area is included based on the risk of traffic related disturbances and health and safety risks caused by project vehicles.

The geographic scope of the anticipated impacts and the social study area is discussed in greater detail in ESIA Chapter 14 Social Baseline.

1.1.3 Aims and Objectives

The aim of the SEP has been to ensure a consistent, comprehensive, coordinated and culturally appropriate approach to engagement throughout the ESIA, committed to an 'international best practice' model, which encourages participatory, open and honest dialogue with all stakeholders.

The stakeholder engagement process is based on the free prior and informed consultation of stakeholders to ensure their informed participation. This can be understood to be defined as:

- **Free**: engagement is free of external manipulation or coercion and intimidation;
- **Prior**: engagement is undertaken in a timely way, for example the appropriate disclosure of information;
- **Informed**: engagement is enabled by relevant, understandable and accessible information; and
- **Consultation:** affected communities are provided with opportunities to express their views on project risks, impacts and mitigation measures. These will be considered and responded to throughout the engagement process.

The SEP has been a 'live' document, being updated and adjusted throughout the ESIA process. It has provided a framework to facilitate and manage effective and meaningful engagement with key stakeholders.

This process of stakeholder engagement aims to:

[1] Tempati Creek is a large tributary in the upper reaches of the Commewijne River watershed and is also referred to as the Commewijne River in Chapter 9, Water Resources Baseline.

- Identify and gain an understanding of key stakeholders and ensure they are included within the engagement process. This stakeholder analysis is used to inform engagement and communications planning, impact assessment, conflict management processes and community investment plans.

- Ensure local understanding of the Project; the stakeholder engagement process should generate a good understanding of the project amongst stakeholders and ensure that they understand the potentially harmful environmental and social impacts of the project.

- Establish the transparency of Surgold's activities to stakeholders. This is achieved by facilitating an open and inclusive approach to engagement providing timely and transparent information on the project to all stakeholders.

- Provide an outline for consultation during the ESIA at the local, regional, national and international levels.

- Build trust between Surgold and its stakeholders. The stakeholder engagement process should improve Community Relations (CR) and increase the opportunity for stakeholders to provide comment on the project and to voice their concerns, regardless of their status.

- Ensure Surgold operates as a good neighbor at a local, regional, national and international scale and maintain Surgold's desire to act in a responsible and conscientious manner in all activities.

- Provide the mechanism for understanding and managing local expectations and possible misconceptions about the Project (e.g. about employment opportunities) and address community concerns.

- Gather baseline environmental, health and socio-economic data and verify the significance of predicted environmental, socio-economic and health impacts identified. This information will be also be used to identify ways to optimize local benefits that can be delivered throughout the project.

- Facilitate stakeholder consultation and seek their input to facilitate understanding of potential significant impacts and development of appropriate mitigation and management measures.

- Aid resource planning through identification of the level of resources required to implement the management plans and a procedure to monitor implementation.

- Establish a feedback mechanism ensuring affected stakeholders have the opportunity to voice their opinions through a transparent process and that the public's views on the project are taken into consideration by decision-makers.

1.2 THIS DOCUMENT

The remainder of this plan is structured as follows.

- Section 2: Stakeholder Engagement Standards explains the process and purpose of stakeholder engagement and outlines relevant standards for the ESIA engagement process.

- Section 3: Project Stakeholders provides an overview of the process followed to identify and define key project stakeholders.

- Section 4: Engagement Plan details the stakeholder engagement process followed to date, including disclosure and proposed on-going consultation.

- Section 5: Feedback Mechanism details the purpose and process for identifying and responding to stakeholder feedback.

- Section 6: Monitoring and Reporting presents an overview of the engagement reporting and monitoring requirements.

2.0 STAKEHOLDER ENGAGMENT STANDARDS

2.1 INTRODUCTION

Stakeholder engagement refers to a process of sharing information and knowledge, seeking to understand and respond to the concerns of others, and building relationships based on collaboration.

This SEP has been developed to adhere to the following national and international standards for engagement as part of an ESIA process:

- Newmont's corporate standards; Environmental and Social Responsibility (ESR) standards.
- National Institute for Environmental Development in Suriname (NIMOS) Guidelines for Environmental Assessment (2009).
- International best practice standards

2.2 NEWMONT STANDARDS FOR STAKEHOLDER ENGAGEMENT

In line with the overall ESIA, this SEP adheres to Newmont's Social Responsibility Standards in relation to Social Impact Assessment (SIA) and stakeholder engagement.

In addition the stakeholder engagement for the Merian ESIA has been developed to adhere to other Newmont documentation including *Beyond the Mine, Newmont Program on Stakeholder Engagement* (1) which states that each site is expected to:

- Develop and maintain a regularly updated map of its stakeholders, their concerns, and their interests in relation to the mine;
- Create opportunities for transparent and respectful engagement;
- Record and monitor expectations, commitments, and complaints; and
- Be responsive to concerns, resolving complaints and grievances (Newmont, 2009).

2.3 NIMOS STANDARDS FOR STAKEHOLDER ENGAGEMENT

NIMOS act as the Environmental Permitting Authority (EPA) for Suriname and has included recommendations for public consultation and disclosure within its environmental assessment guidelines (Volume 1, Second Addition, August 2009). A summary of the key recommendations included in these guidelines is provided in Box 2.2.

Box 2.1 ***NIMOS Environmental Assessment Guidelines - recommendations for public consultation and disclosure***

Public participation in Environmental Assessment process

- NIMOS will develop, with the assistance of international consultants, detailed regulations regarding the administrative procedures of the EA process, including public participation mechanisms and procedures."

Disclosure

- A summary of the EA (Environmental Assessment) study, in non-technical language, will be required; this summary report will be accessible at various easy-to-access locations, in the region where the project is proposed to be developed.
- During the review process, information regarding the major positive and negative impacts of the project, and the proposed mitigation measures will be disclosed in the media, via radio, newspapers and television by the proponent; full (complete) EA available at NIMOS.

Responding to stakeholder comments

- NIMOS will receive public comments and concerns regarding the project and forward them to be addressed by the applicant or by the EA team.

Public Hearing

- Optional: Prior to formal Public Hearings, smaller community-based meetings will be held at which local residents and other interested parties will be given the opportunity to discuss their concerns in the presence of NIMOS and representatives of the applicant (including the study team). Also in attendance will be spokespersons for government agencies and research establishments who also make representations to the EA if needed.
- The Public Hearing will be publicized in the media with a minimum of 15 business days in advance.
- To ensure that the affected people are able to participate in the hearing, the Public Hearing will take place in the most accessible location in the region where the project is going to be implemented.

Documentation

- The Applicant will record and include minutes of the Public Hearing in the project files.

Source: NIMOS Environmental Assessment Guidelines, 2009.

2.4 *INTERNATIONAL BEST PRACTICE*

Engagement for the ESIA has been guided by industry good practice including

- Making the assessment documentation or non-technical summary publicly available;
- Ensuring documentation is available for reasonable periods of time and in relevant local languages;
- Documenting the process and results of consultation; and
- Disclosing information early in the assessment process and on an ongoing basis.
- Free, prior and informed consultation of affected communities;

- Verification of broad community support for the project within the affected communities[1];
- Preparation of an action plan[2] derived from consultation;
- Disclosure of the action plan to affected communities and provision of periodic reports on its implementation;
- Disclosure of any updated measures and actions to address issues of concern to affected communities;
- More comprehensive and on-going information disclosure [3] and consultation with affected communities at a level commensurate with the project's risks and impacts; and
- A feedback mechanism by which people affected by the project can bring their comments, concerns and grievances to the project sponsor, in a culturally appropriate manner, for consideration and redress.

This SEP and the ESIA have been developed to be aligned to meet these best practice guidelines.

Consultation with Indigenous People and other Potentially Sensitive or Vulnerable Groups

Consultation with indigenous people (IP) and other potentially sensitive or vulnerable groups has a specific set of requirements performance standards. This section will explain the definitions of these terms in relation to the Project, and explain the requirements for consultation.

Maroon groups in Suriname typically identify themselves as a distinct cultural and ethnic unit, with their own associated language and identity. These identities are also generally recognized by neighboring ethnic groups.

The Pamaka are one of the smaller Maroon groups of Suriname, and could be considered linguistically, culturally and religiously distinct. In addition, their livelihoods and collective identities are characteristically dependent upon the natural resources within their 'clan lands'.

By Surinamese standards maroons represent one of the 'ethnic groups' officially recognized by the government of Suriname. Under an Inter-American Court of Human Rights ruling (2007) Maroons are considered as minority and tribal peoples – not same as indigenous but enjoying largely the same rights under international law.

Due to the potential vulnerability of indigenous people to socio-economic, bio-physical and cultural change, international best practice has laid out guidance for consultation with them, tailored to their potential vulnerabilities. *Box 2-6* lays out the requirements for consultation with these types of groups.

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(1) Broad community support is a collection of expressions by the affected communities, through individuals or their recognised representatives, in support of the project. There may be broad support even if some individuals or groups within the community object to the project.
(2) Included as part of the Environmental and Social Management Plan (ESMP)
(3) Moving away from consultation "at least twice" to ongoing and iterative consultation.

Box 2-2 ***Defining Indigenous People***

It should be noted that there are no universally agreed processes or definition for recognition and identification of indigeneity and that all classification of Indigenous People (and tribal peoples) therefore requires the use of professional judgment and reference to experience with the group in question.

In addition to potentially identified IPs the Project will also have potential impacts on other potentially vulnerable / marginalized or sensitive groups. *Box* 2-7 outlines a definition of vulnerable or sensitive groups.

Box 2-3 ***Vulnerable or Sensitive Groups***

Vulnerable or sensitive groups can be defined as individuals or groups who could experience adverse impacts more severely than others based on their vulnerable or disadvantaged status. This vulnerability may be due to an individual's or group's ethnicity, gender, language, religion, political views, dependence on natural resources, sickness or disability, or other factors

Sensitive human receptors may include a household, community or wider social group that has reduced access to:

- Diverse, legal productive livelihoods;
- Productive resources;
- Adequate services and infrastructure;
- Participate in political and civil institutions and decision making bodies; and
- Inclusive and cohesive communities.

Alternatively sensitive human receptors may also include a household, community or wider social group that has:

- Reduced health status;
- Low knowledge skills or education;
- Low financial resources;
- A strong independent cultural identity; and
- Few labor rights.

The social baseline documentation (see Chapter 14.7) has identified and discussed types of vulnerable groups.

3.0 PROJECT STAKEHOLDERS

This Chapter discusses the identification and analysis of stakeholders for the purposes of stakeholder engagement planning. For the purposes of this plan, a stakeholder is defined as any individual or group who is potentially affected by or can themselves affect the project or anyone who has an interest in the project and its potential impacts[1].

3.1 STAKEHOLDER IDENTIFICATION AND ANALYSIS

The objective of stakeholder identification is to establish which organizations and individuals may be directly or indirectly affected (positively and negatively), or have an interest in the project. Stakeholder identification is an on-going process, requiring regular review and updating as the project proceeds.

As part of the stakeholder identification process it is also important to identify individuals and groups that may be differentially or disproportionately affected by the project because of their disadvantaged or vulnerable status. All efforts were therefore made during the stakeholder identification phase to identify marginalized or vulnerable groups (whether according to livelihood, gender, age, ethnicity, religion etc.) and efforts were made to develop a fully inclusive and participatory engagement process allowing all stakeholders an opportunity to voice their concerns

A list of potential stakeholders was drawn up by ERM and Project staff and analyzed in alignment with Newmont's Social Responsibility Standard for stakeholder mapping in terms of:

- Whether the stakeholder is directly or indirectly impacted by the site activity;
- Whether the stakeholder is impacted negatively or positively by the site activity;
- Whether the stakeholder supports, is neutral, or is opposed to the site activity;
- Each stakeholder's key interests and concerns in relation to the site activity; and
- Their power/influence, legitimacy, and urgency in relation to the site. (Newmont, February 2010).

Table 3-1 details the potential Stakeholder Groups that might have an interest in or influence over the Project and explains their connections to the project.

(1) This is considered to be equivalent to the definition of "the public concerned" as discussed in the 2000 Implementation Guide to the Aarhus Convention (UN/ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (see http://www.unece.org/env/pp/acig.pdf))

Table 3-1 Stakeholder Groups and Connections to the Project

Stakeholder Groups and Types	Connections to the Project
Government and Community Leadership	
Government – National Government – Provisional Government – District	National and regional government individuals are of primary political importance to the project and are also significant in relation to permitting requirements that must be met by the project.
Local Leaders (e.g. Chief, elders)	Local community leaders and religious or educational leaders, acting as representatives of their local community.
Communities	
Communities in the vicinity of the proposed mine site Community Based Organizations (CBOs)	Households and communities that will be impacted (positively or negatively) as a result of the project.
Vulnerable groups such as women, youth and elderly	Vulnerable groups may be affected by the project by virtue of their physical disability, social or economic standing, limited education, lack of employment or housing. They may also have difficulty in engaging with the stakeholder consultation process and thus may not be able fully express their concerns regarding the project.
Private Sector	
Business organizations Companies - potential suppliers and contractors	Individuals or organizations with direct economic interest in the project. This may be through gaining contracts with the project or due to economic impacts caused by the project. They may also be potential business partners.
Financial Lenders	
International financial institutions.	Multilateral, bilateral and private sector financial institutions providing project finance for construction of the project.
Nongovernmental Organizations	
Local NGOs International NGOs	Organizations with direct interest in the project and that are able to influence the project directly or through public opinion. Such organizations may also have useful data and insight and may be able to become partners on the project in areas of common interest.
Other	
Research/Academic Institutions	Other international, regional and local groups with direct interest in the project.

The information collected to date has been summarized in a Stakeholder Database listing approximately 150 stakeholders or stakeholder groups according to title (description of role), level of potential engagement (local, national or other), category of stakeholder (government, NGO, community, traditional governance, companies, institution), locality (local or not), level of support, level of influence, urgency of engagement, potential project interest, and person responsible for the relationship. Grouping stakeholders in this way and having an understanding of their connection to the project helps identify key objectives for and best approach to engagement for different groups and individuals. This information was verified and updated throughout the ESIA process.

Based on the Stakeholder Database the priority for consultation was with those stakeholders with a high level of influence (e.g. decision makers) and those who have a high level of interest (e.g. local communities and marginalized or vulnerable groups). In order to help define these stakeholders the SEP includes stakeholder maps and analytical tools to outline stakeholders most relevant for engagement and consultation.

Figure 1-3 illustrates an analysis of Project stakeholders according to their support for and influence over the project.

These stakeholder maps have been co-developed by Surgold and ERM staff as part of an iterative process and have been periodically updated since 2007.

The analysis of the stakeholders identified improved understanding of the most appropriate engagement methodology to be developed. Figure 1-3 demonstrates how, dependent upon the influence and impact that certain groups face, they were engaged in different strategic ways.

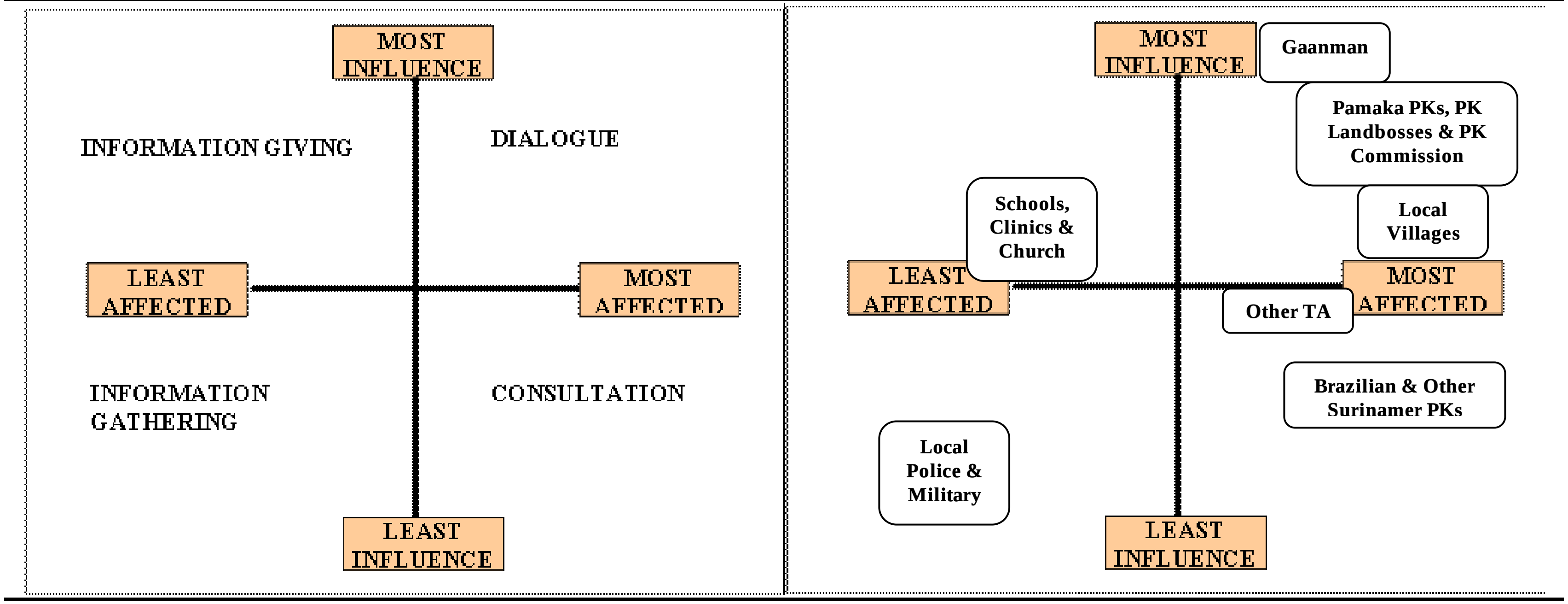

Figure 1-1 *Stakeholder Analysis Tool*

It is important to recognize that the most affected stakeholders and those considered crucial to the progress of the Merian Project demanded an inclusive and culturally appropriate process, aimed at providing stakeholders with opportunities to express their view, so that these could be taken into consideration in the decision making process.

4.0 ENGAGEMENT PLAN

This section provides a summary of the stakeholder engagement plan for this project. This engagement plan has been divided into the following four key phases:

- Phase 1: Screening
- Phase 2: Scoping Engagement
- Phase 3: Baseline Data Collection Engagement
- Phase 4: ESIA Engagement and Disclosure

A summary of the objectives and activities relating to each phase is listed in Table 4-1 and further details are provided in the following sections. The final stage of engagement, ESIA Engagement and Disclosure, began on 4 June[1] 2012 and is due to be completed after the submission of the Final ESIA Report.

Table 4-1 Stages of Consultation

Phase	Objective	Progress
1. Screening	Gain better understanding of the scope of the project and identify any sensitive receptors to potential project impacts	**Completed (July 2011)**
2. Scoping	Set out the process of engagement and consultation throughout the lifecycle of the project and preliminary stakeholder identification.	**Completed (August 2011)**
3. Baseline Data Collection Engagement	Inform local stakeholders about project design to obtain their key concerns and high level issues and to inform the development of mitigation measures for the Project. Detailed Enumeration Study using participatory planning methods.	**Completed (Oct 2011)**
4. ESIA engagement and disclosure	Disclosure of full ESIA report to all stakeholders presenting key impacts and mitigation measures identified during ESIA process and public notice inviting comment on the final ESIA report submitted to NIMOS	**On-going (June – July 2012)**

Figure 4-1 illustrates the process that should be undertaken to establish successful stakeholder relations. This process will work as the model for this SEP.

[1] It should be noted that the Draft ESIA Report was submitted on 4 June 2012 and the first public meetings to discuss the results were held on 11 June 2012.

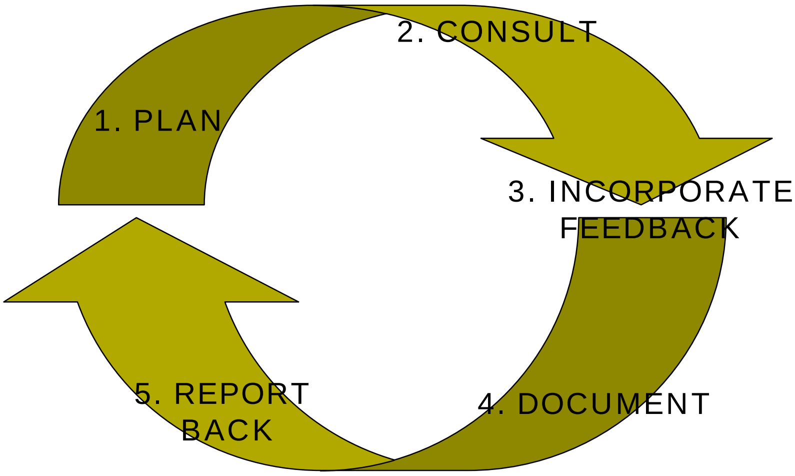

Figure 4-1 *Stakeholder Engagement Process*

4.1 PHASE 1: SCREENING PHASE

4.1.1 *Objectives*

- Gain a better understanding of the scope of the project;
- Early identification of impacts;
- Early identification of sensitive receptors to potential project impacts; and
- Inform stakeholders of ongoing engagement plans.

4.1.2 *Activities*

Meetings were held in Paramaribo, Langa Tabiki and at the Merian Project site. The purpose of these meetings was to introduce Surgold, ERM and the Merian project and announce that an ESIA would be undertaken. The meetings offered participants an opportunity to understand the following:

- The Project;
- The purpose and process of the ESIA study; and
- The proposed scope of the ESIA.

Table 4-2 provides a summary of the screening engagement meetings held, who attended and what the key discussion areas were.

Table 4-2 Screening Meetings – Attendees and Specific Discussion Areas

Location of Meeting	Stakeholders attended	Specific Discussion Areas
Paramaribo – meeting with communities of Commewijne river – 27 July 2011	PKs active in Sabajo project area, Women's Organization Traditional Authority Other interested parties Surgold representatives Village representatives from Java, Moengotapoe, Peninica, Mapana and Godo Daai	· Introduction to Surgold and Merian Project · Community questions/comments re. PK activities, scale of Merian project, Suralco Road, lumber concessions in Merian Project area, local employment, how to engage with the community (via TA) · Next steps
Langa Tabiki – meeting with Paramount Chief and Traditional Authorities July 27 2011	ERM consultants Surgold-Newmont representative GoS representative Community members Ex-small scale miners	· Introduction to ERM · Explanation of ERM purpose/process · Gaanman blessing do ESIA and Pamaka area · Treatment of PKs · PK leadership/organization · Conditions of ESIA consultation/engagement
Merian Camp – Traditional Authority visit, 26 July 2011	Traditional Authority leaders and associates Newmont representatives	· Health and Safety · Explanation of drilling activities · Environmental activities/approach · PK activity – dangers/risks/alternative employment · Explanation of Core Shed and processing activities
Merian Camp – NIMOS visit, 14-15 July 2011	NIMOS representatives Newmont representatives Merian ESR Manager	· Explanation of spatial extent and scope of Merian project including main facilities · PK activity and impact · ESR presentations · Local employment opportunities · Wood concessions as part of ESIA process · Waste management plan · Camp Administrator/Geology ESR activities

4.1.3 Tools and Outputs

Key concerns raised by stakeholders during the Screening phase included:

- Local employment and procurement opportunities.
- Impact of ASM activities and treatment of ASM miners.
- Environmental impact of project.
- Management and impact to lumber concessions.
- Benefits of the project/company to the community.
- What is the interest of Surgold in the area?
- How will Surgold communicate with local communities and the Paramount Chief?
- Scale of project: how large will it be and how much land will it require?

Stakeholder concerns and expectations are recorded in greater detail in Chapter 14 Social Baseline.

The key deliverables from this phase included:

- Stakeholder Database;

- Stakeholder Mapping; and
- Preliminary Stakeholder Engagement Plan.

4.2 *PHASE 2: SCOPING ENGAGEMENT*

4.2.1 *Objectives*

Once the project had undertaken screening and a preliminary impact scoping processes, engagement was undertaken with stakeholders in order to:

- Introduce and discuss the Project and associated ESIA and consultation processes;
- Disseminate information regarding the ESIA process and ERM's role;
- Generate feedback on the scope, approach and key issues for the ESIA;
- Summarize next steps in the ESIA process, as well as avenues by which stakeholders may seek further information or submit questions/ concerns;
- Confirm potential key stakeholders; and
- Establish a precedent for the collection of baseline data.

4.2.2 *Activities*

The distribution of information on the Project allowed stakeholders to familiarize themselves with the Project, thereby encouraging more meaningful participation in the consultation process.

ERM held public meetings in Paramaribo, Moengo and Langa Tabiki. These meetings were used as an opportunity to update stakeholders about the project and inform them of future inputs into the field studies. A list of attendees to the three respective meetings along with specific discussion areas is detailed in Table 4-2. Attendance registers for these meetings can be found in Appendix 14 - G.

Fifteen days prior to the public meetings public notifications were made in public places and via the media (on radio and in newspapers) informing stakeholders of the meeting times, dates and locations. All notifications were made in Dutch or Sranan Tongo. In addition to these public notifications, written invitations were sent to key stakeholders and banners and posters were hung in relevant locations. Further details and evidence of the advertisement for these meetings is available in Appendix 14 - H.

During these meetings information was provided to stakeholders during a presentation made in local languages. This was backed up by a non-technical flyer and simple presentation. These are available in Appendix 14-I.

Table 4-2 Scoping Public Meetings - Stakeholders present and Specific Discussion Areas

Location of Meeting	Stakeholders attended	Specific Discussion Areas
Paramaribo – public meeting Aug 17th 2011	NIMOS representatives GoS representatives Surgold representatives NGO – Moiwana Human Rights Organization ERM Consultant	· Introduction to Surgold and description of Merian Project · Explanation of ESIA purpose and process · Mine closure · Monitoring bodies · Electricity generation for the plant · Small-scale mining activities (PK) · Engagement/disclosure process
Moengo – public meeting August 18th 2011	Surgold representatives ERM representatives NGO representatives District Commission representatives Community representatives	· Introduction to Surgold and description of Merian Project · Explanation of ESIA purpose and process · Local participation in ESIA process · Local employment · Management flora and fauna · Project benefits and community investment · Geographic scope of project/ESIA
Langa Tabiki - Public meeting August 19th 2011	Surgold representatives ERM representatives Community representatives	· Introduction to Surgold and description of Merian Project · Explanation of ESIA purpose and process · Community input into project deal · Local training/employment · Moengo-Langa Tabiki Road · Impact of project on rainwater harvesting · ASM activity · Military presence in project area
Meeting with Surgold staff	Surgold staff ERM representative Surgold representative	· Explanation of ESIA purpose and process · ASM Activity – clearing damage

4.2.3 *Tools/Outputs*

An initial Stakeholder Database was completed and updated, along with initial analyses of stakeholders. These were continually revised during the engagement process.

Minutes were taken during all meetings and are available to attendees on request (please see Appendix 14 –G for details). Signatures and photographs to record the event were collected wherever possible (see Appendix 14-G).

Detailed field plans for the baseline studies were written using inputs from the public meetings.

Key interests/concerns raised during the scoping meetings included:

- Scope of health aspect of ESIA;
- Monitoring bodies;
- Management of liquid waste;
- Mine closure and site rehabilitation;
- Community engagement/disclosure – Free Prior Informed Consent;
- ASM Activity;
- Community benefit/compensation;

- Transparency of ESIA process;
- Local employment;
- Area of project and communities benefiting from project; and
- Access to Moengo-Langa Tabiki Road.

Stakeholder concerns and expectations are recorded in greater detail in Chapter 14 Social Baseline.

4.3 PHASE THREE: BASELINE DATA COLLECTION ENGAGEMENT

4.3.1 *Objectives*

The main objective of engagement during the baseline data collection phase was to continue to share project information, to obtain baseline information, and to give stakeholders an opportunity to comment on the project.

The purpose of the collection of baseline data (socio-economic) was to establish a detailed understanding of the characteristics of the communities within the geographic scope of work so as to benchmark current conditions and allow for improved prediction of potential impacts.

Engagement during baseline data collection also allowed for discussion on potential impacts and preliminary consultation on stakeholder preferences for mitigation and enhancement measures. This was a crucial part of the engagement process for the following reasons:

- Those affected by a project are experts in their own livelihoods. As such they are often a key source of expertise in the identification of the impacts of a project and the development of appropriate mitigation measures. Consultation with affected peoples during the process of impact identification can also assist in generating understanding and buy-in to the project.
- Other stakeholders, particularly government agencies, NGOs working in the area and specialist organizations (e.g., academic organizations) can be key sources of information and advice as well as potential partners for implementation of mitigation measures.
- The perception of impacts by those affected must be taken into consideration in their evaluation. Where impacts are only perceived (and may not occur to the same extent), mitigation activities such as information provision or capacity building may be required in order to prevent secondary impacts from occurring as a result of a perceived primary impact (e.g., land users not investing in land they believe will be purchased by the project).
- A difference between the impacts perceived by local communities or other stakeholders and the actual impacts may pose a risk to the project. It can result, for example, in a rejection of the impact assessment results, general distrust of the project proponent and overall opposition to the project.
- Discussion of potential negative and positive impacts associated with the Project, questions and issues of concern.

The information and feedback gathered during the baseline data collection contributed to the on-going identification of issues, and was used to inform the impact assessment.

4.3.2 *Activities*

ERM split data collection into the following distinct geographic scopes; national level data collection in Paramaribo; data collection in the Moengo area; data collection along the transportation corridor; data collection in the Tempatie and Commewijne Area; and data collection within the Pamaka region including the communities of:

- Akaati,
- Atemsa,
- Badaa Tabiki,
- Kiki Mofo,
- Langa Tabiki,
- Loka Loka,
- Nason,
- Pakira Tabiki,
- Skin Tabiki,
- Tabiki Ede, and
- ASM camps within the geographic scope.

As appropriate, the project team undertook a combination of qualitative interviews and quantitative surveys of local communities/households, local decision makers/community leaders, potentially marginalized groups, local NGOs and government authorities. This was supplemented by focus group meetings to determine concerns and expectations in relation to Project activities in the area.

Data collection used Participatory Rural Appraisal / Learning and Action (PRA/PLA) techniques such as resource mapping and focus group discussions. This was supplemented with a household survey, key informant interviews and semi-structured interviews.

4.3.3 *Tools / Outputs*

To support this engagement the following tools were used to gather specific baseline data:

- Semi-structured interview questions guides to collect baseline information on issues, concerns and sensitivities relevant to impacted stakeholders.
- PRA/PLA tools to gather baseline data concerning impacted stakeholders.

Stakeholder concerns and expectations mentioned during data collection are recorded in Chapter 14 Social Baseline.

4.4 *PHASE FOUR: ESIA ENGAGEMENT AND DISCLOSURE*

A round of stakeholder consultation was conducted between the 11th and 15th June 2012 to disclose the draft findings of the ESIA process and solicit stakeholder feedback on the ESIA process, the identified impacts and proposed mitigation and enhancement measures. Stakeholders have been given until 13 July 2012 to submit their comments on the Draft ESIA and ERM and Surgold will make every effort to respond to all comments received.

4.4.1 *Objectives*

The purpose of the engagement and disclosure meetings was to provide:

- an update on the Merian Project;
- a summary of how the ESIA process was carried out, including details of the social and environmental studies that were undertaken;
- an explanation of the key social, health and environmental impacts that were identified in the ESIA process; and
- details of the mitigation and enhancement measures proposed to minimize negative project impacts and maximize potential project benefits.

Stakeholders were invited to comment on the information provided and to ask questions.

4.4.2 *Activities*

The full ESIA report, written in English, was submitted to NIMOS on 4th June 2012 and made publically available via the NIMOS and Surgold offices in Suriname and from the project website, www.merianproject.com. An Executive Summary of the report was translated into Dutch and physical copies were placed in public offices and venues in Project affected areas.

Specific summary flyers were also prepared and distributed in Sranan Tongo for use in areas where Dutch is less-widely spoken (e.g. Pamaka communities).

A round of public meetings was held to present the findings of the full Environmental and Social Impact Assessment. Meetings were held in Paramaribo, Moengo and Langa Tabiki. A list of attendees to the three respective meetings along with specific discussion areas is detailed in Table 4-3.

Table 4-3 *Public Disclosure Meetings - Stakeholders present and specific discussion areas*

Location of Meeting	Stakeholders Attended	Specific discussion areas
Langa Tabiki, Public Meeting 11th June 2012	Traditional Authority (Village Captains) Community Representatives Surgold representatives ERM consultants	· Recap and update on Merian project and ESIA process · Summary of key impacts and mitigation measures · Community comments on the findings and mitigation measures. · Community questions
Merian Camp, meeting with Surgold staff, 12th June 2012	ERM consultants Surgold staff	· Update on ESIA process · Summary of key impacts and mitigation measures · Comments on the findings and mitigation measures. · Community questions
Moengo, Public Meeting 13th June 2012	Surgold representatives ERM representatives NGO representatives District Commission representatives Community representatives	· Recap and update on Merian project and ESIA process · Summary of key impacts and mitigation measures · Comments on the findings and mitigation measures. · Community questions
Paramaribo, Public Meeting 14th June 2012	NIMOS representatives GoS representatives Surgold representatives NGOs representatives ERM Consultants	· Recap and update on Merian project and ESIA process · Summary of key impacts and mitigation measures · Comments on the findings and mitigation measures. · Community questions

Notice of the public disclosure meeting was issued fifteen days prior to the meetings taking place. Details of meeting times, dates and locations were provided on posters and banners displayed in public places and via the media (on radio and in newspapers), further details can be found in Appendix 14-H. All notifications were made in Dutch or Sranan Tongo. In addition to these public notifications, written invitations were sent to key stakeholders and visits were made by the Surgold CR team to the local Pamaka community informing the Gaanman and village captains of the upcoming meetings.

4.4.3 *Tools / Outputs*

Prior to the meetings ERM prepared flyers, posters and presentations in local languages (Dutch or Sranan Tongo) to disseminate information regarding the impact assessment process, identified impacts and mitigation measures (See Appendix 14-H).

Stakeholders were asked to comment on the impacts and mitigation/ management measures identified and were provided with contact names and details for submission of future questions or comments.

Minutes were taken during all meetings and are available to attendees on request. Signatures to record attendance were also collected however not all attendees signed the attendance record. These can be found in Appendices 14-G.

5.0 FEEDBACK MECHANISM

5.1 PURPOSE

Stakeholder engagement is a two way process. It is therefore important to ensure that there is a feedback mechanism to ensure stakeholders affected by or interested in a Project can present their input (e.g. opinions, requests, suggestions and grievances) for consideration and, if required, redress. It should be noted that, even where not all feedback are deemed 'valid' or applicable to the context of the Project, the feedback mechanism needs to function in a non-judgmental manner and record all information received.

This section identifies the feedback opportunities available to stakeholders. The focus of the mechanism will be on comments related to the Project, in particular with a focus on concerns or comments about the proposed Project and its possible impacts as well as opportunities and constraints for mitigation. The ESIA team will channel Project related issues or requests to the Project. It is anticipated that these will be dealt with through the existing feedback channels, managed by the on-site ESR team.

5.1.1 Feedback Mechanism for the ESIA Process

Each round of engagement undertaken will provide stakeholders with an opportunity to provide input and feedback on the Project. However, it remains important to offer opportunities to people to both provide feedback and receive response in the times between rounds of engagement.

A feedback mechanism has therefore been put in place during the ESIA to ensure that potential concerns raised by stakeholders during engagement are acknowledged and addressed in a timely, structured and culturally appropriate manner.

The main principles on which the feedback mechanism has been structured are as follows:

- **Proportionality**: a mechanism scaled to the potential risks and adverse impacts that the Project may impose on affected communities;
- **Cultural appropriateness**: a mechanism designed in a culturally appropriate manner;
- **Accessibility**: a clear and understandable mechanism that is accessible to all segments of the affected communities at no cost to them;
- **Transparency and accountability**: a mechanism that operates in a transparent way and that is accountable to all stakeholders; and
- **Appropriate protection**: a mechanism that prevents retribution and does not impede access to other remedies.

Figure 4-2 illustrates a typical feedback mechanism process to document and proactively manage the feedback process.

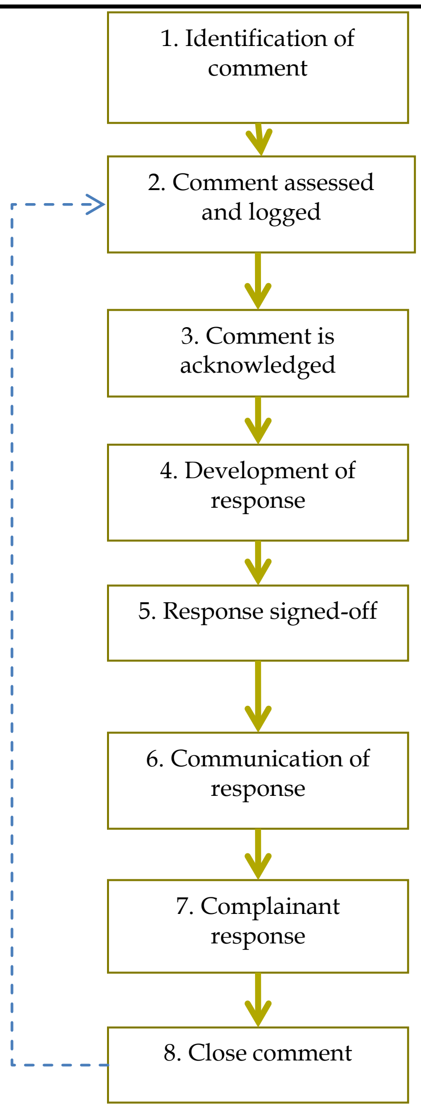

Figure 5-1 *Typical Feedback Process*

During the ESIA process feedback was accepted by Project staff by telephone or verbally face-to-face. Once the draft ESIA report was submitted to NIMOS in order to facilitate comments on the ESIA and other feedback a specific website and email address were also established to receive feedback.

5.1.2 *Existing Project Feedback Mechanism*

The Merian Project CR team operate grievance and expectation registers to document feedback that the Project receives. This existing feedback mechanisms are, at the time of writing, undergoing a review and update process. It is recommended that the CR team publicize the updated feedback mechanism to the stakeholders to increase awareness and to increase by-in .

6.0 REFERENCES

IFC Performance Standard 7: http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/pol_PerformanceStandards2006_PS7/$FILE/PS_7_IndigenousPeoples.pdf accessed April 2012

2000 Implementation Guide to the Aarhus Convention (UN/ECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (see http://www.unece.org/env/pp/acig.pdf)) accessed April 2012

IFC Performance Standards, January 2012. accessed April 2012

NIMOS Environmental Assessment Guidelines, 2009. accessed April 2012

Appendix 14 - G

Public Meeting Records

1 *SCOPING PUBLIC MEETINGS RECORD AND MINUTES*

1.1 *PARAMARIBO SCOPING PUBLIC MEETING AND MINUTES*

Meeting held on August 17, 2011 in Hotel Krasnapolsky, Paramaribo. Meeting was conducted in Dutch.

Presenters included:
Mr. Ryan Kambel, Health Safety and Loss Prevention Coordinator Surgold
Mr. Radjkoemar Santjitsing, Head Geologist Merian Gold Project
Mr. Rutger de Wolf, ERM representative
Mr. Salomon Emanuels, representative of ERM

Meeting Agenda:
Word of Welcome
Introduction /ground rules/ agenda
Project Description
Environmental Assessment
Social Assessments
Questions and Answers
Closure
Get-together

Word of Welcome and Introduction /ground rules/ agenda

Mr. Kambel, HSLP Coordinator Surgold
On behalf of Surgold, Mr. Kambel welcomes the attendees. He indicates that in this respect the first of three meetings is concerned. The next public meeting will be held at Moengo and the last one at Langa Tabiki.

In addition, he indicates that the persons present at this meeting will be given the opportunity to provide input in the form of asking questions. Minutes are kept of the meeting and these will be available in a while.

After giving instructions in case any calamity occurs, Mr. Kambel goes through the ground rules and the agenda.

Project Description

Mr. Radjkoemar Sandjietsingh, Head Geologist Merian Gold Project
Main points of the presentation:

Who are Surgold?
A company of Newmont & Alcoa with Newmont as the manager
Has been exploring in the Merian area since 2004 without gold production yet
No gold production yet – awaiting the agreement with the government

Project site

Project components
Equipment -> hydraulic excavators, haul trucks, dozers, graders, loaders

Project employees:
About 1,500-2,000 during the construction (including temporary contractors used for construction)
About 900 during operations

Waste from the project:
Solid and liquid waste. Solid waste comes from the mine and is transported to a waste rock storage. This waste will not cause damage to the environment and will not result in acid drainage systems. Liquid waste will be transported to a tailing storage facility. Dams will be built and water collected in the pond will be pumped back, which will be partly purified and partly, after purification, drained into the environment.

Processing diagram:
Cyanide and carbon will be used to extract the gold from the rocks. A recovery of 97% will be achieved in the process.

Transport materials
During the Construction phase, the mining operations, materials will be imported, and use will be made of the Port for all this imported materials. The transport will take place via the East-West connecting road to Moengo and from there it will be further transported to Langa Tabiki. The road will be upgraded by Surgold and a road will be built from Langa Tabiki to Moengo of 60 km in length

Mine closure
Examples given of mine closures in Indonesia

Environmental and Social Impact Assessment

Mr. Rutger de Wolf, ERM representative
Main points of the presentation:

What is an ESIA?
Four components of an ESIA -environment, health, social, stakeholder consultation
Who conducts the ESIA? - Environmental Resources Management (ERM)

The role of ERM, what are the requirements for an ESIA, what does an ESIA comprise?

Environmental assessments:
Groundwater: how do the streams run and what can change when the project is carried out?
Air quality: measuring chemicals and particles in the air and examining how all this can change

Noise: examining the current noise levels, what can you expect and what measures can be taken
Trees and plants: examining whether there are special plants or whether vulnerable ecosystems are concerned and how negative effects can be mitigated
Animals: several experts can make an inventory and examine whether there are threatened or endangered animal species
Traffic: the intensity, unsafe situations and a possible increase thereof after starting the project
Quality surface: what impact will the storage facilities have on the watercourses in those areas

Social and Health Assessments
Mr. Salomon Emanuels, representative of ERM
Main points of the presentation:

Studies will be in the villages that may be affected by the project and include:
Household surveys
Interviews and focus group discussions
Public health studies
Start: September 2011

Study area for the social and health situation
Area around the mine
Strip along the road - Moengo to Paramaribo
Paramaccan villages

Public consultation
People will be able to state their opinions -> reports will be distributed to groups / organizations that can give their opinion. NIMOS will advice
Consultation principles: comprehensive, transparent, with attention for among other things culture and livelihood

Review and publication of ESIA findings - ESIA ToR available at:
Surgold office - Paramaribo (Surinamestraat)
NIMOS office – Paramaribo
Surgold camp – Merian

Next steps:
Social & Cultural Heritage study
Ecological study
Keeping interested parties informed
Final meeting around April 2012

Concluding remarks
ESIA must be completed before exploitation rights are granted by the government
ESIA is important for the Project development
You will get the opportunity to participate

The results of the ESIA will be presented so that your comments can be incorporated.

Questions and Answers Session

Mr. Courtar (on behalf of the Minister of ATM):
He believes it unfortunate that the public only has a limited amount of time to ask questions
The invitation is confusing; he thought that the health aspect would be elaborated on. Why was that aspect not included comprehensively in the presentation?
Will we learn from Iamgold in respect of the best practices and lessons learned?

Mr. Salomon (ERM): the health aspect was indeed not dealt with elaborately, which does not mean that this is less important. The health aspects will be elaborately examined during the ESIA, among other things by asking information from the outpatients' clinics and by studying reports. People will also be asked about their health condition.

Mr. Courtar (on behalf of the Minister of ATM): what exactly will be examined?

Mr. Emanuels (ERM): the baseline health status of the people will be examined as far as prevailing diseases are concerned. In addition their food pattern will be examined and which influence the fact that there will be less hunting, will have on their food pattern. The way in which people have access to health care will be examined.

Mr. Meyer (Surgold Representative): the health aspect is critical, for both the communities and the workers. Surgold will work according to international standards. Part of the directive is not to only look at the risks, but also at what the opportunities are to improve the health and safety of people in general and the workers in particular. This is the scoping stage, and health is mentioned in the TOR, which is available to the public.

Mr. Courtar (on behalf of the Minister of ATM): will they consult with IAMGOLD to learn lessons from each other?

Mr. Kambel (Surgold): we do not have to re-invent the wheel and we can learn from Iamgold; at present, the company has good contact with them.

Mr. Bujuku (citizen of Suriname): environmental assessments are conducted in order to prevent the environment from being damaged; is there a governmental body to monitor all this?

Mr. Meyer (Surgold Representative): mine closure is a crucial aspect of a mine operation and before proceeding to exploitation, it will be examined how mine closure should be implemented. Before taking a look at the ecological aspect, first the baseline situation is examined. Unfortunately, for this project, the area in question has already been quite disturbed, even before the company is able to start its operations. There are some advantages for those engaged in small-mining activities, but their activities have substantially affected the ecology of the area. When we talk about developing and closing the mine, it must first be examined how the current disturbance of the area can be improved. There is a big difference between small-scale mining and industrial mining. With industrial mining from the very beginning, the mine closure aspects are taken into consideration and also the best possibilities for rehabilitation. Examples were shown of areas where rehabilitation activities have taken place and those areas have the same ecological circumstances as Suriname.

Mr. Boejoekoe (citizen of Suriname): which body will monitor it all?

Mr. de Wolf: of course the company will perform monitoring activities, but you mean an external organization. NIMOS would be the best body to do this. An environmental act has been laid down, but it has not been adopted by the DNA yet. NIMOS does not have sufficient mandate to truly inspect things, but he does believe that NIMOS is trying to monitor things as properly as possible.

Mrs. Babb (NIMOS): with such big projects, the monitoring has to be done via a commission installed by the government. NIMOS always has contact with the companies independently of the monitoring on the part of the government.

Mrs. Simson (Moiwana Human Rights Organization):
You talked about chemical such as carbon and cyanide; are these the only chemicals that will be used?
What does the liquid waste consist of?
How secured will the dams be to contain the liquid waste?
What will happen to the liquid waste after the mine closure?

Mr. Sandjietsingh (Surgold):
When processing the rocks, use is made of cyanide and carbon. The concentration that ends up in the environment will not be harmful. Cyanide disintegrates into carbon and nitrogen through sunlight.
As regards the safety of the dams, during the mining operations studies will already be carried out to examine whether there are leaks.

Mr. Meyer (Surgold representative):
Mining companies had quite some problems in the past and that is why there are specific approaches and that is why they examine which is the best approach. The International Cyanide Code prescribes guidelines about everything that concerns cyanide. The code has been composed by a prominent group of scientists and comprises all phases, more in particular transport, storage, use and destruction. Newmont is a co-signatory to this Code and must comply with the rules set out therein. The storage will be

regularly monitored and one of the requirements is that the results of this monitoring are published.
As regards the safety and stability of the dams, Golder, a prominent company in this area, will design the dams in accordance with international standards.

Mrs. Simson (Moiwana Human Rights Organization): she is not completely satisfied with the previous answer. It boils down to the fact that after Newmont has left, will there be a permanent pond with chemicals?

Mr. Meyer (Surgold representative): that is correct, but this will mainly consist of rocks in which there is no gold. Before the waste is transported to the pond, the cyanide is destroyed. After the water has been purified, it will be potable for animals.

Mrs. Simson (Moiwana Human Rights Organization): is it potable for human beings?

Mr. Meyer (Surgold representative): he would not drink it. Water that is released from the tailing facilities will be safe for human consumption.

Mrs. Simson (Moiwana Human Rights Organization): will there be active rehabilitation (replanting) or will they just let plants grow again by themselves?

Mr. Meyer (Surgold representative): due to the ecological circumstances in Suriname, in addition to active replanting there will be a natural regeneration.

Mrs. MacIntosch (Natural Resources - NH):
Are there measures (contingency plans) in place in case of a dam failure in a tailing pond?
How will electricity be generated for the plant?
It was said that a new road will be built; has a study been conducted about the impact thereof on the flora and the fauna?

Mr. Sandjietsingh (Surgold): studies are conducted in respect of the building of the road and this is part of the ESIA.

Mr. de Wolf:
The building of the road is part of the study that has to be conducted as yet
As regards the dams, matters will be investigated and recommendations will be made

Mr. Kirk Schmidt (GM Surgold): the company has to generate its own electricity and that generation will be done on the project itself by means of heavy fuel oil or diesel. Studies have shown that Suriname does not have sufficient capacity to implement such a big operation.

Mr. Meyers (Surgold representative):
He wants to emphasize that Newmont will comply with the International Cyanide Code and everyone is welcome to study this Code.
As regards the contingency plans, the environmental management plan is part of the ESIA. All locations where there is groundwater and surface water will be checked. If during the monitoring it turns out that there are problems, certain contingency plans will be in place such as for example letting the water flow back to the storage place.

Mrs. Hermien Gaikhorst: During the crushing of the rock material, fine powder is released that spreads everywhere. At present there are ponds that are very dangerous because the upper part dries up, but underneath the liquid remains and you get the 'quick-sand' effect. She does not believe that the areas will be quickly restored. Not because we see green that means that it has been rehabilitated and she still believes that a lot of flora and fauna will get lost.

Mr. de Wolf (ERM representative): a lot has already been disturbed in the area and you will not be able to restore it to its original state, but they will try to do that as far as possible. Surgold absolutely does not intend to leave behind a mess.

Mr. Kirk Schmidt: small-scale mining activities have caused a lot of damage and they will seek methods to see how the current pollution can be removed, after which they will examine whether there is gold. The costs for removing the current pollution will be very high.

Mr. Jabini:
If the ESIA report is negative, will the project still proceed?
Will the Langa Tabiki road be a bauxite or an asphalt road; what does the upgrading imply?
How about FPIC (free prior informed consent)? Are the people actually informed about the impact of the activities on their lives and this in their language and their own situation?
Small-scale miners have caused a lot of damage and that has to be included. What will happen to them? Will they become contractors or will they allow them to continue damaging the environment? Is there a policy with regard to involving the men in working with better systems?
Will the community be compensated for the big sacrifices that they have to make? Will a fund be formed?

Mr. de Wolf ~(ERM representative):
If the report is negative, theoretically it could be stopped, but in practice that is not really the case. It is examined how the negative effects can be mitigated. Eventually Surgold is the one to decide what to do on the basis of the reports. The government can also indicate what their view is and what kind of agreement they want to enter into with Surgold.
The project also has many positive effects like development of the area, the development of the country and employment.

Mr. Emanuels:
As regards the information to the communities and FPIC, the company is conducting talks with the Suriname government to do business. Applying the FPIC principle is something the government should seize to do. When 'Granman' (paramount chief) Levi was still alive, the company tried to inform the people in the area. A person was hired to maintain contact with the local communities.
Meetings were planned at Langa Tabiki and Moengo and he even visited the Granman a few times. There is regular exchange of information between the company and the local communities. In the early beginning, even committees were installed for these purposes.

Mr. Jabini: the company is also responsible to inform the people in advance. Lessons learned from Iamgold must be incorporated and a substantial part of the proceeds should flow back to the communities. Will a fund be formed?

Mr. Asadang (Surgold Community Relations Coordinator):
We are examining what will happen with the local gold seekers and jointly with the government we are trying to find a solution to this problem. The intention is not to remove them from the area, but that they can continue working and this in a responsible manner and have an income as a result. It is important, however, with whom we have to talk because there are several organizations.
After the operations have started, employment will be created in the area and as far as possible local people will be deployed. Local people will also be encouraged to establish supplying enterprises and their capacities will be strengthened to that end. These enterprises will ensure that part of the money stays in the area.
Although the company does not earn yet, it already invests in the community, such as financial support for those with the highest grades for their exam. A fund will be formed as was done in other countries.

Mr. Johannes Tojo: will they work together with the existing organizations in the area? He has some strange experiences with the company. Their organization is a regional organization of the villages and they had contacted the company in order to contribute to the social organization, but they were ignored.

Mr. Asadang (Surgold Community Relations Coordinator): Surgold certainly wants to work with everyone. The late Granman Levi had set up a platform and what Surgold wants is to have a platform in which every segment of the society is represented. Not a single organization should be excluded, because Surgold is not here to sow discord.

Mr. Courtar: gives advice not to undermine the traditional authority; people should not be played off against one another.

Mr. Asadang (Surgold Community Relations Coordinator): captains are on the platform and they have been appointed by the people of the communities themselves.

Mr. Courtar: he sees a lot of chaos and that is why he advises to maintain the institute of the Granman.

Closure

Mr. Kambel indicates that people can still indicate their comments on paper; it is important that in doing so they also state their name and telephone number. All attendees are thanked on behalf of Surgold for their presence and participation.

Box 1.1 Paramaribo Scoping Record of Photographs

A record was kept of all attendees and this is listed in *Box 1.2* below

Box 1.2 Paramaribo Scoping Attendees

Paramaribo 17/08/11 Krasnapolsky [illegible] [illegible] (1)

Naam	Adres/ Instantie	Telefoon / Email	Handtekening
Mackintosh Angelique		angie_mackintosh@hotmail.com	
Freek Bilkerdijk		freek.bilkerdijk@surmeco.sr	
Aradi Jan		Aradi.Jan@hotmail.com	
Amato Christine		christine.jenee@gmail.com	
John Courtey	Sucadelaan 16	422240 coffu2000@yahoo	
Eddy Fränkel	P/a Dr. H. Adhinstr 21	499649 - 476130 efranke@staatsolie.com	
Hermina Gaikhorst	Costerstraat 29	421802 hermiengaikhorst@gmail.com	
Dana Doekoe		phidas25@hotmail.com	
Simson Renatha	molenpad no 61	natesimmy@hotmail.com / 8541904	
Lie Henk	J.A. Pengel str 161	8563123	
Tjon-Schhold, Yolanda	Nimos	info@nimos.org	
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Sven Naher	Themen	svennaher@gmail.com	
Ronald Themen	Themen Contractors NV	themencontractors@yahoo.com	
[illegible]	[illegible]	m.bajgcker@yahoo.	
Arnhem Xaviera	Leliydorperweg # 34	arnhx.l@gmail.com	08586681
STVS	STVS	journaal@stvs.sr	
Djamam Marciano	Adek	marciadja@yahoo.com	
Palis Jaime	cheec	coordinator@cheec.net	
Esajas. Vincent	ROGB	tafrabergi@gmail.com	
Monique Jagdew	Adek student	monique1.23@hotmail.c	
Amiet Binda	Adek student		
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Kasmo K.	Comm.Weythingweg 126 A	8863613 / melissa---1905@hotm.com	
Essed. S	~~[illegible]~~	8874458 / [illegible]@hotmail.com	
Madhar H	Vaniestraat #4	Hafiz_hm@hotmail.com	
Binda. W.A	Lashkarweg #55 (kwatta)	amiet_86@hotmail.com	
Lieuw, Sergio	~~[illegible]~~ → ADEK (student)	serruli@hotmail.com	S.L.
Jokhan, Sam.	Adek Stud / [illegible]	Shamjokhan@Yahoo.com	

Paramaribo 17/08/11 Krasnapolsky Hotel (2)

Naam	Adres / Instantie	Telefoon / Email	Handtekening
J. Radjkoemar			
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H. Jabini	ANA	hugo.jabini@gmail.com	[signature]
G. Babel	Keysweg psb 5212 Par'bo	g.babel@yahoo.com	[signature]
H. Ramlakhan	Tourtonnestraat #6, Par'bo	alisharam@live.com	H. Ramlakhan
R. Bhulai	Beekhuizenweg 172A Par'bo	rashmi.1992@live.com	R. Bhulai
S. Madho	De nieuwe grondweg 81	8187504	Madho S.
I. Hasselnook	SBB	483131	[signature]
Robert Yambrecht	Surinamestraat #54		[signature]
Adjako Daweni	Thinniastr #19A	8951339 empresadaweni@hotmail.com	[signature]
Hillene Miguel	Wanpapaiweg 10	8565893	[signature]
Tojo JC	Matoelistr 22	commowe@yahoo.com	[signature] Ana Makandie
Richard Venney	GMD / Jaggernath Lachmonstr. 181	8800725 / rtv.sur@yahoo.com	[signature]
Gail Eijk	Apintie tv.	8894277 gaileijk@gmail.com	[signature]
W. Ajaiso	De Goedeverwachting 81	W. Ajaiso @ dravansr.	[signature]
S. Sahdew	Mahiestr. 1 Staatsolie	08904670 ssahdew@gmail.com	[signature]
Dmol, N	Nieuwe Ornaweg no 79	8680068 ornasjie1@hotmail.com	[signature]

It should be noted that not all attendees signed the participation sheet and that additional people to this list joined the meeting.

Meeting held on August 18, 2011 in Recriatie Zaal, Moengo. Meeting was conducted in Dutch and Sranan Tongo.

Presenters included:
Mr. Ryan Kambel, HSLP Coordinator Surgold
Mr. Radjkoemar Sandjietsingh, Head Geologist Merian Gold Project
Mr. Rutger de Wolf, ERM representative
Mr. Salomon Emanuels, representative of ERM

The presentation component of the meeting was the same as in Paramaribo and thus has not been repeated here.

Questions and Answers Session

Representative of the District commissioner
He has a request that providing of information should be transparent.

Ryan Kambel
He replied on his request that the ESIA process will be transparent.

Mariska Poesee, representative of STEP
a. She asked how far the MBO's or CBO's were involved in the ESIA process. She explained the reason for this question that in Moengo there are organization such as PAS and STEP who worked together with NGO's, CBO's women organization and youth organization, who knows the field very well and could have an important contribution on this process.

b. The community of Moengo is interested in the ESIA process, but they are also interested in employment. Most of the people are not educated and also not qualified to work for the company. What shall be done by the company to get those people so far and well qualified that they could be hired by the company.

Salomon Emanuels
a. He said that during the developing of the list of stakeholder an invitation was send to the coordinator of these NGO's in Moengo, who will pass the message further. But this question, will also take into consideration to speak whit the different groups separately, so that they can have also there input.

Santjitsing Radjkoemar
b. He mentioned that regarding employment, the position has not been defined yet. But as soon the information about employment is available it will be broadcasting. What he knows is that the plan is to hired local people (paramaccaners) as much as possible. It could happen that for some position the local people and also people in Paramaribo are not meet the requirements;

in such cases, the company will search for people aboard. He mentioned that currently the company has trained local people and people from Paramaribo and Moengo to do the job in the company.

Francis, representatives of the organization "Kon mek wi Taki Makandi" (let us talked together).

a. She asked in case Surgold come across valuable fauna and flora in the area of exploitation, what shall be the approach of Surgold. Will they continue or stop with the project?

b. What will surgold mean for the local people in the Marowijne area?

Rutger de Wolf

a. He answer that therefore the ESIA is conducted. In case they come across sensitive areas, protected animals and treated species, as specialist they should give recommendations to Surgold to reduce the negative impact on these areas and species. But at this time, they could not give a specific answer on the presence of the above mentioned topics. They will need to do the research first.

Wendell Asadang

b. He answered that Surgold will have a positive impact on the local people and the local people will have benefit of the project. First, we are thinking about employment. Second, the local people will be trained to set up business so that they could deliver goods to the company. It will be possible that the company will not be able to buy all the different kinds of good of the Local people.

The company has its own way how they operate. In other countries, Newmont developed a fund which aimed to develop the Local community. When the company moves out of the country, the money in the fund will stay behind to develop the local community and the area. For this fund a lot of requirements are put in place. One of the requirements is education, which involved that the local people will be educated to survive in the community and which will result in development of their family.

The past three years, scholarship was provided to the best student of the three primary school located at Langa tabiki, Nazon and Loka Loka who passed successfully their exam. A male and a female were chosen and each received 1000 US dollar. Further, Surgold has provided 1000 US dollar to set up a building at Langa tabiki and the road from Moengo to Basecamp is maintained constantly.

Representatives of the DC

a.He mentioned that he heard a lot about STEP and he want to know if STEP will control the benefits coming from the project in operation.

b. he asked also why only the students of the local community received a scholarship from Surgold.

Salomon Emanuels
a.He answer, that how he understand how the company would like to work is that everyone or group who will have a positive contribution to the company will be involved.

Wendell Asadang
b. He answer that the company does not earned at this time, so they prefer to support to the local community who is nearby. But in the future when the company is going over in production, it can happen that more areas will receive support from the company.

Ramijatal Bouwlid,
a.She asked how big the boundary of the project is that surgold will use to operate its project.
b. She states that she is a teacher and what for possibility she has to work at one of the school in the paramacca area.

Ingrid Pradon
a.She answer that it is determine in the ESIA that the study will be conducted for the ten villages along the Marowijne river, the community in the upper commewijne area, the community along the road from Paramaribo to Moengo and the community along the road from Moengo to Langa tabiki. The company will pay also attention on the boundary refer to the presentation.

Santjitsing Radjkoemar
a. He answer as addition on the question regarding the boundaries. Surgold will also work with the exploitation boundary which cover an area of 18000 ha and the company will use 1500 ha of this to establish the mine and the facilities.

Salomon Emanuels
b. He answer that it is not the responsibility of the company to determine on which school teacher should teach. That part is in the hand of the government.

Mike Meyer
b. Mike answer to addition on question b, through the ESIA process the company will identify the opportunity for social development. This will be done in a collaborating way with the local community as they have been talked about the upper Marowijne area, the paramacca area. We also try to have better understanding of what needed for the camp during operation. At this time we do not expect a camp for family only for workers. It will be good when the majority of the people should coming from the local community and when they finish with their worker they could go back to their family.

Ms. Simone Betterson
a. She states that she understand that the ESIA is about three topics, which are Environment, Social and health. She did not see any body of the three responsible ministries. She does not mean their attendance in the public

meeting, but the collaboration during the ESIA process. She recommended involving these three ministries in the ESIA process.

Salomon Emanuels

He comments overall that they during the ESIA process most of the answer will be clear and can be provided to the community.

Box 1.1 Moengo Scoping Record of Photographs

A record was kept of all attendees and this is listed in *Box 1.4* below

Box 1.2 Moengo Scoping Attendees

Public Meeting Moengo

Naam	Adres / Instantie	Telefoon / Email	Handtekening
H. Amalinsi	Suralco	0857-1681	[illegible]
N.R. Azah	Lidoewang str 84	8231340	[illegible]
[illegible]		716137	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
Akoi Marita	Abraham Grynsenlaan 18	0872463	[illegible]
Amoko H	Stejos.	kanganistraat 9	[illegible]
Francis A	Kow tahi makandi	8608106	[illegible]
Elkekbout	[illegible]	8658215	[illegible]
Tjakadiwaufo	Kawmastr. 22	8592325	[illegible]

It should be noted that not all attendees signed the participation sheet and that additional people to this list joined the meeting.

Meeting held on August 19, 2011 in Krutu Oso, Langa Tabiki. Meeting was conducted in Dutch, Sranan Tongo, Pamaka and Aucaans.

Presenters included:
Mr. Wendell Asadang, HSLP Coordinator Surgold
Mr. Radjkoemar Sandjietsingh, Head Geologist Merian Gold Project
Mr. Rutger de Wolf, ERM representative
Mr. Salomon Emanuels, representative of ERM

The presentation component of the meeting was the same as in Paramaribo and thus has not been repeated here.

Questions and Answers Session

Mr. Adrean Adawde
a. Mr. Adrean mentioned that Mr. Salomon en Santjitsing states in their presentation that the government will determine what should be included in the deal with Newmont. Besides of the fact that the government will determine, it is also important that the local community has their input. He missed the three feet collaboration from the government, the company and the local community. He states that this is not the mistake of the company, because he saw their presence since 2004 frequently in the area.

b. He also states that the company will start mining in 2014. He asked Surgold to establish a training centrum to train the local people, which will be a good opportunity for the local community to develop their self and have a change to get a job.

c. He continued saying that Santjitsing mention that the project will be operated 1X 24 hour. This means for him that the situation in the community will change. The man will be away from his wife and the wife will received less support from the man in the farming.

d. He suggests that Surgold should take a delegation of the local community to other part of the world where Newmont operates. In this way, they will see how the companies operate.

e. He asked also that the road that Newmont will build from Moengo to Langatabiki could be used by the local community.

f. He asked if Surgold will come back to present the findings of the ESIA study and if the local community will have insight in the final ESIA report.

g. He states also that most of the local people are collecting rainwater for use in big tanks. But when the project will start, they will not be able to do that anymore because of the big amount of dust that will be created.

h. He states also if local people will be involved in the environmental baseline studies.

Salomon Emanuels

a-g. He answer that all these questions will take into the ESIA process and the road could be used by local community. ERM will come back to present the findings of the ESIA in April 2011 and the ESIA report will also available for review.

Rutger de Wolf

h. He answer that for the flora study, a local person is involved which name is Van Troon. But also the possibility will seek if more paramaccaners could add to the group.

Redmond, Head of the primary school of Loka Loka

He states that the company gave the best student of the three primary school at Langatabiki, Nason and Loka Loka a scholarship of 1000US dollar to continue their study in Paramaribo. They received the money once and is not enough to finish the study in Paramaribo. So he has a request if the company could continue give these students the scholarship every year, as soon they are making progress. In this way they will stimulate the students to continue doing their best.

Wendell Asadang

He mentioned that this request will be communicated further.

Adam Ceder, entrepreneur

He states that he speak on behalf of the community. Granman Levi guarantee the local community that the community should exploit ate gold in the paramaccaans area and sell the gold to the Central bank of Suriname and they did. Since they move the porknockers from the Gowtu Bergi area, they promised to build a road for the porknockers what is still pending.

He mentioned also that there is a lot of military in the area and they are not so happy with that. He requested to remove all the military from the area.

Wendell Asadang

The company will work together with the local community and he think that this is really the time.
But what they will prevent is different people show up as representatives of the local community.

He states that the government does not have it in his hands to determine where the police should operate. At this time, there are no military in the camp

Mr. Johannes Amouten, entrepreneur
He mentioned how he has it attribution to move the porknockers out of the area. He said that they promised to build a road so that the porknockers can continue with their activity.

Johannes Toyo.
He mentioned that the community always wants to work with the company.

Ezechiel, captain
He has a request that the local community should be involved in the process of dealing with the government and also opportunity for the porknockers.

Box 1.1 Langa Tabiki Scoping Record of Photographs

A record was kept of all attendees and this is listed in Box 1.6 below

Box 1.2 Langa Tabiki Scoping Attendees

PUBLIC MEETING [illegible] [illegible]

dorp

	Naam	Adres / dorp	Telefoon / Email	Handtekening
1	Doedoe Walter Jozef	Nason	8263588/8799310	[illegible]
2	Ceder Adam Edion	Langatabiki	8845200	[illegible]
3	August Sisins	[illegible]		[illegible]
4	Tjappa John	Kriki-Motto	8669062	[illegible]
5	Tappa Thomas	" "		Tjappa Th
6	Sanna Johannes	" "		Sanna
7	Aboeka Bajan	Tabiki Ede	08759142	~~Sanna~~
8	M. Klemens	Tabiki ede	08616408	M. Klemens
9	Edson	Lagatabikif	8988237	E.A.
10	Deel	L.T.		
11	af-Se			
12	Sebe			[illegible]
13	Adaweda	[illegible]	8585357	[illegible]
14	Ceder J	Skintabiki	8598852	Ceder
15	Asaiki J. M	Skintabiki	8144818	Asaiki
16	Amekang C. A	Langattabiki	8827785	[illegible]
17	Clemens R	nason	827719	Clemens R
18	Finas Antonius	kikimoto	8532820	[illegible]
19	Johannes	Langatabiki	0891407	Foaster
20	Dina Pente	nason	8128611	Pente D.
21	Abai M.	Nason	8679006	[illegible]
22	Masanna Filomena	Skientabiki		Nason
23	Tojo Johannes	Alemsa	08540120	[illegible]
24	Tabiki Yohannes	Nason	8148898	[illegible]
25	[illegible]	Nason	8183493	
26	Nida Hendrika	Poy		
27	Clemens Alouisia	Jofis	8619749	, alusia te 71581
28	Anselian Afaido	"	8905391	, 61
29	Ashlobie	Am		AMERAN
30	Brun 8785869	BIMAFO		
31	Peeters			

	Naam	Adres	Telefoon / Email	Handtekening
32	Asalobie Max.	Langatabbetje	8859485	M. [illegible]
33	William	Sapaia	8848688	
34	M. Babel	Alati Langatab.	8951663	[illegible]
35	O. Tjon-Akon	Paramaribo		[illegible]
36	McDadoe - Alimoenadi	PARAMARIBO		Mcamoe
37	R. Ramsukul	Paramaribo		RR
38	Silva	Paramaribo		Silva
39	Sanna-Maritje	Langatabbetje		
40	Redmond, Paul	Kolka-Kolka school	8242611 / 8041516	P. Redmond
41	Kamilie - Joleain	Paramaribo	8944460	[illegible]
42	AL	Silvi		
43	Ceder. Renaldo	Atemsa	8251499	Ceder. R
44	Joels	Sana	8120032	
45	Sonna Corinne	Corinne Atemsa	00594 694 982503	[illegible]
46	Van de Goth Joyce	Joyce Atemsa	00594 028481	[illegible]
47	LONDA Oliane	Atemsa	0694 91 83-cel	[illegible]
48	Adoenaga Carmen	Atemsa	8983444	
49	Gidins Helmina	Atemsa	8709204	X
50	Cedore Lucia	Atemsa		X
51	Cedore Mauritina	Atemsa	8814857	
52	Ceder Grethe	Atemsa		
53	Tojo B	Surgold		[illegible]
54	A. Gow-Smith	Bam		[illegible]
55	Kapt. Bando	Langatabiki		
56	Javinde Evert	Langatabbetje	8512686	
[illegible]	Sama Lucas	Stoelmanseiland		
[illegible]	Frans Boiboi	Atemsa		
[illegible]	Kapt. Ndada	Paliwa Tabiki		

It should be noted that not all attendees signed the participation sheet and that additional people to this list joined the meeting.

4 OTHER SCOPING MEETINGS HELD

In addition to the public meetings held Surgold and ERM conducted two separate internal presentations, recognising that Surgold employees, as part of the community were keen to understand the ESIA process and the way the project will be developed.

In addition it was recognised that Surgold employees have the capacity to communicate to their families, friends and neighbours, further disseminating the information to the public.

The presentation component of the meeting was the same as in Paramaribo and thus has not been repeated here.

Questions and Answers Session

Leysner, SEMC.
a. He asked if Surgold has a system in place to recover the damage created by the porknockers.

Kirk Schmidt
a. Cleaning of the garbage has taken place in the field, followed by the removal of scrap metal for recycling. The soil that will contained gold will be taken to the processing plant from where it will be disposed for treatment. A group of engineering is working on this now.

Box 1.1 Internal Record of Photographs

LANGA TABIKI CONSULTATION AND DISCLOSURE MEETING

Meeting held on 11th June 2012 in Krutu Oso, Langa Tabiki. Meeting was conducted in Sranan Tongo and Pamaka.

Presenters included:
Mr. Salomon Emanuels, representative of ERM
Ms. Maureen Silos, representative of ERM
Mr. Ryan Kambel, Health Safety and Loss Prevention Coordinator, Surgold

Meeting agenda:
Word of Welcome
Agenda
Role of ERM in the Project
Who is ERM
What is an ESIA
Introduction / ground rules
Recap on the Merian Gold Project
Findings from the Environmental and Social Impact Assessment (ESIA): existing conditions, expected impacts and mitigation measures
Questions and Answers

Transcription Surgold Public Disclosure Meeting
Langa Tabiki
Krutu Oso
11 June 2012
10.00AM – 1.00PM

0min
Master of Ceremony: Ms. Maureen Silos

Good morning.*Granman*, head captains, captains and *basja's*, ladies and gentlemen, children, welcome. I am Maureen Silos and I am the chairperson for today. I will make sure that everyone who would like to say something today will get the chance to do so. I will also make sure the meeting runs in an orderly way. I am happy to see this many people here today. Some of you will remember that a year ago Mr. Salomon and his colleagues came to the area to ask the G*ranman* and his people permission to conduct a research. Mr. Emanuels will tell you more about the research and why the research was necessary to do. We know that Surgold would like to mine gold in this area. In today's world, companies like these cannot operate in an area without showing consideration for the people living in the area, the animals, fish, water, and all the things people use. You cannot come just like that and start working. You have to show consideration for the people. This is the reason why, whether you would like to mine gold or bauxite, you have to ask an independent organization, an organization that has nothing to do with your line of business, to study the effects of the operations. They study what the negative effects will be, but also what benefits the project will bring.

The independent organization conducts the study and they will write the report and advise the company on how to strengthen the positive effects and to reduce the negative effects. Surgold requested ERM, an American company, to conduct this study. The research is called ESIA. Mr. Emanuels will tell you later on what this is exactly. ERM is a big organization, they have more the 30 years of experience in doing this types of research. They operate in more than 140 countries around the world, about 3000 people work for ERM. So, you can imagine they are very experienced in doing different types of research relating to health, mining. They have been active in many areas. When ERM does a project in a country, they don't only work with their own consultants, they also work with local experts like Mr. Salomon Emanuels and other people. I guess you noticed people coming to study the water, animals, fish, and those kinds of things. Mr. Emanuels and his colleagues talked to the people that are living here.

As I said, Surgold requested ERM to conduct this study and to find out what effects the project would have. Today's meeting is a special meeting, because the research has been done, ERM made the report, and today we are here to tell you what the findings are, to tell you what advice ERM has given Surgold to make the positive effects become stronger and mitigate the negative effects.

I am happy that so many people took the time to come and listen to the presentation and I thank you for that. I will now briefly tell you what we will be doing during this meeting. We will start with Mr. Ryan Kambel, he works for Surgold and he will briefly tell you what the Merian gold project entails. Then Mr. Salomon Emanuels will tell you more about the research, he will tell you about the findings, and the advice given to Surgold. I also introduce to you Ms. Wielzen, she is sitting over there, she works for ERM today and will write down everything that is said during this meeting. ERM thinks it is very important to incorporate in the report all the things you put forward, all your comments about the project.

As I said, I am the chairperson of the meeting and today I work for ERM. I would like to make a few requests: show consideration for each other, so the meeting can run in an orderly manner. I would like to ask you to register. It is possible someone from Surgold or ERM will present you with a list to put down your name and village. I cordially ask your permission to record the meeting and take pictures. We need to include all the information in the report. I also would like to ask you to use the microphone if you want to say something, it's over there, so just walk over to the microphone if you would like to say something. But please state your name and village before, so Ms. Wielzen can write this down as well.

I don't have to mention the following things, but it is good to say it anyway, show consideration for each other, don't yell, don't call each other names, don't interrupt the speaker, listen. I would like to ask you to switch off your mobile phones or put it in the vibrating mode, so it won't interrupt the meeting. Finally I would like to ask you to save your questions until Mr. Emanuels has finished his presentation. You will then have all the time you want to ask questions or make comments, but let Mr. Kambel finish his presentation and Mr. Emanuels as well, and then you will get all the opportunity to ask questions.

I would like to give the mike to Mr. Kambel of Surgold.

10min

Mr. Ryan Kambel

Good morning to all of you. First of all, thank you for being here and having taken the time to come and listen to today's presentation. Firstly, I would like to present, I would like to tell you more about Surgold. Many of you already know the company, but especially for those of you who don't know me, my name is Ryan Kambel and I work for Surgold. I have been working for the project for more than 10 years, so I assume that many of you already know me. At the Merian project, the place we work at, there is one thing that is of great importance to us. It is one of the most important aspects of the work and that is safety, as it is called in English. Safety of all workers of the project. We don't take safety lightly. We don't want people to get into accidents or hospital. The work we do, we would like to do it safely. It is our conviction that you should return to your home, in the same condition as you had left it when going to work: with all ten fingers and toes. We don't take the safety of our workers lightly. It is very important to us, who work at Merian project.

The Merian project, Surgold, we create employment for the people to come and work for us. It could well be that you come to work for us, and you don't know how to do certain things. We will train you how to do your job well. I know that many of you have relatives working there. If you have the opportunity, ask them how we work, they will tell you: "yes", I didn't know how to do it, but they taught me to do it. We don't just train them, they can share what they have learned with those at home, share it with their relatives at home.

On the slide, you see there is written: "Safety today, for a better tomorrow". A few days ago we had a contest at the Project to find out how our own workers think about safety. We held a contest and one of our workers, Clemens Banai, maybe you know him, he works with us and came up with this beautiful slogan: "safety today for a better tomorrow". This is how we look at things at the Merian project, at Surgold. This is how we must work, how we would like to work and how we currently work. We don't want accidents to happen. So you will come across this slogan more often, because at Surgold we will work in this manner.

I mentioned Surgold and Merian, but I will now explain a bit more about Surgold. Surgold came to the area in October 2004. Newmont and Alcoa set up a company, they called it Surgold. Newmont is the operator. This means they are responsible for operations. But Alcoa is a partner of Newmont. Not only Newmont, but two companies participate in it. The official name of the company is Surgold.

I know that some people like to talk about Newmont, but Newmont is not the only one participating. Newmont and Alcoa are participating and the company's name is Surgold. Since Newmont arrived in October 2004, as I said, the only thing they have been doing until now, is exploring. This means they are looking for gold, they are looking where it is and how much of it there is. We don't take it out, and go to the bank to collect money. We only do research. So, if you hear many stories about how we load the gold in trucks and carry away, it is not true. The only thing we do is looking for gold. Till now. We will continue looking.

I assume you all know where the Merian project is located, but let's still look at the map of Suriname to locate it exactly. This is Paramaribo, you drive to the east, to Moengo, from Moengo on you continue southwards to arrive at the Merian project. This is Langa Tabiki, where we are at currently. This you know of course. So this is how you reach the Merian project according to the map. If you consider the distance, you see here 98 kilometers, and here, if you calculate it, 66 kilometers, this is the distance between Moengo and Merian project.

As I said already, we are currently only exploring at Surgold. Just now I made a distinction, Surgold was set up by Newmont and Alcoa. Newmont is not the sole owner of Surgold. Two companies own Surgold. As you may know there are also activities undertaken at Nassau mountain. But these activities are undertaken by Suralco, not Surgold, not Newmont. But only Suralco, they mine bauxite, not gold. So Surgold and Suralco are two different companies. Surgold is active on the Nassau mountain, they mine bauxite, sorry, Suralco is active on the Nassau mountain, Surgold mines gold. At the moment, we are doing two things at Surgold, we look for gold, this is exploring, and we are constructing.

These are a few pictures of the exploration activities. This is a drilling machine, they use this to dig into the soil. They dig quite deep, sometimes more than 200 meters deep. This is a picture of the soil that is taking from the drill hole. They take it to camp, this is one of the technicians, he labels and inspects it, geologists are coming into the process, and they inspect it, make notes. There is a lab in the camp, this lab does not check if there is gold occurrence, the only thing they do is making the soil ready, in a neat way. They make a package and send it abroad to be analyzed and determined whether it contains gold or not. It is possible it does not contain gold. This is the exploration process.

We are also constructing a camp. Heavy equipment, drilling machines, bull dozers are at the site, because we need to clear the area to construct the camp. Many people are working on the construction of the camp. This is a picture of our base camp. To have an idea of the planning and how things will proceed: we are in 2012 now. We are negotiating with the government to sign, so mining operations can start. When they have signed and when there is agreement on the issues which Mr. Salomon will discuss in a moment, we will then start with the big construction project.

20min

We will start with the construction of the plant, the camp where people can stay, the construction of nearly everything that comes with such a project. This will take two years if all goes according to plan. In 2015 we will start mining, if all goes according to plan. In 2015, they will start mining. The study showed that the life span of the mine is 14 years. People will be find work here. You will understand that while we are mining, the exploration will continue. It is written here, 2030, but while were working, exploration will continue, in the case we find more gold, the date will be extended, we will stay longer.

This is a map, it gives an overview of what the mine will look like once operating. We will have three mine pits, the bigger one you can see here, and the other smaller ones. These yellow parts represent the place where they will put the rock waste, as they call it. There is also a facility for storing the liquid waste, as we call it for reasons of simplicity. This green part will be camp. This will be the plant, they will need a lot of energy, so there will be many generators to run the plant, the camp and all places that need energy. In camp there are also a few offices, to work at. There will also be a medics point, in case medicine is needed, all those kinds of things will be put in place.

It is also in the planning to build our own airstrip within the concession. There are many reasons to do so. One of the reasons is, and I said it already, we don't want people getting into accidents. We work safely, we don't want accidents, but if an accident happens, we should help the victim. If the airstrip is nearby, it is possible to quickly get to the plane and go to Paramaribo. Many of you will still remember there were a few times we had to take people from our side all the way to this side to take the plane to go to the City. Time matters when there has been an accident, we lose a lot of time by taking the person to Langa Tabiki. We would like to have it closer to us, everything will be near, the plane will be going directly to the City.

These pictures give an overview of the future situation. This is what they call a Haul Pack, one of those big trucks. This is a person in front, and this is the tire, look at the height of the person and that of the tire, you will have an idea how big the Haul Pack is. This gives an even better overview, look where the person is standing, you will have an idea now how big the machine is. This is a loader and this is a grader. This is a picture of what the mine will look like, this is Rosebel, "I am Gold", where the mine's at, where they work. This is a picture of what the plant will look like. Again, this is a picture of the waste rock, which I discussed just before. This is again Rosebel. This is Ghana, one of Newmont's other projects in Africa. This is the liquid waste.

To give you an idea of the way Newmont works, well I say Newmont, but intent to say Surgold. This is a picture of Indonesia, in April 2003 they finished working there. They were busy with the activities that follow after closure, the environmental work, they call it rehabilitation, meaning restoring the old situation as much as possible, like it used to be. This is the same place we just saw, but now five years later. The whole place is wooded again. The company finished working, they did what they had to do, they left and this is how they left it behind. You could almost not imagine they had been working there only two years before.

That was my part for today. I give the mike to Ms. Maureen.

Ms. Maureen Silos
Thank you Mr. Kambel. I now would like to invite Mr. Emanuels to come and tell you more about the results of the study and the recommendations made by ERM for Surgold.

Mr. Salomon Emanuels
Thank you Ms. Silos. I greed the *Granman*, who is present, the head captain, the captains, the *Basja's*, ladies and gentlemen, children, all people of Pamaka. Today I returned to tell you about the study we conducted, for which we had asked your permission. We came to tell you what the results of the study are. Before I start, I want to say something first so that it will be very clear. I mention it every time I come to Pamaka and today I want to say it again so it will be very clear. I, Salomon Emanuels, don't work for Surgold, I work for ERM. I was trained to do research, and conducting research is what I do. I don't know how to mine gold, nor bauxite. I know how to conduct research.

The research we did, like Ms. Silos already said, is called an ESIA. This is a study where you look what effects, in case of mining gold or bauxite, what the effects will be on people, animals, birds, fish, everything living in the area where you will be working. What good and bad effects will the project have on them? Why is the ESIA done? It is conducted, because you need to take a decision whether or not to start the project. If you decide to start the project, you will need to organize it in such a way that it has a positive effect on the people and everything else living in the area. If you decide not to do it, you also need to be able to tell people why you're not proceeding with the project. The research is needed. The research has to be done, to find ways to turn the negative effects of the project around and almost turn them into positive effects. The negative effects should be mitigated, but the positive effects should be strengthened. The ERM team did the work and produced findings.

30min
Based on the findings, we made recommendations and put them on paper, for the company and the government about what they should do if the project goes on. I will tell you about these things in a moment. One aspect of the study, this kind of research, you don't do for yourself. Worldwide there are guidelines on how to do this type of research. For that reason you saw us coming and going. If you don't conduct it in this way, other people in the world will tell you, listen, you conducted research in the Pamaka area concerning gold mining, but the research wasn't done in the right way. There are guidelines on how to conduct the study. For that reason we do it. There

are people present today, who have come to see and listen if we conducted the study in the right manner, according to international standards. NIMOS, the governmental institution, will also evaluate the study. When I do something, once I leave, they will check what I have done, evaluate it, and see if it was done in the right way.

The ESIA study consists of different parts. One of the parts is called "the environment". Another part is called Social, health and stakeholder involvement. This means you should talk to the people that will be affected by the project one way or another. When talking about the environment, we talk about things like water, birds, animals, trees and all the other things we know exist. You have to look at these aspects. Regarding social, this refers to all people that live in the area where operations will take place.

With respect to health, you have to look if as a result of the project, illnesses in the area will be manifest even more or become worse, or you should check whether new illnesses are introduced in the area as a result of the arrival of the project. You have to evaluate all those things. You also have to see to it that enough doctors are present in the area, because with the arrival of new people, and many more people will come, having just one doctor per 4000 people or 10000 people might not be enough, you will need to have more doctors or do something else.

One of the difficult aspects of the study concerns involving all people that are affected by the project one way or another and call them together, to sit down and talk with them, to be able to understand each other, to know about their views on the project. This is called: "Stakeholder involvement". It concerns Pamaka people but also people from outside Pamaka. They can also be involved in the project, you also need to hear them. This is one of the difficult parts.

I can tell you, in this study, I have been coming to the Pamaka area for many years, but still there are sometimes people, when I go talk to them, I can't say they are calling me names, but the way they look at me, sometimes make me feel a certain way. But I'm doing my work, so I go on. The more difficult part of the study, like I said, is the stakeholder involvement. It is not to draw them into the project, but it's just to hear their views on how the project should be done. If someone is reluctant, it is difficult to involve him. Sometimes it happens, like I said, that you are around in the area. The person was sitting and sees you nearing. He gets up to go into the house. You knock on the door and he says he doesn't have time. You notice the person doesn't really want to address you. Because if someone is willing, he will stand talking to you, he will say sorry but I am on my way to church or I have to take my child to the doctor's, but come back tomorrow or another day. Then you will know this person is willing. But if someone gets up and closes the door, you understand this person does not want to talk to you.

So far ERM called the people together to talk to them and explain what would be happening. Posters, folders were put up in different places. We had several meetings, this is not the first one, we came to ask for your permission, we came to talk to the people many times, we sat down with them and talked with them. The people from Surgold also came, Mr. Asadang and Ms. Tjappa, all of them came and talked to the Pamaka people about the project. Other people phoned the company, or ERM, to tell us what they think about the project, what their views are. When I meet the elderly and also some young ones in the street, they stop me and ask how the project is coming along, what is happening in Pamaka. I tell them what I know and if I don't know it, I tell them where to find the information.

The research. Before continuing let me tell you this. There is much to be said, it is a long story, but I will try to break it down in little pieces. I won't talk about everything in detail, but if there are any questions, I will go into it a little deeper, because I could fill a whole day talking about it. You will notice that I will not always elaborate on things, not because I don't want you to know about it, I want you to have the information. But in order to win time, I will work this way. I am asking your permission for this.

The study we did consists of three parts. The first part we call "scoping" in English. Scoping means that the people who will conduct the study, people from ERM, from the company and all other people that needed to be involved, sit down together and discuss what aspects need to be included in the research. What should be left out and what should be in? Because you will not research everything. This is what they call scoping.

One time I went all the way down to the Kawina river to see if there were people living there, to be sure if there were people there we needed to talk to. Mr. Asadang and I went together one time, the night almost fell, we got lost and didn't know where to go to. Later on we took a boat and went on our way to look for people living in the area. Because, if we conducted the study and later on it turned out people were living in that area and we did not talk to them, we would have had a flaw in our study. In order not to make that mistake, we went all the way over there. That is the first part.

After completing the first step, we looked at all the information collected, only then we took the decision whether to conduct the study or not. A long time ago we came to talk to the *Granman* and captains. I phoned a few captains to call for their support, to help ask the *Granman* for his permission to conduct the study. All of this we had to do. This was done from June to July 2011. Only after we had finished this part, the actual study started. We went into the area, talked to the people, the people responsible for the environmental part, they did not go into the bush to talk with the animals and birds.

(One or two sentences are missing here because the technician started a second audio file).

40min

If you are educated, you are able to understand certain things better. Regarding the cultural matters, the negative impacts that can occur from the project could be that you can't go to the forest or certain parts of the forest anymore. Possibly parts containing things that are of ancestral importance. You wouldn't be able to go there anymore. Changes could also come in the way the people live together, like I said before. Let's say a person cannot go to that part of the forest anymore to pick herbs or wood. He then has to go look for it somewhere else. He could well become tired of this situation, and think "I don't want to go anymore, I don't want to do it anymore, I will stop doing it". This way of thinking could occur. Another consequence could be that a lot of people that are not from Pamaka, come to work here and when they arrive, they will also take along their habits and customs. They have their ways of doing things and they will bring this to Pamaka and Pamaka people might copy this. The elderly will complain and say that the Pamaka traditions are being destroyed. This can also happen.

We also gave the company some advice on ways to prevent the culture of the Pamaka people being affected too much. It is not possible to offset everything, but make an effort to prevent the changes from becoming too big. We told the company to see to it that dialogue between themselves and the Pamaka people is ongoing. I heard the Samaaka people saying that by talking with each other, people can understand each other. As long as there is communication, solutions can be found. We need to find a way to organize it. The company could come once a week, and talk to the people to make them understand what is happening. It would not be a good thing if they came to stand opposite each other.

We also told the company that the Pamaka people have ideas on how to preserve their cultural heritage. They have ideas about it, look for ways to support them, make an effort to preserve their cultural heritage. Let's say for instance, the Pamaka people want to build a museum, help them to build this, so they can say this is the way they are preserving their cultural heritage. We also told the company to write a code of conduct for the workers of the company, so they know what behavior is expected from them. We have codes of conduct in the interior. If you go to another country, you will need to know how to carry yourself. What you don't like happening in your own country, don't do that in another men's country. The company should put down on paper for all its workers, how they should carry themselves when they come to the Pamaka area.

Another effect of the Merian project, relates to accidents, many accidents might occur. Why? Because the road will, you see it's a winding road, before you know it one of those big trucks can be in front of you. If you're not on the alert and your wheel turns slightly, you might end up in the ditch. All sorts of accidents could happen, I don't have to tell you this, more accidents might occur because more cars will be on the road. They will be working on the road, the roads might be closed, they could be working on the road at night or daytime, they will be active, they will build bridges, all those sorts of thing. Accidents could happen while doing all those activities. It is possible that one day you're coming from a meeting, or you were out all night long, and this part of the road is quite long, it might be you're driving and fall asleep behind the wheel. Accidents might happen as a result of these kinds of things. Or someone is operating a machine and falls asleep, or someone gets unwell, something has happened to him, all those kind of accidents could occur, as a result of the project.

To be in control of the situation, and again, you can't prevent everything, we also gave the company some advice regarding accidents. We advised them to make a plan to organize traffic on the road. This matter has to be done in consultation with the government. There need to be clear signs, maybe traffic lights, to indicate to people what they are approaching. All these things have to be organized well. Don't leave the road just like that, it's not to discourage people driving, but organize it and make it clear, let people know how they should use the road. Pay attention also to the driving speed. There are people, who jump behind the wheel, you know those people that drive on the road by Moengo, in a twinkling of the eye they have driven past. Sometimes they yell at you to get out of the way. See to it that people don't drive too fast on the road, especially the cars from Surgold. Tell the people also how to behave in traffic, to behave in a good way. Give them information, tell them how they should do it.

We also told the company to see to it that the contractors that bring in people to work will also be informed about safety matters. Because not only the safety of the company's workers should be looked after, as Mr. Kambel told us, also the other people. Even if you don't work for the company, you can cause problems for others, so you also have to follow certain guidelines. If someone drives without a helmet, it could cause problems.

Another negative effect. They will work with, they won't use mercury, they will use cyanide and other things that are not good for the human skin. These things can cause problems, these chemicals can cause problems. How? It is possible someone is driving a truck, a big truck. He is driving all the way from the City to deliver goods to the company. He didn't notice his tank has a hole, it is leaking on the road, it catches fire, that's a problem. So oil can leak away without anyone noticing, it could leak into a creek, or the river, or just stay on the road.

Regarding the things that are left behind, the white people call it "waste". What you have finished eating, you throw away, when something is used up, you throw it away. You have to know where you store all these things. Like I said before, oil can leak from the mine, contaminated oil, oil they won't use, or oil that has been used, but they want to get rid of it, they store it somewhere, they don't manage it, it can leak into the water, or where people are living at. These kinds of things could happen.

We also gave the company some advice on how to manage these matters. We told them to make a good plan on how to remove those things. So if oil leaks away, or a chemical substance, one of those that are used to mine gold, you need to have clear how you will remove it, before it reaches the people. It needs to be clear how it's going to be removed.

50min

With respect to the cyanide that is going to be used, and the other substances, it has to be clear, the company should also have a clear plan on handling cyanide. What will be used to wash the gold, it has to be clear. It should not be the case that people die as a result of this and if something happens, just like we expect the fire engine to arrive quickly when a house is on fire or the ambulance to arrive quickly if an accident occurred on the road, in the same manner the company should see to it little time elapses between the moment something occurred and the moment someone has to be taken to the hospital.

It should see to it that help can be offered quickly when needed, so that people can stay alive, because we don't want casualties.

This part goes deeper into the cyanide matter. I won't go into much detail, but the fact is that cyanide is different from mercury. The big companies use cyanide, because mercury can't be removed, it stays where it is. Cyanide can be removed because of the sun. When it is exposed, the sun breaks it down and it can cause no harm anymore, but mercury, no, if mercury spreads it doesn't matter how many years have gone by, it is still there. That's why the big companies work with cyanide. But cyanide is more dangerous than mercury. So if you come in contact with these two matters, what will happen? Ryan I'm right or not? Ok, the one will kill you quicker than the other. That is why the big companies work with it. To be able to work with it, every company that wants to work with it has to sign a code. They have to follow the code, it is written down, that's why you can't conceal it. If you're party to the code, people will know it. What I didn't know, but came to know these last two days, is that Newmont was one of the initiators of the code. When you work with cyanide, people expect you to adhere to the code. If you, being a big company, are not participating in this initiative, you should in fact not be allowed to work with it. Newmont was one of the initial companies that helped developing the code. I did not know they are participating. If I'm not correct, Mr. Ryan can help me clarify it because I don't work with cyanide. But that's what they say, you can't just handle it like that. It is one of those things that are worked out in detail in their plans. They should have clear where it is stored, when it will be taken out, and how it will be managed further. We told them to include this in the plan, so it will inspire confidence and show they are not just doing anything. That is one of the things we told them as a result of our study.

Regarding the environment, when you look at where the mine will be located, you will see the forest has been disturbed. At the location of the Merian mine, there is no more forest. People that have been there, know what it looks like. Everyone who comes to the mine will immediately see the forest is gone. All the trees and other things have gone. Certain creeks have disappeared, are not in the area anymore. When looking for it, you won't find it. The streams of the creeks have changed, so you don't see them anymore. It is in a completely different place. Things will change. You will see holes when you go there.

I will tell you how we are working. First we go and look what can be observed. Then we look how we can change things or what can be done. With respect to the environment, these are the things you might see when you go to the mine. It can cause problems for the animals and trees in that area. What will the company do that will affect the animals and trees? The fish will be affected and other things such as frogs. It will cause problems. The project can also affect the air and water, water quality. Water quality means that you can use the water or animals can use the water. Another effect has to do with noise. It concerns all you hear. When cars drive or boats and other things, you hear them making noise. The project can cause problems in this area. What will be the effects on water? What problems can arise with the water? The project can cause many things to grow in the water, things that were not there before. So, you will see things in the water, things you had never seen there before. It could also be that you won't be able to use the water anymore. You will not be able to use it anymore. It could also be, like I said before, that the flow of the creeks will change. They won't run anymore where we knew them to run. They will run in another place.

We advised the company on how to deal with these matters. We told them to make a plan to see to it that not too much dirt will flow into the creek or another place. They have to make a plan to prevent the water from washing away the dirt into other places. We told them to construct something where the water can flow into, so that it doesn't go everywhere but stays in one place. They will have to manage this water in a certain way, because the water is not good. They have to put it in a place where they can manage it and recycle it. Maybe you wouldn't be able to drink it, but you can use it for other things. So they have to manage this. We also told them they shouldn't wait till all the gold has run out, before they help the forest to become again like it was before. When they are going to leave, they should start managing it. So when they have finished, everything is again like it was before. They shouldn't wait, however, they have to do it simultaneously.

1h00min

We also told them, listen: you know where the water can be found. In the creeks, in the river, in swamps, in the ground. You know where the water can be found. Make a plan to see to it that this water is not contaminated. Things shouldn't leak into the water and spoil the water. Let it remain the same, as much as possible. This we also told the company. There will also be negative effects on the animals, birds, fish and other things. The project will affect these things. What will be the negative effects? When you go to the forest, you will see it is different. The colors, everything will be different. But it could well be that the company starts working tomorrow and you see everything has turned yellow. Or blue. A change has occurred, the vegetation as white people would say, has changed. You might see grass when you go to the area. Things will change. It could also happen, like I said, that the forest, the earth are not the same anymore. If I produced vegetables and they used to grow here, it could be that in the future it doesn't grow there anymore. This can also happen. Animals could be wounded as well. If you and I walk without looking, we can get into accidents. This can happen also with the animals. An animal that is running might be hit by a big machine. All these kinds of things can happen. We also advised the company how to deal with this. We told them to make a plan on all issues. How do you deal with the animals, so they are not killed? You have to see to it that special things are preserved. Let's say there is a special plant in the bush and it can only be found in Pamaka, then you have to make sure it is preserved.

We also see negative effects regarding the fish. Especially if the water is not good, it will cause problems for the fish. Problems can arise here as well. As I said, problems can also arise with respect to creeks. We also told the company what to do about this. They have to find out where the creek has changed and where the flow is changing. They have to manage this. The company also has to pay attention to the dirt and it being washed away. It should not wash away too much. If possible, you should build a dam that will prevent the contaminated water to reach the good water. With respect to the environment, it could also be that dust blows up in the air. This dust can come down again on the people. Also the cars that drive around can produce fumes. These fumes can affect people. This also needs to be taken into account. In this respect we told the company, make sure the road isn't too dry. They have to sprinkle it so not too much dust will be blown up. Try to monitor the issue of dust on a daily basis. In this way, they will know when there is too much dust and action can be taken. Don't drive with broken cars on the road, because broken cars can cause problems relating to dust. Try to fix bad parts of the road as soon as possible. Check before how the wind is turning, so you can plan what time of the day the job can be done best, in the morning or in the afternoon. It could well be they use dynamite. Even if people are not living near the place where the dynamite is blown up, it can cause vibrations. Maybe your house starts shaking. We told the company that this can happen, that things will be shaking. They have to have consideration for the people. We told them to make a plan to manage these issues. We told them also to maintain everything they have, so they won't produce too much noise. Try to work in the same manner, as you do when working with dynamite.

I have rushed through this last part, but I couldn't help doing so. It is difficult to listen to someone speaking, for such a long time. I can tell some people are getting restless, well, I'm coming to the end of the presentation. Everything I talked about is in the report. We can't distribute the report just like that. Look how many people are here today. We can't give everyone a copy. That's why we came to tell you the story. If you would read the report, you would find the same things there. You won't find other things. I have come to the end. The report is available. The people from Surgold have it. NIMOS also has it. I think they will also try to have the report at the camp, but they are still talking about that. The report is available, people that can access the internet will find it there. If you want to know more about the research, if you didn't understand everything and you want to know more, you can contact ERM. My name is Salomon Emanuels or you can contact Mr. Wendell Asadang from Surgold to find out more about the research. I have reached the end, thank you for your time and listening to me.

Ms. Maureen Silos

That was a long story. I want to thank Mr. Emanuels for the way he presented this long story. This is important, because ERM would like to know what you are thinking. Therefore the mikes are now open, you can ask questions and tell us what you think about all that Mr. Emanuels and Mr. Kambel have told us today. When standing in front of the mike, please state you name and which village you're from. To whom shall I give the floor first? You now have every opportunity to ask about things you didn't understand or to make a comment. Just ask what you want to know. Yes, please go the mike and state your name and village.

Question & Answer Session

1h10min

Mr. Adriaan Adawde (entrepreneur, Loka Loka)

First of all I can say that for the first time in the Pamaka history such an explanation was given about a project, a report, dealing with Pamaka. For the first time I listened so attentively and critically. So ERM, and Mr. Emanuels, thank you for the work, you did a very good job, and you deserve applause for the work done.

In Suriname, generally speaking, there is one thing you can stake your life on. Whenever it concerns writing reports, Suriname could win many trophies, but when it comes down to implementing the reports, Suriname would fail. That is for sure. In my experience, very interesting, critical reports have been written, but the compliance with the reports leaves much to be desired for. So I don't think that such an interesting report, I support it to a large extent, the draft report should be given to the community.

When you present a report, the community must agree with it. We heard a few things, Mr. Salomon said we had the opportunity. But I herewith ask the company to distribute a few copies of the draft report to a number of people including the head captains and *Granman* so that we can brainstorm about it. Before going into detail, I want to say that a committee needs to be set up, consisting of ERM, the company and the community, to monitor compliance with the report. We can talk about these matters, but the question is whether the report will be complied with. And how will you know the report is being complied with? Only when a committee will critically monitor the report. It is a very interesting report, if you ask me, but the compliance with the report, with all due respect, the company will not comply with it. Don't resent me for saying so, it's not that they won't want to, but they have other things to do. If we are involved, and independent people are involved that critically monitor the report, so the company will see that there are people monitoring whether the report is complied with, then I think matters will run more smoothly. This is what we are requesting.
It needs not only to be Pamaka people that are monitoring the report, we also know people from outside the community who can help us critically monitor the report and I am sure that if it is complied with, it will be a good thing, we will benefit from it, the company will benefit from it, and so will the community.

Another matter regarding Mr. Salomon. This is the second ERM report, research that he is conducting in the community, one for Suralco, one for Newmont and I am sure there will be a third one, if I may put it this boldly. I am sure of it. A third one will follow and maybe even a fourth one. Because I was at the house of *Granman* Apensa, talking, saying that a few spot lights are pointed at us. All three reports will be conducted in the Pamaka area. I am sure a third report will follow, for the gran creek project, because if I have followed the news well. The study has been done already, supervised by Mr. Kopinsky and a few others. Another study will also have to be done because a dam will be build. If it proceeds, a third ERM study will need to be conducted. Also in this case, a commission will need to guide it critically. These are the things that are on my mind, I repeat, in the case it proceeds, I think a third one will follow. The Pamaka community will then have to keep the question to the fore. This is what I intended to say, some years ago, the spot lights are pointed at us, this is not a bad thing, but we have to know how to deal with this. I am sorry if I'm talking too much, but these are the things on my mind. Another matter, I'm afraid to be bold again, when saying that in the case such a commission is set up, either Mr. Salomon or someone close to him will have to take part in it. It is not a demand, but only a request, because he knows how things work.

I don't hope that the time will come that the company and the Pamaka community will have to go to lawyers. I really don't hope so. However, if you do not conduct yourself well, I will ask the *Granman* to get support from lawyers to go after the company, even if I work for the company. I'm Surinamese in heart and soul, in the second place I come from the interior, I am also Paramakan. So I hope we will not have to go to court because of the fact that the company did not comply with the report.

With respect to Mr. Kambel, indeed, we are still in research phase, I was sitting with this man, who is sitting next to Mr. Tojo, we were sitting on my balcony. I am sorry I did not state my name before, I am Adriaan Adawde. I was sitting with Mr. Asadang and Mr. Tojo on the balcony and they asked me what I thought about the company. I replied that I could not say too much because they are still in the research phase, but Mr. Kambel said in two years' time a new phase will be entered. This will be in 2014. The things we are talking about now should not start in 2013, but should begin in 2012. This means that hardly two more years are left.

Mr. Salomon mentioned that there are not many educated people in the community, that's true, but if we don't have them we should look for them. Now is the moment for the community to say what they want. In two years' time we will begin, and we should say what we want. I don't have to say too much about what we want, because the report clearly shows what the needs are, in particular for the small scale miners. I am very happy with this part, because their lives have to go on. That's why I say the report has to be complied with. Again, we now have to say what we want, and we should start before 2014. It's not a demand, but a request, because we need to work like partners and not enemies. I think I will leave it at that, although there is more to say.

What I want to say, I plead with you, Mr. Salomon said it already, the community does not have educated people. You are educated, once you have received an education, you are not educated if you did not get an education, that's why training is one of our priorities, which we will request from the company, Mr. Salomon talked about it. Let the company support us with a training center, outside the company. It doesn't matter where, but let us discuss together where it will be set up.

There are many matters to deal with. We are having problems with the recruitment of workers. Many people have phoned me, even this morning four people phoned me, I will not name them, and they don't have to be afraid of that. He said the recruitment of workers is a bit problematic. It has to be dealt with in consultation with the community. I am happy it is incorporated in the report, let it be complied with. My point is, I support the report, by God, I plead with you, I plead with the company, the community, the government, comply with the report. If there are government officials present, let the report be complied with. If there are comments, incorporate them in the draft report.

Lastly, the community relations department has proven its value. Under supervision of Mr. Asadang, and the others, they work, but in my personal opinion, I, Adriaan Adawde, think there should be a dependence of community relations by the river. A small office, whether located in Langa Tabiki or Nason or somewhere else, it doesn't matter. If Mr. Asadang leaves the company, the community shouldn't be the one to say that he can't leave. The relationship between the community and Mr. Asadang has to be such, that they will almost form one entity outside the company. They work together, but let it be more our thing as well, because it is an important matter, we haven't got the experience.

I also request that a few people go to Africa, to see how the company operates over there. It did not happen yet, but I say again, select a few people, or let the community select a few people, to see how you operate in other countries, so it will be in our minds and we will understand it. Thank you.

Ms. Maureen Silos
Thank you, these are things we want to hear, and Ms. Wielzen writes down everything. It will be included in the report, all the recommendations of the community. What I also would like to say, is that we will give a summary of the report to all the captains, and make available a folder that people can take home and read when they have time. To read about the project. To whom can I give the floor?

1h20min
Mr. Athoni Abagi (Head Captain, Badaa Tabiki)
Good afternoon.

Ms. Maureen Silos
Can you state your name and village?

Mr. Athoni Abagi (Head Captain, Badaa Tabiki)
In the past we were invited by Surgold, but now we will invite Surgold to come and talk with us. There are many points that cannot be dealt with today, but on that day we can talk about it. Then Surgold can hear our points and we can hear about theirs.

Ms. Maureen Silos
Thank you.

Mr. Paulus Ezechiel, (Captain, Langatabiki)
As far as I know, the current operating area where Newmont chose to work in Suriname, is the Pamaka area. In this area four groups are living together: Paramakan, Aucaners, the Indians and Alukus. It is important to spread the

information obtained from Mr. Salomon to the other groups. It is also important that Newmont does not make the same mistakes it has in the past, because this can be very damaging.

This meeting should be the last. There should be more meetings to discuss issues with each other. In the period that the *Granman* died, there was a shortage of food and the people of Drie Tabbetje received food. Some received the food and ate it, but said that they would not hand over their piece of land for gold mining. Some people grasp information very quickly and some are more slow. Therefore it is important to give the information to the people so that they can understand it and be more involved.

Ms. Maureen Silos
Thank you, but before returning to your seat, can you state your name and village. Thank you.
Next, who wants to ask something, or say something? Is everything clear?

Mr. Salomon Emanuels
The people that are sitting down. I will put down my ERM hat for a moment. I don't do research for ERM anymore. I am Pamakan now. And if you like I can be Samakan. But for the moment I will be Pamakan. I am attending a meeting, a few white people have come and tell me they have done research about my community, they went to my forest and they have several findings. Then I would have a lot of questions to ask. In the first place, as Mr. Adawde said, about the research, the way it was done, was it done well, does it benefit me? The things they included, yes, this is how it is. You can say: this part does not represent things well, you should put it in this way, and you should also include this in the report. So when the report is implemented, these things are dealt with as well. And if you don't include these comments in the report, Pamaka people will not agree with the report. The comments of the Pamaka people should be incorporated in the report first, before they can agree with it and proceed. Say: Newmont, you have to return, Surgold you have to return, so we can talk more into detail about these matters. As a Pamakan, this is my opinion.

Actually I said, you have to buy time, to be able to move ahead. Mr. Adawde has said, when the committee is set up, I have to be one of the members. If I participate in your committee, I will spoil it, because you know, but you don't want to talk. You wait till you're outside, only then you say what is on your mind. Then things are suddenly not ok. Pamaka people, I will move out of Pamaka.

Mr. Adriaan Adawde (entrepreneur, Loka Loka)
With permission of the audience and the others. Mr. Salomon is right there, for 45%, the other 55% belongs to the community. Head captain Athoni said it well. They knew you were going to come, but they still ask the company, all the head captains ask the company to return to talk with them. It is true that Pamaka people don't speak their mind until being outside, but if we start saying what is on our mind, we will be here a long time. That's why we want to plan a specific day, after we have received the report from ERM, very soon, after we have brainstormed, the Pamaka people, together with you, we will

send for you and you have to come. We will come looking for you. That is what I want to say.

1h30min

Mr. Salomon Emanuels

Mr. Adawde, you have understood me well, everyone has understood what I wanted to say. This is it. When we leave today, we need to know what was agreed on. All Pamaka people who came and the other people who came as well, when you leave, you need to know what was agreed on. I said earlier, they need to know, because they need the report to be able to proceed. The longer you discuss amongst yourselves, the sooner 2015 is nearing. What Mr. Adawde talked about, to start implementing now, will not be possible then. I don't want to pressure you, to do something you don't want. When you call for the meeting, it is a meeting to manage the matters and proceed with the report. That's what I wanted to check with you and hear clearly. It's been settled.

Ms. Maureen Silos

I understand that..
The mike..

Ms. Getruida Dewini (Influential Community member, Ateemsa)

In meetings the women cannot have a say, but when problems arise, it is the women that first experience the negative consequences. Ms. Dewini requests that the foreigners that come into the area, should work together with the people and not consider them to be inferior people. The place where they arrived, they reached by foot, not by boat. When she was younger and her children still little, she could give them water from the river to drink, but she has noticed that people now use bottled water. People have to make a lot of efforts to find bottled water, but it was not like this in the past. The white people know exactly what they are going to do with the people from the Paramaka area. The Pamakan should not have to say what they want, because the company knows exactly what they need.

When trees are cut down, also trees that have high medical value are taken out. When these trees are exported and medicines are made, these medicines should be send back to the local people because they are in need of good medicines.

Till now, it has been possible to go to the bush and hunt for wild animals. They can eat them without a problem. This should not change in the future, they should not have to examine the animals before eating them. She calls on the company to work in unity with the people and not see them as their enemy.

Ms. Maureen Silos

Thank you.

Mr. Jozef Emanuel (Basja, Langatabiki)

Emanuel states that they have spoken for some time now and that it is enough. When the head captains and the *Granman* have spoken, then the meeting is over because the *Granman* always has the last word. Today the people of Surgold have come and they have talked. When we go to Surgold, we will talk. For now he thanks Surgold for coming and talking with them.

Ms. Maureen Silos
Thank you.

Mr. Boike Tojo (Surgold)
There are many Pamaka people living abroad, in Paramaribo, America and the Netherlands. They are educated. When the company will recruit people, they need to make sure that no one in the city will prevent the company from recruiting Pamaka people from abroad.

Ms. Maureen Silos
Thank you. You heard what the *Basja* said, that everything has been said for today. I want to know if we can close the meeting now or if anyone still has a question.

Mr. Adriaan Adawde (entrepreneur, Loka Loka)
Maybe it's a nuisance, so I'm sorry. Look, I have a suggestion for the G*ranman* and head captains. Surgold is present, ERM is present, Captain Athoni said it as well, I suggest the head captains, captains and *Granman* now arrange a date to meet with Newmont. Let's make an appointment, the longer we wait. It's request to the captains to come together and decide on a date, because most of the captains are here today. That is my request.

1h40min
Ms. Maureen Silos
The people from Surgold are present, so before we all leave the appointment can be made.
Alright, then this is the end of…ok, sorry.

Mr. Johannes Amauntan (Captain, Langa Tabiki)
Before the meeting, the captains have decided that they would like to have a meeting with Surgold. Too much time was spend on going back and forth, now the time has come to work together.

Ms. Maureen Silos
Thank you. The meeting has come to an end. I thank you, also on behalf of ERM and Surgold that you have taken the time to come here, to listen. I am happy with the results of this meeting, that the Pamaka people will take the initiative to make sure that Surgold will exert itself to comply with all the recommendations in the report. I am very happy you made the decision today. Before you leave, I invite you to have some food and drinks. Thank you and till we meet again. Good afternoon.

Box 2.1 Langa Tabiki consultation and disclosure meeting photo log

A record was kept of all attendees and this is listed in *Box 2.2* below.

Box 2.2 ***Langa Tabiki consultation and disclosure meeting list of attendees***

Place: Langa Tabiki Public Disclosure Meetings
Date: June 11, 2012
Time: 10:00 tot 13:00

Naam	Kondre	Organizatie	Telefon
8846290		Langatabbetje	Adam E.
8774866	O.B.O	Langatabbetje	Kamil mm
8922293	B.O	Langatabbetje	Amekang C
865223F.	Onderneming	Langatabbetje	G.P. Jan Dun
8819749	onderneming	hangatabbtye	J. Joris
8846696	Surgold	Langatabbetje	Towter HQ
8206699	geen	Krikie mofoe	Tjapp. Th
8785299	geen -	Langatabbetje	Koffie. P
8133935	geen	Langatabbetje	Forster. T
8768790	geen	Langatabbetje	Forster. J
8814315	Ondernemer	Langatabbikie	Omartan. R
8859485.	onderneming	Langatabbetje	ASA Lobie. m
8585357	onderneming	Weedaa	Adaune
+1-410-991-6897	ERM	ERM	DAVE BLAHA
402 852	Surgold -	Menan	Percy Montey
8571681	Suralco		Harold Amalinsi
08638655	Surgold	Menian	Wendel Asadang
08550972	Surgold	Merian	Ingrid Paden
TELEFON	ORGANIZATIE	KONDRE	NAAM

It should be noted that not all attendees signed the participation sheet and that additional people to this list joined the meeting.

5.1 MOENGO DISCLOSURE MEETING

Meeting held on July 13th 2012 in Recriatie Zaal, Moengo. Meeting was conducted in Dutch and Sranan Tongo.

Presenters included:

- Mr. Salomon Emanuels, representative of ERM
- Mr Bart De Dijn, representative of ERM
- Ms. Maureen Silos, representative of ERM
- Mr. Ryan Kambel, Health Safety and Loss Prevention Coordinator, Surgold

The presentation component of the meeting was the same as in Langa Tabiki and thus has not been repeated here.

Questions and Answers Session

Transcription Surgold Public Disclosure Meeting
Recreatiezaal Moengo
13 June 2012
5.00PM – 9.00PM

(Note: the first two welcoming sentences of the master of ceremony were not recorded on the audio file and are therefore not noted down below).

0min

Master of Ceremony: Ms. Maureen Silos

In October, November they started the research and interviewed people from Moengo and the village. Today we would like to tell you what the results are. We will tell you briefly why the research had to be done. The research was necessary, because Surgold as you know mines gold in this area. And nowadays, when a big company is present somewhere to mine gold, or bauxite, or oil, like Staatsolie is mining oil in other districts, they can't come and start digging and mining just like that, they have to take into account the people living there, the animals, the birds and the trees, the environment as it is called. They have to take into account the people and the environment, because the project should not have too many negative effects on the people and the environment. That's the reason why the company has to do the research, because this research will show what positive and negative effects the project will have.

As is common practice around the world and also with the government, through NIMOS, they don't want Surgold to do the research itself. They want Surgold, or any other company that is involved in mining, to contract an independent organization to conduct the research. So Surgold contracted an American organization, ERM, to conduct the research and find out what positive and negative effects the project would have. Mr. Salomon Emanuels and Mr. Bart de Dijn, who looked at the environment, and a few other experts, conducted this study.

What will we do today? We will present the results of the research, but before I do this, I want to introduce the people who will be presenting today. They are:

- Mr Kambel of Surgold, he will briefly tell you what the Merian project entails.
- Mr Salomon Emanuels, he will present the results concerning the social part of the study.
- Mr. Bart De Dijn will present something about the environment.

I also want to briefly tell you something about the American organization ERM. This organization is a big organization and it has been doing this work for more than 30 years, around the world. They work in about 140 countries and more or less 3000 people work for the organization. So they have a lot of experience, they are independent and they take on a critical approach. So when they conduct research and write the report, they don't conceal anything. They report everything regarding the project, the good things and bad things and importantly, they give advice in the report. They advise a company, like Surgold, what to do to make the good results become even better and to mitigate the negative results.

I would like to agree with you that during the presentations, you hold your questions till the end. After that you will have all the opportunity to ask questions and make comments. I also would like to ask you to use the mike, when you would like to say something, because there is another colleague, Ms. Esther Wielzen, she sits there, she records everything on tape, because ERM thinks it is important to have your comments and questions and incorporate them in the report as well. I also would like to ask you, when someone is speaking, to let this person finish first, don't shout, don't call names, let us make things go in an orderly way tonight. So with these words, I want to invite Mr. Kambel to start his presentation about Surgold.

Mr. Ryan Kambel
Thank you Ms. Silos. Good evening to everyone present today. My name is Ryan Kambel. I work for Surgold. Today I will give a presentation about Surgold and the Merian project. Later on you will have the opportunity to ask a question, should you have one, about what Surgold does or something else having to do with Surgold or the Merian project.

First of all, I want to thank you for having taken the time to come here with us. To come and listen what is being said, all the things that are going to be said here. You should know what is going on. I am also Surinamese, in our country. At Surgold, the Merian project, there is something we call safety. Working in a safe manner. There should be no accidents, people should not have accidents, no car should turn upside down, there should be no damage as a result of the way we work there. So if you go there, the same way you left your house to go to work, the same way you must return home. You should not lose any part of your body. That's how we perceive work there. At the same time, this project will create employment at a later stage. That is also an element of this project.

Here is written, I think you will understand it, it is written in Sranan Tongo: "Safety today for a better tomorrow". A few days ago, we held a contest to come up with a safety slogan, something having to do with safety, to show people how they should work at the project. How do the workers think about their safety, how do they perceive their work? There were a lot of submissions, answers, options and possibilities. This is the one that has won. Safety today, for a better tomorrow. So you see that the safety slogan does not come from outside, it was created by the workers themselves, men and women. This is how we deal with safety at the project. I think many of you have already heard about the company Surgold, maybe you heard many things. It is nothing less than two companies setting up a new company. Maybe you heard about Newmont or you heard about Surgold or other names. Surgold is part of Newmont, an American company that mines gold, and Alcoa. Maybe you have heard of Suralco, Alcoa is the mother company of Suralco. These two came together and set up Surgold. Surgold mines gold, no let me state it better: till now they have been looking for gold. It has to be clear that we don't take the gold out of the ground, put it in our pockets, load many trucks to transport it and sell it. We don't do that. We only do research, research to find out where the gold is.

Since October 2004, Surgold has been in Suriname. From 2004 till today, again, we have been looking for gold, we don't take gold from the soil to take it away and make money. That doesn't happen yet. For the ones who don't know yet where the project is located, this is a map of Suriname, here is Paramaribo. From Paramaribo on, you drive to Moengo. I think everyone knows where Moengo is, and from there you drive past the mall, just as you would when going to Langatabiki. It is the same road you would take when you would go to Patamacca. That's the road we take to go to the Merian project.

10min

One of the reasons we thought it was necessary to come here, to give the presentation and show you the results, is because we use the road a lot. And when we will enter the next phase a few things will happen. A few big machines, big trucks are coming and they will also drive past here, to go to the Merian project. Don't be surprised when you see the trucks on the road and ask yourself what is happening in the country. So now you know in advance what will happen.

These are a few pictures. At the project we are doing two things at the moment. The first thing is exploring, this is the search for gold, again, we are looking for it, we look how much of it there is, where it is and what it looks like. We don't take it out. This is an example, it's a drilling machine. With this, holes are made in the ground and they then look for the soil and with the help of these men they take it up. This is what it looks like. Here you see a few wooden boxes. You see a few things in the soil, in the ground. We inspect the soil when it arrives in the camp, as you see the men doing here. We label it, do many things, a few geologists, if you know what a geologist does, the people that inspect the soil, to see what is inside, what it looks like, if there is gold occurrence. Then, you see here a few, maybe you don't see it very well, you see two bags. We have a lab in our camp, this lab does not analyze gold. They make the big sample of soil ready. They make a small package out of it. We then send it to the lab and only there they will look if there is gold occurrence and how much.

So as I explained to you, we don't do anything with the gold, in the sense that we take it out and carry it away. We just do research to see where it is located.

The second thing we are doing is constructing. You will understand, that people work there, there is a need for sleeping accommodation, offices are needed, bathroom, kitchen, many things like that. So we are constructing. This is the second thing we do, constructing the camp. The first thing is looking for gold.

This is how it will look like in the future. Now we are in 2012. We are still waiting for the mining agreement, that the company and the government will sign, agreeing to mine gold, to take the gold out of the ground. The government hasn't given its approval yet, they are still negotiating. So that hasn't taken place yet, they are still busy. The approval of what we are here for today also has to take place still. When everything is approved and the signature has been placed then, in 2013, 2014 we will start constructing the plant, the processing plant, with all the things that are necessary to be able to start mining gold. So for two years they will be working on that.

In 2015 they will start the mining operations and then they will really start to mine gold. Here is written that in 2030 the mine will be closed. You have to know also that while we're mining, we will still do research to see if there are more gold occurrences. So it doesn't mean that we have found what we wanted and then we will close the mine, no, while they're mining, we will be looking for more gold. So this date you see here, might be extended. This is a map of what the mine will look like. When everything has been put in place, this is what it will look like. You see here, one, two, three, these will be the pits where the gold will be mined. These yellow parts refer to where they will put something they call rock waste. This light green part is what they call liquid waste. This green part is the camp, where the workers, men and women will stay, and also the offices and other things will be there. This yellow part here will be the plant, where the mine will be, sorry, where the people will mine gold, where they will process the gold.

This is an interesting thing, it's on a line, it has a nice color, it's a little bit purplish. That is an air strip, a place where planes will land. I think that, if we think a bit deeper about it, and like I just said, safety of workers, that there should be no accidents, this is a big thing for the company. So one of the more important reasons why we will make this air strip, we don't hope it will happen, but if an accident occurs, the airstrip is nearby the place we think the accident will happen. That means that we can take the person very quickly to the air strip and a plane can land and go to Paramaribo where the person can be treated. At the moment, planes cannot land here yet, because there is forest all over. If there is an accident we have to go to Langa Tabiki. The ones that know it know it is a long way to go there, to go to the airstrip. If the airstrip is nearby, we will save time and the chance that the person doesn't die is bigger. So they even thought about this when planning the mine.

Before proceeding, I also want to tell you, you heard of Suralco, I just talked about Surgold. On the Nassau mountain, Suralco is working, not Surgold, but Suralco. Suralco mines bauxite. Surgold mines gold, or we look for gold, let me say it correctly, we look for gold. So they have no similarities, they are two different companies. Maybe before people where mixing it up, but I hope that from today it will be clear that Surgold is different, they are at Merian, Suralco is at Nassau mountain, two different projects. These are a few pictures, here we see a very big truck, they call it Haul Pack. We see a lady standing in front, this is to show us how big this truck is compared to a human being. This equipment will be at the mine, I will say it again, they will be at the mine. I just said, we might use the roads to transport things to the project, but you will not see these big trucks. When these trucks will arrive, they will be dismantled and we will transport them to the mine. You don't have to be afraid that tomorrow you will see such a big truck driving through Moengo. These things will only be at the mine. This is the same truck looked at from the side, and a person can reach up till here. So then you have an idea about the height of the machine.

This is another example, this is a loader. With this they load the soil in the big truck we see here. There I think, maybe you know it, you have seen it sometimes, this might be on the road, it will level the road, fix the road so you can drive more freely. But this one will also be more at the mine, because operations are there. These are another two pictures. This is an example of a mine, this is Rosebel, this is Suriname. This is what their mine looks like.

20min

These are two pictures, two examples of what the mine will look like, where they will process the gold. This is a picture of waste, solid waste. This is a picture of liquid waste. What I want to say also is that the liquid waste, you see there is water as well. They will have a processing plant for the water, they will recollect the water and reuse it.

This is the last thing I would like to show you. This is where Newmont worked in Indonesia, which is another place where they operate a mine. In April 2003 they finished the work there, in Indonesia. They rehabilitated the area. The aim is that when finishing the project, they will make an effort, do many things, plant grass, so the area becomes again like it was before. Five years later, 2008, you see this is the same area. What does it look like, it is a forest again. This has been an example of how Surgold will also work in Suriname.

This was my part, thank you.

Ms. Maureen Silos

Thank you Mr. Kambel. Before I invite Mr. Salomon Emanuels to give his presentation, I would like to tell you that for Moengo, Mr. Salomon mainly focused on the transportation road. The project will mainly affect the Pamaka people. So for Moengo he looked especially at the transportation, and the road, and the things you will see pass by. That is why he will tell you more about these things, the cars and the transportation issues. Mr. Emanuels.

Mr. Salomon Emanuels

From my side, also a good evening to everyone. As they already said, I am Salomon Emanuels. Last year August we came here to the people from Moengo and the villages around here, to tell them we would start a study regarding the Merian gold project. Now the time has come, to present you the results of the study, and like Ms. Silos already said, what effects the project will have on people, animals, birds, fish and everybody who live in the area. But before I continue, I would like to say that in these kinds of studies, you don't only look at the positive and negative consequences of the project, you must also try to find ways to deal with these. You understand, that people cannot talk to the animals, birds and fish, but still you must understand how animals, birds, fish and all other things that are in the forest, like the trees, how they live, so you can understand what effect things could have on them. I will tell you a little bit about what we did.

The study we did, as has been said before, consisted of different parts: environment, social, health and involving the people, so they themselves could have a say in the study. Stakeholder involvement, as they call it. I will mainly talk about the social and health issues and the part about the people. My colleague there, will talk about the environmental part, just as Ms. Silos has said. Just a few words about the effort we did to let the people have a say in the project we conducted. We made the project known through posters, folders, we distributed folders, we held meetings with the people, also here in Moengo. We went to all the villages, as we know them. The Pamaka area has ten villages, we went to all ten of them and sat down to talk with the people, even if there was just one person, we sat down with them to talk to them. So that they could understand and we could understand each other. And of course, there were people who phoned us and send a message or talked to us about certain things they had on their mind regarding the study. When you do a study like this, and why do I talk about this, it is really necessary to do so. Because when you do research, other people will evaluate if you did it well. If you did not do it well, they will tell you 'no'. Even if you think they did not do the research well. That's why I want to tell you about this.

This study was done, let's say, in two phases. It has three parts but two important steps. The first step was to discuss with each other about what we would be studying exactly. You can't start and just look at everything, you have to know exactly what you are going to study. This we had to talk over with each other, all the people of ERM, and the people of Surgold, with all the other people. We had to talk with each other. This we did last year, from June till July. We sat together almost day and night to talk with each other. After we knew exactly what we wanted to do, we actually started the research. This was from September last year till about two weeks ago. In this respect, I also came to Moengo, we talked to different people here in Moengo, but also in all the villages around here. Actually along the road that goes to Patamacca.

Another element of the study is organizing meetings and telling the people what the results of the study are, just like we are doing here today. Where do we stand now with the study? You see there, that the study which we call an ESIA, environmental, social, and so and so, study. You see that we have now nearly finished the study. Nearly. Why do I say nearly? What will be said today also has to be included in the report. So we haven't completely finished, but the report is a draft report, as they call it. This draft report, we have already sent to Surgold. Surgold has the draft, and NIMOS, which is the government institution that has to evaluate our report, they as well have the report, so that they can study it further.

We gave some advice to the company on what they can do, and you will see they have already started to manage a few things, making an environmental management plan. They are making an effort for the report to be approved and sign an agreement with the government so that they can start mining gold, as Mr. Kambel told us. This is the environmental part, so I won't talk about this, my colleague will talk about it.

Regarding the social part, we looked at the economic side, which means: how the people are living in the area where the project is located and how they earn their money. We looked at that. We looked at the cultural heritage, things of their culture: what do they have and what do they want to keep? Saving my treasure, as Mr. Pinas would have said. The things you have, valuable things from your grandparents.

30min

We looked at health issues and we looked at the traffic issues and just as Ms. Silos has said, this is also one of the important things, also for the people from around here. But the health issues and all the other issues, we also did research about these things for Moengo. We talked to the people from the RGD clinic, we talked to doctors, a few people, but we also talked to teachers and other people. We also talked to the water supply company and to, how are they called, the electricity company. We talked to all kinds of people here in Moengo.

When we look at the research, two things are relevant, as I said before. What are the bad and good effects of the project, the consequences, and what are the measures that can be taken to manage these? The other thing you see here is that the ones who present and the people from Pamaka, but also the people from the city will have the opportunity to comment on the results of the study, so that the report can be a good report agreeable to almost all people. The government, NIMOS, and all other people have the opportunity to say what they think about the results of the study. Let it be clear, today we are talking about the results of the study.

When we conduct research, the first thing we do is analyzing the current situation, as it is at the start of the study. What is happening in the community where we are doing the research at that moment?

When we looked at the Pamaka area, when we started the study, we saw that the people of the area, the way they live, the way they earn a living, food, etc, comes from hunting, fishing, farming. But the farming they do and almost everything else they do, mainly is for themselves, so they can eat and stay alive. They almost don't sell anything. However *kwak* they do sell, they sell it in French Guyana, but other things they mainly keep for themselves. And you have a few people who also undertake small scale gold mining activities. Another thing we also noted with the Pamaka people, is that they clearly identify themselves as true bush Negroes. They are, as the Dutch would say, proud to be Pamakan and if you ask them they will want to show you that they are Pamaka people. We also clearly observed that the people of this area did not get a lot of education. Most of them didn't really go to school and if they went to school, their education level is not that high. This does not mean that the Pamaka people don't have people that are educated, people with a higher education, but the ones who received higher education, most of them went to Paramaribo, or they are in French Guyana or other countries. They don't live in the area at all, just as is the case with almost all bush Negro villages in Suriname. And as I said before, many of the Pamaka people have left the area. In some of the villages, there are hardly any people left. And if you look at the area, you see that health matters and education, communication, so how the people send messages back and forth, and transportation issues, are not organized very well. If the people from Surgold didn't maintain this road from Moengo to Langa Tabiki, then you almost wouldn't be able to drive on it.

Observing this situation, we then asked ourselves: if this is the situation, and the Merian gold project starts, what will then happen with the people living in the area? What will happen with their community. We then saw, that as a result of the project, there is a big chance that more investments, money and business will come into the villages of the people. The villages can become livelier. People can earn money because they themselves will do certain things. It is also possible that certain things like water and electricity can be organized for the villages and that we call community investments. Moreover, regarding the people that mine gold, it could happen and it has already happened, that these people will lose their income, because the place where the company will locate its plant, is just the place where the small scale gold miners were looking for gold. And now they are not allowed to go there anymore, because the area belongs to someone else. Whether you agree or not, the area belongs to the people from Surgold. The government gave it to them, it is their concession, so if you go there to mine gold, you will be removed from the site. That was the story we heard about the people that were removed from there. This means that these small scale gold miners will be out of work.

We also observed that one of the effects of the project will be a change in the culture of the people. An example: If everyone will turn to the mining business, then there will almost be no time left to learn things from the elderly. Because you will work shifts and when you return home you won't have time and you will be tired. One or two of the elderly in the village know how to prepare a certain medicine, but if you are not in time to learn the work from them, this knowledge will be lost. Because your rhythm and your way of life will have changed, you won't have time to sit down and talk with the elderly. And soon, when the elderly pass away, the knowledge will be lost.
The project does not only have negative effects, it also has positive effects. Positive effects such as we see on this picture. As a result of the project, Pamaka people will be educated and learn things and work for the company. They will receive training. Let's say you did not receive a lot of education, but you would like to work, and you look for work with the company, you want to operate a bulldozer, they can teach you how to do it and finally you could work there. Another effect the project will have on the Pamaka people, but also on other people, when I talk about the Pamaka people, you should not exclude other people, you must know that besides the Pamaka people, also other people can work there, but now I talk about the Pamaka people.

At the start, where we are now, so between 2013 and 2014, around 750 people will find employment there. Out of these 750 people, around 200 people of the Pamaka area will find employment. The remaining part of the 750, so 550, will be other people, including people from Moengo and Paramaribo, they will be able to find employment there. But because it is the Pamaka people who will be mainly affected, and they will suffer more than others from the consequences, because it is in their area that the company will mine gold, they can be sure that around 200 Pamaka people will find employment between 2013 and 2014. Here it is written, 200 unskilled workers, but you shouldn't see it this way. Unskilled means that maybe you did go to school, you went till the sixth grade, but you didn't learn the skill of, let's say, tying up, then you are unqualified to do that kind of work, although you went to school. Only when you have been educated to do the work, you are qualified to do the work. So you shouldn't think that with what is being said here, they want to say that the Pamaka people are stupid. But this is the way they have put it.

40min

Another benefit is that from 2015 on, around 1200 people will find employment with the company, including Pamaka people and also people from around here. So, the benefits workwise, if you work for the company, the benefits you can enjoy. So if you find employment with the company, that is a benefit, but especially if you work for the company you will enjoy certain benefits, you will earn money, this money will become more, maybe you don't have money now and you struggle and maybe when the end of the month is near, you only have 300 SRD, maybe if you work at the company, it might turn out to be 700 SRD or 1000 SRD. I don't know, because I don't know how much the company will pay you. When the money starts coming, if you and I have money, what do we do? We buy things. As soon as you have money, you go to the shop. Because we go to the shop, the people that own shops and businesses, they will be able to sell. The man that sells gas, the man that sell noodles, the woman that sells chips, these people will also sell things. This means that the economy of the area will get going.

Another benefit is that when things are lively, and the economy is going, people won't have the urge so much to move away. At times it will occur that people return, and that is also a benefit, just as how finding employment with the company is a benefit. So, the ERM people who did the study, when we saw there were negative and positive effects, we then told the company, just as Ms. Silos said, we gave advice. What advice did we give the company? We told the company, listen, what you should do is make clear, write down very clearly, how you are going to recruit workers. And when you have written it down, tell it to the people so that they know exactly what to do and what education and qualifications they should have in order to find employment. You should do that. Don't keep it to yourself, but inform the people. You should also give training to the people that come and work for you. Don't give them just any training. Give them training, that when they get a certificate from the company and when the company is closed down or if they are let go, they can find employment with the same certificate at another company. So give them good training, certified training.

We also told the company that money would roll in the area, there will be a lot of money. And you know that when people have money, we suddenly have all kinds of bad luck. Immediately your car breaks down, immediately the television breaks down, immediately your girlfriend wants to see you, all those things happen, the money will be spend before we know it. There will be no more gold, but the money will have run out as well. So we told the company, listen, start helping the people by giving them training on how to handle money. Help them to prevent that all the money is wasted on gambling, alcohol or a careless way of living.

We also told the company what they should do in the area. There are people that have a small business, help these people to grow their business. Support them, because you will leave some day, and when you leave, life shouldn't stop. The people from Moengo know about these kinds of things. Suralco was here, the whole of Moengo, almost all of Cottica was benefitting then. Since Suralco has more or less left, things have gone down the hill. There are almost no other things left to do. This is what we told the company, look at what happened there, don't do the same thing here, do it differently, start helping the people, so that they can grow.

The whole project, as I said before, does not only have benefits for the Pamaka people or people from around here. It has benefits for the whole country. Benefits for Suriname, because there will be money flowing into the country. Tax payments, which the company will pay, will flow into the cash register of Suriname. The government can use this money to do other things like maintaining roads, pay allowances and give people medical cards and those kinds of things. Money will flow into the country. The government can work with the company and other organizations to bring more development to the people from the area. Also for the people of the Pamaka area. We said, the company, the whole thing can lead to health care, education, social economic things, think about these matters, work on these matters, so that everyone can have an advantage from the project.

Negative effects. This is one of the important things for the people from around here, especially regarding the road. As a result of the project, as Mr. Kambel told us, in the beginning we will see many big cars, big trucks pass by. They will transport loads to the project. After that, it won't be so busy anymore, but still there will be traffic. Because trucks will drive on the road, it will have to be maintained. You will encounter a lot of things, at times you will drive and find the road closed. You will be angry because you wanted to be quickly in the city and they closed the road again, all those kinds of things. Moreover you will see that drivers can become tired, and as a result accidents can happen. It could have been prevented, either the person was driving too fast, or the person was driving and fell asleep, the person was drunk, all those kinds of things. Because the person got money, he went to party, he became drunk and, "BAM", he caused an accident to happen.

To manage the negative effects regarding the road, we told the company to make a clear plan about the way the traffic on the road should be organized and especially for the part that leads to the company, but also the road from the city to this point. This does not only concern the company, but it is something for the company and the government.

We also told the company, listen, organize things in such a way, that the driving speed should be set. It shouldn't be the case that people drive 120 km per hour or 220 km per hour. Agree on something so that the traffic will run at a normal pace. This means that there has to be monitoring of the speed limits. And of course, let the people understand, that fast driving does not mean that you will arrive at your destination. Sometimes you drive quickly, but you don't arrive at your destination. They have to understand the matters concerning the traffic, so don't drink, don't drive too fast, all those kinds of things. Make them understand those things better, because you think you will arrive, but in fact you're putting someone else's life at jeopardy.
And of course, take care of, the company will work with contractors. People that will deliver services, will work for the company, but they are not employed by the company, they deliver things to the company. These people also have workers so they should also be given advice and be taught how to behave on the road.

Another negative effect of the project is what we call, chemicals. All kinds of liquids, negative things that can cause illnesses and problems for human beings. For example, it could be that there is a big tank with oil inside and the driver makes a short stop along the way to go to the bathroom and while doing so the tank is leaking, all the oil is leaking on the road. This is a problem for the traffic. The company will also work with a lot of toxic things, negative things, and these things, like Mr. Kambel said, are waste. This waste, if you discharge it just like that, it can cause problems for human beings, but also for the animals and the other living creatures.

50min
There is a chance that something can happen, where the mine is located, a tank explodes, and a cloud of smoke, that can cause illnesses, is discharged into the air. Or oil leaks away and flows into a creek or the river, which can cause problems for the people.

We told the company that in order to manage these kinds of things, they have to work in such a way that there is a plan on how to store the bad things in a place where they can't have negative effects on human beings and the other living creatures in the area. The company will work with cyanide instead of mercury. Mr. Kambel showed you a water tank where they will store water. Actually in this water, there will be cyanide. But that's why they leave the tank open, because they taught us that when it is open and the sun shines on it, it breaks down the cyanide so that it becomes less poisonous. But mercury, if you work with this, it remains in the ground for hundreds of years. It doesn't break down. Cyanide breaks down, but it is more poisonous than mercury. That's what I understood, but if I'm mistaken, the people that are here and that know more about this, will tell you in case there is a question.

We also told the company, in case of an emergency, for example a fire broke out, there is a fire somewhere, an accident happened, a car was hit or gas is leaking somewhere, to make sure that they are prepared and always ready to go and offer help.

The cyanide matters, I can be brief about it, the company is obliged to stick to world standards that apply when you work with cyanide. With respect to this, the company has a code in place on how to handle this matter, so we believe things can't go wrong here. The matter of cyanide, I don't know in detail, so I won't talk too much about it.

In fact the environmental matters are not for me, but for my colleague, so I will stop here and I will ask him to continue. The master of ceremony, of course, is the one to say that.

Ms. Maureen Silos
Thank you Mr. Solomon Emanuels. Now Mr. Bart de Dijn will tell you something about the environment.

Mr. Bart de Dijn
Good evening. I saw that everyone else was talking Sranan Tongo, so I will try to speak it a little bit as well. It will be mixed with Dutch. At the Merian area, where the company wants to build the big mine, we have to look how the environment, how the surroundings are at the moment. We did this and we noted that the area has been disturbed. The forest is still there, but big

parts of the forest have been cut down. There are roads everywhere, made by gold miners and woodworkers, so the forest has been disturbed very much. You can also see it on this picture, as you can see the forest is green, but the yellow parts are the mine and roads, so the disturbance is everywhere.

There are still creeks left in the area, but almost all creeks have been totally disturbed. The miners were looking for gold in the creeks and there is no more forest aside the creeks. The way the creeks used to be before, has been completely disturbed. What we can also see, are the pits that the gold miners made to dig the soil, like on this picture here. What we have to ask ourselves, is what will happen if we build the big mine, if Surgold builds the big mine. Will the situation change, will it become worse, or will it become better for the bush, the creeks and things like that.

We looked at the situation concerning water, the situation regarding plants and animals, the situation regarding the fish, the situation concerning the air and the noise. When the company builds the big mine, it could well be that more dust will settle down into the creeks. Because they dig in the soil and the rain falls on the dust, then the dust will go into the creeks and that affects the quality of the creeks, it might deteriorate. It is also possible that the streaming of the creek, so the amount of water that the creeks contain, will also change a bit. From our study it seems like in the rainy season more water than before, will run into the creeks. If that situation occurs, what should we do? How should we react on that situation? The situation where more dirt will come into the creeks or where more water will come into creeks.

The first thing we should do is to make two small lakes, two small Basins. The water of the creeks goes into these small lakes, so that the dirt that is in the water, can sink to the bottom. I don't know if you have ever tried, if you see dirty water and you put this dirty water in a bottle and you leave it to stand there for one or two days or a week, then the dirt in the water will sink to the bottom. This is the way the company wants to remove the dust from the water so that the dust does not leak into the bigger creeks or into the Marowijne river. So the dust will stay in one place and then later on they can remove it. The water will then be clean and it can be pumped into the creek and the creeks will not get dirty water.

If we look at the animals and plants, a patch of the disturbed forest is at the moment, this part is going to be cleared. The fact is that more forest is being cut down in that area. But the area where the forest is being cut down, is not a big area, it is a limited area. When the men will go into the forest to cut it down, it could be that a few animals will be killed. It could be that the animals are frightened, and that they will move out of that area.

1h00min

What do we have to do about in this situation? If we cut down trees at the beginning of the operations, then later when the operations have finished, if they finished mining for gold, they have to restore the forest. So they have to plant trees. This we can do slowly. While the mine, the operations are running, we can start with the rehabilitation of a few parts. At the end of the operations, when the company is closing down the mine, they can rehabilitate the whole area again and plant trees. So the important thing is that if the forest is rehabilitated in the area, then the animals will come back as well. Slowly, but still they will return.

It is also important to inspect the situation concerning the dirt in the creeks. The animals are also dependent on the water in the creeks. So the removal of the dust, the dust in the water, that is also important for the animals and the other things. What we also want to do, is that if there is a place where many animals come, or where there are special things, like special trees, or other things, they should try to conserve those places. We have to look at the fish as well. It is clear that if we contaminate the creeks, the fish won't like this. But actually it is the same story as I have already told you, we have to see to it that the water becomes clean, so that the fish return to the water. This is the same story, if we mine in an area, and there are creeks in that area, then the fish that are in those creeks, will disappear. At least as long as we are mining in that area. It is important that when we leave the area, when the mining activities are over, we have to rehabilitate it again, so the fish and other things can come back in the creeks.

The situation regarding the air. Mr. Kambel has already said that big machines will be used in the mine, but only in the mine. The company will have to generate electricity to run the operations. When the big machines drive in the area, then they will create a lot of dust. The dust then whirls up. When the machines drive with their big tires on the road, they create a lot of dust. That is a problem. Another problem is that the machines will exhaust gasses, just like you breathe, the machine breathes as well. It might be that the breath of the machine is a bit dirtier than your breath, if you don't smoke. The important thing is that the big machines will only drive in the mine. So for the people that live, actually there are no people living in the mining area, so the dust being created by the machines, will not have a harmful effect on the people living in that area.

It could have an effect on the workers of Surgold, but Surgold has to see to it that the workers won't get problems. They will need to take measures to solve this. This is what they have to do in any case. The thing we also have to do is what they call monitoring: follow how operations create dust. Dirt in the air. Monitor the exhausting of fumes produced by the machines. If we work with big machines, the machines make noise, so there will be more noise in the surroundings of the mine. If a big truck drives on the road, it will make a lot of noise. Moreover when they build the big mining pits, they will have to use dynamite or something like that, and when they blow up the dynamite, it will make a loud noise as well,

Like the previous issue, we don't expect people from the surroundings suffering from the noise, because there are no people living in the area. The noise is produced in the mining area and just like with the previous matter, the company has to take measures to protect its workers, so that they won't get problems with the noise and other things like that. It is important to see to it that the noise does not become too loud. We should maintain the machines well, if they are not maintained well, they will make more noise. We have to see to it that the maintenance of the machines is done well. We should also monitor, we must measure how loud things are. If they blow up dynamite, we must measure how much noise is created, also to be sure that the workers are protected. That they are well protected.

That's it.

Mr. Salomon Emanuels
Colleague, on behalf of the MC, I thank you. Here you see the study, the report we wrote. I alone cannot carry it, that's how thick it is, so we cannot distribute it here, but it is out there for you to find. If you want to know more about the research, then I am Salomon Emanuels, you can send me a message and we can talk about the research. If you want to know more, you can also talk to someone from Surgold namely Mr. Wendell Asadang. Where is he at? Look there he is, the man with the bigger belly, outside the entrance. So you can also talk with him and get more information about the study, but also about the report.

1h10min
Ms. Maureen Silos
Thank you Salomon. Now we have come to the part of the meeting where you can ask questions. I want to request again, if you would like to ask something or say something, please use the mike, because my colleague has to write down everything and we record this on tape. The American organization ERM finds it important to take down all your comments and questions to put them in the report as well. To whom can I give the floor? And I forgot to say, if you would like to say something, please state your name so we can write that down as well.

Question & Answer session

Mr. Robby Boto
A good evening to everyone. I have a few questions about what I have heard. My first question is whether or not the operations will cause floods. The second question is what percentage stays in the area? Actually I can link this with, do they already have a social fund for the area?

Ms. Maureen Silos
Please, wait a moment, I could not hear the question, your first question was, floods, if the project would cause floods. The second question I didn't catch.

Mr. Robby Boto
I asked what percentage of the revenue will stay in the area and if they have a social fund? So I link these two together.

Ms. Maureen Silos
A social pact?

Mr. Robby Boto

A social fund, where people with social needs can turn to in order to solve them. The other question I have, I have a few questions, I heard about Suralco and Surgold. In the beginning we understood that Suralco was going to mine gold. My question is, if we were led astray by the use of the name Suralco. Now it is Surgold. But still I ask the question, who is this company exactly? Can you give more information about them? You did talk about them a bit, but more information? Where they have worked before you already told us, but still it is little information. And regarding the road, you don't have to maintain it too much, level it, and asphalt the road up till where you are working. Because I think you will earn money. Electricity: you will be working there and be able to make use of electricity, but the surrounding villages, they are still without electricity and are struggling. The final question and maybe you are not able to answer it, but maybe you can give an estimation? How much will an unskilled worker earn? Because it can be the case that you hire someone, but the work does not pay well, so the worker will quit the job. Ok, thank you.

Ms. Maureen Silos
Thank you.

Mr. Salomon Emanuels
These are many questions, but I won't answer all of them, the other people, the big bosses of Surgold, the other people sitting here, they will help answering the questions. One of the questions I want to answer is the one about Suralco and Surgold and so on. It's not because I know a lot about it, the people from Surgold can actually answer it themselves, but yesterday I answered this question, and they liked the way I answered it, so I will try to answer it in the same way. Let's be clear on something, I see someone with a shirt. On the back of it, it is written "95 years". Suralco has been in Surinam for 95 years, actually, Alcoa. Alcoa is the mother company and from the Brokopondo agreement onwards, Alcoa has owned Suralco and they have been in the possession of the concession of the Nassau area, stretching all the

way up to the area where Surgold will work now. But Suralco, Alcoa, owns a concession to mine bauxite.

When they saw there was gold in the ground, they were not allowed to mine it, because they don't have the qualifications for that. But they own the concession and gold is a good thing. Then they said, you know what we will do, we will mine gold. Then together with Newmont, because Newmont does mine gold, they set up, they approached Newmont and said, look, let's join. I have access to an area where there is gold, but I don't have the qualifications to mine it. Let's work together and you operate it. To be able to work on it, they set up a new company. They called it Surgold. Actually it means Suriname Gold Company. So Suralco, Alcoa, and Newmont, Newmont is an American company. Newmont and Alcoa, two American companies came together and set up Surgold, a Suriname company just like Suralco. When Alcoa came to mine bauxite in Suriname, they set up Suralco. Suriname Aluminium Company. In the same way, Surgold was set up. So Surgold operates there, but Newmont has to inspect the work. It is as if two people, you and I, or me and Mr. Kambel, came together and I give Mr. Kambel the responsibility and say, listen, you do the work, I trust you. My money is invested, your money is invested, but I trust you, you can manage the work. That is the whole story.

So Alcoa is not in the picture anymore, they left the work to Newmont that is managing it, they are in control and Surgold is the new company. That's all, but in the beginning, because Suralco owned the place, they went to the villages to explain what would happen. It then looked as if Suralco would mine gold, but it was not Suralco, they changed it and they set up a new company. It is my area of operation, so I bring in whoever I want and I do what I want. Do they have a social program? In the study we did, we gave them the advice to work in such a way that the people of the area benefit from the project. I understood that the company has plans to set up a special fund for the people from that area. What the fund will look like, that will have to be discussed in the coming period.

The company and the Pamaka people have to sit down together with the government to see how this matter will be organized. From there on, they will do certain things. But already now, the company is active, they have been doing a few things for the people living in the area. You must understand, in the beginning, they will first care for the Pamaka people. Because they will be affected the most. The other people will follow, but in the first place, the focus will be on the Pamaka people. This is what I understood from them, that they will find a way of helping the people to develop their villages. If there is a need they have, how they can help them with this? This will be part of the project. What percentage of the revenue remains? I leave this question to be answered by the company itself, but I think, just like I was telling you about the social fund, that they will also have to discuss it to settle it, but I don't know how much they will give.

Ms. Maureen Silos
Mike, do you want to say something about the profit or Cheryl? This is Ms. Cheryl White, she works with Surgold, for the community development program.

Ms. Cheryl White

Good evening everyone. I speak English, that is my mother tongue, I can speak Ndyuka, but I might mix it with English words. What I want to say first is that I work for Surgold, I work for Community relations.

1h20min

What do we do? We look for support in the city, to help the people, the Pamaka people, so that their lives can be improved. We currently have two projects there, to help the children. The way we work, if someone asks us, they must ask us first, look, help us with something, help us with something specific. For that we look for support in the City. We know many people in Paramaribo who know how to set up a development program in the interior. That is how we work now. Regarding the money issue, that is something for later, now we are looking for programs, we are developing things, we help them with work, we build things at the river, we already build many things at the Pamaka river. A water tank, toilet and things like that. When we build things, we look for Pamaka people to work for us, that is how it is already. So, the Pamaka people get money for that, this brings development to the area. When the people will start working at the company, the country will earn something, not only the Pamaka people, but the whole country, Suriname, will earn money through tax. When they work with the company they will get some money. They will earn tax, let's say they will get 50%, which they will earn with the employment of workers. Maybe there will be workers at Pamaka, Moengo, Paramaribo, many people will work at the camp, at the company, and so they will earn a living there. So, now Suriname, the company will work together with the City, the government, to sign an agreement, this is called a Minerals agreement. But before the agreement is made, they have to clearly know, the government has to know exactly how much money they will get, maybe they will get 50%. But this does not have to be only money. You get it through tax, through work, through employment, but the company will bring money to the City, to the country. That's how it is.

Ms. Maureen Silos

Mike, maybe the question about the electricity for the villages around the site?

Ms. Cheryl White

Just like I said earlier, the way we work with the Pamakan, when people ask us something, it does not mean that the company has the expertise to do everything. We look for help in the City. The city has to help us, the government has to work with us to organize things for the Pamakan. We will not bring electricity or generators to the villages, that is not how we work. We look for help from the government first, we look for help in the City first. This is how we currently work. We know the Pamaka people do not have much electricity, not all villages have electricity at night. Maybe they are often in the dark because there is no oil, or this or that is not available. They already called us, and said the government does not help us, what can you do to help us? We told them, we are a company, we don't have the expertise to do everything. We will do our best in another way. The other way we work is turning to the government for help. We look for help in the City.

Ms. Maureen Silos

Who will say something about flooding?

Mr. Bart de Dijn

So indeed, they want to construct a pond in the area. I don't remember exactly the name of the creek, where the pond is at. What was the name again? Dominicas? OK. A small branch, actually a side branch of a side branch of the Tempati river. There, they want to flood a small area, to construct a pond. The pond is necessary for the plant, because the plant needs the water to run the operations. The pond is also important, because the company uses cyanide and cyanide is a hazardous substance. If the cyanide flows directly into a creek, it could kill the fish and other things. Therefore it is better that, when they use cyanide, that all the water that contains cyanide, or if it still contains cyanide, goes directly into the pond and not into the creeks. The pond is closed, the water of the pond does not flow into the creek. So if they use cyanide in the water and the cyanide flows into the pond, then the cyanide cannot flow into the creeks in the area. That is a kind of safety. At least, if I understood it correctly. David?

Ms. Maureen Silos
This is Mr. David Blaha, one of the senior people of the American company ERM.

Mr. David Blaha
I'll speak in English and you translate? Where the mine is located, is, water, this side goes to the Commewijne and the water on this side goes to the Marowijne.

Ms. Maureen Silos
What water, the rain water or the water of the..

Mr. David Blaha
Rain water.

Ms. Maureen Silos
Where the mine is located at, I am going to say it in Dutch. Water, rain water flows on this side into the Commewijne river and on that side into the Marowijne river.

Mr. David Blaha
Because the mine is right at the top, the streams are very small.

Ms. Maureen Silos
Because the mine is at the top, very high, the streams are very small.

Mr. David Blaha
So we don't expect a lot of change or potential for flooding but there will also be ponds that will store the water to prevent flooding.

Ms. Maureen Silos
That's why they don't expect flooding, but they are preparing for it, just in case it happens. They construct small ponds to collect excess water. Ok, thank you David. Sir, are your questions answered satisfactorily? O sure, there was another question about the road, what road are you talking about exactly? What they will do about the dust? This man wants to know, because we said that there will be dust, if we will asphalt the roads to control the dust. You were talking about how the people would sprinkle the roads and so on? Dust

management. The question is why don't you just asphalt the roads to have dust management?

Mr. Wendell Asadang
I am Mr. Asadang, Wendell, and will briefly go into the question. We are actually working on it now, I think that the people that drive on the road to Langa Tabiki and Patamacca, will see that we are busy with the road. We are clearing it on all the sides.

1h30min
So that the sun can shine on it and it can dry, so it will become dry. We will fill it, we won't asphalt it, we will fill it, the bridges, we will make the bridges of stone, concrete bridges, all the bridges that are on the road will go over there, and we will replace them. They will become concrete bridges, but we won't asphalt the road, we will maintain it, and put a laterite layer on top. I think when the laterite layer will be on top, it will be well kept, and you will almost see no dust whirling up. So we will put the laterite on the road and we will improve the road, this is the first phase. When the minerals agreement has been signed, we will start with the bridges. We will continue maintaining the road. We will work there, we will use the road and we will maintain it, but herewith I want to say that we are not going to asphalt it.

Regarding the dust you were talking about, that dust might whirl up. The places where people are living at, we already marked the road with GPS, and we identified the points where people are living. We will see to it that posts are placed there, so that when you arrive there, you will have to drive slowly. If it is necessary as well, we will place thresholds in consultation with the government. So you can't drive pass fast and create dust where the people are living. So we already marked the place, the points where the people are living alongside the road, to see to it that marks will be placed there, so that when you drive pass, you will take into account the fact that people are living there. Is it clear?

Ms. Maureen Silos
Thank you Wendell. Next? Who? There is the mike. Please state your name.

Mr. Velanti
I am Velanti. Regarding employment, things were presented in a very nice way. Employment will be created from the Marowijne till the Paramaka area. How many? 200 people from Paramaka will find employment and so on. I would like to know how long the company will stay? And the people that will work there, are there any guarantees for them? When there is no more work. Employer, employee. What about the salary of the people when there is no more work? Because the company will leave, the gold will run out. Will it be possible to start a trade union in the workplace? Because if there is no union, you can say there will be work for two years and if in two years' time all the work, because 200 Paramakan people together with those from Marowijne, they leave and others will come, foreigners will come. Because it is possible for foreigners to come and work in Suriname, detached civil servants, so to say. I heard about unskilled workers, no, you are not an unskilled worker, because as long as you work and receive training you are

not an unskilled worker anymore because you have a job. What guarantees will there be for the workers?

Ms. Maureen Silos?
Guarantees for what?

Mr. Velanti
For the workers, not being let go at once, so they don't leave the job. Because you can have a job, but then they tell you there is no more work and they let you go. What guarantees will there be? Will there be a trade union? And one other thing: a mine will be build and cyanide will be used. It is more dangerous than mercury, but in that area they used to work with mercury. Now they will work with cyanide, and my brother here has asked if there will be floodings. The floodings I think my brother was talking about relates to the total volume of cyanide that will be there. And, now I hear there will be no floodings, because there will be holes to drain the cyanide. This is not normal water anymore. Isn't it dangerous for the Marowijne and Commewijne area? Because here we use surface water. So these things, I want to know how they will deal with this. These are my questions.

Ms. Maureen Silos
If I understand you clearly, you have two questions, two important questions. First, what guarantees can Surgold give, that they won't dismiss the workers en masse? Let them go and hire other people. Secondly, what are the guarantees that when the water from the cyanide pond is drained, the cyanide water does not leak into the river? Is this correct?

Mr. Velanti
Yes.

Ms. Maureen Silos
Ok.

Mr. David Blaha
In terms of the cyanide, we are, the project that is pointed out there is a. The process, of gold in this location.

Ms. Maureen Silos
The gold, there is a plant there, to take the gold out of the ground, that is this part over here. You have seen the picture before of the Rosebel plant, yes, the plant will be here, where the gold will be taken out of the ground.

Mr. David Blaha
Part of the processing involves a cyanide destruction cycle that will destroy most of the cyanide.

Ms. Maureen Silos
While the gold is being mined, at the same time, in the whole mining process the cyanide will also be collected from the waste. The first step of breaking down the cyanide takes place in the plant itself.

Mr. David Blaha

So before anything is discharged to the environment, it will meet all the requirements.

Ms. Maureen Silos

When the people remove the waste from the process, in the environment, in the pond, the level of cyanide there, will, how can I say this, meet international standards, showing they did not put too much in the water. That's why they already remove the cyanide in the plant, before they put something in the pond. Am I making myself clear?

Mr. Wendell Asadang

What Mr. Blaha is actually explaining, is that during the process, when they have finished processing the material, the waste water must go into the thing, we call it tailing point facility. Before they put it into this facility, in the pond, they have a processing thing in the mine, in the plant, where they heat it, because when cyanide is being heated it breaks down. They start breaking it down in the plant first, before they drain it into the pond, and when the sun shines on it, it breaks down further. They don't take it out of the process and drain it into the pond, no, they break it down first. They heat it, because when it is heated it starts breaking down. So what they have heated, the thing that is already half broken down, that is what is put in the pond. Is this clear? And that is not drained into the environment, we process this again to reuse in the process. So the water they are talking about, that will be drained in the environment, is water in which dirt has sunken to the bottom.

When the rain falls, the dirt that is drained, that would have directly flowed into the river, is collected in the ponds in the area. When the dirt has sunken to the bottom, the water on top will be drained. So the water that will be drained in the environment is not cyanide water. If we did that we would be acting irresponsibly. We don't drain the water containing cyanide into the environment. The water that would contain dirt, the dirt that would actually be there and would flow into the creeks when the rain falls, this we collect and when the dirt has sunken, the top water that is left, the clean water, is drained into the environment. The cyanide itself we reuse in the process. Is this clear? Regarding the union, I can say that Suriname is a free country. Surinamese law does not hinder anyone to join forces. Surgold also does not hinder workers to join forces in a trade union. If they join forces, it is a good thing. We work according to Surinamese law and the law in this country states that workers have the right to join forces in a trade union.

1h40min

Regarding mass dismissal. Look, we came to this community, and we want the people to do well. If you want them to do well, then I don't think you will let them go, no. We are not like that, what we will do, one of the important things, when we recruit you, like Mr. Salomon said, if you don't have the right qualifications, we will train you. So in case the company leaves, you will have a certificate at the end of the day, and with those papers you can go to any company to find employment and show that you worked at Surgold. You can say this is what I learned, and you can find a better job. So people don't have to be afraid of mass dismissal. Except if you do something at work that wasn't right, then you can't expect that, and I'm not talking about many people, I am talking about an individual, If you do something at work, and you knew from the moment you started the work that you shouldn't do that, you then cannot expect, if you did something that was not right, then you will understand that they will not employ you any longer.

Ms. Maureen Silos
I think you also had a question about the length of the project. How much time the project would take.

Mr. Ryan Kambel
Ok, let's go back to this slide to show you again how long everything will run. We told you that we are in a process with the government. This is 2012. In 2013 and 2014, the mine will be build. From 2015 on, we will start mining gold. Here you see the life span they calculated for the mine, if you subtract 15 years, 14 years. But while they will be mining gold, they will also do research to see if there is more gold. And you can be sure that more will be found. So that means that this date will change. It will be prolonged. So I can't tell you how long the company will stay, if more gold is found, then this date will be prolonged. Of course you understand that if there is no more gold, you know what will happen. You will have to find a new job. So will I and all people working there. So I hope the question is answered clearly.

Ms. Maureen Silos
Thank you. Next person? The next question? You have a question? Sir, I made a mistake, this woman was first. Is it OK? Please, state your name.

Ms. Simone Batterson
Good evening, my name is Simone Betterson. I have a question for that man over there.

Ms. Maureen Silos
Mr. Kambel?

Ms. Simone Betterson
I want to know, from 2004 till 2012, are you looking for gold only in the Merian area? And the life span of 2013 till 2014. You will have 750 workers, and from those 750, 200 will come from the Paramaka area and from 2015 till 2013 *(note: she swopped the dates)* you need around 1200 workers. Will it be that out of those 1200 workers, you will still recruit 200 workers from the Pamaka area? That is what I want to know. Will you be only working in the Merian area, or will you also be to other areas to look for gold?

Mr. Ryan Kambel
Thank you for your two questions. I will first answer your first question. Surgold did research in many places, outside Merian, different places in the direct area. They even did research at Pakira, I think many of you know Pakira. When doing this research, they check whether or not there is gold, and how much of it there is. If there is not enough gold, it's no use to build a mine, then they leave the place and go somewhere else where there is enough. I hope the first question is answered well.

The second question. When they will shift from 750 workers to 1200 workers. You understand, if more people come, and Mr. Salomon already said it, the people from the area there, we will always start recruiting there. So if out of the 750, we needed 200 workers, we will look for more people. You have to also understand that a lot of Paramacan People are not there, they are somewhere else, maybe at the French side or in the City or other places. Maybe when they hear about the jobs over here, they might return to this area. Then you will notice that the area will be full of people that are able to work and want to work and that can get a job. Of course in this period, I think the number of workers from the area will increase beyond the 200 workers. Alright? Is there another question for me?

Ms. Simone Betterson
If I may ask the question, how much gold have you been able to find already in the area?

Mr. Ryan Kambel
Wait, I'll give someone else the opportunity to answer this question. Ok, the amount that was found, constitutes 3 till 5 million ounces, that is how it is being measured. Thank you for your question.

Ms. Maureen Silos
Thank you. That man over there. Sorry, please come forward in the meanwhile. Mr. Asadang will say something as well.

Mr. Wendell Asadang
I want to elaborate a little bit on the question that was asked by that lady. Like Mr. Kambel said, in the construction phase, there will be opportunities for 200 Pamaka people. This won't cease when we go into the production phase, when we will employ 1200 people. If there are more Pamaka people that can work, then the number will go up. So it I snot that we only want to employ 200 people, and then we stop, no, as long as there are people that are able to work, just as was said before, we are not only considering that area, but where Pamaka people are, if they want to work, then the number can go up. Another important thing I also want to put forward is that Moengo, Moengo also has experience, a history with mining. There are a lot of people here with mining experience. There will also be opportunities for people from Moengo to find work. Here are people with experience, we know them, and also in the future there will be opportunities for experienced people to also find work at the company, because here in Moengo there were mines. So when we talk about the Pamaka people, we don't exclude people from Moengo. No, Moengo is included. And Moengo has good chances because there are people here with mining experience. Thank you.

Ms. Maureen Silos
Sir, please state your name.

Mr. Robby Pinas
My name is Pinas, Robby. I have two questions: When you look at today's globalizing world, you notice many changes taking place. Companies that were present in countries often recruited permanent workers. Permanent employment. Nowadays, you see this is not the case anymore. My question is that if there are no guarantees to find permanent employment, will there be any guarantees that the people will earn good money? Money to live by, because you will understand, if you are not permanently employed, like was the case with Suralco, you will have to be able to pay for things with the money that you earn, like pay the doctor, help your family to pay the doctor, and all those kinds of expenditures. How will this be? Will the pay be

sufficient so that you can enjoy it even though you are not permanently employed?

1h50min

My other question is: the companies recruit workers, but when they do so, they hand you over to a contractor. How will this be? Will Surgold also work like this? Because I want to say it is better not to work like that, because the moment they direct you to a contractor, they enrich the contractor, but the worker works himself to dead for the contractor and is left with nothing. Thank you.

Ms. Maureen Silos

Thank you.

Mr. Wendell Asadang

I want to respond to your first question. In the first place, we want good workers. If you're a good worker, you will get the opportunity to work for the company. Just as you said, this is what will happen. But we have a way of working. The company has standards by which it operates, policies that guide them in the work. If we will work with a contracting company, we will see to it that it will treat the workers in the same way as we treat our own workers. The way we work with our workers is important. We cannot bring in a contractor and he acts in a way we would not do with our workers. You don't have to be afraid of that. If you find employment with us, you will get a pay by which you can make ends meet. Is this clear?

Ms. Maureen Silos

Next. Someone else has a question or want to say something? Please state your name.

Mr. Robby Boto

My name is Robby Boto. One of the men told us that the company would give information about how to apply for work. I did not get the answer yet.

Mr. Wendell Asadang

To briefly go into this matter, which you brought forward. We are actually waiting for the agreement to be signed with the government. We are also in the process of setting up a HR department. Today we came to present you the results of the study, but we are also awaiting the big event: that the government comes to an agreement with us and we can start working. You will get the information, but today I can't tell you what it will be exactly. The more important thing is the minerals agreement, we are waiting for that. The other things will follow.

Mr. Robby Boto

How will the information about how to apply be disseminated?

Mr. Wendell Asadang

That is one of the things I can't tell you now, but when the time is there, the information will be given.

Ms. Maureen Silos

Yes sir, please, there is the mike. Please state your name.

Mr. Jurgen Asampa
Good evening. My name is Jurgen Asampa. I also have a question relating to the answer of that man. Let's say you finish working in the Merian area, and you will continue working in another area. Let's say I was already employed, simple example, and you are leaving. I will be out of a job. I am trained and educated. Can I then also go with you to the area you are going to?

Mr. Ryan Kambel
Thank you for the question. The answer has actually been given already in your question. Because, like you said, the company invested in you, spend time on you, trained you, so that you become a permanent worker in the company. If they move to another area, you will have been trained already, so I am sure there is a chance that you will move with the company to work in the other place. Maybe when you go there, you will train other people. Like I said, you gave the answer yourself in the question. Thank you.

Mr. Wendell Asadang
Mr. Velanti, I want to clarify your question. You are here today, you had the information, we put up posters, we made it public. In the same way you received the information to come here today, to talk to us, for us to present the results of the study, for you to ask questions, in the same way you will learn about it when we need workers.

Ms. Maureen Silos
Thank you Ryan and Wendell. Does someone else have a question? Is everything clear? Please state your name.

Mr. Velanti
My name is Velanti. Whenever you dig the ground, you inspect the gold. I am sure that you dig in the area where there is gold for sure. What do you do with the samples?

Mr. Ryan Kambel
Thank you for the question. I repeat, this is the drilling machine, with the drilling machine they take the soil up. This is what it looks like. When the soil is brought to the camp, there are a few technicians that will label it and do a few things with it. There are geologists that will look what the soil looks like, they will describe it. After that, they will put the soil in bags and take it to a lab in the camp. This lab is only to make, what they call a representation of the big sample. It is this small. We send this away to be analyzed and to look whether there is gold inside or not. What happens, half of the sample stays behind. They keep this here and it's like, what they call, a library. When the results are returned, they will go back to the sample to see what it looked like, the soil with gold, and this is what the soil looked like when there was no gold in it. With this they can make a plan and think: this is what we think happens under the ground, in the ground. From that point on, they can make further plans about where to dig holes. So they can find out how the gold moves around in the ground. Is it clear? More explanation needed?

Mr. Velanti
When you dig the sample, you will find gold. Even if you go to analyze it, and you don't find it, at some point you will find it. And when you find it, where do you store it? The amount you found, you found it, you found a little

bit, where do you store it? It is available for whom? I intent to say, to whom is it given? Who will take the gold? Will the company take it?

Mr. Ryan Kambel
What they do, like I said, they have a library there. The other part that is taken out of the lab, just as I said..

Mr. Velanti
That I understand..

Mr. Ryan Kambel
A small part of the sample..

Mr. Velanti
A small part will stay behind…

Mr. Ryan Kambel
The rest will stay behind..

Mr. Velanti
Please, a moment…

Mr. Ryan Kambel
They have land fill..

Mr. Velanti
I am talking about the fact that you will take a piece of it and send it away. A part will stay behind. But if you find gold, what will you do with the gold? Will it go..

Mr. Wendell Asadang
Mr. Velanti I can clarify the answer. I will give you an overview of the whole process. Like Mr. Ryan explained. You see that machine there in the air, with that machine we are drilling in the ground. They take the soil and put it in boxes, just like there, and take it to the camp. When they are in the camp, they tear it in half. So out of the entire hole, they take half of it. This "half" is what you see there in those bags. What do they do with this part? They take it to a lab and they bake it in an oven. When they finished baking it, when they have baked it, they grind it, so it becomes powder. If the hole they dug is 200m, the soil they send abroad to be analyzed is 200 grams.

2h00min
You won't be able to find gold in the soil. We look for gold, but it not visible gold we are looking for. That's why we send it to the lab abroad for the people there to analyze the soil to see if it contains gold. Sometimes you can see the gold, but it is not the main thing we are looking for, because you can't see it just like that. In the lab they have to determine it, because even if you see it, you can't determine how much of it is in the soil, the amount of it, and the quality. Only the lab can do that, that's why we send it away. The part that stays behind is for them to be able to go back to it, in case a mistake was made. Where we stored it, where we keep it, to look for that soil again, because from the moment the hole is dug, it gets a number. This is the administration by which you can monitor it. If a mistake is made, you come back, go back in the process, to arrive at the box where the soil is. But it is not

that we find gold, and the gold is send abroad. Everything that goes abroad comes back again. What has been send away to be analyzed, comes back again, because there is no money to keep it abroad. You understand? There is no money to store it abroad. Because we do research, we are not in production. You don't have the money to store it there, so it comes back. You get the results and the material comes back too.

Mr. Velanti
When you find gold in the material, what is being done with the material? Where is it stored? That is what I am asking.

Mr. Wendell Asadang
Look, the big boss here said to me that this material, you would need a dozen trucks of material to be able to produce one kilo of gold. A dozen trucks for the 200 grams we send abroad, before you will get one kilo gold. Actually, the way the Maroon's people look for gold, differs from the way the big companies are looking for gold. I can't give you the whole process, but it was a way to..

Mr. Velanti
Mr. Asadang, I saw at "I am Gold", that when they take the sample, they drill first and then it is put in plastic bags. Bigger than this, this size. Why? When they worked there, I saw where they worked. The people that were let go where there. We went and looked. I saw the samples they send away placed on racks. They were numbered. They send them away, but that gold, you don't know where the gold is. That's why I ask this question. What is Surgold going to do with the samples? Will they also place them on racks or will they bring them to the museum? So, the samples that you are sending away and that will be returned, where will you put them? Because I am sure that you will not drill for nothing, if there is no gold occurrence. That is my question, where will you put it? Or will it go to a museum?

Mr. Wendell Asadang
Sir, what I have been explaining, because you talk about samples, I was explaining, the soil, we talk about soil, you talk about gold, we talk about soil. We drill in the ground. We take half of it, then we bake it in an oven, then we grind it, and from the grinded matter we only take 200 grams to send it abroad, to be analyzed. Tell me how much gold you will find in 200 grams of soil? You talk about "I am Gold", we don't know how "I am Gold" is working. But I explain to you what our process looks like. It is only a small envelope, maybe this size that contains the 200 grams. How much gold will you find in 200 grams of soil? Half of the hole is taken, then you grind it, from one hole you take 200 grams to send abroad to be analyzed. That is what the big boss already explained to me. You would need a dozen trucks to get one kilo of gold from that soil.

Ms. Maureen Silos
Thank you. Sir, after the meeting, the people from Surgold would like to talk to you about this further, to explain it to you. More questions?

Ms. Simone Betterson
I want to make a correction. When you will leave the Merian area, and move to another area, for example Commewijne, you then can't give the 1200 workers the guarantee that they will find employment there. There will be a preference for people from that area. Maybe you can guarantee work for 100 or 150 people, but you can't give 112 *(note: she meant to say 1200*) people the guarantee that they will work in the other area.

Mr. Ryan Kambel
Thank you for your remark. My answer is as follows: I said, chances are high you will find work there, but nobody can give you any guarantees, I can't either. Thank you.

Ms. Maureen Silos
Thank you. Who would still like to ask a question? No. Once, twice? Then I want to thank you for having taken the time to come and ask questions. Everything has been written down and will be included in the report as well, to recommend to Surgold. I want to end the official part of this meeting, but we still have some food and drinks for you and you can ask all the questions you still have to the people here, the people from ERM, the American organization that did the research. They are here and the people from Surgold, you can ask what you like, they are still here. Thank you ladies and gentlemen. Good bye.

Box 2.3 Moengo consultation and disclosure meeting photo log

A record was kept of all attendees and this is listed in *Box 1.2* below

Box 2.4 ***Moengo consultation and disclosure meeting attendee list***

Place: MOENGO

Date: JUNE 13, 2012

Time: 17:00 - 20:00

MN. 45

Head Const MN.

Naam	Dorp/ Adres	Role/Organisatie	Telefon
Sergio Pinas	moengo		6938639
mickEyPinas	moengo		8959926
Rosito ABiting	moengo		8124622
Hendrik moekan	moengo		7124619
Apzakson Ricardo	mongo		8576771
Tjuelling	[illegible]		8798411
Pinas Ricardo	Buesidewe 139		8119696
Prika Tobias	Sabrawi 51236		8653437
Babel Roël	Moengo		8573913
Betterson Simone	Moengo		7144820
Bron Rolita	Watertoren 375		8598706
olga Pinas	Pelo.ondro		8840215
MAmboi John	Pelo.ondro		
Asadang W	Parpo	Surgold	08638655
Amalinsi H.		Suralco	
Afeki U.H	moengo	min R.O.	8731240
Adopai D.B	moengo		8629060
Adopai Rael	moengo		7173865
KASAN C	moengo		8770833
Kenner [illegible]	moengo		8209729
Pinas J	Moengo	[illegible]	8856471
Velantie N.M.	Sabiwenist 15	[illegible]	8772631

Place: MOENGO

Date: JUNE 13, 2012

Time: 17:00 - 20:00

Naam	Dorp/ Adres	Role/Organisatie	Telefon
Tokromo H.	Moengo.	Bedrijf	341371
Lino Frits	Moengo	Tokromo	8763735
Deekman R.	Moengo	—	7140877
Deekman Scheila	Moengo	—	8113679
Alting Clyde	Coppenamestr	W tec Sole	8665596
Pinas W.	Lijnweg	Tokromo	8152077
Misasie A.	Bernardsdorp 12	Min. R.	8178906
Kamanchi S	Sterlij	m	7114997
R. Batho	Pelgrimshoek	R.R.	8541827
Keamopawiro R	Moengo	GeoSel	8873379
Sepawai A	Lijnweg 317	R.h	7181642
Amwojo C	Sunala straat 18	Min. van Ro	8768633
Vianen D	Surgold.	Surgold	8747066.
Bange E	Moengo		8871687
Pinas Robby	Akale-Kondre	Security	8186279
Daniël Andrey	Kartoadmodjostraat		8918655
WATSON. D.R.	Moengo		8824612.
Jordan Geor	Moengo		8291941
Mainsie Ramon	Moengo		7234408
Dilmet Chanjin	Moengo		8890700
Brunswijk Minerso	Moengo	T.C.T.	7216097
Pinas R.J.	moengo		8763584

Place: MOENGO

Date: JUNE 13, 2012

Time: 17:00 – 20:00

Naam	Dorp/ Adres	Role/Organisatie	Telefon
[illegible]	MEC/BG		08788362
Koniza	Baron.str		8625221
Th. Collyn.	Paramaribo		—
Brunswijk	Julianadorp		8270646
Pinas	Paramo		7134720
Kwelling	Dennis		8264079
Brujen	Moko		8212048
Asampa.	conceci'e weg	—	7136399
Amarth	Lijnweg 121	TAXI	8865589
Pika. adodui m.	Akale-Kondre	TAXI	8663532
Marlon	KOTKS		8135259
Gordon	gouden regenlaan		7107521
Daschwels	onderwijs complex		8597525
Silla	Wilhelmas RR		8906519
Asampa M	Pelo – ondro		8914782
Kwelling S	Pelo-ondro		8968789
Kwelling nanda	pelo-ondro	88	8880902
Lil Julie	Lijnweg 175		7143490
Marjana S	Skintabiki	7178845	
Robb	gr. Roly		

Place: MOENGO
Date: JUNE 13, 2012
Time: 17:00 - 20:00

Naam	Dorp/ Adres	Role/Organisatie	Telefon
Mainsie Rano	moengo	poclaine	7234408

It should be noted that not all attendees signed the participation sheet and that additional people to this list joined the meeting.

Meeting held on June 14th, 2012 in Hotel Krasnapolsky, Paramaribo. Meeting was conducted in Dutch and Sranan Tongo.

Presenters included:
- Mr. Salomon Emanuels, representative of ERM
- Mr Bart De Dijn, representative of ERM
- Ms. Maureen Silos, representative of ERM
- Mr. Ryan Kambel, Health Safety and Loss Prevention Coordinator, Surgold

Transcription Surgold Public Disclosure Meeting
Paramaribo
Hotel Krasnapolsky, Conference Ballroom
14 June 2012
6.00PM – 10.00PM

0min

Master of Ceremony: Ms. Maureen Silos

Good evening ladies and gentlemen. I would like to ask the people here in the centre, to move one row up to the front so there will also be people sitting at this table. Otherwise there will be so many empty seats. Thank you. On behalf of Surgold and ERM, I welcome you tonight to the presentation of the Environmental, Social Impact Assessment study. My name is Maureen Silos, I work for ERM, and tonight I am the master, mistress they also sometimes say, of ceremony. Before we continue, I would like to say to the persons who do not speak Dutch, that translation is available. You can get a headset in the back and please tune it to channel 2. As I said, tonight we will present the results of the environmental, social impact assessment of the Merian Gold project. Let’s quickly go through the agenda.

We will begin, in the first place, with a brief overview of ERM’s role in the Merian Gold project. After that, a brief background on ERM and who they are will follow. Then also briefly something about what an ESIA entails. Then we will listen to the presenters of tonight. The first presenter will talk about the Merian Gold Project and then the two other presenters will give a summary of the results. Ryan Kambel, sitting next to me on this side, is the one presenting the Merian Gold Project. He is member of the safety team of the Merian Gold project. Sitting next to Ryan, is Salomon Emanuels. He will tell you more about the social results of the ESIA study. And Bart de Dijn, who is setting at the end of the table, will tell you more about the environmental effects. We will then have a Q&A session in which you will have all the opportunity to ask questions and make comments.

I also have to introduce you to another member of our team, she is sitting in the far back, in the corner. That is Ms. Wielzen, she is taking the minutes tonight. This meeting tonight is recorded, that is why we would like to ask you to use the mikes when asking a question and state your name so that Esther can write down all the details.

Let's quickly start with the role of ERM in this project. As you know, when big projects like these are set up somewhere in the world, then big international companies such as Surgold, Staatsolie, Newmont and so on, are required to conduct a study about the effects, both the social as well as the environmental effects. It is then very important that they study both the positive as well as negative impacts very well. There are also regulations required by Surinam, principally from NIMOS, that states that the company is not allowed to do the study itself. The company has to contract an independent organization who will conduct the study. Based on the international and national requirements for independent research, Surgold has contracted ERM to do the research.

As you will see, ERM's assignment was to be objective, to propose measures, to strengthen the positive effects and minimalize the negative effects and of course to involve all the stakeholders at every step of the process, and it is a long process. Environmental Resources Management, better known as ERM, is a relatively big international environmental advisory organization. It has more than 30 years of experience in doing this type of research. ERM works in 140 countries and has around 3000 employees worldwide. I think we can draw the conclusion, at least at this moment, that ERM has a lot of experience with these kinds of studies. They work with interdisciplinary teams, in the fields of social, environment and health aspects and all these people have experience with mining projects around the world. One of the ERM policies is that when working in a country they do not arrive with an army of foreign consultants. They also work with local experts. A number of them you see sitting here at the table, there are many more, but Bart de Dijn and Salomon Emanuels are two experts of the Surinam team.

What is an ESIA, an environmental and social impact assessment? It consists of three main parts, which I shall mention: in the first place the environment is reviewed on aspects such as air and water quality, waste and noise, and so on. In the second place the social effects of the project on communities, their culture, behavior and income and so on, are considered. They of course also look at health effects of the project. I want to emphasize again that each time the stakeholders are being involved. It is impossible to do it without the stakeholders. Tonight is an example of this. You came here, you were invited to come here, you will get all the opportunity to ask questions and make comments. We already held this session at Langa Tabiki, the Pamaka area, where the people are directly involved in the project and the effects, both the positive as well as the negative effects. We also held a meeting for the employees of Surgold in the camp and we held one in Moengo. Today we are here in Paramaribo to present you the results of the study.

As I already mentioned, we have three presenters tonight. Ryan Kambel of Surgold and from ERM: Salomon Emanuels and Bart de Dijn and myself Maureen Silos, and Ms. Wielzen, who will support the team. Before ending my part of the afternoon, I would like to request a few things. In the first place, as we are used to do, let's stick to a few basic rules. Let everyone finish their sentence. If we do not talk during the presentation, then everyone will be able to hear what is being said, and there will also be no rustling then. If you please can turn off you mobile phones or leave it in the vibration mode, I think it is called that way, because I never use it, or on silent.

The experience from the previous days leads me to request you to limit yourself to asking only two questions or making two remarks in the first round. Or one question and one remark so that everyone has the chance to say something. After that we will have a second round of questions and remarks and you can surely raise your hand again and you will get a turn. I also had to say that there is a signing up list, it is on the way, together with the handouts, and when they arrive you will find them on the table in the back. So please, if you remember later on, if you have the opportunity, please register yourself. Then I want to end my part for now and invite Ryan Kambel to briefly give an overview of what the Merian project entails.

Mr. Ryan Kambel
Thank you Ms. Silos. I also want to thank everyone for being here with us. It is relevant to all of us, the subject matter we are going to present. I am Surinamese myself.

10min
At the Merian project safety is very important to us. Safety, work safely, prevent that people get into accidents, that company or vehicles and equipment suffer damages, anything by which the company or people can suffer losses. This is very important at the Merian project. That is the reason why tonight we will start to explain what our evacuation procedure will be. We are in a hotel, every hotel has elevators, anyone who doesn't know it, if anything happens and we have to evacuate this space, it is not allowed to use the elevators, only the stairs. The next step, we are in this location, there are two options, you'll find a door to your left, or there to your right, if anything should happen, go in an orderly way to the nearest exit. At that side you follow the hall, straight on, turn to the right and you arrive at the stairs, go down, go outside, turn right, continue straight, then turn left, you are at the stairs and then you are downstairs. That is the evacuation procedure, in case anything should happen.

I just said, we are very serious about safety at the project. It is very important. Another aspect of the Merian project is creating opportunities for Surinamese people to work there, to be trained, to take with you everything you have learned there. It is not the case that you are trained and you go home and leave everything you learned at the workplace, so to speak. No, everything you learn is for you to keep and to potentially teach the people at home about it. Here you a see slogan. This slogan was just launched. It states: safety today, for a better tomorrow. It is written in Sranan tongo that was also the intention. A few days ago a contest was held at the project, where the workers had the opportunity to submit a slogan. It is not worth much if supervisors or higher ranked people would think up a slogan. But if the workers themselves think it up, besides the fact that they feel involved, it is theirs and you will also directly know what they think. At the same time, there will be a change in the thinking of the people, because in Surinam, indeed, safety, we do not want to have accidents, but it is still not at the level where it should be. That is why we thought to hold a contest, and this is the slogan that has won: Safety today for a better tomorrow. With this slogan we will continue at the project.

You might have heard about Surgold, I just told you something about the Merian project. What is Surgold? What is the Merian project? Surgold is a company that was created by two companies, namely Newmont and Alcoa. Again, Surgold was set up by Newmont and Alcoa. It is managed by Newmont, they are the drivers of Surgold, the company Surgold, and they do nothing more than exploring gold. With this I intent to say they are looking where the gold is, and how much of it there is. There is no mining taking place yet, nothing is being sold yet, they only look for gold, how much there is and everything related to that. Newmont came to Surinam in October 2004. At that time Surgold was also set up and from that time on we only talk of Surgold, not Newmont. I know there is still some confusion about Newmont, Surgold, Alcoa, Suralco. Surgold is the company that currently explores gold at the Merian project, it looks for gold. Not to be confused with Suralco, because Suralco works on the Nassau mountain, it is about two hours away from Merian. Suralco, not Surgold, mines bauxite. These are two different projects. Sometimes people still mix them up, but they are two different projects. Surgold, gold, Suralco bauxite, Nassau.

How do I reach the Merian project? This is Paramaribo, you drive about 98 kilometers to the east, you reach Moengo, from Moengo on southwards, and then you arrive at the Merian project. This is Langa Tabiki, to give you an indication, this is French Guyana. This star here is the Merian project. What is Surgold doing at the moment? I just said a few things about it. We are looking for gold, but besides this, we are also doing something else. People are living there and I say living, because people are really living there. You stay for a longer period of time and of course you need sleeping accommodation, food, recreation, and all these kinds of things. Besides exploring, looking for gold, we are constructing. This is an example of an exploration activity, maybe you can't see it clearly, but it is a drilling machine. This is where they are lifting up the sample that is taken from the soil. This is what it looks like when it comes out of the ground. It then goes to what we call the core shed. There the sample is studied by technicians, geologists. They do research, they inspect it and describe it, when they finish their activities, the sample goes to the preb lab which is on-site.

The prep lab can only make a small bag out of the big samples. We do not perform analysis in the field. We make a representative smaller sample out of the big sample and this is send away to be analyzed on gold occurrence or any other metal that is used in the process. So we do not analyze gold at the Merian project in the camp, we only prepare the sample to send away. As I just said, this is our camp, here you see activities being undertaken to expand the camp, sleeping accommodation, offices, and everything else that is needed. Exploring and constructing, is what we have been doing so far at the Merian project.

What will the future look like? We are now in 2012. We are in a negotiation process with the government about a minerals agreement. Furthermore, simultaneously the ESIA study is ongoing, we are completing the study. At the same time we are doing a feasibility study, and when all has been completed, the management of Surgold will have to take the decision whether to go ahead with the mine or not. Starting construction of the mine. If everything is positive, in 2013 and 2014 we will be constructing the mine, that means the plant, the roads, the building, everything that is needed on site, and in 2015 we will actually start mining.

20min

This is 2030, this has been identified as the closing date of the mine, but while they are mining, taking gold out of the ground, to put it bluntly, exploration will continue. It is not stopped, they will continue looking for gold occurrence, if they find gold, it is self-evident that the end date will be prolonged. The life span of the mine will be extended. This is an indication of the current situation, but it can change in the future. This is what it will look like. These three reddish pictures are the three mine pits. This yellow part, these five spots refer to the place where rock waste will be put. At this side, you see a lighter green, this is liquid waste. Over here, the dark green part will be our camp. This will be the plant where the material will be brought to and processed and everything else linked to it. Here you see a purplish color, it is a straight line, and this is an air strip. There will be an air strip close to the camp, close to operations. There is of course one important reason for this. In the beginning I said that the Merian project, Surgold, values very much the safety of its workers. If anything should go wrong, we don't hope so, but if anything should go wrong, it is important that we can quickly transport the person who has been in the accident to the city. In the end, you will need to go to the City. With the air strip near operations, you can be quickly in the City. If anything happens, we currently have to drive all the way to Langa Tabiki and take the plane there to go to the City. Of course, it will be a big difference, and like with all accidents, time matters. The amount of time you have before the situation of the person deteriorates. That is one of the main reasons why the airstrip will be there.

These are a few examples, pictures, of how we will work. This is the Haul Pack. Over here, this person is used as a dummy, to be able to see how big the trucks are in reality. Mind you, this is the side of the truck, the person reaches up till about here. We will also have loaders, these are used to fill the haul packs with material. This is a picture of a grader, this is used for the construction of roads. This is a picture of Rosebel and their solid waste. Below, there is a picture of Africa, where we see a pond filled with liquid waste. You have to realize that this liquid waste is being reconditioned and reused in the process. It won't stay there, we will reuse it.

Finally, an example of a rehabilitation project that Newmont did. This is Indonesia. In April 2003 they finished mining and started the rehabilitation process. In five years' time it looked like this, completely covered again. It looked more or less like it did before the mining operations.
This was my part, I'll give the mike to Ms. Silos.

Ms. Maureen Silos

Thank you Ryan. This was a brief overview of the Merian project. I now would like to ask Salomon Emanuels to tell you about the results of the ESIA study, in particular the social and health effects, the positive as well as the negative effects of the Merian project and at the same time to clearly indicate what advice ERM has given Surgold to strengthen the positive effects and minimalize the negative effects.

Mr. Salomon Emanuels

Good evening also from my side. I will try to be as clear as possible. This study was conducted, we started last year August with the preparations and the last months, last weeks, we have been busy finalizing the study. Just as

Ms. Silos already said, I will only deal with the social and health issues and my colleague will later on deal with the environmental aspects. A study like this consists of different parts. The slide you see below is important: involving the people of the direct surroundings, but also everyone that can be affected in one way or another by the project or that can influence the project. So you have people, organizations, situations that can affect the whole of it.

We involved the people at different times, by advertising in the newspapers, we put up folders in different places, in the Pamaka area, in the language of the local people, but also in Sranan Tongo. There have been public disclosure meetings. I myself went to the Pamaka, area several times, and talked with the *Granman*, the captains and head captains, to explain the matters and ask for their consent and so on. It was very important for us to consult the people, because the people in Paramaribo, the people in the rest of Surinam do hear about the project, but it is the people of Pamaka that are affected by the project, that are already now affected. Via mail and telephone we are also getting response from people on everything. A study like this consists as I already said, of a few steps that need to be taken. The first part was for the group of experts to come together and decide on the scope and level of detail of the study.

We presented this to different stakeholders, we talked to different people to decide what we were going to study exactly, how we were going to go about it and who we were going to involve. This was the first step and only when those things are clear, a decision can be taken to start the research and that was the phase in which we went to the villages, to Moengo and talked to doctors there, with people from civil service, we spoke to nearly everyone we could identify, we talked to them.

30min

Then the moment is there to present the results. When you conduct an ESIA, there is a set procedure that has to be followed. You will be evaluated on this. If you skip one of these steps, people who criticize the report can say that it is a good report, but you didn't take such and such a step. We have now come at the final stage, presenting the results of the study, like we are doing with you tonight.

The situation as of today is that the draft report has been finalized. We have given the report to Surgold and NIMOS. NIMOS, representing the government will look at the report and give comments and study it and decide whether we have delivered a good job or not. Only the report will be completely finished. Also your comments of today will be incorporated in the report. The comments of the last days of Moengo and the Pamaka area will also be incorporated to finalize the report. If NIMOS states that we have left out something, we will go back to the drawing table and will try to add the information in order for it to be complete. In the meantime, based on a few recommendations we have made, the company is already dealing with a few matters, working on an environmental management plan. And of course the company is very expectantly awaiting a response from the government, stating that this is the contract, you can start mining. This is also linked of course to this study.

The social study as I said has several aspects, we looked at the social economic aspects. How are people living, what do they live by in the Pamaka area, where do they get their money from? Where do they get food? We have studied all these matters. We looked at their cultural heritage, what cultural aspect is important to them? What do they want to preserve, what do they think about such matters? Where are the holy places in the villages but also in the forest We have been to places, they have taken us to places, we looked, we have , as I said, studied the health situation, we have spoken to health workers, we spoke with the local people to find out what they think about their health situation, what is not going so good, which diseases are prevailing, where's the doctor's at, we looked at all of that.

We also looked at traffic. Between Bosje bridge, till Moengo, and from Moengo on the road to Langa Tabiki, we counted traffic, on different days, at different hours, to observe the traffic flow and to see what changes might occur at a later stage. All of this we did first of all to get a picture of the current situation. What do we observe? When we started, this was the leading question: what is the situation at this moment? What is the traffic flow like? Where do the people get money from? Then we studied what would happen, should the project continue.

So we studied the effects. What will happen with the people? What changes would occur, both positive as well as negative? We have, just as Ms. Silos said, looked at what measures should be taken to influence the effects in a certain way. We have, as I said, the opportunity, you and others have the opportunity to add information to report and incorporate your advice or comments. We will consider each question or remark you make today and see how we can improve the report as a result of that.

I already told you, we studied the current situation. When we went to area, we determined that in the Pamaka area there are several means of existence. The people have several ways to provide their own income: hunting, fishing, farming, but mainly for their own use. In the past, some ten years ago, Pamaka people were quite active in producing *kwak* to sell. But the number of people that is still doing this has dropped drastically. The main part of the agriculture produce is for their own use. And here are a few people, mainly young people, young men and young women that are active in small scale gold mining. We determined that people in the Pamaka area have a strong identity. When talking to them, they want to tell you and show you that they are proud to be Pamakan. It is striking that they tell you that their history has not been recorded much compared to other Maroon communities.

We determined that the education levels are rather low in the area. There are well educated Pamaka people, men and women, but they are not in the area, they are elsewhere. The people that are still living there either have a low education level or have never been to school. To a large extent, people are migrating, they don't have work, a bleak future, they move away, to French Guyana, Paramaribo or elsewhere in the world. The health situation and the facilities are not optimal. As nearly everywhere in the interior, there is no secondary education. At times the teacher doesn't show up, you know about all these problems of the interior. With respect to education and transport, in the Pamaka area it is no different. Observing all of this, the question was: what will happen should the project go ahead? In case the project goes ahead, we determined that there will be direct and indirect employment created. We do not know yet for whom, but here will be employment created. Direct employment through working directly for the company. Indirect employment to a certain extent, for your own business, or via a contractor, finding work so that you can earn an income.

It is possible that as a result of the company coming to the area, investments will flow to the communities. Investments, on the one hand, for example the company can help carry out projects in the villages. Since the workers from the Pamaka area will earn money, they will be able to build houses in the villages, all those kinds of things. As a result of which economic development can for sure take place.

In the Pamaka area we have, you know the story, Mr. Ryan talked about Merian. Merian in fact is a creek. That creek, the project will be situated in those surroundings. Exactly there, in the middle, where Surgold is going to work, that was the area where the small scale miners were working. They were working there. They are not there anymore. This means that these people are now out of a job, they don't earn their bread. We met them, in the forest and in the villages. And I can tell you it wasn't easy, because they were very angry. They didn't want to talk to us at all, but thanks to a lot of talking and making requests, we succeeded. For these people, the arrival of the company has changed their life maintenance. They are sitting at home, they don't have money, and even people in those villages say, look, the men start drinking and smoking again. Now problems will arise.

40min

The arrival of the project will also change the culture of the people. You may ask yourself how? At a certain moment, certain traditions, look, if you are working for an employer, you sometimes don't have time for certain things any more. You work a lot, going from home to work, and then you almost have no time anymore. Your life style has changed. Before you know it, the elderly will have passed away. The young men did not sit down with the elderly and listen to them. What will happen? The 'archive' will disappear, the knowledge will have gone and with that the culture and other aspects will change.

Another point is that with the arrival of the company, expectations are high. Expectations from the people, but also outside the communities expectations are high. People think they will find employment, they will get ahead, and that sort of thing. If they don't find a job, they will be disappointed. If you don't take care, many problems will arise, people will start drinking, it could even occur that people commit suicide. Those kinds of things could happen.

Of course, we expect the project to also have positive effects. One of those is that the people working for the company, Pamaka people, whether they are trained or not, will be trained. In this way, on the long run there will be an army of people in the Pamaka area that are educated and trained. Should the company close down one day or should people need to be dismissed in some way or another, they can also earn their bread elsewhere. This situation could occur.

But also unskilled workers can find employment with the company. Also young Pamakan people that are living elsewhere, can return to the area and find employment. You see here, that before going into production in 2012 till

2014, around 750 people can find employment. Of course Pamakan people are included. During the peak period, in 2015, and after, it is expected that around 1200 workers will find employment with the company, those are not the 750 workers plus 1200 workers, the 750 workers are expected to increase to 1200 workers. The benefits for the people of the area, but also for other people are that the household income could increase. Expenditures will increase because of an increase in income, as I said earlier. There will be money in the villages, money will flow into the area. The expectation is that if more money flows into the area, less people will be willing to move.

The researchers advised Surgold about the improvement of local employment opportunities. We have said that the company has to clearly communicate to the people what the recruitment process will be like. How will you recruit people? Where do people have to register? What training? Make it clear to everyone, so they know what to expect. Because I can tell you that since we started this research, I have been regularly receiving phone calls from people asking me where to send their application to. I am not from the company, so I can't give a good answer.

We also advised the company to train the people, to train them well. Not just any training, but quality training, so they can also use it somewhere else. Certified training. We also advised them to do something with financial management. Again, there is already money in the area, but more money will come into the area. And you know, when there is money, people have more needs. The moment people have money, they have more needs. Some people really don't know how to handle the money. We say: they spend money like water. To prevent these kinds of situations, where problems arise such as alcoholism, it would be well advised to prepare the people in advance, through organizations, local organizations, training people how to handle their budget. This goes for people both inside as well as outside the company.

When you are in the Pamaka area, you see people everywhere working hard for a living, trying to make ends meets. They are active, I already said it, women bake and sell *kwak*, others have a small business. We advised the company to stimulate local entrepreneurship, in order for local employment to also be created outside Surgold.

Community investing. In general, the project has benefits for the whole of Suriname. The country will get tax from the company, it will be put in the big pot and it will be divided by the men and women who govern this country. That is what they do, dividing the income of the country as best as possible. Tax income will run out, one way or the other, in any case, tax will be coming in. So this is a benefit according to us.

Another benefit is that the government and the company, and other companies and NGOs can work together as partners on developing Surinam, but also in particular on developing the area where the project is located. In this respect, it is good to give attention to the health services, education and social economic development.

How can you improve the investments in the communities? We advised a strategy be developed on how this can be done. Everybody in the Pamaka area is waiting for the next steps. How much money? What percentage will we get? And so on. What will the company do for us? We can keep on asking this question and try to answer it for each one individually. Is it well advised to sit down together and talk to each other about the plans for the area. The company has a role to play, the government has a role, and everyone else. So come up with an investment strategy for the area.

Mainly work with local partners. There are people in the area that are active in different fields. Try to involve them. Should you need vegetables, don't source them from the City, but if possible, source them locally. If there are no people to be found who are doing it, try to stimulate them to start doing it. This does not mean you should exclude others, but look first at the people from the area. It could well be that someone from the area is working together with someone from Paramaribo, that has benefits of course, it works both ways.

50min

We also said, as long as the company is active in the area, keep on listening to the people. Keep on talking to them, this is very important, consult them. Don't take decisions to do certain things by only involving the government, or others, but also involve the local people to decide how to move forward. When you come to the Pamaka area you will see the *Granman*, head captains, *Basjas* all do their utmost to run the area, but they don't always succeed.

The company is taking a lot of time to talk to people, but it doesn't go that smoothly yet. We advised them to try and create a dialogue structure, a platform or something else. Then the company and the people can sit down and talk about what is happening in the area.

A negative consequence for the small-scale miners is that they have no more access to the area. Because the concession is quite big, and they were active in this area, they don't have access to it anymore, and this is quite inconvenient for them. We looked at it from their point of view. This has resulted in a loss of income for businesses. There were people who were carriers, who had different businesses linked to the small scale gold miners. All of this has disappeared. Gas supplies, people who let equipment, all of this has now been stopped.

The possible effects on the small scale gold miners. Their income will decrease, resulting in a lower standard of living. In the meantime, some of them have already moved away from the area and have gone to other places, or they have gone to Paramaribo or elsewhere. An important aspect is, look, you will all understand this. If you don't have money or income, and if your housing and living conditions are bad, then you will feel less deserving. Less deserving, not less valuable, but less deserving. This means that you might think you are worth nothing. You will maybe be ashamed, you no longer go to the pub where you used to go to with your friends, because money will be spend. If your friend buys you a beer, you will want to buy him a beer as well and you don't have money, so you won't go. These kinds of things happen to unemployed people. In certain countries people commit suicide because they're out of a job. Fortunately the small scale miners haven't done this yet and we truly hope that they will never have to do this.

What can you do to meet the small scale miners half way? We advised Surgold to sit down with the small scale miners to make a management plan on what they can do to survive. Of course this has to be done in consultation with the government. This matter is very sensitive. They say "I am Gold" has some experience with this. Go and talk to them, look at the lessons learned and sit down to see what will work.

The "Structuring Gold Sector" *(Ordening Goud Sector)* is operational. We understood that they will try to help the small-scale miners to transform, to operate in a different way, more environmental friendly. We advised the company to talk to "Structuring Gold Sector" to see if they could support that process as well, so that the small-scale gold miners could be given a push from that side as well. We also said to source locally as much as possible and recruit people from the area. By doing that, there will be chance that you also include the previous small scale miners. Train the people, teaching them skills they can use with the company but also elsewhere.

With respect to the cultural aspects, changes might occur because people will no longer be able to access certain parts of the forest. I already said, they have taken us to certain places, they have told us stories about the importance of certain spots for them. This has been restricted now, they cannot access it anymore. I also said it already, that changes will occur within the local communities: a different way of living, a different way of communication, a different way of valuing things. Again, people that earn money, will immediately change their life style and this has an effect on certain traditions. The presence of workers from outside the Pamaka area can cause changes. Firstly, when you walk in the area, you will see that the demographics of the area are already changing. You will see different colors, the play of colors is changing. The population is getting mixed, you nowadays see a few mixed persons amongst them, and they speak Pamakan. These are ongoing changes, we are not saying that it is negative or not a good thing, but the people are indicating this. It shows it attracts their attention. At some point, if you think about it, the number of workers could increase. Someone in Moengo or the Pamaka area made a comment that people are afraid that the number of workers will overshadow the number of locals, many more workers and less Pamaka people. That will upset the balance and people feel hesitant about it.

So what can you do? We advised the company, I repeat, they do a lot, they talk a lot with the people, they go to the villages, they have community relations, they employ people who go to the villages and talk to the people. We advised them to expand this, look for other ways to talk to the people. The people have indicated they would like this. Until recently they talked with the *Granmans*, the captains, and so on, but the initiative was mainly taken by the company. However, the people have now said that they want to take control, and from now on they will also invite the company to come and talk with them. So expand the communication channels. Help the people with a plan to organize their cultural heritage.

The Pamaka people have ideas, just as I said, there history has not been written down like has been the case with the other Maroon groups. They have ideas to do something about it. Support them in these plans. Maybe they also want to have a Pamaka museum in the area. Help them with these kinds of things, so that they won't have the feeling their culture is disappearing completely. Certain things can't be prevented, but what can be preserved, you should try to preserve.

We also advised the company to introduce a code of conduct for its employees, so people that go to the area to work, will know what behavior is expected from them. That is a common thing, if you go to another country you will have to comply with the rules of that country.

We also identified negative effects relating to traffic accidents. I already said that we looked at traffic. We expect an increase of mainly trucks on the roads that will be transporting different things. You have to know, I thought Mr. Kambel said something about that or would have said something about it, but in any case, heavy, the heavy trucks will be at the site. They will not really be on the roads. Only in the beginning we expect there will be much heavy traffic, but afterwards it will become less. In any case there will be an increase of traffic on the road. Also the continuous rehabilitation of the road, the maintenance is taking place. It could be that you are driving on the road at night, or during day time, and suddenly you find the road to be closed, you have to turn around. People don't like things like that. Some people start calling names. In any case, these kinds of things will happen, activities on the road, to maintain the road.

1h00min

What can also happen, since the road in the area is quite long, you are about four and a half hours on your way. People will get tired. There are people that go back and forth in one day. It can cause fatigue. To somewhat be in control of this, we advised the company to develop a traffic control management plan where the company clearly indicates, of course in consultation with the government, what the traffic will be like in that area. To monitor the speed limits, maybe through thresholds or clear warning signs so that people will know how to behave on the road. Give also information to the people, keep on informing the public. Keep on talking about safety, so that the information will stick, and they will think about it before going to sleep and when waking up in the morning. Of course, the company will work with contractors. Give them the same information. Not only the people working at Surgold, but everyone active in the area should be alert on traffic safety and should have some consideration for others. Maybe you don't value your own life, but other people do value their lives, so don't put the life of other people in jeopardy.

And then, regarding chemicals, they will be working with substances. We expect this will have effects. One of those is that in an unguarded moment, chemicals could be spilled. In the case of a tank exploding or becoming empty at a place where it is not supposed to become empty. The driver crosses the road, to urgently let water. He steps out of his pick up or what have you. When he returns, the road was bumpy and the truck is leaking. He went away to let water, and his tank is leaking. So now you have two people that are leaking. In this way chemical waste will be leaking on or alongside the road. You might not understand me, but..

In the area they will be working with different substances. When you have finished, you are eating something, an orange, you have finished eating it, and you have to then throw it away, because you don't eat it. That will also be the case here. They will use substances that produce waste. They have to know how to handle this.

In the area itself, during operations, at the location of the mine, accidents can also happen. As a result, substances can escape, gasses evaporate into the air. Substances that might contain a health risk. What can you do? We have suggested the company develops different management plans for handling the substances. Safely managing and discarding of all hazardous substances. Cyanide and other chemicals should be used in a responsible manner. It should be managed in a safe way, and efficiently and effectively react to emergencies. If an accident occurs in the area, as Mr. Kambel has said, the company has to be alert, and react effectively and quickly, and offer help, so that things can be contained and don't get worse.
With respect to cyanide, we studied it, international agreements exist. Companies apply these, especially gold companies work with these. Instead of using mercury, they use cyanide. But if a company works with it, there are international agreements that need to be adhered to. We looked if the company is also party to the agreement. In any case Newmont, that is the information we were given, Newmont is one of the parties that has worked on the realization of the cyanide code. The international cyanide code. This means that Surgold will also have to adhere to the code and apply it in the company.

The environment. I told you I would only talk about the social and health issues, so my part for tonight has come to an end and I hand it over to the master of ceremony.

Ms. Maureen Silos
Thank you Salomon. Ladies and gentlemen, we will now turn to the presentation of Bart de Dijn, who will talk about the environmental effects. Afterwards we will have the Questions and Answer session.

Mr. Bart de Dijn
Thank you Maureen.I think the previous speaker has explained very well how a study such as this is conducted and how an organization like ERM advises Surgold. It comes down to the fact that not only social but also environmental aspects are looked at and experts go to the area and study the present situation in the area. We studied the plan of the company, in this case Surgold, and looked at what they want to do in the area and we try to predict what the environmental effects will be if the company takes certain actions. Once we have identified these, and it appears there are important negative environmental consequences, we then have to advise the company how they can mitigate these consequences. That is how we work in practice.

The present situation in the Merian area, where the mine will be build, can be summarized in one slide. It actually comes down to the fact that the area has been disturbed for a large part. This wasn't caused by Surgold's activities, but is the result of the activities of small-scale miners who have been active in the area for years. Mind you, the Merian area is an old, it has been a gold mining area, where in the past gold miners were working. The new gold miners have also been very active in this area, until Surgold, with the consent of the government, marked the area where they would like to mine, and said this part is where we want to work. But the part where Surgold would like to mine, is already heavily disturbed as you can see here. This is part of the area, the white, yellow and red spots are spots that have already been cleared, to put it like that. The forest has been swept away, the creeks have been deepened and so on. You will see the forest is still there, but everywhere there are roads and quarries, you won't easily come across an uninterrupted patch of forest anymore in the area. That is what is written here, the rain forest in the area has been affected, and deforestation has taken place on a large scale, the forest has been cleared completely and the creeks in this area, the creeks you see here in this area, this used to be a creek. The creek and the forest alongside the creek, has been turned upside down so hardly anything has been left of the original creek and forest.

In discussing the remaining matters, I will take into consideration five subjects. You can see the five topics here. The first topic is water quality in the area. Another topic is plants and animals, mainly plants and animals that live in the forest. We will also look at fish and aquatic habitats, these are the places where fish live: creeks and swamps and so on. We will also look at air quality, the quality of air in the area. We will look at noise, noise nuisance that is noticeable in the area.

1h10min

Water quality. You have to understand that an important part of the area, the specific area, where the mine will be build, will need to be deforested. Where the mine pits will be build, will be deforested. The location where the waste of the mine will be stored, also needs to be deforested. Except for the fact that there will be deforestation taking place, the creeks in the area, at least what is left of the creeks in the area, those creeks will also, while the mining operations are ongoing, their outline and location will change. What will happen, when the ground will be exposed to the rain, the natural elements, together with the water that falls down on the ground, the ground, not the dust, will flow with the water into creeks and the result will be dirty water.

In Moengo I also gave this example, dirty water, if you would collect the water in a bottle and leave it to stand there, you will then see that at a certain moment the bottom will sink. You will then be able to see how much soil and dirt is being washed away by the water. So there will be an increase of mud in the water, in the creeks in the mining area. What could also happen is when the mud gets into the water, certain substances that are in the mud could dissolve in the water, heavy metals for instance. There are certain types of soil where the risk is high, but based on the information we collected in the Merian area, we found few soil occurrences that are at risk, where heavy metals could dissolve in the water. So, for as far as we can predict at the moment, the risks are limited. What will happen as well, because the whole area will change as a result of the mine, is that also the amount of water that will be drained off by the creeks in the area will change. Some creeks will receive more water, and some creeks might receive less water.

How do we expect to deal with this? What did we advise Surgold to do about this? An important advice is the construction of what is called sediment ponds. This works is the same way as that bottle. So you construct a pond, basin, that collects the dirty water. So the water does not flow into the creeks in the area, it is collected first in a basin, it then sinks to the bottom, when the dirt of the water has sunk to the bottom, the clear water on top can then be pumped away. If necessary the water can be treated further, if it is not clear enough to drain away to the area. This could well be the most important point, problems can be solved concerning dust, soil dissolving in water. The sediment ponds can also be used to solve problems such as heavy metals dissolving in the water. It can then be dealt with at that moment, when the water has not yet been drained away to the area.

Another important aspect, as I said, while the operations are ongoing, when they are working in the mine. The natural flow of the creeks will change, they won't remain the same in the mining area. When they are done mining in the area. We advised them to rehabilitate the natural flow of the creeks as much as possible. This cannot be done overnight, but they have to work on it, so that the drain, this is the way water is drained away in the area, will be rehabilitated as much as possible to reinstate the old situation.

When we look at the flora and fauna, the animals and plants, mainly plants and animals of the forest, it is clear that part of the vegetation, of the habitat, this is the part where wild life can be found, will disappear for a part. The mine pit will be located where there is still forest now, the forest will partly disappear. Forest will also disappear where the waste will be stored. It is important to know that the parts of the forest where this will take place are already disturbed. A limited area will be deforested, the parts that will be deforested will be marked, they won't deforest like crazy. They will work in an organized manner.

Another thing that could happen while deforesting, is that animals could get into trouble. It could be that animals are killed or wounded as a result of the activities with heavy equipment. When they are on the road with, heavy equipment, the big trucks, it could also occur that animals are hit and are subsequently killed are wounded.

How do we advise the company to deal with this? On the one hand, when during mining operations parts of the forests are cleared, it will be of importance with the closure of the mine in sight, that the area should not be left behind like this. They will have to rehabilitate the area where mining activities took place. This means that they will rehabilitate the land scape, in those areas they will afforest trees, to create on the long run a situation where the area is wooded again. Earlier we also saw a slide of Indonesia, I believe it was. This is what we would recommend the company to do. You should not leave the area behind as it is now. You have to plant trees.

With respect to animals being wounded or killed as a result of deforestation taking place or heavy traffic in the area. On the one hand, what the company will definitely do is impose a prohibition of hunting within the area. In any case, the area will only be accessible for Surgold employees. Hunting will not be allowed in the area. There are several reasons for this. One of those of course is to be able to manage the negative effects on wild life. It can be very tempting to hunt, when you see a very tasty wild animal. On the other hand, to prevent animals from being hit, but also for other reasons, of course speed limits will apply in the whole area. Safety regulations and speed limits, so people won't drive like crazy. Maximum speed limits will apply.

Now more on fish and where it is found. Much of what is written here, is similar to what I said when talking about water quality. There will be more mud flowing into the creeks. The flow of the creeks will change. In the central part of the mining area, several of the creeks that are located there will temporarily disappear. During mining operations, the outline of the creeks will change. But those creeks are without an exemption all creeks that have been very disturbed. So the impact will be relatively small. East and west of the area where Surgold will be mining, the creeks are in better condition, and there you still have got some interesting fish. But this part actually does not fall within the area Surgold will be using. We gave Surgold the advice to leave intact, those areas that fall just outside of their mining area.

1h20min

Let me check if I discussed everything, I think so, the other issues I had already dealt with. Sorry, yes, the measures. What do we advise Surgold to do? Maybe I already mentioned it in in my enthusiasm, let me see. The critical habitat has to be preserved, this is the part that falls outside the mining area. The sediment basins will have to be constructed, like I already said when talking about water quality. Anyway, it should be planned in such a way, so that it is dealt with in the correct way,

Air quality. It goes without saying that when working with such heavy equipment in the area, a lot of dust will be produced. I think everyone knows the case of Suralco, where heavy equipment make use of the bauxite roads and a lot of dust is being produced. The machines run on gas, so exhaust fumes are produced. The plant itself, the company itself, will use energy. Emissions will be discharged. To prevent too much dust from being produced in the area, the roads could be sprinkled with water, for instance. In this manner much less dust will be produced. Matters will need to be monitored. Mind you when we talk about air quality, what has been referred to as emissions standards. So the levels of CO_2 contained in similar gasses, that will be discharged as a result of the mining operations will be low, considering international standards for these kinds of companies. The company will comply with the best standards, the best norms to limit the discharge. So not much CO_2 and other gasses will be discharged. To achieve this goal, it is important to maintain the equipment well. I think you will know that when working with equipment that is old and not well maintained, a lot more exhaust fumes, soot, and so on are produced, compared to equipment that is well maintained. So we advised the company to maintain their fleet of trucks well, so they will not cause any nuisance in this respect.

Mining will take place on a large scale. When the mine pits will be constructed, explosives will be used, the ground will be blown up. I don't know if they will use dynamite, but let's say they use dynamite. A lot of noise will be produced and as a result of that, there will be vibrations in the ground. They will start working, the big trucks also produce a lot of noise.

Considering air quality as well as noise, it is important to realize there are no villages near the mining area. There are no people living here. So the machines do produce dust and noise, in the case of an explosion, there will be noise, but this will in fact not hinder the people living in the area, because of the distance. It will take place at a large distance. The workers, however, will be confronted with it. But in any case, there are several safety measures in place for these people and for the activities, safety measures when working with explosives. Protecting the ears during certain operations, personal protection as it is called. Or they will have to keep a certain distance from the object that produces the noise. We assume the company will take measures to protect its workers. We assume that, due to the distance, the impact for the wider area will be limited.

But still we suggest they carry out a measurement, when the process has started. While the activities are ongoing, they can exactly measure the production of noise of the activities, so they can take action in case too much noise is produced. We advise the company to at least monitor and measure matters concerning noise and air quality, so that they can take action should any problem or inconvenience arise.

That was my part for the moment.

Ms. Maureen Silos
Thank you Bart. People, the report can be found, it is a thick report, it contains hundreds of pages. You can obtain it from the Surgold office at the Suriname street 54, at Zorg & Hoop and also at the NIMOS office. It is a public document, available to everyone. The intention is also to give the people of Merian, of Surgold itself, access to the document. Should you require more information about the study, you can contact at all times Salomon Emanuels, his email address is included, and for all other questions about the report or comments, you can contact of course Wendell Asadang, who is somewhere around here, there is Wendell Asadang. He works for Surgold, you can find his contact details there, at least his telephone number. The report can also be downloaded from the website.

It has been a long sit. It has been a long story, the report is even bigger. We tried to summarize a lot of information in a relatively short period, so that you will have a good insight into the effects of the project on the area, the people, the animals, the environment and so on. Because it has been such a long sit, I suggest we take a two, three minute break so you can stretch your legs and, importantly, in that period take the time to register, the signing up list has arrived. The people that haven't got a hand out yet, can also take a copy, and after the break we want to proceed with the Q&A session. Thank you for your attention and I will see you again shortly.

1h31min40sec

Question & Answer Session

Ms. Maureen Silos
Can you all please take a seat, we will start with the Q&A session. Like we agreed in the beginning and to be able to give everyone the chance to ask questions, we would like to request you to stick to two questions and two remarks in the first round, or one question and one remark, combinations are not really infinitive I believe. Then in the second round, you will surely get the opportunity to make again two remarks or ask questions. We would like to request you to use the mikes, because your comments are important, this is not only a status update meeting, it is also a consultation meeting. So your remarks, questions, proposals are very important to ERM and they will be noted down literally, we need them, recorded on tape. So please, use the mikes, and when you do so, please state your name before making you remark or asking the question. Who can I give the floor? Madam.

I forgot the most important thing, Please wait Madam, I forgot the most important thing. There are two groups of people present, two groups of experts that will answer your questions. Besides Bart de Dijn and Salomon Emanuels of ERM, there are other experts from ERM here, such as Dave Blaha who is sitting there and Alastair Gow Smith. These four people are willing to discuss with you all the questions you have about the study and the results of the ESIA. Besides that Surgold also has a number of resource persons, experts here in the room and they are, of course you had already seen Ryan Kambel, the other person is Esteban Crespo, he is sitting there with the blue blouse, blue shirt, sorry, shirt, it is a shirt, blue shirt. Percy Montoya, Wendell Asadang, we mentioned him before, Cheryl White, she is also sitting there, and Mike Meyer with the green shirt. These people of Surgold are willing to discuss with you all the questions you have about the procedures of the company, the policies of the company and the details about the project. I am so sorry that I forgot to mention the names. I now invite the woman to ask the first question or to make a remark.

Ms. Louise Zuilen
My name is Louise Zuilen. I have a question about the mine pit and about the process. How deep will the pit be? Can I assume it will be like the one at “I am Gold”? How will the rehabilitation take place? Regarding the process, is it exactly the same process like the one at “I am Gold” or are there any changes, and what are those changes?

Ms.Maureen Silos
Thank you. David Blaha of ERM shall answer this question and I will translate.

Mr. David Blaha
The mine pit itself is about 170m on average, there are three pits, they are all about the same depth, one is a little bit less, I think 130m, the other two a 170m.

Ms. Maureen Silos

There are three pits, one has a depth of 130m and the other two have a depth of around 170m.

Mr. David Blaha
I'm not sure about the depths of the pits of the Rosebel mine, so I can't compare whether these are more or less than that.

Ms. Maureen Silos
David does not have any concrete information about the depths of the pits of Rosebel mines, so he can't give information about that nor make any comparisons. Thank you. You had two more questions about rehabilitation and about the process.

Mr. David Blaha
The process is essentially the same as what they have got at Rosebel.

Ms. Maureen Silos
The process is more or less the same as the one at Rosebel. You wanted to say something about rehabilitation too? Rehabilitation.

Mr. David Blaha
The plans are to, at the end of the mine life, to fully restore the sites so there would be revegetation, a lot of that will occur naturally, but there will be some plantings to promote that.

Ms. Maureen Silos
As was also said in the presentation, there is a plan for the rehabilitation of the area. Can you please, Ms Zuilen, use the mike again?

Ms. Louise Zuilen
The pit has a depth of 170 m. How are they going to bridge that?

Ms. Maureen Silos
What do you want them to bridge?

Ms. Louise Zuilen
You will get the same lakes, as with the old mines of Suralco. Will that be the situation here as well?

Ms. Maureen Silos
Did you get the question Dave?

Mr. David Blaha
As I mentioned the site will be restored, the pits will flood, they will fill with water, and the during raining season, they will spill over and feed the streams, like in a very natural cycle, so they will flood and be lakes at the end of closure.

Ms. Maureen Silos
The pits will fill with water, mainly with rain water and in the raining season it will flood. Next person with a question?

Ms. Chiquita Resomardono
Good evening, my name is Chiquita Resomardono, from Conservation International Suriname. I have two questions. The first one is: Bart de Dijn has indicated that it concerns an old mining area, a disturbed area. I would like to know how the environmental baseline was determined. He also mentioned a few environmental issues for which mitigating measures have been developed. I would like to know if prior to choosing these environmental issues a risk analysis has been performed.

Ms. Maureen Silos
Thank you.

Mr. Bart De Dijn
I want to ask you to elaborate a bit on the first question, can you be a bit more specific?

Ms. Chiquita Resomardono
You indicated that it concerned an old mining area, an area that in fact has already been disturbed because of the small scale gold miners. When conducting an ESIA, an environmental baseline study is required to be able to determine a baseline of the pristine environment, to determine the current situation regarding quality of water and soil. I would like to know how you determined this, because in fact it was already a disturbed area. What was your reference?

1h40min

Mr. Bart De Dijn
If I understood the question well, the reference is the current situation. We studied the current situation in the area. So it is a disturbed area, maybe you intent to say that in disturbed areas, how do you say that again, you conduct a more limited environmental assessment than in an undisturbed area? A full environmental assessment was conducted.

Ms. Chiquita Resomardono
It concerns a base line, you have to make a comparison between an undisturbed area and an area that possibly will be disturbed because of gold mining activities. To make the comparison, you cannot, in my opinion, use elements of a disturbed area. You mentioned it concerned an old mining area. What did you use as a reference to make the comparison, to be able to come to the rehabilitation or mitigation?

Mr. Bart De Dijn
Ok, I think I understand it a little bit better now, so you intent to say: what is the reference of “Undisturbed”. If you want to rehabilitate it later, what is the reference for this rehabilitation?

Ms. Chiquita Resomardono
Yes, what will you be looking at again, because that is the ESIA or not?

Mr. Bart De Dijn
You understand of course that an important part of the ESIA is describing the current situation and the current situation includes the present disturbance. If

we study the area, we don't only look at the undisturbed parts, we also study the disturbed parts and look what the situation is. When we gave advice, we didn't only look at the exact points where the mine is planned to be located. We also looked around in the direct surroundings. There are some parts that are less disturbed, for example a less disturbed part of the forest, a less disturbed part of the creek, because indeed you ask yourself, what used to be here, before the gold miners came in this area. But it is rather difficult in an area like this, to find out at this point what the undisturbed situation had been. When you are going to rehabilitate, you will of course use the information you were able to collect about the less disturbed parts of the area, as a kind of reference, but your other reference will undoubtedly have to be the way other parts of Surinam look like, where there has been less disturbance. When you rehabilitate, you will not only use the original data you have collected there, you will also need to use information about what it looks like elsewhere, in a similar situation.

Ms. Chiquita Resomardono
Thank you, I shall send you via email…

Mr. Bart de Dijn
The second question, can you repeat the second question? Mitigating measures. I think I would like to pass this question on to David. It concerned risk analysis or not? Maybe you can explain it David, so he knows exactly what to cover.
Ms. Chiquita Resomardono
There are a number, do you have the question David, or do I have to repeat it?

Mr. David Blaha
I think I understand. The risk assessment that we did, really occurred in two ways. There was an initial one.

Ms. Maureen Silos
The risk assessment was done in two ways.

Mr. David Blaha
The first one really focused on using the baseline information to help us better understand how the mine layout should occur.

Ms. Maureen Silos
The first assessment was done to collect baseline information about what the design of the mine should look like.

Mr. David Blaha
So as Bart mentioned in his presentation there were some streams that were undisturbed by any of the small-scaled mining, where we found some very natural fish populations, so in those areas, this was an area we protected and made sure there weren't any mining activities occurring even in the entire watershed of that stream.

Ms. Maureen Silos

There were parts, not were, there are parts which they discovered that are more or less undisturbed, and in their advice to the company they have asked them to leave it exactly like this.

Mr. David Blaha
The second type of impact or risk assessment that we did was evaluating the project as proposed by Surgold, we evaluated what we saw as the potential impacts, we characterize them as whether they were major moderate or minor and made recommendations to reduce the significance of those impacts.

Ms. Maureen Silos
The second element of the risk analysis is the evaluation of, in fact making a ranking of the effects, ranging from major, to moderate and minor and giving advice on all of these points, on what the company should do. Thank you David. Next question please.

Mr. Marciano Dijksteel.
Good evening my name is Marciano Dijksteel. I have a question regarding erosion and water pollution, because some of the NGOs make efforts to introduce the plant, Vetiver, I don't know if some of you know it. Introduce it also in the interior.

Ms. Maureen Silos
Sorry I didn't quite get what the NGOs would like to introduce.

Mr. Marciano Dijksteel.
Some NGOs make efforts to introduce a plant type, it is called Vetiver, against erosion, land degradation, for water purification. Studies have been done about this, also Peace Corps Surinam stimulates communities to work with it. With respect to the study that the organization has conducted, to what extent is it possible to pick this up? Since the plant is considered to be the solution? My second question is what is the link with Suralco? With the research that has been done for Suralco in the Nassau mountain? When you talk about the streams of creeks, do I have to consider this separately from Suralco? Do I have to consider it as two separate areas, or are we talking about one area that will be dealt with?

Ms. Maureen Silos
I want to ask David to answer the first question and I think that Salomon can answer the second question. Or David as well? Yes.

Mr. David Blaha
For the first one, about the plant that helps with the water pollution, I am aware of some studies that have shown that there are plants that will remove some contaminants from the water. We haven't specifically proposed any here, but if you have additional information we would certainly be interested in looking at that and seeing whether it might be applicable to his project.

Ms. Maureen Silos
David is aware of plants that play this role in the environment, for water purification and so forth. They haven't explicitly advised on this in the report. He asks that when you have specific information, he will be very interested to hear from you so it can potentially be included in the report.

Mr. David Blaha
And then the second question relating to the Suralco Nassau Project. They are really two very different projects, I think about 40 kilometers apart, so there are pretty good distance, and they are very different in terms of the habitat, so you have Nassau being up on this mountain with a plateau and the Surgold project being down in sort of the low dry savanna forest.

Ms. Maureen Silos
The Nassau project of Suralco and the Surgold gold project are two completely different projects. Geographically speaking, there are also quite far apart, about 40 kilometers. The habitat is also very different. Nassau is situated on a plateau in a very different area and Surgold is in the much lower, what did you say David, in a dry, savannah like situation? Thank you. Next question please.

Mr. Johannes Tojo
My name is Johannes Tojo, I am chairperson of the regional organization of that area, the Pamaka area. First of all, I want to thank Mr. Emanuels for his clear presentation and then I am talking about the social effects. He said it very well. Low education levels and the circumstances of the local people, especially the chasing away of the small scale gold miners. This has been a big blow, not only for the small scale miners, but for the whole community.

1h50min
You can imagine, the men were earning money, they were building things, buying local material from the people. If you chase these people away, then everything breaks down. So it has not only been a big blow to the miners, but for the whole Pamaka community. It has a chain reaction in our community. I welcome the advice given to the company to carry a socially responsible policy and also the fact that they have to find new ways to communicate with us. Our organization is out there, we have offered ourselves for the social infrastructure. With this plan, they will be listened to. Thank you.

Ms. Maureen Silos
Thank you. It will be taken into account. Next question.

Ms. Tanja Lieuw
Good evening, my name is Tanja Lieuw of the small grants program UNDP. For my own understanding, a lot of recommendations have been made on several issues such as environment, health. If I understood it correctly, there will be a lot of management plans, around 20 maybe, I don't know. What inspection and monitoring measures will be put in place? Is it a prerequisite to have a management plan in place? And will Surinam, the government or whoever, study it first to see if it is OK before proceeding with the project? That is what I was wondering.

Ms. Maureen Silos
Thank you.

Mr. David Blaha
Yes, Tanja,

There are quite a few, I don't know the exact number of management plans that are proposed, but those management plans will capture all these mitigation measures that were identified in the presentation and that are in the ESIA and those will all be presented to NIMOS for their review and concurrence before the project constructional begin.

Ms. Tanja Lieuw
But is that only with NIMOS, because we are talking about social, economic, Oh sorry it is English, is that OK.

Mr. David Blaha
It is probably better to do it in Dutch.

Ms. Tanja Lieuw
You indeed mention NIMOS as the Surinamese partner, is that the only partner? Because I know that NIMOS will look mainly at the environmental side. There are also many other issues such as social and economic, which also have to be looked at. How will this work out?

Mr. David Blaha
The NIMOS guidelines include both environmental and social. So they will be looking at both, but certainly there is an intent to partner with others and I don't know whether we want anyone from Surgold to talk about other partners on the social side?

Ms. Maureen Silos
Let me briefly translate what David has said. In the report the management plans are mentioned concerning different fields. The management plans will be given to NIMOS and they will look at both the environmental and social management plans and will give their evaluation of it. Salomon wants to clarify a few things.

Mr. Salomon Emanuels
I want to add something. This is a good question. This question was also put to us by the people of Langatabiki. We were all surprised by this question. They were talking about control. Who makes sure that the things happen as they were presented? We answered that we will include this in the report, that a structure or mechanism has to be put in place so that the monitoring of things will go well. The people of the Pamaka area in Langatabiki have explicitly said that they themselves are going to install a monitoring committee consisting of different people to monitor how the plans will be implemented. We will also include this in the report that it will be taken into account, so that these people will get the support needed to be able to do that in a fair way.

Ms. Tanja Lieuw
On one of the slides, I saw written low education level and so on. Actually this is the case everywhere in the interior. Has a comparison been made with another area in the interior, whether the Upper Surinam region, or another area? Indeed you mentioned low education levels, low levels of employment, and so on. Are there certain characteristics in this area that are different from other areas, have you also looked at that?

Mr. Salomon Emanuels
We did not make a comparison with another area. We only looked at the situation of the Pamaka area and what could possibly change there and what could be done about that. The Pamaka area and other areas where Maroons live, the Pamaka area consists exclusively of Maroons, we are talking about ten villages, and the situation is almost comparable to that of other Maroon villages, with one exception. Because in that area there is gold mining and big companies are present. You have to understand that currently the Pamaka area, and the villages and communities, they are so to speak, how to say it, they are surrounded by big boys and girls who try to benefit from it. The Pamaka people, because of their low education levels, are not able, and I don't mean to be unfriendly, are not able to quickly react and produce thoughts, to quickly put them on the table and go along with that process. We only looked at what is happening over here, and how we could make sure that in the case of any damage, how we could minimalize this as much as possible. We did not make a comparison with other areas.

Mr. Alastair Gow Smith
Hi, sorry I also can't speak Dutch so I have to ask Maureen to translate for me. Just to add on to what Salomon said, my name is Alastair and have been working with ERM and Salomon to develop the social component of the impact assessment.

Ms. Maureen Silos
This is Ali as we call him and he worked together with Salomon on the social part of the ESIA.

Mr. Alastair Gow Smith
As Bart and Salomon explained, the starting point of the ESIA is to understand the conditions before the project occurs and that involved understanding the socio economic, the social, the health characteristics within the Pamaka area.

Ms. Maureen Silos
Just as Salomon explained, this research was done to identify the initial conditions of the area regarding issues such as health, social and economic circumstances. That is what they call the baseline.

Mr. Alastair Gow Smith
You can't project how impacts might be in the future without understanding the situation at the moment.

Maureen Silos
You cannot predict future effects, if you don't know what the starting point is.

Mr. Alastair Gow Smith
So in order to understand the situation in the Pamaka area within our ESIA reports we make comparisons between Surinam in general and other areas within the interior to understand and contextualize how the Pamaka area fits into the wider socio economic picture within Surinam. So while we didn't conduct primary research everywhere in Surinam we looked at secondary research and made comparisons.

2h00min

Ms. Maureen Silos
We did secondary research to get a better picture of the situation in the Pamaka area and to be able to make comparisons. We looked at the circumstances in Surinam in general and in other areas to be able to contextualize the situation of the Pamaka people and pronounce upon this for the report.

Ms. Maureen Silos
Ms Lieuw, you were only allowed two ask two questions so we will give someone else the floor.
Madam, sorry, this man was before you, after him it's your turn.

Mr. Winston Roseval
A few times the low education levels were mentioned in the presentations of today. Although I don't agree with this term for philosophical reasons, I want to focus on the issue of illiteracy in that area. In the presentation it was made clear that in the development of this project, the research study, reading matter was translated to the local language. I assume the Pamaka language in this case. That was said. I am wondering about something. With illiteracy, we mainly look at the level of Dutch that is being understood in that area. When this is already a problem, when it is already a problem because people can't read Dutch, does this mean they will read better Pamaka? That is the first point. Secondly, I also want to know how this report that contains hundreds of pages, will be brought back to the area. I specifically want to know which medium can be used best.

Ms. Maureen Silos
Thank you. Ali will answer.

Mr. Alastair Gow Smith
I totally agree, it is a very valid point, once you have recognized that low literacy in the area is a problem, we can't rely just on the paper documents and rely on people to read it and understand it.

Ms. Maureen Silos
Your point is absolutely valid. ERM is aware of the fact that in the case of low literacy in the area, you cannot use written documents to communicate.

Mr. Alastair Gow Smith
So to combat the possibilities that people would fail to understand the reports, we had to come up with some other measures to make sure we could pass the message on. There were wide ranged these, but I'll give you a few examples.

Ms. Maureen Silos
To make sure that the people in the area would understand the report, a few measures were taken.

Mr. Alastair Gow Smith
The first and most obvious one was Mr. Emanuels and myself and a few other colleagues have visited each of the ten villages along the river, at least once, and sat with different groups in the village to listen to their concerns,

explain to them the changes that might happen and to hear their feedback about what expectations and concerns that might cause.

Ms. Maureen Silos
Salomon and I personally went to each of the villages and extensively talked with the people, explaining to them what would happen and what the consequences would be. We also listened to their reaction, their concerns, hope and expectations.
Mr. Alastair Gow Smith
And another example of a way to explain the results of this study without relying on the report is the meetings we are having right now. Two days ago we were in Langatabiki and we invited everyone who could come from the Pamaka area. We helped provide transport, we had maybe 100 people there to come and listen, not just to read the slides but to listen to Mr. Emanuels speaking the local language and explaining the project and what the impacts might be.

Ms. Maureen Silos
The second example of how we try to communicate the project and the results of the study are these kinds of meetings. Two days, three days ago we had a meeting in Langa Tabiki. People were invited beforehand, transportation was available for all the villages, for people to come, around 100 people came, they did not look at slides only, but Salomon Emanuels has extensively and clearly explained in Pamakan what the results of the study are.

Mr. Alastair Gow Smith
And the final example I'll give is some activities that Surgold have been doing on their own, they have tried to put the results of the study in activities, they have been doing on their own into picture diagrams and taking those into the villages and having smaller, informal conversations with different people in the area to help explain in further detail about the project.

Ms. Maureen Silos
Thirdly, Surgold itself is active in the area with their department and their people, they use pictograms to thoroughly explain people what the project entails and what they can expect. They carefully listen to their wishes and they try to do something with that. Thank you Ali.

Ms. Joan Telg
Good evening, my name is Joan Telg of Staatsolie. I have two questions. It was mentioned that one of the results of the study, was the possible occurrence of changes in the culture. I did not catch how you will deal with this, especially in relation to the preservation of Surinamese culture. How will you deal with this? The second question: in this ESIA I saw that a third element was included, namely health. I didn't catch it, or maybe it was not clear enough to me, what special health measures have been taken? The information that was collected in the field, the health situation of the people, the health centers, what has been done with all of this?

Ms. Maureen Silos
Thank you. Salomon will answer the question.

Mr. Salomon Emanuels

What will be done about effects on the cultural heritage? Just for you information. for years I have been coming to the Pamaka area, also apart from my work activities. There is one thing that I learned from the start from the people. Captains have once told me, it has been said to me in Pamakan, I can't totally recall it, otherwise I would say it to you. I asked what do you mean and the captain said "it is enough". He said it in a certain way "it is enough". From now on we will write down our history. I knew enough. My background is in anthropology and if someone says a thing like this, then I'm happy. After that I talked a lot with the captains and during this research it was brought up again. Can we record our sacred places and our ancestral history? Can you help us with that? In the report we included the support of the people to the preserve their cultural heritage. In dialogue with the people, what do they want to preserve and what not? How do they want to do it? Support from the company in whatever way. That is the advice we included. We don't know how it will be implemented. You have to understand, we give advice, we cannot elaborate on things in detail. I personally can have my own opinion on how I would go about it, but that is not the point. The point is that something has to be done and the implementation of things has to take place on the basis of participation of the people. But it has been included in the report. Maybe we didn't explain it thoroughly, but it has been included. Regarding the health issue, I want to ask Ali to go into this. It has also been included.

2h10min

Mr. Alastair Gow Smith
Was your question what the health impacts were that we identified or what the health studies that we undertook were?

Ms. Maureen Silos
Was your question what the effects will be on the health of the people, or was your question what is the health infrastructure in the area?

Ms. Joan Telg
I thought I saw on one of the slides, matters concerning the health infrastructure, but if in such a study health has been included as one of the important issues, then I'm missing an important part of the interpretation of that. So actually I want to know what has happened to this issue and how will it be dealt with?

Mr. Alastair Gow Smith
Thank you for clarifying, I didn't understand. I think the summary, the summary is that the health impacts that we identified were not predicted to be of a very large scale. We looked at health in two aspects, health as in your body, the absence of illness, but also health as in your wellbeing, mentally.

Ms. Maureen Silos
We found that the health effects of the project will not be manifest on a large scale. We defined health in two ways. First, the physical aspect and on the other hand the mental aspect, the wellbeing.

Mr. Alastair Gow Smith
On the physical aspect we talked already, my colleague Salomon talked about the potential for health impacts from release from chemicals, I think he has

already discussed how we identified that impact and how we plan to mitigate that impact. On the wellbeing, the sense of health of being a healthy person, we identified that within each of the other impacts. Mr. Emanuels talked about if your income is decreased how that affects your wellbeing, if your culture changes how that affects your wellbeing, and we attempted to mitigate that within the other impacts.

Ms. Maureen Silos
Regarding the physical aspect of health, they looked at, already discussed here, the effect of chemicals on the body and what measures the company should take to prevent it, or to mitigate it. Regarding wellbeing, the emotional and mental side of it, they look at the effects of changes in income on wellbeing and culture. Some mitigation effects have also been proposed for that. Next question please. No more questions or comments? Alright. I hope all was clear and that you were able to get information tonight, at least in a comprised way, but I repeat the report is available for everyone to read, both on the internet as in hard copy at different locations, at the office of Surgold, at NIMOS for sure, and also in the Merian camp.

Because there are no more questions and comments, I will now officially close the meeting, but we don't have to leave, there are some food and drinks, you can stay, the people of Surgold and ERM are here to further talk with you in an informal setting about the results of the report. I want to thank you very much, especially the people that love football and came here at 18h, in large numbers. I don't know who played and who won, but on behalf of Surgold and ERM, thank you for coming, also for you active participation, the questions you asked and the comments you made. I can assure you that when you read the final report, you will see you were listened to. Thank you. Salomon wants to say something as well.

Mr. Salomon Emanuels
Regarding the report. I just heard my colleague stating that he tried to find the report yesterday or a few days ago on the internet, but he failed. I just checked, the report is very big, so it takes time to compress it and publish it on the internet. So it could be that you try to find the report on the internet and it is not there. But if all goes well, it should be on the internet today or tomorrow. The past few days they have been working on this, technically. If you don't find it yet, don't think they led us astray, it will be there.

Ms. Maureen Silos
Thank you, again thank you very much and I hope you will stay to enjoy the drinks and snacks and further talk with the people of Surgold and ERM about the report. Thank you very much.

PLACEHOLDER – MEETING MINUTES

Box 2.1 Paramaribo consultation and disclosure meeting photo log

A record was kept of all attendees and this is listed in *Box 2.7* below

Box 2.2 ***Paramaribo consultation and disclosure meeting attendee list***

Place: PARBO
Date: JUNE 14, 2012
Time: 18:00 – 21:00

Naam	Dorp/ Adres	Role/Organisatie	Telefon
Lakhisaran S.		SBB	0645624 483131
[illegible] A		SBB	8606[illegible]
Jefferson Finch		Eurasia Group	~~NA~~
[illegible]		Procurement [illegible]	6850[illegible]
Eric v. Ravenswaay	SEMC	Director	[illegible]
Gonsalves Glenda			
[illegible] A.			
[illegible] N			8729580
Rambhadjan M.	Sur.gold.	HR.	[illegible]
[illegible] S			8727761
Wong-A-[illegible]		Suregold	
Polak		Kab Pres/BHU	850-9193
Pinas L	Smalkaldsen	Suralco	8179195
Debidin A.	Telesur	[illegible]	8830922
Van Daal B	[illegible]	UHT	8601618
Cairo M.	Umai	UHT	7198409
Finisie W			[illegible]596948
[illegible] M	[illegible]	[illegible]	[illegible]
C [illegible]	Parbo	[illegible]	8663472
[illegible]	Combe markt		8369772
L. [illegible]	Parbo		8657734

Place: PARBO

Date: JUNE 14, 2012

Time: 18:00 – 21:00

Naam	Dorp/ Adres	Role/Organisatie	Telefon
Vroom Xaviera	Paramaribo		
Radhesh Gopadhiadsih	"	Surgold.	08505033
J. Asraf	"	Telesur	08140110
J. Tjang-A-Sjin	PAR IBV	N.V. ATHENA	08585502
M. Mous	Parbo	VSB	475286/287
HAUHES J	PARBO	HAUHESNV	8109552
F. Hulsman	stg. Tana.	Educatie	425489
M. Grauenberch	Ckl Motors/Parbo		402833
M.A. Ashraf.	PARBo	R.G. m.n.v.	865 7034
E. Akrum	LETTL. SEMENEWEG 123A	SURTEL NV	492110
TH. RADJIMAN	V. SEMENELWEG 121A	SURTEL NV	492110
M. Panboe	Java / Bou Com.	UHT. vrouwenorga	08849694
R. Kiek	Morgolapoe Bou Com		08530518
Misidon S.	Marpane Bou Com	Umang Holi	8970806
Nandaal	Peninika	Aman Holi	8203888
Tjon Kie Sim, P		CBrS	08585387
Kwari R.			08825357
Zuilen L.		AdvS- Milieuwetenschappen	08669091
R. Tooy	Brokopondo	Surgold	8521936
Tojo	Paramaka	Mayedy (Toerist.)	8731610
E. LANTE	Parbo Sunny Point	LWI ITCT	8566836

Place: PARBO

Date: JUNE 14, 2012

Time: 18:00 – 21:00

Naam	Dorp/ Adres	Role/Organisatie	Telefon
[illegible]	[illegible]		8582621
Tojo Jc	Atemisa	Anamakond.	005-40120.
Tjappa M.	Kiekie mofo	S/ Ojentoeba	08642225
Sabajo, P.	Magnoliaweg 10		8813942
Rachel Mohan	Pob 376	Surgold	8172797
Winston Roseval	SEMC Kronkang	SEMC	8809595
Joan Telgt	HSE afd.	Staatsolie	8811531
Rowena Oliviera	Parbo Zuid	Surgol	07144170
G. Spakslede	parbo Zuid	Integra Marine	897 3149
S. Dahdew	Mariesho / Parbo	Prive / Geologist Earthmover	8709817
R. Ramsaran	Paramaribo	Surgold	8643815
S. Elmont	Havenlaan Zuid	Suriname freightways	850516
S. Badloe	v. Gemelandsweg 102	Brothers gold	8782886
R. Hasnoe	,,	,,	,,
G. Ramdjan	Bonnimastraat 16		08819272
T. Gewo	Heerenstr 15-17	SGP LUNDP	420030
M. Djanam	Munnalleweg 190	HAUKESNV	8978114
J. Martodihardjo	Kwattaweg # 28	Student Chemisch Analist	0721710
R. Wongsowikromo	Saltweg 77	Conf. van Sur	8166477
P. Lee Van Oo	Parbo	CAL Motors	8687222
Djojopawiro M.	Amrosistr. 28		8637056
Meritokarijo E.	NGO Cottica dra. 21	Rosgold	8862665

Place: PARBO

Date: JUNE 14, 2012

Time: 18:00 - 21:00

Naam	Dorp/ Adres	Role/Organisatie	Telefon
M. Ragunath	Par'bo	CKC Motors	402833
J. Lapar	PAR'bo	SAO	456561
A. Mohan	Par'bo	Qualogy	08794450
Daniela Herkul	Par'bo	IAMGOLD	08545522
R. Artist	Par'bo		0860/426)
R. Ashruf	Paramaribo	—	852310
R. TJON	PAR'bo	Cons Int'l Sur	[illegible]
C. Resomardono	Par'bo	Conservation Intern. Sur.	
Corinale G.M	Par'bo	IAMGOLD	7100013
Beel Huldman	Par'bo	TANA	425490
QUAN TJON-AKON	PAR'bo	NIMOS	
[illegible]	Par'bo	[illegible]	8503484
Maureen			

7 OTHER CONSULTATION AND DISCLOSURE MEETINGS HELD

In addition to the public disclosure meetings held Surgold and ERM conducted an internal presentation to Surgold staff based at the Merian camp. This meeting was held in recognition that as part of the community, it is important that Surgold employees understand the ESIA process and how the Surgold project will impact the surrounding community and environment.

The presentation component of the meeting was the same as in Langa Tabiki and thus has not been repeated here.

PLACEHOLDER – MEETING MINUTES

Box 2.1 Merian camp disclosure meeting photo log

Appendix 14 - H

Notifications of Public Meetings

1 PRIOR NOTIFICATIONS OF PUBLIC MEETINGS

Prior to both the scoping and the consultation and disclosure public meetings public notifications were made in public places and via the media informing stakeholders of the times, dates and locations. All notifications were made in Dutch, Sranan Tongo or other local languages.

Box 1.1 and Box 1.2 list the text that was used to announce the scoping disclosure public meetings, respectively, through the media.

Box 1.1 Public Announcement Text

Surgold invites all interested parties to attend public meetings to learn about the proposed Merian Gold Mining Project.

Surgold has commissioned Environmental Resources Management (ERM), an international environmental consultancy, to complete an independent study of the environmental, social and health impacts of the project. The Environmental, Social and Health Impact Assessment (ESHIA), carried out by ERM, will identify, reduce or avoid negative impacts and promote positive impacts. These meetings are a key element of the on-going ESHIA and are being held to inform the public about the project and to invite them to ask questions and express their views.

The meetings will involve a presentation providing information about the project and the ESHIA process, and will discuss the avenues by which the public may seek further details or submit questions. Maps, informational brochures and the proposed methodology for the assessment will be available for review. Representatives of both Surgold and ERM will be present at the events.

We want to hear from you! Please join us at one of the following meetings:

Paramaribo | Wednesday 17 August 2011
Hotel Krasnapolsky Conference Ballroom | 6.00PM – 9.00PM

Moengo | Thursday 18 August 2011
Recreatie zaal | 3.00PM – 6.00PM

Langa Tabiki | Friday 19 August 2011
Krutu Osu | 10.00AM – 1.00 PM

Learn about the Merian Project and let the Merian Project learn from you!

If you would like to attend one of these meetings but require transport, please contact Clausine Tjappa at (08831090).

For further details regarding the public meetings and the Project, please contact:
Wendell Asadang
Community Relation Coordinator
Email: wendel.asadang@newmont.com
Tel: 8638655

Box 1.2 ***Disclosure meeting announcement text***

Public Notice: Surgold Merian Gold Project – Public Meetings

Surgold invites all interested parties to attend public consultation meetings to learn about the Merian Gold Mining Project.

Surgold has commissioned Environmental Resources Management (ERM), an international environmental consultancy, to complete an independent study of the environmental, social and health impacts of the project. The Environmental and Social Impact Assessment (ESIA), carried out by ERM, has identified the potential impacts of the project and defined mitigation measures to address them. These meetings are a key element for the finalisation of the ESIA and are being held to inform the public about the project and its potential impacts, and to invite them to ask questions and express their views.

The meetings will involve a presentation providing information about the project, the ESIA process and its findings, and will discuss the avenues by which the public may seek further details or submit questions and feedback. Maps, informational brochures and the methodology undertaken for the assessment will be available for review, as well as a summary of the key impacts identified in the ESIA. Representatives of both Surgold and ERM will be present at the events.

We want to hear from you! Please join us at one of the following meetings:

Langa Tabiki | Monday 11 June 2012
Krutu Osu | 10.00AM – 1.00 PM

Moengo | Wednesday 13 June 2012
Recreatie zaal | 5.00PM – 8.00PM

Paramaribo | Thursday 14 June 2012
Hotel Krasnapolsky Conference Ballroom | 6.00PM – 9.00PM

Learn about the Merian Project and let the Merian Project learn from you!

If you would like to attend one of these meetings but require transport, please contact Clausine Tjappa at (*8831090*).

For further details regarding the public meetings and the Project, please contact:
Wendell Asadang
Social Responsibility Chief
Email: wendel.asadang@newmont.com
Tel: *8638655*

Table 1.1 lists the dates that these announcements were made in the local media.

Table 1.1 ***Public notifications***

Radio Station	Date announced		Newspaper	Date published	
	Scoping (2011)	**Disclosure (2012)**		**Scoping (2011)**	**Disclosure (2012)**
Radio 10	03-Aug, 10-Aug	8 announcement until 14 June 12	De ware Tijd	04-Aug	21-May, 28-May, 04-June, 06-June
Radio Apintie	04-Aug, 10-Aug,	19\21\24 \ 28\31 May 12 - 4\7 June 12	Times of Surinam	04-Aug	23-May, 26-May, 30-May, 02-June, 06-June, 09-June
Skyradio	04-Aug, 10-Aug	18\22\25 \29 May 12 - 1\ 5\ 8 June 12	Dagblad	04-Aug	24-May, 31-May, 7-June, 14-June
Radio Koyeba	04-Aug, 10-Aug	21\23\26 \28\30\ May 12 - 2\4\6\9\ 11\12\13 \14 June 12	De ware Tijd	04-Aug	
BOB Moengo		23\26\ 30 May 12 - 2\6\9\11 \12\13 June12	GFCNieuws (online)	n/a	17-May
SRS		23\26\30 May12 - 2\6\9 June 12			

In addition to these public announcements written invitations were sent to key stakeholders and banners (see *Box 1.3*) and posters (see *Box* 1.4) were hung in relevant locations.

Box 1.3 Public Meeting Banners


SURGOLD
NEWMONT
The Gold Company
Algemene Uitnodiging voor een Openbare Vergadering
i.v.m. de Milieu-, Sociale- en Gezondheidseffecten Studie
(zgn. ESHIA) van het MERIAN GOLD Project
Langa Tabiki | Maandag 11 Juni 2012
Lokatie: Krutu Oso | Tijd: 10.00 – 13.00
05/29/2012 15:28


SURGOLD
NEWMONT
The Gold Company
Algemene Uitnodiging voor een Openbare Vergadering
i.v.m. de Milieu-, Sociale- en Gezondheidseffecten Studie
(zgn. ESHIA) van het MERIAN GOLD Project
Langa Tabiki | Maandag 11 Juni 2012
Lokatie: Krutu Oso | Tijd: 10.00 – 13.00
05/29/2012 14:57

Box 1.4 Public Meeting Posters

SURGOLD

Public Notice

Surgold Merian Gold Project
Public Meetings

NEWMONT
The Gold Company

Surgold invites all interested parties to attend public meetings to learn about the proposed Merian Gold Mining Project and associated Environmental, Social and Health Impact Assessment (ESHIA).

These public meetings are being held to inform the public about the project and to invite them to ask questions and express their views. The meetings will involve a presentation providing information about the project and the ESHIA process, and will discuss the avenues by which the public may seek further details or submit questions. Maps, informational brochures and the proposed methodology for the assessment will be available for review.

These meetings are a key element of the ongoing ESHIA which aims to identify, reduce or avoid negative impacts and promote positive impacts for the Merian Gold Project and affected communities.

Learn about the Merian Project and let the Merian Project learn from you!

If you would like to attend one of these meetings but require transport, please contact Clausine Tjappa (*088311090*).

For further details regarding the public meetings and the Project, please contact:

Wendell Asadang
Community Relation Coordinator
E: wendel.asadang@newmont.com
T: *8639655*

We want to hear from you!

Please join us at one of the following meetings:

Paramaribo | Wednesday 17 August 2011
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6.00PM – 9.00PM

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Langa Tabiki | Friday 19 August 2011
Krutu Osu | 10.00AM – 1.00 PM

ERM consulting services worldwide **www.erm.com**

ERM

Public Notice

Surgold Merian Gold Project
Public Meetings

Surgold invites all interested parties to attend public meetings to learn about the Merian Gold Mining Project and the associated Environmental and Social Impact Assessment (ESIA).

These public meetings are being held to inform the public about the project and its potential impacts, and to invite them to ask questions and express their views. The meetings will involve a presentation providing information about the project, the ESIA process and its findings, and will discuss the ways the public may seek further details, submit questions and feedback. Maps, informational brochures and details of the methodology undertaken for the assessment will be available for review, as well as a summary of the key impacts identified in the ESIA.

These meetings are a key element for the finalisation of the ESIA which aims to identify, reduce or avoid negative impacts and promote positive impacts for the Merian Gold Project and affected communities.

Learn about the Merian Project and let the Merian Project learn from you!

If you would like to attend one of these meetings but require transport, please contact Clausine Tjappa (*8831090*).

For further details regarding the public meetings and the Project, please contact:

Wendell Asadang
Social Responsibility Chief
Email: wendel.asadang@newmont.com
Mobile: *8638655*

We want to hear from you!

Please join us at one of the following meetings:

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Paramaribo | Thursday 14 June 2012
Hotel Krasnapolsky Conference Ballroom |
6.00PM – 9.00PM

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Appendix 14-I

Public Meeting Materials

1 *PUBLIC MEETING MATERIALS*

In order to disseminate information regarding the ESIA and the Project, flyers and presentations were prepared for stakeholders for both the scoping and the disclosure public meeting. All flyers and presentations were available in Dutch and English and the presentation slides were displayed in Dutch.

1.1 *PROJECT FLYERS*

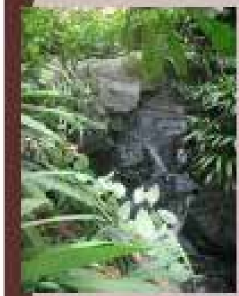
Box 1.3 shows the flyer available to stakeholders during the scoping public meeting, and Box 1.2 shows the flyer available during the consultation and disclosure public meeting.

Box 1.1 *Scoping Flyer*

Merian Gold Project

August 2011

SURGOLD



This document provides information to help the public to understand the planned Merian Gold Project and the related impact assessment process.

Project Background

What is the Project?

Surgold is currently conducting a series of studies to examine the feasibility of the development of a gold mine in the area south of Moengo and north of the Nassau Mountains. The Project would involve the development of a gold mine and associated infrastructure in the Merian area and some upgrade of a transport route to Nieuwe Haven.

WHO ARE SURGOLD?

Suriname Gold Company, LLC (Surgold) is a limited liability company held by Newmont Overseas Exploration Limited (Newmont) and Alcoa World Alumina LLC. Newmont is the manager of Surgold, and Surgold hold the Merian Right of Exploration where the Project is located.

Surgold began exploration at Merian in 2004 and in 2007 applied for a right of exploration. They are about to start negotiations with the State to complete a Mineral Agreement that will set the conditions for the granting of exploitation rights, amongst other aspects.

Surgold anticipate that, if approved, the Project would involve three open pit mines, a gold processing plant and other infrastructure such as waste rock storage areas, a tailings dam area to store liquid waste, and worker accommodation.

In accordance with the directives of the National Institute of Environment and Development of Suriname (NIMOS) Surgold is required to prepare an Environmental and Social Impact Assessment (ESIA) for which Surgold has commissioned Environmental Resources Management (ERM), an independent international environmental consultancy. This study will seek to identify, reduce or avoid negative impacts and promote positive impacts to the local communities and environment.

PROJECT ACTIVITIES

Expected Activities for the Project will include:

- Drilling and exploration activities
- Improvements to the transport route from the Merian site to Moengo
- Construction activities in the Merian area
- Mining activities once the project is approved
- Transport of Surgold staff and goods to and from Merian Camp, Paramaribo / Nieuwe Haven.

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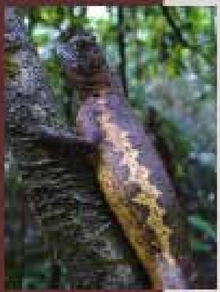
Page 2

Environmental and Social Impact Assessment Process



What is the ESIA Process?

An Environmental, Social and Health Impact Assessment, or an ESIA, is a process to determine what effects a Project will have on people and the environment. The results of an ESIA are used to document potential impacts of a Project and the required mitigations. The impact assessment process will culminate in the development of a written ESIAESIA report, which is a public document available to interested groups.

What are the requirements for an ESIA?

In performing an ESIA, ERM will follow the guidelines of the National Institute of Environment and Development (NIMOS), international best practice and the Surgold business practices.

The main components of an ESIA are:

- characterize the existing environment;
- assess potential impacts and required mitigations; and
- engage potentially impacted groups.

To help ERM to understand the social and environmental conditions experts will visit the area and record their findings. ERM will use these findings to make their report.

ESIA SCHEDULE

STEP 1 - Feasibility Study (Exploration Activities) Already Complete

STEP 2 - Scoping Phase March 2010 to August 2011 (including public meetings)

STEP 3 - Impact Assessment Phase September 2011 to approximately May 2012 (studies and designing mitigation plan)

STEP 4 - Disclosure Phase approximately May 2012 to July 2012 (authorities and communities revision before ESIA approval)

NIMOS ESIA PROCESS

STEP 1 - Screening Phase

To establish if an ESIA is required. This has already been undertaken.

STEP 2 - Scoping Phase

To gain a preliminary understanding of the project and help to focus the ESIA

STEP 3 - Impact Assessment Phase

Conducting studies on the current environmental and social conditions in the area and the potential effects of the project.

STEP 4 Disclosure Phase

Holding public meetings to discuss the findings with communities and interested groups.

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Merian Project

Involvement of Stakeholders

What is a Stakeholder?

Any person who is affected by a project or who is interested in the project is known as a 'stakeholder'. Consultation with stakeholders is a crucial component of the ESIA process.

STAKEHOLDER COMMENTS ON THE TERMS OF REFERENCE

ERM have developed a Terms of Reference for the ESIA which describes the structure and detail of the planned studies in more detail. If you would like to see this document copies are available from:

- Surgold office on Suriname Street (Paramaribo)
- NIMOS Office (Paramaribo)
- Surgold camp (Merian)

CONSULTATION

Participatory — communication to involve stakeholders in the consultation process.

Flexible— the methods and techniques that will be used will be flexible and adapted to the changes and concern

Culturally sensitive— it is important to have a good understanding of the historical background of the area and the cultural and socio-cultural dynamics within the stakeholder groups.

Transparent— the process of consultation will be open and transparent. All comments and feedback will be recorded and attempts will be made to address them.

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Villages along the Marowijne River

SURGOLD

How can I get involved?

Where do I get more information?

Should you have any comments or concerns regarding the Project or any questions regarding the ESIA process, please contact the representative of Surgold below:

How can I get involved?

The public consultation will take place throughout the ESIA process. ERM will consult the communities and other stakeholders in many ways during the ESIA process. If you would like to be involved please contact the Surgold representative below:

We want to hear from you!

Wendell Asadang
Community Relation Coordinator
Email: wendel.asadang@newmont.com
Tel: (0) 5978638655 / 5977172880

Salomon Emanuels
ESIA representative for ERM
E-mail: salomonemanuels@yahoo.com / merian.esia@erm.com
Tel: +597-8553324

PROPOSED STAKEHOLDER CONSULTATION METHODS

Public consultation will take place throughout the ESIA process including:

- Telephone interviews
- Public Meetings
- Small group meetings
- Individual interviews
- Household surveys
- Media announcements
- Release of documents
- Public comments

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Box 1.2 Consultation and Disclosure flyer

Merian Gold Project

June 2012

SURGOLD

This document provides information to help the public understand the Merian Gold Project and related impact assessment process.

PROJECT ACTIVITIES

Expected Activities for the Project will include:

- Drilling and exploration activities
- Improvements to the transport route from the Merian site to Moengo
- Construction activities in the Merian area
- Mining activities once the project is approved
- Transport of Surgold staff and goods to and from Merian Camp, Paramaribo / Nieuwe Haven.
- Communication and consultation with government, local community and interested parties

Project Background

What is the Project?

Surgold has been exploring the feasibility of developing a gold mine in the Merian concession located south of Moengo and north of the Nassau Mountains. The Project would involve the development of a gold mine and associated infrastructure.

In accordance with the directives of the National Institute of Environment and Development of Suriname (NIMOS) Surgold is required to prepare an Environmental and Social Impact Assessment (ESIA) for which Surgold has commissioned Environmental Resources Management (ERM), an independent international environmental consultancy. This study has identified the potential impacts of the project and defined mitigation measures to address them. These measures aim to maximize positive impacts from the project, while reducing or avoiding potential negative impacts.

WHO IS SURGOLD?

Suriname Gold Company, LLC (Surgold) is a limited liability company held by Newmont Overseas Exploration Limited (Newmont) and Alcoa World Alumina LLC. Newmont is the manager of Surgold, and Surgold holds the Merian Right of Exploration where the Project is located.

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ALCOA

NEWMONT

ERM

Environmental and Social Impact Assessment Process

What is the ESIA Process?

An Environmental, Social and Heath Impact Assessment (ESIA) is a process to determine what effects a Project will have on people and the environment. The results of an ESIA are used to document potential impacts of a Project and the required mitigation measures. The final ESIA report is a public document available to interested groups.

What has been done to carry out the ESIA?

To help ERM understand the social and environmental conditions of the Merian Surgold Project area, experts visited the area and recorded their findings. These findings were used to assess the potential positive and negative impacts of the Project on the environment and local community. Stakeholder consultations were undertaken throughout the process to engage any person who may be impacted by the Project.

CONSULTATION METHODS

Public consultation took place throughout the ESIA process including:

- Public Meetings
- Small group meetings
- Individual interviews
- Household surveys
- Media announcements
- Release of documents
- Public comments

NIMOS ESIA PROCESS

STEP 1 - Screening Phase (June—July 2011)
To establish if an ESIA is required.

STEP 2 - Scoping Phase (July—August 2011)
To gain a preliminary understanding of the project and help to focus the ESIA .

STEP 3 - Impact Assessment Phase (Sept 2011—May 2012)
Conducting studies on the current environmental and social conditions in the area and predicting the potential effects of the project.

STEP 4 Disclosure Phase (May—July 2012)
Holding public meetings to discuss the ESIA findings with communities and interested groups.

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Key impacts and mitigation measures

How mitigation measures are designed?

Mitigation measures are aimed at reducing or avoiding negative impacts and maximizing the positive impacts from the project. They are based on field studies and stakeholder consultations to ensure all considerations have been taken into account and they are fully adapted to the specific conditions of the Merian Surgold Project area. Some of the key Merian project impacts and mitigation measures are listed below.

Impact on environment

- potential disturbance, loss and damage to animals and plants
- Water quality deterioration
- Stream flow changes
- Increase in dust and emissions
- Increase in noise and vibration due to movement of heavy vehicles and equipment

→

- Wildlife management plan
- Revegetate disturbed areas with native species
- Erosion and sedimentation control plans
- Construct sediment ponds and water treatment plant
- Water and water resources management plan
- Avoid sensitive or critical habitats and areas with high vegetation diversity
- Wildlife awareness training program for workers
- Noise monitoring program
- Equipment and vehicle maintenance

Impact on community and livelihoods

- Potential loss of incomes and decreased standard of living due to exclusion of ASM activities within the Merian Industrial Zone
- Actual and perceived loss of access to the Project area and project induced changes to the forest ecosystem may affect traditional livelihood practices and community identity

→

- Work with relevant stakeholders to improve small scale mining techniques
- Alternative livelihood and skills training for ASM miners
- Development of an ASM management plan
- Implementation of a stakeholder engagement plan
- Implementation of a cultural heritage management plan

Impacts on health

- The Project may lead to an increase of infectious and communicable disease transmissions in the Project area
- Movement of heavy equipment and vehicles may increase traffic accidents along the transport corridor
- Potential risk of community exposure to environmental contaminants

→

- Screening and monitoring for malaria and HIV amongst workers
- Traffic Management Plan, including monitoring speed of Surgold drivers
- Safe driving training
- Community Safety Awareness training and Coordination
- Implementation of Hazardous Waste Management Plan
- Employee training for handling of hazardous materials
- Use of appropriate containers and vehicles for storage and transport of hazardous materials

Direct and Indirect employment

- Approximately 1200 skilled, semi-skilled and unskilled workers will be required for the Project
- Increased revenues can boost the local and national economy and create indirect employment opportunities

→

- Development of a recruitment policy that prioritises local employment
- Local procurement of goods and services
- Providing education and skills training to residents of the Pamaka communities to increase local employment capacity

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How can I get more information?

Where do I get more information?

Surgold will keep the public informed on every phase of the Project using story-boards in the surounding communities, as well as via the project website and through publishing announcements in newspapers and on the local radio.

How to get the full ESIA report?

The full report will be available to download from the Merian Surgold project website, www.merianproject.com and can also be requested by contacting the Surgold and ERM personnel using the contact details below.

We want to hear from you!

Should you have any comments or concerns regarding the Project or any questions regarding the ESIA process, please contact the representatives of Surgold and ERM below. Comments can also be submitted via the Merian Surgold project website www.merianproject.com.

Wendell Asadang
Community Relation Coordinator
Email: merian.esia@erm.com
Tel: (0) 5978638655 / 5977172880

Salomon Emanuels
ESIA representative for ERM
E-mail: merian.esia@erm.com
Tel: +597-8553324

www.merianproject.com

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1.2 *PROJECT PRESENTATION*

The following section displays the presentations that were given during both sets of public meetings.

Welcome & Introductions

Purpose of Public Meeting:

- Inform interested groups about the Project
- Describe Merian Project
- Listen to your potential concerns

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Ground Rules

- Mutual respect, courtesy, and patience.
- Please help maintain an atmosphere where everyone feels comfortable and welcome.
- Please don't interrupt anyone while they are speaking.
- Please remain quiet so everyone can hear; please leave the room for side discussions.
- Please turn off cell phones or set them to vibrate.
- Raise hands to ask a question.

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Agenda

1. Project Description
2. The Environmental and Social Impact Assessment (ESIA)
3. Questions and Answers
4. Closing Remarks

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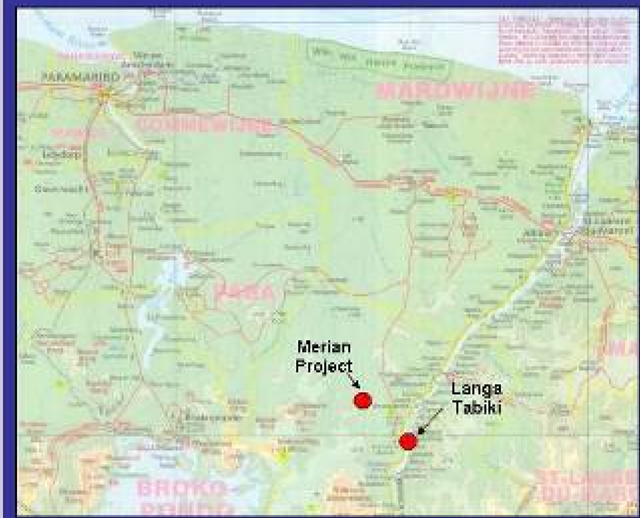
Who Are Surgold?

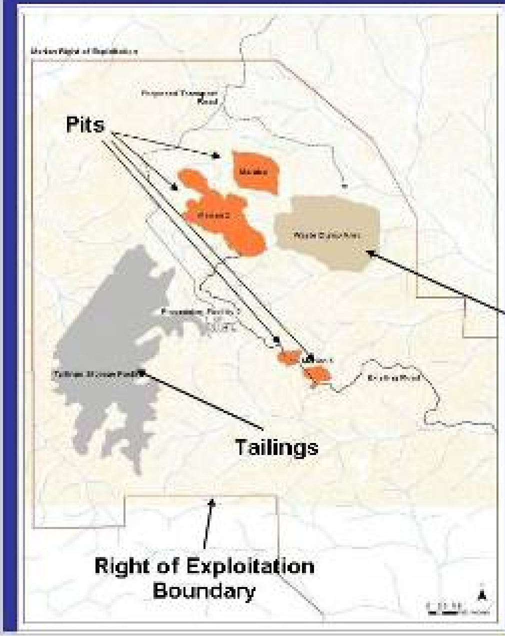
- A company held by Newmont & Alcoa with Newmont as the manager
- Exploring in Merian area since 2004
- No gold production yet – awaiting agreement with state



What is the Merian Project?

Project Location

- Approximately 66km South of Moengo
- Between Commewijne and Marowijne Rivers
- Langa Tabiki is the nearest village (approximately 10km from site)
- Approximately 40km north of Nassau Mountains

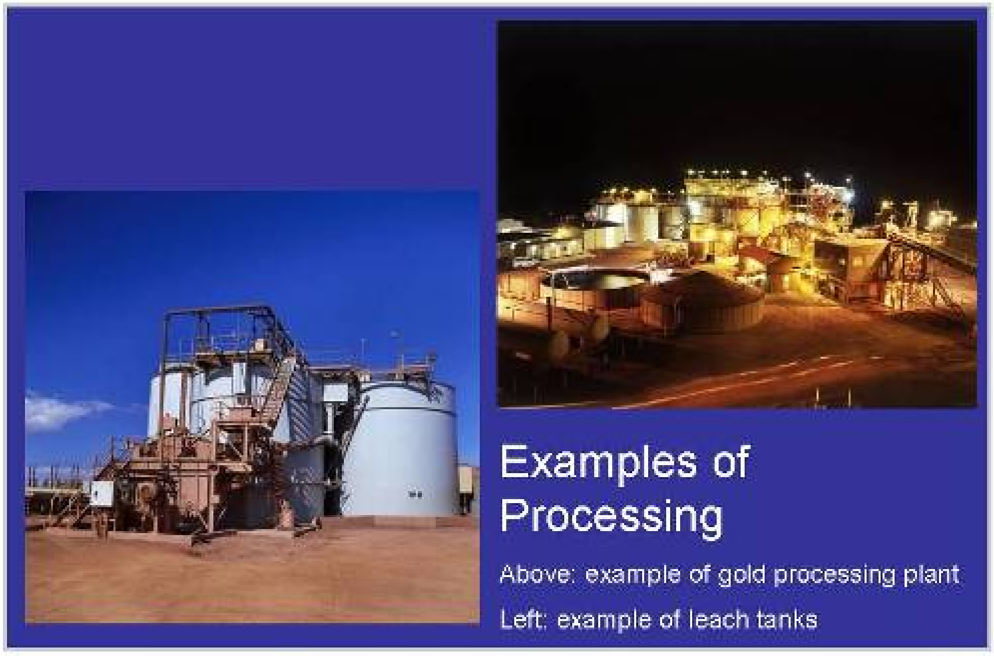


Project Components

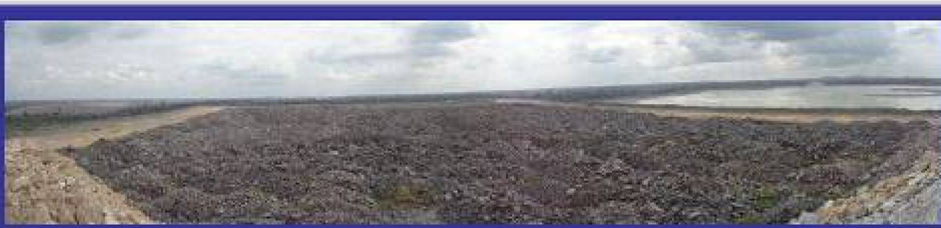
The Project will need the following components:

- 3 – 4 open pits
- Processing Plant
- Waste rock storage
- Tailing storage
- Power generation
- Water Treatment facilities
- Offices and accommodation

Example Open Pit


Examples of Processing
Above: example of gold processing plant
Left: example of leach tanks

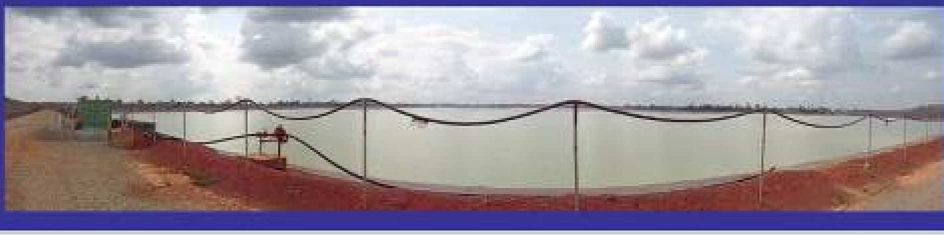

Example Machinery



Waste from the Project

Above: example of waste rock storage

Below: example of tailings facility



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Project employees:

- Approximately 1,500-2,000 during construction (including temporary contractor for construction)
- Approximately 900 during operations

Current Merian Exploration Camp

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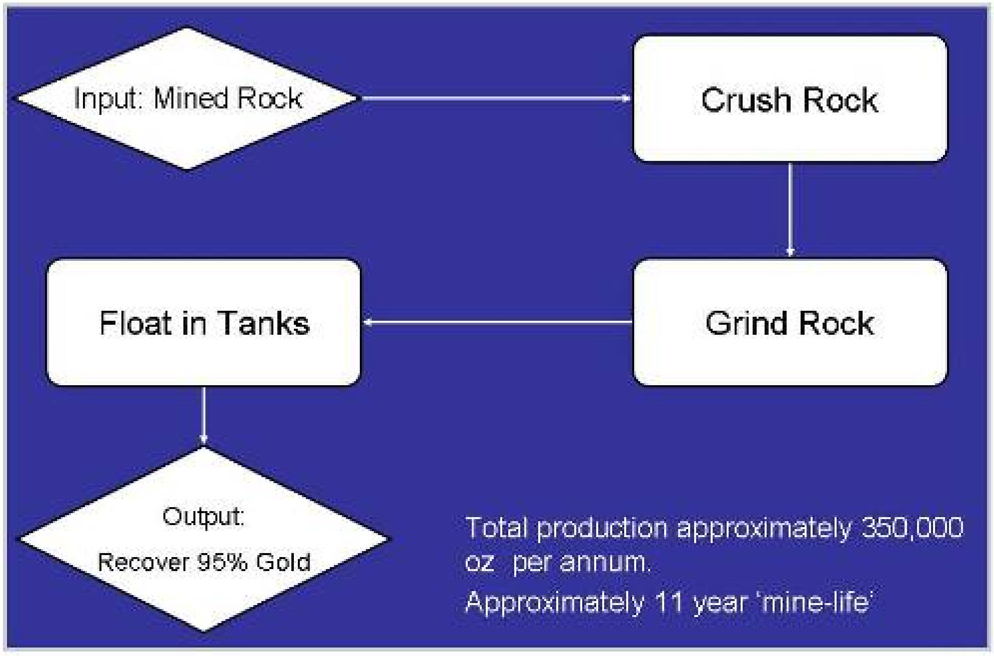
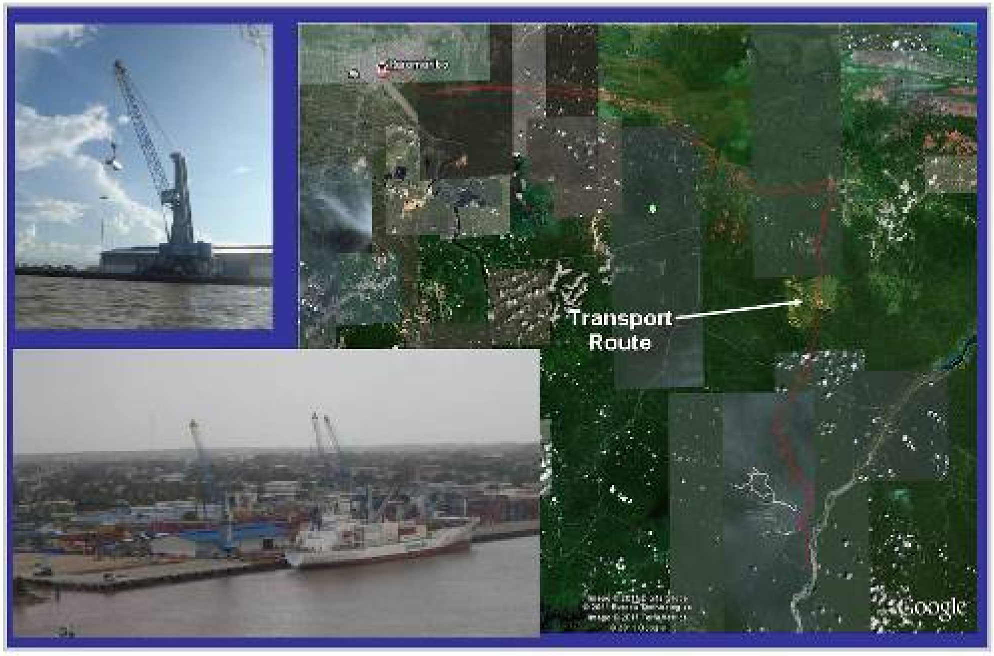


SURGOLD **Simple Mining Flow Diagram** ERM



SURGOLD **Mine Transport Route** ERM

Mine Closure

- Protect environment & public health & safety – ensure physical and geological stability of land
- Sustainable use of site after closure – continuous reclamation & rehabilitations of land back into forest
- Minimize negative effects after closure to environment and community - monitoring
- Overall positive impact to wildlife, animals and people - sustainable social and economic benefits

Example Mine Closure - Indonesia


Example Mine Closure - Indonesia
May 2008 – Five years later


Example Mine Closure - Indonesia


FEBRUARY 1999
MAY 2000
3/16/2000
Example Reclamation of Mine - Indonesia
SEPTEMBER 2006
MAY 2007
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2003
27/08/2003
2004
Example Reclamation of Waste Rock - Indonesia
2005
17/02/2005
2007
SURGOLD
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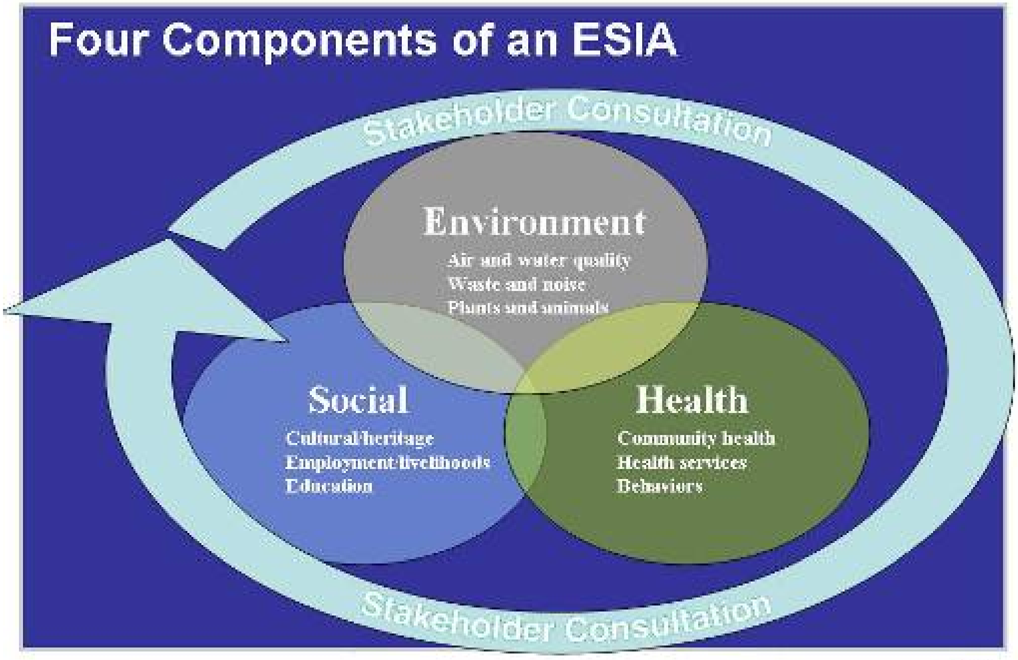
SURGOLD ERM



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Who will do the ESIA?

Environmental Resources Management (ERM) will conduct the ESIA.

- Independent, international consultant specialising in ESIAs
- ERM is an international environmental consulting firm with over 30 years of experience in impact assessment
- 40 countries, 3,000 employees - global expertise & local context
- A team of environmental, social, and health specialists with experience in mine Projects
- Approach to ESIA involves partnership with local specialists, including the specialists here today from ESS and others

SURGOLD ERM

ERM's Role

- Surgold has contracted ERM to prepare the ESIA for the Proposed Merian Project
- ERM is separate from Surgold, they have commissioned ERM to:
  - Act as independent consultant to conduct the ESIA
  - Recommend measures to promote the positive and minimize the negative effects of the Project
  - Facilitate public involvement - encourage and enable interested people or organizations to participate in this process

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What are the requirements for an ESIA?

ERM will follow best practice guidelines for the ESIA:

- Surinamese National Institute of Environment and Development in Suriname (NIMOS) guidelines
- International Standards (International Finance Corporation Performance Standards)

IFC International Finance Corporation

This means the ESIA will:

- Involves public input throughout
- Documents current environmental and social conditions
- Predicts future conditions
- Recommends measures for maximizing positive and minimizing negative effects

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What does an ESIA involve?

- Scoping – Identify likely impacts and studies required
- Impact Assessment
  - undertake studies to understand existing conditions & predict potential changes.
  - Design ways to promote positive & reduce negative impacts
- Monitoring and Evaluation

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Environmental Studies

- Groundwater Study
- Air Quality Studies
- Noise Study
- Plant Study
- Animal Study
- Soil Study
- Traffic Study
- Surface Water Quality Study

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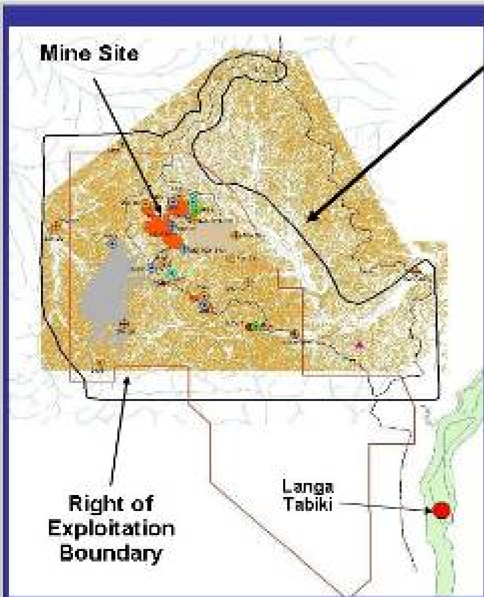

Environmental Study Area

The area that may be affected by changes to the environment caused by the Project

Studies – August 2011 to February 2012

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Social and Health Studies

In the villages that could be affected

- Survey of households that may be impacted
- Interviews and groups discussions in impacted villages
- Health studies

September 2011 onwards

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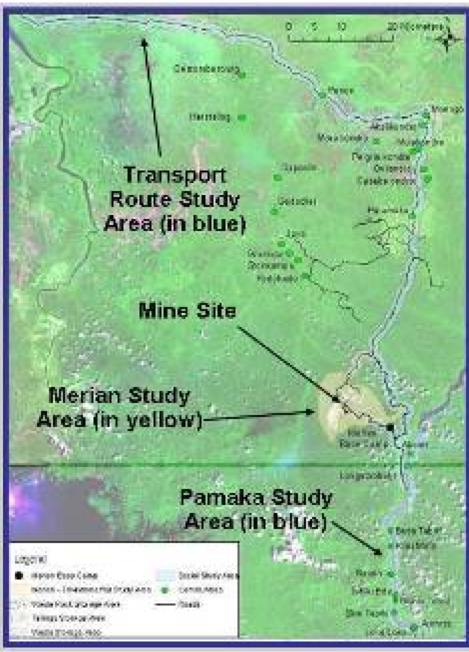

Social and Health Study Area

The area that may be affected by changes to the conditions in local villages:

- area surrounding mine site
- area along road
- Pamaka villages

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Public Consultation

- Public input is a critical component of the ESIA process
  - Solicit input from you throughout the ESIA process
  - Ongoing communication via mail, radio, email, and newspapers

Consultation Principles:

Inclusive, culturally sensitive, transparent

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Review & Publication of ESIA Findings

- Distribute ESIA report to NIMOS, government & other interested groups
- Hold meetings to present impacts, the assessment & mitigation / management measures
- Receive public comments on the impacts & mitigation

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ESIA Terms of Reference

To Describe the purpose and structure of the ESIA

Available from:

- Surgold Office - Paramaribo (Suriname Straat)
- NIMOS office – Paramaribo
- Surgold Camp - Merian

Overall ESIA Schedule

Date	ESIA Process/Activity
August, 2011	Public meeting
August 2011-Februrary 2012	Baseline Studies
February –March, 2012	Impact Assessment Studies
March – April 2012	Prepare Draft ESIA report & hold public meeting to disclose findings
May 2010	Finalize ESIA report
June 2012	Deliver Final ESIA

Next Steps

- Social & Cultural Heritage studies
- Environmental studies
- Will keep interested groups informed
- Disclosure meeting around April 2012

Project Contacts and Information

ERM

For ESIA questions or comments: Salomon Emanuels

Phone: (0) 8553324

Email:salomonemanuels@yahoo.com / merian.esia@erm.com

Surgold

For Project related questions or comments:

Project point of contact: Wendell Asadang

Phone: (0) 8638655 / 7172880

Email: wendel.asadang@newmont.com

Closing Remarks

- ESIA must be complete before exploitation right awarded by government
- ESIA is crucial to Project development
- You will have the opportunity to participate
- The ESIA results will be presented to you so you can comment.

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Consultation and Disclosure Presentation

Agenda

- Role of ERM in the Project
- Who is ERM
- What is an ESIA
- Recap on the Merian Gold Project
- Findings from the Environmental and Social Impact Assessment (ESIA): existing conditions, expected impacts and mitigation measures
- Questions and Answers

SURGOLD ERM

Agenda

- Role of ERM in the Project
- Who is ERM
- What is an ESIA
- Recap on the Merian Gold Project
- Findings from the Environmental and Social Impact Assessment (ESIA): existing conditions, expected impacts and mitigation measures
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- A team of environmental, social, and health specialists with experience in mine Projects
- Approach to ESIA involves partnership with local specialists, including the specialists here today from ESS and others

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Four Components of an ESIA

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Introductions

- Surgold
  Ryan Kambel
- ERM
  Salomon Emmanuels
  Maureen Silos
  Bart de Dijn

ERM: an Independent, international consultant

Ground Rules

- Mutual respect, courtesy, and patience.
- Please help maintain an atmosphere where everyone feels comfortable and welcome.
- Please don't interrupt anyone while they are speaking.
- Please remain quiet so everyone can hear; please leave the room for side discussions.
- Please turn off cell phones or set them to vibrate.
- Raise hands to ask a question – *save questions for the end of the meeting please!*

Merian Project

Welcome and Thanks for Your Participation!

- *Safety is our Foundation*
- *Creating opportunities for Suriname*
- *Safety Tide Gi Wan Boeng Tamara*

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SURGOLD ERM

Recap – '*The Company*'

- Owned by Newmont and Alcoa
- Managed by Newmont
- Began exploration in 2004
- No right of exploitation – awaiting Mineral Agreement

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ALCOA

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Recap – 'The Project'
• Approx. 15km from Langa Tabiki
• Approx. 40 km north of Nassau mountains
• Transport to mine via Nieuwe Haven Port, east-west highway road and Moengo-Langa Tabiki Road
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What are Surgold doing now?
Exploration
Camp Construction
1
2
3
4
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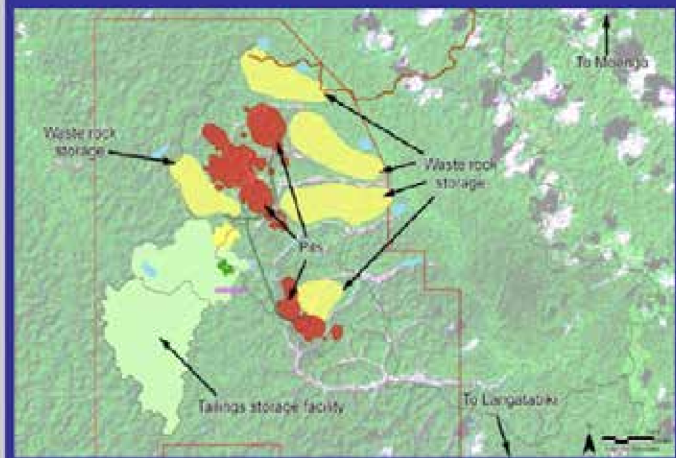
Project Schedule

- Late 2012
  - Mineral Agreement and ESIA Approval
- 2013-2014
  - Construction
  - Recruitment
- 2015 - 2030
  - Mining
- 2030
  - Mine closure

Recap - Project Components



- 3 open pits
- Processing Plant
- Waste rock storage
- liquid Waste (tailings) storage
- Power generation
- Water Treatment facilities
- Offices and accommodation


Recap -
Example
Machinery
SURGOLD
ERM


Recap - Project Component Examples
• Open pits
IAMGOLD -Rosebel
• Processing Plant
SURGOLD
ERM


Recap – Project components: Waste from Project
Left: example of waste rock storage (Rosebel)
Below: example of tailings facility
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Newmont Mine - Indonesia
APRIL 2003


Same Mine - Indonesia
May 2008 – Five years later
Recap – Environmental and Social Impact Assessment (ESIA) Process
• Studying the effects of a Project on people and the environment
• Promote positive impacts & reduce or avoid negative impacts
• Follows best international practice and guidelines
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Recap - ESIA Components
• Environment
• Social
• Health
• Stakeholder Engagement
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Stakeholder Engagement
• A stakeholder is anyone who can be affected by, has an interest in, or can influence the Project – including YOU!
• Stakeholder Engagement activities include:
• Information disclosure
• Public Meetings
• Community consultation
• Receiving feedback
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ESIA – Summary of Activities

Monitoring and Evaluation

Scoping (June-July 2011)

likely Project impacts identified for further study

Impact Assessment (Sept 2011 – May 2012)

- Understand existing conditions and predict effects of Project
- Enhance positive impacts and minimize negative impacts

Disclosure and Approval (June-August 2012)

ESIA findings disclosed for public review and comment prior to approval

Stakeholder Engagement

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ESIA Updates June 2012

✓ ESIA studies completed

✓ Draft ESIA submitted to Surgold and NIMOS

- Environmental and Social management plans in process (reflecting public comments)
- Pending approval of ESIA and conclusion of Mineral Agreement, permission to mine can be given and full construction can begin

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Environmental Studies Completed
Water
Air Quality
Noise
Biodiversity – Plants and animals
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Social Studies Completed
Socio-Economic
Cultural Heritage
Health
Traffic
SURGOLD
ERM


ESIA Findings
• Impacts
• Mitigation measures
• ESIA review and public comment
• Government, NIMOS, stakeholders
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Existing Social and Health Conditions in Pamaka region
• Key livelihoods include hunting, fishing, subsistence agriculture and small scale mining
• Strong Pamaka Maroon identity
• Low levels of literacy
• Low levels of formal employment
• High out-migration
• Poor health, education, communication and transport infrastructure
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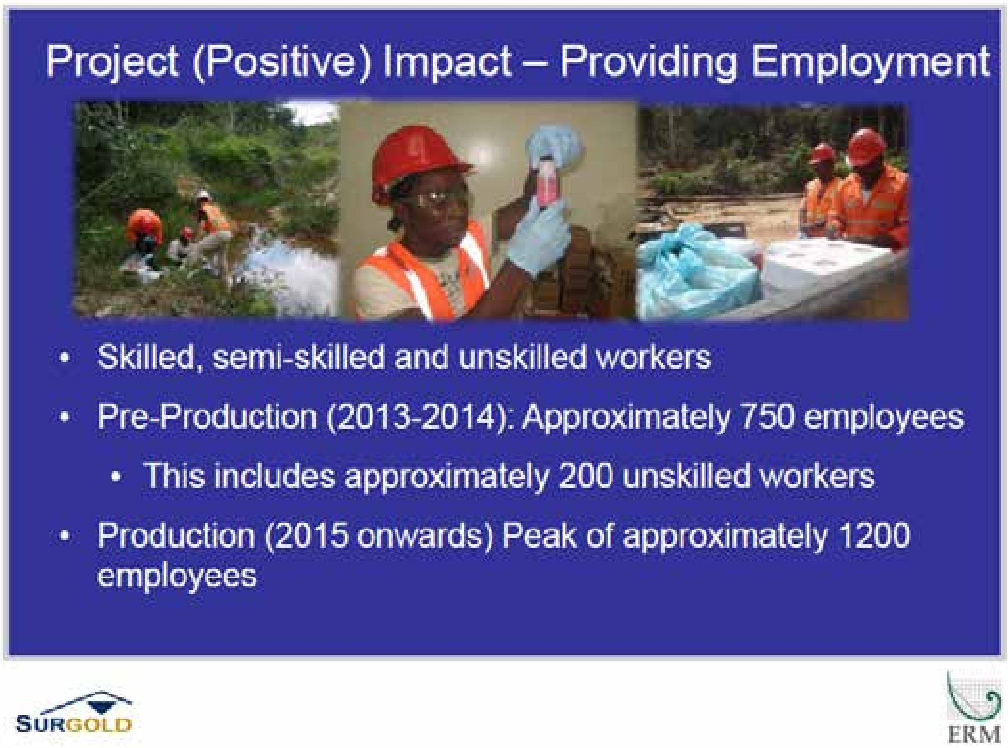
Socio-Economic Impacts and Mitigation Measures
• Direct and Indirect employment
• Community investment
• Livelihood Impacts related to Porknocking
• Cultural change
Community Expectations
SURGOLD
ERM


Project (Positive) Impact – Providing Employment
• Skilled, semi-skilled and unskilled workers
• Pre-Production (2013-2014): Approximately 750 employees
• This includes approximately 200 unskilled workers
• Production (2015 onwards) Peak of approximately 1200 employees
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ERM

Surgold Providing Employment-Benefits

- Increased household income
- Increased spending giving boost to local businesses
- Reduced out-migration

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Enhancing local employment

ERM Recommendations:

- Implement Recruitment Policy
- Certified Training
- Financial Management Training
- Surgold support for local entrepreneurs

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Project (Positive) Impact – Working to invest in communities

- Government of Suriname will be an equity partner and will also receive taxes and royalties
- Work through partners to promote development
- Focus on areas of health, education and socio-economics

SURGOLD ERM

Enhancing Community Investment

ERM Recommendations:

- Community Investment Strategy
- Working with local partners
- Community Consultation
- Community Platform

SURGOLD ERM

(Negative) Impacts to Income from Porknocking

- Loss of access to certain PK sites - Gowtu Bergi
- Loss of income for businesses dependent on porknocking (boat drivers, fuel providers etc.)

Potential consequences from impacts to porknocking

- Decreased income leading to decreased standard of living
- Out-migration
- Impacts on community sense of well being

Mitigating loss of income related to porknocking

ERM Recommends:

- Implement PK Management Plan
- Support OGS – improve the 'sustainability' of PKs
- Local procurement and hiring
- Improve local Skills and provide training

ORDENING GOUD sector

SURGOLD ERM

(Negative) Impacts Related to Cultural Change

- Restrictions to forest resources
- Changes within local community
- Presence of workers from outside Pamaka area

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Mitigating Cultural Change

ERM recommends:

- Increase communication with interested groups
- Cultural Heritage Management Plan
- Personnel Code of Conduct

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(Negative) Impacts related to Accidents and Injuries Related to Driving

- Increase in number of trucks on road
- Road construction / upgrade activities
- Driver fatigue

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Mitigating Surgold Accidents and Injuries (from driving)

ERM Recommends:

- Implement Traffic Management Plan
- Speed monitoring of Surgold vehicles
- Community Awareness and Coordination on Public Safety
- Contractor's Health and Safety Management

(Negative) Impacts Related to Exposure to Chemicals

- Accidental spill of chemical along the road
- Contaminants in waste products
- Escape of contaminants from the minesite

Mitigating Exposure to Contaminants and Chemicals

The Project will have various management plans to:

- Safely manage and remove hazardous waste
- Safely manage the use of cyanide and chemicals
- Respond effectively and efficiently to emergencies
- ***Cyanide Code***

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What is the Cyanide Management Code?

- Developed by a multi-party stakeholder group under the guidance of the United Nations Environmental Program
- Directed at the safe management of cyanide
- Covers manufacture, transport, storage, use, and disposal

INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

SURGOLD

ERM


Existing Environmental Conditions around the planned Mine
• Disturbed Rainforest
• Large amount of deforestation
• Disturbed creek flows
• Pit excavation


Environmental Impacts and Mitigation Measures
• Water Quality
• Flora and Fauna
• Fish and Aquatic Habitat
• Air Quality
• Noise

Water Quality Impacts

- Potential increase the total suspended solids (dirt and dust) in the streams
- Potential to degrade water quality
- Changes to stream flows

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Water Quality Mitigation

ERM Recommends:

- Implement an Erosion and Sediment Control Plan
- Construct sediment ponds and implement water treatment
- Concurrent mine and rehabilitate
- Implement a Water Resources Management Plan

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ERM

Plants and Animals Impacts

- Vegetation loss
- Habitat loss and degradation
- Wildlife injury and mortality

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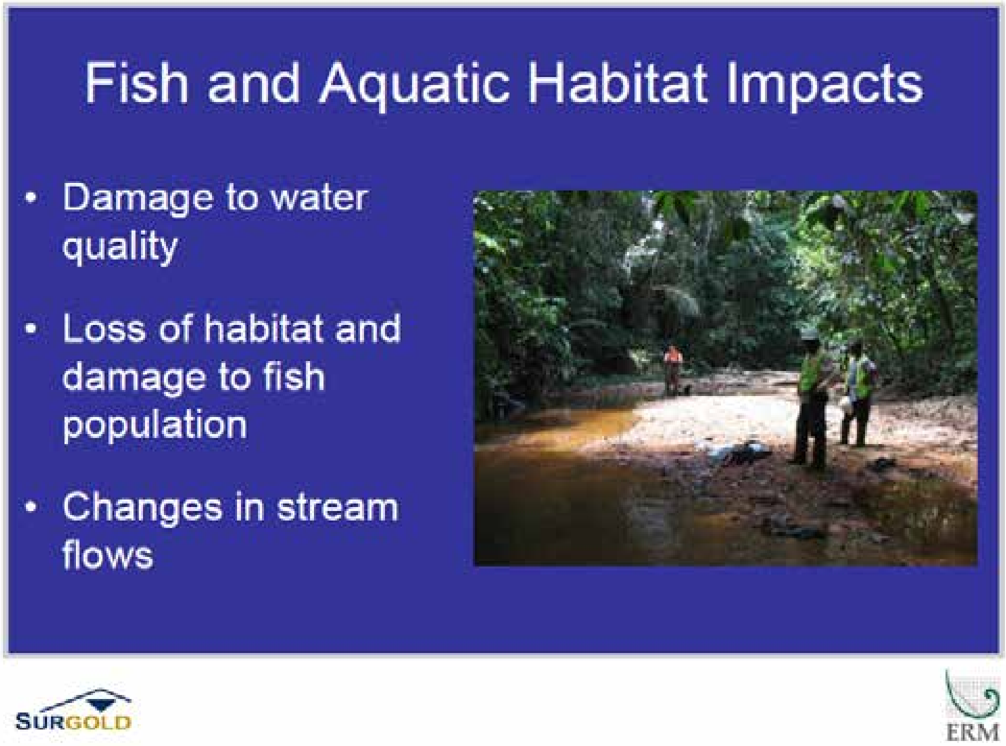
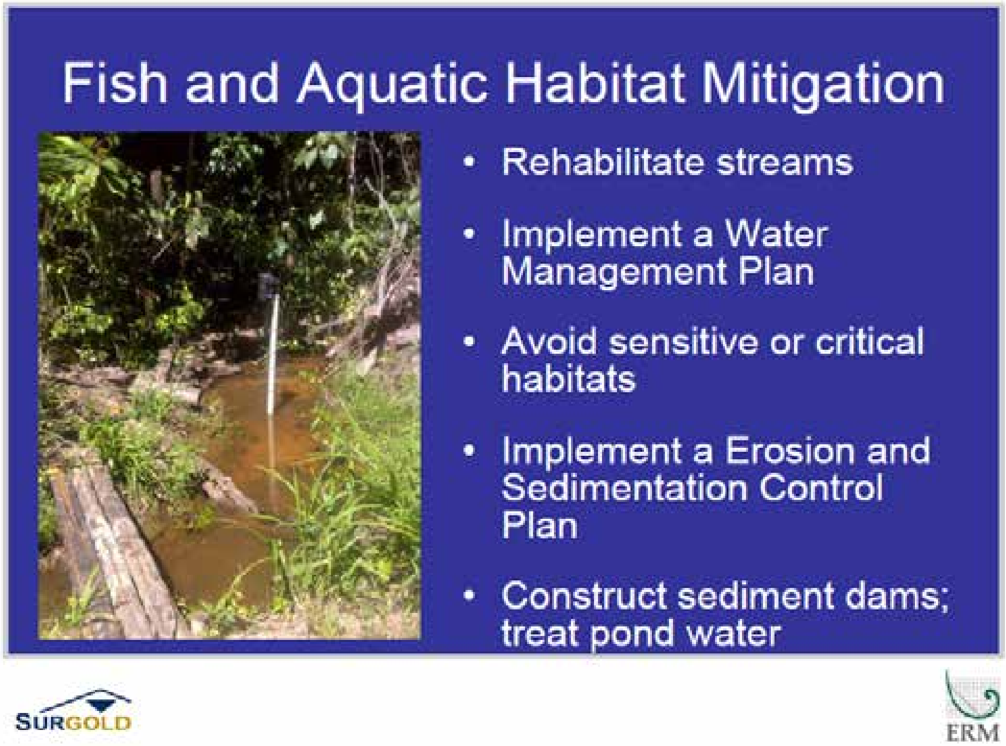
Plants and Animals Mitigation

ERM recommends:

- Implement a Wildlife Management Plan
- Re-vegetated disturbed areas with native species
- Prevention of hunting in Mine area
- Vehicle speed limits

SURGOLD ERM


Fish and Aquatic Habitat Impacts
• Damage to water quality
• Loss of habitat and damage to fish population
• Changes in stream flows
SURGOLD
ERM


Fish and Aquatic Habitat Mitigation
• Rehabilitate streams
• Implement a Water Management Plan
• Avoid sensitive or critical habitats
• Implement a Erosion and Sedimentation Control Plan
• Construct sediment dams; treat pond water
SURGOLD
ERM


Air Quality Impacts
• Potential increase in dust
• Emissions from vehicles and power generation
SURGOLD
ERM


Air Quality Mitigation
ERM recommends:
• Watering of disturbed surfaces
• Daily visible dust checks
• Maintenance of mine fleet/vehicles
• Rehabilitate disturbed areas
• Implement a Air Quality Management & Monitoring Plan
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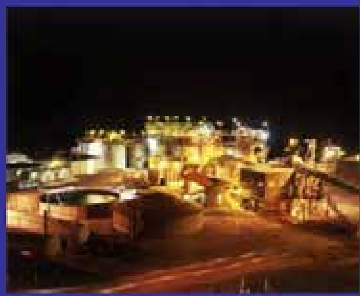
Noise and Vibration Impacts

- Potential increase in vibrations and noise



- Potential increases in daytime and night-time Noise

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Noise and Vibration Mitigation

ERM Recommends:

- Implement a noise Monitoring Program
- Maintenance of all equipment and haul trucks
- Monitor all blasting

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ESIA Report

Available from:

- Surgold Office - Paramaribo (Suriname Straat)
- NIMOS office – Paramaribo
- Surgold Camp - Merian

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ERM

Project Contacts and Information

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Surgold
For Project related questions or comments:
Project point of contact: Wendell Asadang
Phone: (0) 8638655 / 7172880

Please also go to the project website www.merianproject.com

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NEWMONT
Thanks for your time!
Questions?
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Appendix 16-A

Air Emission Calculation Sheets

Table 16-1-1. Summary of Fugitive and Combustion Emissions and Control Factors during Operations at the Mine Site
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

Emission Source/ Activity	Source #	UTM Coordinates Northing	UTM Coordinates Easting	Control Factor (%)	Emissions (g/s) TSP	PM_{10}	$PM_{2.5}$	NOx	CO	VOC	SO_2	Pb
Merian 2 Pit and haul road												
Grading	--			0%	0.075	0.041	0.0023					
Loading overburden into trucks at mine pits/ overburden stripping	--			0%	0.0022	0.0011	0.00016					
Loading ore into trucks at mine pits	--			0%	0.0063	0.000049	0.00045					
Bulldozing activities on ore at mine pits	--			0%	2.40	0.82	0.053					
Drilling at mine pits	--			0%	1.50	0.75	0.11					
Blasting at mine pits	--			0%	3.11	1.62	0.093	0.0022	0.0093		0.00027	
Truck transport of overburden from pits to waste dump areas	--			50%	0.13	0.031	0.0031					
Truck transport of ore from pits to ROM stockpiles at Process Plant area	--			50%	7.16	1.78	0.18					
Nonroad diesel engine emissions	--			0%		0.068	0.066	0.051	0.015	0.0013	0.000047	
Subtotal	*S-1*	771098.62	566896.9		*14.4*	*5.11*	*0.51*	*0.053*	*0.024*	*0.0013*	*0.00032*	
Maraba Pit and haul road												
Grading	--			0%	0.075	0.041	0.0023					
Loading overburden into trucks at mine pits/ overburden stripping	--			0%	0.092	0.043	0.0045					
Loading ore into trucks at mine pits	--			0%	0.0063	0.000049	0.00045					
Bulldozing activities on ore at mine pits	--			0%	2.40	0.82	0.053					
Drilling at mine pits	--			0%	0.93	0.46	0.069					
Blasting at mine pits	--			0%	2.09	1.09	0.063	0.0014	0.0058		0.00017	
Truck transport of overburden from pits to waste dump areas	--			50%	5.15	1.28	0.13					
Truck transport of ore from pits to ROM stockpiles at Process Plant area	--			50%	4.40	1.10	0.11					
Nonroad diesel engine emissions	--			0%		0.068	0.066	0.051	0.015	0.0013	0.000047	
Subtotal	S-2	772044.45	568715.3		*15.2*	*4.90*	*0.50*	*0.052*	*0.021*	*0.0013*	*0.00022*	
Merian 1 Pit and haul road												
Grading	--			0%	0.075	0.041	0.0023					
Loading overburden into trucks at mine pits/ overburden stripping	--			0%	0.012	0.0057	0.00087					
Loading ore into trucks at mine pits	--			0%	0.0015	0.00069	0.00010					
Bulldozing activities on ore at mine pits	--			0%	2.40	0.82	0.053					
Drilling at mine pits	--			0%	0.35	0.17	0.026					
Blasting at mine pits	--			0%	0.48	0.25	0.014	0.00051	0.0022		0.000063	
Truck transport of overburden from pits to waste dump areas	--			50%	0.68	0.17	0.017					
Truck transport of ore from pits to ROM stockpiles at Process Plant area	--			50%	1.65	0.41	0.041					
Nonroad diesel engine emissions	--			0%		0.068	0.066	0.051	0.015	0.0013	0.000047	
Subtotal	S-3	773177.77	563762.2		*5.65*	*1.94*	*0.22*	*0.051*	*0.017*	*0.0013*	*0.00011*	
Waste Dump - West												
Unloading overburden trucks at waste dump areas (complete reclamation by worst-case Mine Year 4, hence zero emissions)	--			0%	0	0	0					
Bulldozing activities on overburden at waste dump areas	--			0%	0.33	0.063	0.035					
Wind erosion emissions from waste dump	--			80%	0.31	0.15	0.023					
Subtotal	*S-4*	770113.53	567277.6		*0.64*	*0.22*	*0.06*					
Waste Dump - North												
Unloading overburden trucks at waste dump areas	--			0%	0.084	0.040	0.0041					
Bulldozing activities on overburden at waste dump areas	--			0%	0.33	0.063	0.035					
Wind erosion emissions from Waste Dump	--			80%	0.52	0.26	0.039					
Subtotal	*S-5*	772046.43	570167.0		*0.94*	*0.36*	*0.078*					
Waste Dump - Central												
Unloading overburden trucks at waste dump areas	--			0%	0.0079	0.0038	0.00057					
Bulldozing activities on overburden at waste dump areas	--			0%	0.33	0.063	0.035					
Wind erosion emissions from Waste Dump	--			80%	0.61	0.30	0.046					
Subtotal	*S-6*	773567.35	568624.3		*0.95*	*0.37*	*0.081*					
Waste Dump - East												
Unloading overburden trucks at waste dump areas	--			0%	0.0079	0.0038	0.00057					
Bulldozing activities on overburden at waste dump areas	--			0%	0.33	0.063	0.035					
Wind erosion emissions from Waste Dump	--			80%	0.68	0.34	0.051					
Subtotal	*S-7*	773210	566584.8		*1.02*	*0.40*	*0.086*					
Waste Dump - South												
Unloading overburden trucks at waste dump areas	--			0%	0.012	0.0057	0.00087					
Bulldozing activities on overburden at waste dump areas	--			0%	0.33	0.063	0.035					
Wind erosion emissions from Waste Dump	--			80%	0.28	0.14	0.021					
Subtotal	*S-8*	773535.27	564103.8		*0.62*	*0.21*	*0.057*					
Process Plant Area												
Loading ROM stockpiles at process plant area	--			50%	0.0059	0.0028	0.00042					
Wind erosion emissions from stockpiles at Process Plant Area	--			80%	0.68	0.34	0.051					
Unloading from ROM stockpiles at process plant area	--			50%	0.0059	0.0028	0.00042					
Loading ore to trains (prior to crushing) at process plant area	--			0%	0.012	0.0055	0.00084					
Material handling, transfering, and conveying at process plant area	--			0%	0.012	0.0055	0.00084					
Primary crushing at Process Plant	--			50%	2.54	1.01	0.19					
Pebble crushing due to wet ore feed at Process Plant	--			50%	7.61	2.54	0.57					
Wet grinding at Process Plant (zero emissions)	--			0%	0	0	0					
Subtotal	*S-9*	771411.71	565487.98		*10.9*	*3.91*	*0.81*					
Power Plant - 52.5 MWe running capacity (HFO)												
Exhaust stack for 10.5 MWe reciprocating engine 1	*S-10*	771339.68	565302.28	0%		0.42	0.42	15.6	3.53	0.34	3.12	0.00033
Exhaust stack for 10.5 MWe reciprocating engine 2	*S-11*	771342.46	565301.27	0%		0.42	0.42	15.6	3.53	0.34	3.12	0.00033
Exhaust stack for 10.5 MWe reciprocating engine 3	*S-12*	771340.95	565297.23	0%		0.42	0.42	15.6	3.53	0.34	3.12	0.00033
Exhaust stack for 10.5 MWe reciprocating engine 4	*S-13*	771366.43	565295.21	0%		0.42	0.42	15.6	3.53	0.34	3.12	0.00033
Exhaust stack for 10.5 MWe reciprocating engine 5	*S-14*	771369.21	565293.95	0%		0.42	0.42	15.6	3.53	0.34	3.12	0.00033
Tailings Storage Facility												
Wind erosions from TSF	*S-15*	768448.93	561389.91	80%	3.03	1.52	0.23					

Table 16-1-2. Grading Activities at the Mine Site
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 11.9. Western Surface Coal Mining - Table 11.9-2, US EPA July 1998.

$EF_1 = 0.0034 \times (S^{2.5})$	where:
$EF_2 = 0.0056 \times (S^{2.0}) \times 0.60$	EF_1 = TSP emission factor in kg/VKT
$EF_3 = 0.0034 \times (S^{2.5}) \times 0.031$	EF_2 = PM_{10} emission factor in kg/VKT
$E = EF \times VKT \times (1\ tonne/\ 1000\ kg)$	EF_3 = $PM_{2.5}$ emission factor in kg/VKT
$VKT = S \times T \times N$	E = Emission rates in tonnes/year
	VKT = vehicle kilometers traveled per year at mine site
	S = mean vehicle speed (kph)
	T = time of grading activity at mine site in hours/year
	N = number of graders at mine site

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Mean vehicle speed for the graders, S	kph	3.22	Assumed based on typical 2 mph (3.22 kph) vehicle speeds for graders at industrial and construction sites
Annual hours of operation for graders at each mine pit, T	hrs/yr	5,840	Estimated based on 16-hr/day of continuous operation for 365 days/year at each mine pit
Number of graders at each mine pit, N	-	2	Estimated based on a total of six motor graders expected to operate at all three pits

1 kph = kilometers per hour; and hrs/yr = hours per year

C. Calculations

Emission Source/ Activity	Annual Vehicle Kilometers Traveled (VKT/yr)	Uncontrolled PM Emission Estimates (tonnes/year)		
		TSP	PM_{10}	$PM_{2.5}$
Grading activities at mine site				
Merian 2 Pit and surrounding areas	37,594	2.38	1.31	0.07
Maraba Pit and surrounding areas	37,594	2.38	1.31	0.07
Merian 1 Pit and surrounding areas	37,594	2.38	1.31	0.07
Total	**112,783**	**7.1**	**3.93**	**0.22**

Table 16-1-3. Loading and Unloading Activities at the Mine Pits, Waste Dump Areas, and Process Plant Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.4, Aggregate Handling and Storage Piles - Equation (1), US EPA November 2006.

$EF = k \times (0.0016) \times [(U/2.2)^{1.3} / (M/2)^{1.4}]$

$E = EF \times TM \times (1 \text{ tonne}/1000 \text{ kg}) \times [1-(CF/100)]$

where:
- EF = Emission factor in kg/megagram or kg/tonne
- E = Emission rates in kg/megagram or kg/tonne
- TM = Total material handled in tonnes/year
- k = particle size multiplier
- U = mean wind speed in miles per hour (mph)
- M = material moisture content, weight percent (%)
- CF = control factor (%)

B. Input Data

Parameter	Unit[1]	Values: Merian 2 Pit	Maraba Pit	Merian 1 Pit	Total	Source/ Assumption
Mine Life	Years	12-14	12-14	12-14	12-14	Assumed mine operations would occur for 12 years while ore processing would occur for 14 years.
Worst-case Mine Year	Year	4.0	4.0	4.0	4.0	Year 4 is assumed to be the worst-case mine year for air pollution since it has the highest amount of overburden removed from concurrent operation of all 3 mine pits (~72.2 Mtpa) as well as a maximum amount of ore to be processed (16 Mtpa). Year 8 has a higher amount of overburden removed annually (74.04 Mtpa), but the amount of ore processed in Year 8 is expected to be much lower (~10 Mtpa) due to more hard ore being mined. As a result, Year 8 was not selected as the worst case mine year.
Mine area disturbed	ha	260	160	60.0	480	Source: Merian ESIA Project Description
Total overburden to be removed from mine pits during worst-case mine year	Mtpa	1.52	62.42	8.22	72.16	Source: Memo on Preliminary Waste Dump Design, GMining, dated 01 May 2012
Total overburden to be removed from all mine pits during Mine Life	Mt	--	--	--	678	Source: Memo on Preliminary Waste Dump Design, GMining, dated 01 May 2012
Total ore to be removed from mine pits during worst-case mine year	Mtpa	8.67	5.33	2.00	16.0	The maximum 16 Mtpa from all 3 pits is based on the extraction of mostly soft ores during the first four years. The total ore removed from each pit was estimated based on the percent size of each pit
Total ore to be removed during Mine Life	Mt	--	--	--	150	Source: Merian ESIA Project Description
Particle size multiplier (k), partilce size <30 µm	-	0.74	0.74	0.74	0.74	Source: US EPA AP-42, Section 13.2.4
Particle size multiplier (k), partilce size <10 µm	-	0.35	0.35	0.35	0.35	Source: US EPA AP-42, Section 13.2.4
Particle size multiplier (k), partilce size <2.5 µm	-	0.053	0.053	0.053	0.053	Source: US EPA AP-42, Section 13.2.4
Mean wind speed (U)	m/s	0.80	0.80	0.80	0.80	Merian Weather Station (Dec 2005 - Dec 2011)
Mean moisture content for overburden [$M_{OVERBURDEN}$]	%	7.9	7.9	7.9	7.9	Source: US EPA AP-42, Section 11.9, Table 11.9-3
Mean moisture content for ore [M_{ORE}]	%	13	13	13	13	Assumed an average ore moisture content of 13% based on the average moisture contents for the soft ores (20%) and fresh rock (6%) at the site.
Control factor for loading and unloading stockpiles, water sprays (CF)	%	50	50	50	50	Australian NPI Emission Estimation Technique Manual for Mining, Table 4, Version 3.1, January 2012

1 ha = hectares; kg/ha = kilograms per hectare; Mm^3/yr = million cubic meters per year; Mtpa = million tonnes per annum; Mt = million tonnes; m/s = meters per second, % = percent

Table 16-1-3. Loading and Unloading Activities at the Mine Pits, Waste Dump Areas, and Process Plant Area (Continued)
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

C. Calculations

Emission Source/ Activity	Over-burden Transfer (Mtpa)	Ore Transfer (Mtpa)	Control Efficiency, water sprays (%)	Uncontrolled Particulate Emission Estimates (tonnes/year)			Controlled Particulate Emission Estimates (tonnes/year)		
				TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
Loading overburden into trucks at mine pits/ overburden stripping									
Merian 2 Pit	1.52	N/A	0	0.071	0.033	0.005	0.071	0.033	0.005
Maraba Pit	62.42	N/A	0	2.896	1.370	0.143	2.896	1.370	0.143
Merian 1 Pit	8.22	N/A	0	0.381	0.180	0.027	0.381	0.180	0.0273
Unloading overburden trucks at waste dump areas									
Waste Dump - West(1)(2)	0	N/A	0	0.000	0.000	0.000	0.000	0.000	0.000
Waste Dump - North(1)	57.03	N/A	0	2.646	1.252	0.130	2.646	1.252	0.130
Waste Dump - Central(1)	1.52	N/A	0	0.250	0.118	0.018	0.250	0.118	0.0179
Waste Dump - East(1)	5.39	N/A	0	0.250	0.118	0.018	0.250	0.118	0.0179
Waste Dump - South(1)	8.22	N/A	0	0.381	0.180	0.027	0.381	0.180	0.0273
Loading ore into trucks at mine pits									
Merian 2 Pit	N/A	8.67	0	0.200	0.002	0.014	0.200	0.002	0.014
Maraba Pit	N/A	5.33	0	0.123	0.058	0.009	0.123	0.058	0.009
Merian 1 Pit	N/A	2.00	0	0.046	0.022	0.003	0.046	0.022	0.003
Loading ROM stockpiles at process plant area									
Process Plant area, near crushers	N/A	16.0	50	0.370	0.175	0.026	0.185	0.087	0.013
Unloading from ROM stockpiles at process plant area									
Process Plant area, near crushers	N/A	16.0	50	0.370	0.175	0.026	0.185	0.087	0.013
Loading ore to trains (prior to crushing) at process plant area									
Process Plant area, near crushers	N/A	16.0	0	0.370	0.175	0.026	0.370	0.175	0.026
Material handling, transfering, and conveying at process plant area									
Process Plant area, near crushers	N/A	16.0	0	0.370	0.175	0.026	0.370	0.175	0.026
Total particulate emissions from loading and unloading activities				***8.72***	***4.03***	***0.50***	***8.36***	***3.86***	***0.47***

Notes:

(1) Total volume of overburden hauled to each dump site was taken from the Memo on Preliminary Waste Dump Design, GMining, dated 01 May 201

(2) During the worst case Mine Year 4, progressive reclamation at the Wast Dump - West would be complete, so no overburden material would be hauled to that dump site, hence zero emissions.

Table 16-1-4. Bulldozing Activities on Overburden at Waste Dump Areas & Ore at Mine Pits
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 11.9. Western Surface Coal Mining -
Bulldozing equation in Table 11.9-2, US EPA July 1998.

$EF_1 = 2.6 \times (s)^{1.2} / (M)^{1.3}$	where:
$EF_2 = 0.45 \times (s)^{1.5} / (M)^{1.4} \times 0.75$	EF_1 = TSP emission factor for overburden in kg/hr
$EF_3 = 2.6 \times (s)^{1.2} / (M)^{1.3} \times 0.105$	EF_2 = PM_{10} emission factor for overburden in kg/hr
$EF_4 = 35.6 \times (s)^{1.2} / (M)^{1.4}$	EF_3 = $PM_{2.5}$ emission factor for overburden in kg/hr
$EF_5 = 8.44 \times (s)^{1.5} / (M)^{1.4} \times 0.75$	EF_4 = TSP emission factor for ore in kg/hr (assume factors for coal)
$EF_6 = 35.6 \times (s)^{1.2} / (M)^{1.4} \times 0.022$	EF_5 = PM_{10} emission factor for ore in kg/hr (assume factors for coal)
$E = EF \times OP \times$ (1 tonne/1000 kg)	EF_6 = $PM_{2.5}$ emission factor for ore in kg/hr (assume factors for coal)
	s = material silt content (%)
	M = material moisture content (%)
	E = Emission estimates in tonnes/year
	OP = Annual hours of operation for the dozers

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Annual hours of operation for dozers	hrs/yr	5,840	Estimated based on 16-hr/day of continuous operation for 365 days/year at the waste dump areas
Mean silt content for overburden, $s_{(OVERBURDEN)}$	%	6.9	US EPA AP-42, Section 11.9, Table 11.9-3
Mean silt content for ore, $s_{(ORE)}$	%	8.6	Assumed silt content for coal; US EPA AP-42, Section 11.9, Table 11.9-4
Mean moisture content for overburden, $M_{(OVERBURDEN)}$	%	7.9	US EPA AP-42, Section 11.9, Table 11.9-3
Mean moisture content for ore, $M_{(ORE)}$	%	13	Assumed an average ore moisture content of 13% based on the average moisture contents for the soft ores (20%) and fresh rock (6%) at the site.

1 hrs/yr = hours per year; and % = percent

C. Calculations

Emission Source/ Activity	Uncontrolled PM Emission Estimates (tonnes/year)		
	TSP	**PM_{10}**	**$PM_{2.5}$**
Bulldozing activities on overburden at waste dump areas			
Waste Dump - West	10.5	1.98	1.10
Waste Dump - North	10.5	1.98	1.10
Waste Dump - Central	10.5	1.98	1.10
Waste Dump - East	10.5	1.98	1.10
Waste Dump - South	10.5	1.98	1.10
Total	**52.5**	**9.89**	**5.51**
Bulldozing activities on ore at mine pits			
Merian 2 Pit	75.8	25.7	1.67
Maraba Pit	75.8	25.7	1.67
Merian 1 Pit	75.8	25.7	1.67
Total	**227**	**77.1**	**5.00**

Table 16-1-5. Drilling at the Mine Site
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology
Reference - AP-42, Section 11.9. Western Surface Coal Mining - Table 11.9-4, US EPA July 1998.

$EF_1 = 0.59$

$EF_2 = EF_1 \times 0.50$

$EF_3 = EF_1 \times 0.075$

$E = EF \times HB \times B \times (1 \text{ tonne}/1000 \text{ kg}) \times (1-CF/100)$

$HB = HH \times DA \times B$

where:
EF_1 = TSP emission factor in kg/hole
EF_2 = PM_{10} emission factor in kg/hole (assumed PM_{10} = TSP x 0.5 per AP-42, Section 13.2.5)
EF_3 = $PM_{2.5}$ emission factor in kg/hole (assumed $PM_{2.5}$ = TSP x 0.075 per AP-42, Section 13.2.5)
E = Emissions estimates in tonnes/year
HB = Number of holes per blast
B = Number of blasts per year
CF = Control factor (%)
HH = Number of holes per hectare
DA = Disturbed mine area

B. Input Data

Parameter	Units[1]	Value: Merian 2 Pit	Maraba Pit	Merian 1 Pit	Total	Source/ Assumption
Disturbed mine area, DA	ha	260	160	60.0	480	Source: ESIA Project Desciption
# of drill holes per hectare, HH	ha	309.3	309.3	309.3	309.3	Based on a drill pattern of 6.1 x 5.3 m (Source; Memo on Conceptual Blasting at Merian dated 27 January 2012)
# of blasts per year, B	blasts/yr	250	250	250	250	Based on 5 blastings per wk, 50 wks per year
# of holes per blasts at mine pits, HB	holes/blast	322	198	74.2	594	Based on the # of drill holes per hectare, # of hectares disturbed, and # of blasts/yr

1 ha = hectares

C. Calculations

Emission Source/ Activity	Control Factor (%)	Emission Estimates (tonnes/year): TSP	PM_{10}	$PM_{2.5}$
Drilling at mine pits				
Merian 2 Pit	0	47.45	23.72	3.56
Maraba Pit	0	29.20	14.60	2.19
Merian 1 Pit	0	10.95	5.47	0.82
Total	0	**87.6**	**43.80**	**6.57**

Table 16-1-6. Blasting at the Mine Site
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference 1- US EPA AP-42, Section 11.9. Western Surface Coal Mining - Table 11.9-4, US EPA July 1998.
Reference 2- US EPA AP-42, Section 13.3. Explosives Detonation - Table 13.3-1, US EPA February 1980 (Reformatted January 1995).

$EF_1 = 0.00022(A)^{1.5}$	$A = HB \times (1/HH) \times (10{,}000\ m^2/ha) \times PA$
$EF_2 = 0.00022(A)^{1.5} \times 0.52$	$E_{1,2,3} = EF_{1,2,3} \times B \times (1\ tonne/1000\ kg) \times (1-CF/100)$
$EF_3 = 0.00022(A)^{1.5} \times 0.03$	$E_{3,4,5} = EF_{3,4,5} \times TM \times (1\ tonne/1000\ kg) \times (1-CF/100)$
$EF_4 = 34$	
$EF_5 = 8$	
$EF_6 = 1$	
where:	
EF_1 = TSP emission factor in kg/blast	HH = Number of holes per hectare
EF_2 = PM_{10} emission factor in kg/blast	PA = Percent of area requiring blasts (%)
EF_3 = $PM_{2.5}$ emission factor in kg/blast	$E_{1,2,3}$ = Emissions estimates in tonnes/year
EF_4 = Carbon monoxide emission factor in kg/ megagram or kg/tonne	$E_{4,5,6}$ = Emissions estimates in tonnes/year
EF_5 = nitrogen oxides emission factor in kg/ megagram or kg/tonne	B = Number of blasts per year
EF_6 = Sulfur dioxide emission factor in kg/ megagram or kg/tonne	CF = Control factor (%)
A = Area blasted in m^2	TM = Total material to be blasted in million tonnes per annum (Mtpa)

B. Input Data

Parameter	Units[1]	Value				Source/ Assumption
		Merian 2 Pit	Maraba Pit	Merian 1 Pit	Total	
Total material (fresh rock, hard ores) to be blasted at mine pits during worst-case mine year, TM	Mtpa	8.67	5.33	2.00	16.0	The maximum 16 Mtpa from all 3 pits is based on the extraction of mostly soft ores. The total ore blasted at each pit was estimated based on the percent size of each pit
Disturbed mine area, DA	ha	260	160	60.0	480	Source: ESIA Project Description
# of drill holes per hectare, HH	ha	309.3	309.3	309.3	309.3	Based on a drill pattern of 6.1 x 5.3 m (Source; Memo on Conceptual Blasting at Merian dated 27 January 2012)
# of blasts per year, B	blasts/yr	312	250	250	250	Based on 6 blastings per wk, 52 wks per year
# of holes per blasts at mine pits, HB	holes/blast	258	198	74.2	594	Based on the # of drill holes per hectare, # of hectares disturbed, and # of blasts/yr
Percent of pit area requiring blasts, PA	%	70%	70%	70%	70%	Assumed 70% of total pit area would contain fresh rock and hard ores that require blasting.
Area blasted, A	m^2/blast	5,833	4,480	1,680	13,440	Calculated based on number of holes per blast, number of drill holes per ha, and percent of area requiring blasting.

1 Mtpa = million tonnes per annum; ha = hectares; % = percent; m^2/blast = square meters per blast

C. Calculations

Emission Source/ Activity	Control Factor (%)	Emission Estimates (tonnes/year)					
		TSP	PM_{10}	$PM_{2.5}$	CO	NOx	SO_2
Blasting at mine pits							
Merian 2 Pit	0	98.0	51.0	2.94	0.29	0.069	0.0087
Maraba Pit	0	66.0	34.3	1.98	0.18	0.043	0.0053
Merian 1 Pit	0	15.1	7.9	0.45	0.068	0.016	0.0020
Total	**0**	**179**	**93.1**	**5.37**	**0.54**	**0.13**	**0.016**

Table 16-1-7. Wheel-Generated Dust from Truck Travel on Unpaved Roads
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.2, Unpaved Roads - Equation (1a) and (2), US EPA November 2006.

EF = [(k x [(s/12)^a] x [(W/3)^b] x 281.9] x [(365-P)/365]

E = EF x VKT x (1 tonne /1,000,000 g) x [1-(CF/100)]

VKT = (TM/LOAD) x L

where:

EF = size specific emission factor (g/VKT)	281.9 = conversion factor from lb/VMT to g/VKT
E = emission rate (tonnes/year)	P = number of days in a year with at least 0.254 mm of precipitation
k = particle size multiplier (lb/VMT)	VKT = vehicle kilometers traveled
s = surface material silt content (%)	CF = control factor (%)
a = particle size constant	TM = total material handled in tonnes
W = average weight of construction trucks (tons)	LOAD = average truck load in tonnes
b = particle size constant	L = average travel distance in kilometers (roundtrip)

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Particle Size Multiplier (k), particle size <30µm	lb/VMT	4.9	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (k), particle size <10µm	lb/VMT	1.5	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (k), particle size <2.5µm	lb/VMT	0.15	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (a), particle size <30µm	-	0.7	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (a), particle size <10µm	-	0.9	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (a), particle size <2.5µm	-	0.9	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (b), particle size <30µm	-	0.45	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (b), particle size <10µm	-	0.45	US EPA AP-42, Section 13.2.2
Particle Size Multiplier (b), particle size <2.5µm	-	0.45	US EPA AP-42, Section 13.2.2
Surface Material Silt Content(s)	%	4.3	Assumed haul road to/from pit at taconite mine sites; US EPA AP-42, Section 13.2.2
Weight of Loaded 785D Haul Truck (W_{LOADED})	tons	275.6	Source: Merian Gold Mine Project Key characteristics Table; converted from tonnes to tons
Weight of Empty 785D Haul Truck (W_{EMPTY})	tons	121.3	Source: Merian Gold Mine Project Key characteristics Table; converted from tonnes to tons
Average Weight of 785D Haul Trucks (W)	tons	198.4	Source: Merian Gold Mine Project Key characteristics Table; converted from tonnes to tons
Average Truck Load (LOAD)	tonnes	170.1	Weight of loaded truck minus empty truck
# of days in a year with precipitation $\geq$ 0.254 mm, P	days/yr	183	Based on precipitation data recorded at the Merian Weather Station (Dec 2005 to Dec 2011)
Total Overburden Handled during Worst-Case Year at Merian 2 Pit (TM_{OB-i})	Mtpa	1.52	Source: Memo on Preliminary Waste Dump Design, GMining, dated 01 May 2012
Total Overburden Handled during Worst-Case Year at Maraba Pit (TM_{OB-ii})	Mtpa	62.42	Source: Memo on Preliminary Waste Dump Design, GMining, dated 01 May 2012
Total Overburden Handled during Worst-Case Year at Merian 1 Pit (TM_{OB-iii})	Mtpa	8.22	Source: Memo on Preliminary Waste Dump Design, GMining, dated 01 May 2012
Total Ore Handled during Worst-Case Year at Merian 2 Pit (TM_{O-i})	Mtpa	8.67	Source: Merian ESIA Project Description
Total Ore Handled during Worst-Case Year at Maraba Pit (TM_{O-ii})	Mtpa	5.33	Source: Merian ESIA Project Description
Total Ore Handled during Worst-Case Year at Merian 1 Pit (TM_{O-iii})	Mtpa	2.00	Source: Merian ESIA Project Description
Average Truck Travel Distance to Waste Dump areas, Roundtrip (L_{WD})	km	0.4	Based on an average 0.2 km distance from each pit to waste dump areas
Average Truck Travel Distance to Process Plant area, Roundtrip (L_{PP})	km	4.0	Based on an average 2 km distance from each pit to ROM stockpiles at Process Plant area
Control Factor (CF) - Watering, as necessary	%	50	Assume Level 1 watering (2 liters/m^2/hr) (Source: Australian NPI Emission Estimation Technique Manual for Mining, Table 4, Version 3.1, January 2012)

1lb/VMT = pound per vehicle mile traveled; Mtpa = million tonnes per annum; km = kilometers

C. Calculations

Emission Source	Vehicle Kilometers Traveled (VKT)	Control Factor (%)	Emission Estimates TSP (tonnes/yr)	PM_{10} (tonnes/yr)	$PM_{2.5}$ (tonnes/yr)
Truck transport of overburden from pits to waste dump areas					
Merian 2 Pit to Waste Dump West, Central, & East	3,574	50	3.96	0.99	0.10
Maraba Pit Waste Dump North, Central & East	146,776	50	163	40.5	4.05
Merian 1 Pit to Waste Dump South	19,329	50	21.4	5.34	0.53
Sub-total	*169,679*	50	*188*	*46.8*	*4.68*
Truck transport of ore from pits to ROM stockpiles at Process Plant area					
Merian 2 Pit to Process Plant Area	203,791	50	226	56.3	5.63
Maraba Pit to Process Plant Area	125,410	50	138.9	34.6	3.46
Merian 1 Pit to Process Plant Area	47,029	50	52.1	13.0	1.30
Sub-total	*376,229*	50	*417*	*104*	*10.4*
Total wheel generated dust from truck travel on unpaved roads	**545,908**	50	**604**	**151**	**15.1**

Table 16-1-8. Nonroad Diesel Engine Combustion Emissions at the Mine Site
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition, Equations 1 to 7, NR-009d, July 2010

$E = \sum(EF_{adj} \times P \times OP \times (1\ tonne/1{,}000{,}000\ g))$, where sum $\sum$) is from 1 to N	TAF = transient adjustment factor (unitless)
$EF_{adj(HC,CO,NOx)} = EF_{ss} \times TAF \times DF$	DF = deterioration factor (unitless)
$EF_{adj(PM)} = EF_{ss} \times TAF \times DF \times S_{PMadj}$	S_{PMadj} = adjustment to PM emission factor to account for variations in fuel sulfur content (g/hp-hr)
$EF_{adj(SO2)}$ = (BSFC x 453.6 x (1 - soxcnv) - HC) x 0.01 x soxdsl x 2	BSFC =in-use adjusted brake-specific fuel consumption (lb fuel/hp-hr)
$EF_{adj(BSFC)} = EF_{ss} \times TAF$	soxcnv = grams PM sulfur/grams fuel sulfur consumed
DF = 1 + A x (Age Factor)^b; where b = 1 for diesel compressor ignition engines	HC = in-use adjusted hydrocarbon emissions in g/hp-hr
Age Factor = (cumulative hours x load factor)/median life at full load, in hours	0.01 = conversion factor from weight percent to weight fraction
Cumulative hours = Equipment age in years x Activity in hours per year	soxdsl = episodic weight percent of sulfur in nonroad diesel fuel
S_{PMadj} = BSFC x 453.6 x 7.0 x soxcnv x 0.01 x (soxbas - soxdsl)	2 = grams of SO_2 formed from a gram of sulfur
	0.87 = carbon mass fraction of diesel
where:	453.6 = conversion factor from pounds to grams
E = annual emission rate; tons per year (tons/yr)	A = relative deterioration factor (%increase/%useful life)
EF_{adj} = final emission factor used in model, after adjustments to account for transient operation and deterioration (g/hp-hr)	b = constant between 0 and 1 for a given pollutant/technology type; b is 1 for diesel nonroad engines
P = diesel engine input; horsepower (hp)	Age Factor = fraction of median life expended
OP = annual operating hours; hours per year (hr/yr)	7.0 = grams PM sulfate/grams PM sulfur
N = number of diesel-fueled construction equipment	soxbas = default certification fuel sulfur weight percent
EF_{ss} = zero-hour, steady-state emission factor (g/hp-hr)	

B. Input Data

Diesel Engine Data	Units[1]	Value	Source/ Assumptions
Worst-case Mine Year	years	4.0	Year 4 is assumed to be the worst-case mine year for air pollution since it has the highest amount of overburden removed from concurrent operation of all 3 mine pits (~72.2 Mtpa) as well as a maximum amount of ore to be processed (16 Mtpa). Year 8 has a higher amount of overburden removed annually (74.04 Mtpa), but the amount of ore processed in Year 8 is expected to be much lower (~10 Mtpa) due to more hard ore being mined. As a result, Year 8 was not selected as the worst-case mine year.
Mine activity duration	days/yr	365	Based on the mine operating 365 days a year
Construction equip operating hours, per engine, (OP)	hrs/day	12	Assumed each mine equipment would operate for approximately 12 hours per day
	hrs/yr	4,380	Estimated based on operating hrs/day and activity duration
Equipment Age at worst-case Mine Year	years	4.0	Assumed all mine equipment were purchased new in Year 1
NONROAD median life at full load	hours	7,000	Assumed based on Tier 2 construction equipment >300 hp; NONROAD Model (USEPA 2010a)(1)
Episodic weight percent of sulfur in nonroad diesel fuel (soxdsl)	weight%	0.0020	Based on suggested average diesel fuel sulfur content for 2014 (i.e., year mining is projected to start) (USEPA 2010a)(1)
Grams PM sulfur/grams fuel sulfur consumed (soxcnv)	-	0.02247	(USEPA 2010b)(2)
Default certification fuel sulfur weight percent (soxbas)	weight%	0.33	(USEPA 2010b)(2)
Conversion Factor for total hydrocarbon (THC) exhaust emissions	-	1.053	VOC = THC x 1.053; (USEPA 2010c)(3)
Conversion Factor for particulate matter (PM) exhaust emissions	-	0.97	$PM_{2.5} = PM_{10} \times 0.97$; (USEPA 2010b)(2)

1 days/yr = days per year; hrs/day = hours per day; hrs/yr = hours per year

C. Calculations

Emission Source/ Description	# of Units	Maximum rated capacity (hp)	Load Factor(1)	Typical Annual Activity (hrs/yr)(1)	BSFC (g/hp-hr)(2)	Mine operating hours (hrs/yr)	In-use adjusted emission factors, EF_{adj} (g/hp-hr)(3)						Emission estimates (tonnes/year)					
							NOx	CO	VOC(3)	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC	PM_{10}	$PM_{2.5}$	SO_2
Merian 2, Maraba, and Merian 1 Pits																		
Hydraulic Excavators (Hitachi EX3600 Backhoe Configuration)	2	1,944	0.59	1,093	0.371	4,380	4.525	2.037	0.408	0.026	0.026	0.0066	77.1	34.7	6.94	0.45	0.44	0.11
Hydraulic Excavators (Hitachi EX3600 Face Shovel Configuration)	4	1,944	0.59	1,093	0.371	4,380	3.908	1.213	0.187	0.016	0.016	0.0066	133	41.3	6.36	0.56	0.54	0.22
Caterpillar 785D Haul Trucks (140t wet payload)	39	1,450	0.59	1,641	0.371	4,380	3.914	1.235	0.188	0.018	0.017	0.0066	970	306	46.6	4.39	4.26	1.627
Blast Hole Drills (Atlas Copco DML rotary drills)	6	330	0.43	466	0.367	4,380	4.340	0.852	0.176	0.012	0.012	0.0065	37.6	8.15	1.69	0.11	0.11	0.062
Motor Graders (CAT 16H)	6	288	0.59	962	0.371	4,380	3.811	1.181	0.345	0.016	0.016	0.0066	28.8	8.94	2.61	0.12	0.12	0.050
Large Track Dozer (CAT D10T)	8	646	0.59	936	0.371	4,380	3.906	2.095	0.187	0.016	0.016	0.0066	88.4	47.4	4.22	0.37	0.35	0.15
Excavators (CAT 349D 45t))	6	380	0.59	1,093	0.371	4,380	4.132	1.337	0.187	0.016	0.016	0.0066	41.3	13.4	1.87	0.16	0.16	0.066
Water Trucks (CAT 785D or smaller)	2	1,450	0.59	1,641	0.371	4,380	3.914	1.235	0.188	0.018	0.017	0.0066	49.7	15.7	2.39	0.23	0.22	0.083
Fuel and Lube Trucks (CAT 740B)	2	489	0.59	1,641	0.371	4,380	3.914	1.235	0.188	0.018	0.017	0.0066	16.8	5.29	0.81	0.076	0.074	0.028
D-6 Wide Pad Utility Dozers	2	140	0.59	899	0.371	4,380	3.906	2.093	0.186	0.016	0.016	0.0066	4.79	1.41	0.13	0.011	0.011	0.0044
												Nonroad diesel engine emissions:	**1,447**	**482**	**73.6**	**6.48**	**6.28**	**2.40**

Notes:

(1) US Environmental Protection Agency (USEPA) 2010a. Median Life, Annual Activity, and Load Factor Values for Nonraod Engine Emissions Modeling, EPA-420-R-10-016, NR-005d, July 2010

(2) US Environmental Protection Agency (USEPA) 2010b. Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition, EPA-420-R-10-018, NR-009d, July 2010

(3) Emission factors of total hydrocarbons (THC) for nonroad sources were converted to volatile organic compounds (VOCs) by multiplying by a factor of 1.053 (Source:USEPA's Conversion Factors for Hydrocarbon Emission Components, EPA-420-R-10-015, NR-002d, July 2010 (USEPA 2010c)

Table 16-1-9. Crushing and Grinding Activities at the Process Plant
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology
Reference - US EPA AP-42, Section 11.24. Metallic Minerals Processing - Table 11.24-1, US EPA August 1982 (Reformatted January 1995).

	where:
$EF_1 = 0.2$	EF_1 = TSP emission factor for primary crushing in kg/ megagram or kg/tonne
$EF_2 = 0.02$	$EF_2 = PM_{10}$ emission factor for primary crushing in kg/ megagram or kg/tonne
$EF_3 = EF_1 \times 0.075$	$EF_3 = PM_{2.5}$ emission factor for primary crushing in kg/ megagram or kg/tonne
$EF_4 = 0.03$	EF_4 = TSP emission factor for pebble (tertiary) crushing in kg/ megagram or kg/tonne
$EF_5 = 0.01$	$EF_5 = PM_{10}$ emission factor for pebble (tertiary) crushing in kg/ megagram or kg/tonne
$EF_6 = EF_1 \times 0.075$	$EF_6 = PM_{2.5}$ emission factor for pebble (tertiary) crushing in kg/ megagram or kg/tonne
EF_7 = Negligible	EF_7 = TSP emission factor for wet grinding in kg/ megagram or kg/tonne
EF_8 = Negligible	$EF_8 = PM_{10}$ emission factor for wet grinding in kg/ megagram or kg/tonne
EF_9 = Negligible	$EF_9 = PM_{2.5}$ emission factor for wet grinding in kg/ megagram or kg/tonne
$E_{1-12} = EF_{1-12} \times TM \times (1 \text{ tonne}/1000 \text{ kg}) \times (1-CF/100)$	E_{1-9} = Emissions estimates in tonnes/year
	TM = Total material to be cushed and grinded in tonnes/year
	CF = Control factor (%)

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Total material (saprolite, saprock, and fresh rock) to be crushed and grinded at the Process Plant during worst-case mine year, TM	Mtpa	16.0	The maximum 16 Mtpa from all 3 pits is based on the extraction of mostly soft ores (high moisture content).

1 Mtpa = million tonnes per annum

C. Calculations

Emission Source/ Activity	Control Factor (%)	Emission Estimates (tonnes/year)		
		TSP	PM_{10}	$PM_{2.5}$
Process Plant Area				
Primary crushing at Process Plant[1]	50	80.0	32.0	6.00
Pebble (tertiary) crushing due to wet ore feed at Process Plant[1]	50	240	80.0	18.0
Wet grinding at Process Plant[2]	0	0	0	0
Total	**0**	**320**	**112**	**24.0**

[1]Assumes 50% control for primary crushing and pebble/tertiary crushing due to water sprays on ore feed and SAG discharge, respectively (Source: Australian NPI Emission Estimation Technique Manual for Mining, Table 4, Version 3.1, January 2012)

[2]Particulate emissions from wet grinding are negligible per US EPA AP-42, Section 11.24, Table 11.24-1 (August 1982; reformatted January 1985)

Table 16-1-10. 52.5 MWe Power Plant Combustion Emissions at the Process Plant Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference 1: IFC EHS Guidelines for Thermal Plants, Table 6(A), December 2008.

Reference 2 - US EPA AP-42, Section 3.4. Large Stationary Diesel And All Stationary Dual-fuel Engines - Table 3.4-1, US EPA October 1996.

Reference 3 - US Code of Federal Regulations, Title 40, Part 98, Subpart C - Mandatory GHG Reporting - General Stationary Fuel Combustion Sources (40 CFR 98.33)

$E_1 = EF_1$ x HI x (1 tonne/2,204.62 lbs) x OP	$E_2 = EF_2$ x FD x FC x (10^6 liters/1 million liters) x (1m³/1,000 liters) x (1 tonne/10^9 milligrams)
EF_1 = Emission factors in lb/MMBtu of fuel	EF_2 = Emission factors in milligrams per kilograms of fuel
HI = Heat input in MMBtu/hr	FD = Fuel density in kg/m³
OP = Annual operation hours in hours/year	FC = Fuel consumption in million gallons per year

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Installed capacity of HFO power plant (power output)	MWe	63.0	Provided by GMining on 31 Jan2012; based on six 10.5 MWe reciprocating engines. The 63 MWe is equivalent to approximately 159.4 MWth, assuming a 2.53 conversion ratio from MWe to MWth (per IFC EHS Guidelines for Thermal Plant, Table 6(A). Dec 2008).
Maximum running capacity of HFO power plant (power output)	MWe	52.5	Provided by GMining on 31 Jan2012; assumed a maximum of five of the six 10.5 MWe engines would be running with the last one on stand-by (most times, only four gensets would be running with two on stand-by)
Dry gas, excess O_2 content (reciprocating engine)	%	15	Source: IFC EHS Guidelines for Thermal Plants, December 19, 2008
Exhaust Stack height	m	30	Provided by GMining on 31 Jan2012
Exhaust stack temperature at exit point (@ 25°C ambient)	°C	313	Provided by GMining on 31 Jan2012
	K	586.15	
Exhaust stack stack diameter (inner)	mm	1,200	Provided by GMining on 31 Jan2012
Exhaust stack stack velocity	m/s	32.8	Provided by GMining on 31 Jan2012
Exhaust stack flow	m³/s	37.1	Calculated based on the exhaust velocity and inner stack diameter
	scf/min	78,602	
Sulfur content of heavy fuel oil (HFO)	wt %	0.745	Based on heavy fuel oil analysis (Grade 240SS) provided by GMining on 14 Mar2012
Density of heavy fuel oil	kg/m³	975.3	Based on heavy fuel oil analysis (Grade 240SS) provided by GMining on 14 Mar2012
Heat input	MMBtu/hr	179	1 MWe = 3,412,141.16 Btu/hr
Molar volume of any gas at0°C and 1 atm	L/g-mol	22.4	Molar volume at standard temperature and pressure
	scf/lb-mol	359	Molar volume at standard temperature and pressure
F_d factor on dry basis for fuel oil	dscf/MMBtu	9,190	Source: US EPA Method 19
Overall plant utilization	%	92	Provided by GMining
Annual hours of operation	hrs/yr	8,059.2	Based on 8,760 hrs/year times overall plant utilization

[1]MWe = megawatt electricity output;MWth = megawatt thermal input on high heat value basis; % = percent; m = meters; °C = degree Celsius; K = Kelvin, mm = millimeters; m/s = meters per secons; m³/s = cubic meters per second; scf/min = standard cubic feet per minute; wt % = weight percent; kg/m3 = kilograms per cubic meters; MMBtu/hr = million British Thermal Units per hour; L/g-mol = liters per gram-mole; scf/lb-mol = standard cubic feet per pound-mole; dscf/MMBtu = dry standard cubic feet per million British Thermal Unit; and hrs/yr = hours per year.

C. Calculations

Pollutant	Control Factor (%)	Maximum Emission Estimates				
		mg/Nm³ @ 0°C, 1 atm[(1)]	ppmvd @ 0°C, 1 atm[(2)]	lb/MMBtu[(3)]	mg/kg[(4)]	tonnes/year
Criteria Pollutant						
NOx	0	1,850	901	3.76	N/A	2,461
CO	0	N/A	N/A	0.85	N/A	557
VOC	0	N/A	N/A	0.082	N/A	53.6
PM_{10} /$PM_{2.5}$	0	50	N/A	0.10	N/A	66.5
SO_2	0	N/A	N/A	0.752	N/A	493
Pb	0	N/A	N/A	N/A	1.0	0.052
Hazardous Air Pollutants and PAHs						
Benzene[(5)]	0	N/A	N/A	0.000776	N/A	0.51
Toluene[(5)]	0	N/A	N/A	0.000281	N/A	0.18
Xylenes[(5)]	0	N/A	N/A	0.000193	N/A	0.13
Propylene[(5)]	0	N/A	N/A	0.00279	N/A	1.83
Formaldehyde[(5)]	0	N/A	N/A	0.0000789	N/A	0.052
Acetaldehyde[(5)]	0	N/A	N/A	0.0000252	N/A	0.017
Acrolein[(5)]	0	N/A	N/A	0.00000788	N/A	0.0052
Total HAPs	0	N/A	N/A	0.00415198	N/A	2.72
Total PAHs	0	N/A	N/A	0.000212	N/A	0.14
Metals						
Aluminium	0	N/A	N/A	N/A	5.0	0.259
Silicon	0	N/A	N/A	N/A	10.0	0.518
Sodium	0	N/A	N/A	N/A	2.0	0.104
Vanadium	0	N/A	N/A	N/A	13.0	0.674
Nickel	0	N/A	N/A	N/A	39.0	2.021
Iron	0	N/A	N/A	N/A	8.0	0.415
Calcium	0	N/A	N/A	N/A	24.0	1.244
Zinc	0	N/A	N/A	N/A	6.0	0.311
Phosphorus	0	N/A	N/A	N/A	1.0	0.052
Magnesium	0	N/A	N/A	N/A	1.0	0.052
Potassium	0	N/A	N/A	N/A	1.0	0.052

Notes:

mg/Nm³ = milligram per normal cubic meters; ppmvd = parts per million (volume basis, dry); lb/MMBtu = pound per million British Thermal Unit

(1) NOx and PM emission concentrations in mg/Nm³ were based on IFC's limits for reciprocating engines burning liquid fuel (IFC EHS Guidelines for Thermal Plants, December 19, 2008). It should be noted actual NOx and PM concentrations/emissions from the new reciprocating engines would likely be lower. Assume PM = PM_{10} = $PM_{2.5}$

(2) NOx emissions in ppmvd was calculated based on IFC's NOx conc limit of 1,850 mg/Nm³ for reciprocating engines, volume of any gas at 0°C and 1 atm (22.4 L/g-mole), and molecular weight of NO_2 (46 g/g-mol).

(3) NOx and PM emission factors in lb/MMBtu were calculated based on their concentrations in mg/Nm³, 22.4 L/g-mol at 0°C and 1 atm (vol of gas at STP), Fd factor on dry basis for fuel oil per US EPA Method 19 (9190 dscf/MMBtu), 359 scf/lb-mol at 0°C and 1 atm (vol of gas at STP), and 15% O_2 in exhaust. Emission factors in lb/MMBtu for other criteria pollutants, HAPs, and PAHs were taken from US EPA AP-42, Chapter 3.4.

(4) Emission factors for metals (including lead) in mg/kg were based on heavy fuel oil analysis (Grade 240SS) provided by GMining on 14 Mar2012

(5) Hazardous Air Pollutant

Table 16-1-11. Wind Erosion Emissions from Exposed Storage Piles at the Process Plant Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.5, Industrial Wind Erosion - Eqn 2, US EPA Nov 2006.

EF = k x Sum(Pi), sum is from 1 to N (Equation 2)	
where:	
EF = emission factor ($g/m^2/yr$)	u* is the friction velocity (= 0.1 times the surface wind speed distribution, u_s^+ (m/s))
k = particle size multiplier (unitless)	u_s^+ = surface wind speed distribution = $(u_s/u_r) \times u_{10}^+$
N = number of disturbances per year	u_s/u_r = ratio of surface wind speed (u_s) to approach wind speed (u_r) (see US EPA AP-42, Table 13.2.5-3)
Pi = erosion potential function based on fastest mile between disturbances (g/m^2)	u_t^* = threshold friction velocity (m/s) = 1.12 m/s for uncrusted coal pile from AP-42 Table 13.2.5-2 (u_t^* for uncrusted coal pile has been assumed for the mine ore).
$P = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*)$ (equation 3)	The fastest mile is defined as the fastest observed one mile of wind from the Merian Mine Site in Suriname for the period Jan 2006-Dec 2011.
P = 0 for $u^* < u_t^*$	

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Threshold friction velocity (ut*)	m/s	1.02	US EPA AP-42, Table 13.2.5-2
Frequency of disturbance, N	day/yr	365	Assume surface is disturbed daily
Particle size multiplier (k), particle size <30 µm	-	1	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <10 µm	-	0.5	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <2.5 µm	-	0.075	US EPA AP-42, Section 13.2.5
Total disturbed area for two stockpiles at the Process Plant area	ha	26	Source: Merian Gold Mine Project Key characteristics Table dated 23 Nov 2011
Control factor	%	80	Assumed a 80% control factor due to the high moisture content of the ore (as high as 20% for soft ores) plus high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station)

1m/s = meters per second; days/yr = days per year; ha = hectares

C. Pile Surface Area Disturbed (Conical Pile)

Area ID	u_s/u_r	Pile Surface %	Pile Surface Area (m^2)
A	0.9	12	3,877
B	0.6	48	15,510
$C_1 + C_2$	0.2	40	12,925
Total			32,312

D. Calculations

Month	Erosion Potential Emission Factors: Fastest Mile, u_{10}^+ (mph)	Fastest Mile, u_{10}^+ (m/s)[1]	Threshold Friction Velocity for Ore, u_t (m/s)	Friction Velocity, $u^* = 0.1u_s^+$ (m/s): u_s/u_r: 0.2	u_s/u_r: 0.6	u_s/u_r: 0.9	Does Wind Erosion Occur? (Yes/No)	# of Wind Erosion Events Per Month[2]	$(u^*-u_t^*)$	$(u^*-u_t^*)^2$	P (g/m^2)	No. of Piles	Average Pile Radius	Average Pile Height (m)	Total Disturbed Surface Area (m^2)	Control Factor (%)	Controlled Wind Erosion Emissions (tonnes): TSP	PM_{10}	$PM_{2.5}$
January	29.16	13.04	1.12	0.26	0.78	1.17	Yes	1	0.05	0.003	1.49	4.0	50.0	12.0	32,312	80	0.01	0.00	0.001
February	30.95	13.83	1.12	0.28	0.83	1.25	Yes	2	0.13	0.016	4.03	4.0	50.0	12.0	32,312	80	0.05	0.03	0.004
March	50.56	22.60	1.12	0.45	1.36	2.03	Yes	2	0.91	0.835	71.30	4.0	50.0	12.0	32,312	80	0.92	0.46	0.07
April	65.68	29.36	1.12	0.59	1.76	2.64	Yes	4	1.52	2.318	172.52	4.0	50.0	12.0	32,312	80	4.46	2.23	0.33
May	30.05	13.43	1.12	0.27	0.81	1.21	Yes	1	0.09	0.008	2.69	4.0	50.0	12.0	32,312	80	0.02	0.01	0.001
June	26.48	11.84	1.12	0.24	0.71	1.07	No	0	N/A	N/A	0	4.0	50.0	12.0	32,312	80	0.00	0.00	0.00
July	36.29	16.22	1.12	0.32	0.97	1.46	Yes	4	0.34	0.116	15.21	4.0	50.0	12.0	32,312	80	0.39	0.20	0.03
August	25.60	11.44	1.12	0.23	0.69	1.03	No	0	N/A	N/A	0	4.0	50.0	12.0	32,312	80	0.00	0.00	0.00
September	73.74	32.96	1.12	0.66	1.98	2.97	Yes	6	1.85	3.410	243.96	4.0	50.0	12.0	32,312	80	9.46	4.73	0.71
October	65.68	29.36	1.12	0.59	1.76	2.64	Yes	1	1.52	2.318	172.52	4.0	50.0	12.0	32,312	80	1.11	0.56	0.08
November	67.48	30.17	1.12	0.60	1.81	2.71	Yes	4	1.59	2.544	187.40	4.0	50.0	12.0	32,312	80	4.84	2.42	0.36
December	30.95	13.83	1.12	0.28	0.83	1.25	Yes	1	0.13	0.016	4.03	4.0	50.0	12.0	32,312	80	0.03	0.01	0.002
Annual Wind Erosion Emissions from Stockpiles at Plant Area (tonnes/year)																	**21.3**	**10.6**	**1.60**

Note:

1 Maximum fastest mile for each month were taken from Merian Weather Station at the Mine Site in Suriname (data from Jan 2006 to Dec 2011).

2 The number of wind erosion events per month was estimated based on the recorded daily fastest mile values and the calculated friction velocity.

3. There would be approximately four storage piles at the process plant area, each assumed to have a diameter and height of 100 m and 12 m, respectively.

4. The disturbed surface area, S, of each storage pile was calculated as follows: S = π x pile radius x SQRT (pile radius² + pile height²); Source: EPA AP-42, Section 13.2.5 dated 11/06

5. Assumed a 80% control factor to account for the concurrent reclamation of storage piles, high moisture content of the ore (as high as 20% for soft ores) plus high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station)

Table 16-1-12. Wind Erosion Emissions from Exposed West Dump Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.5, Industrial Wind Erosion - Equation 2, US EPA November 2006.

EF = k x Sum(Pi), sum is from 1 to N (Equation 2)

where:
EF = emission factor ($g/m^2/yr$)
k = particle size multiplier (unitless)
N = number of disturbances per year
Pi = erosion potential function based on fastest mile between disturbances (g/m^2)
$P = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*)$ (equation 3)
$P = 0$ for $u^* < u_t^*$
u^* is the friction velocity (= 0.053 times the fastest mile at a reference anaemometer height of 10 m, u_{10}^+ (m/s))
u_t^* = threshold friction velocity (m/s) = 1.02 m/s for overburden from AP-42 Table 13.2.5-2.
The fastest mile is defined as the fastest observed one mile of wind from the Merian Mine Site in Suriname for the period Jan 2006 - Dec 2011.

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Threshold friction velocity (ut*)	m/s	1.02	US EPA AP-42, Table 13.2.5-2
Frequency of disturbance, N	day/yr	365	Assume surface is disturbed daily
Particle size multiplier (k), particle size <30 µm	-	1	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <10 µm	-	0.5	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <2.5 µm	-	0.075	US EPA AP-42, Section 13.2.5

[1]m/s = meters per second; days/yr = days per year

C. Calculations

Month	Erosion Potential Emission Factors				Does Wind Erosion Occur? (Yes/No)	# of Wind Erosion Events Per Month	$(u^*-u_t^*)$	$(u^*-u_t^*)^2$	P (g/m^2)	Total Exposed Surface Area (m^2)	Total Disturbed Surface Area (m^2)	Control Factor (%)	Controlled Wind Erosion Emissions (tonnes)		
	Fastest Mile, u_{10}^+ (mph)	Fastest Mile, u_{10}^+ (m/s)	Threshold Friction Velocity for Overburden, u_t (m/s)	Friction Velocity, u* (m/s)									TSP	PM_{10}	$PM_{2.5}$
January	29.16	13.04	1.02	0.69	No	0	N/A	N/A	0	1,140,000	114,000	80	0	0	0
February	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	1,140,000	114,000	80	0	0	0
March	50.56	22.60	1.02	1.20	Yes	1	0.18	0.032	6.28	1,140,000	114,000	80	0.14	0.07	0.01
April	65.68	29.36	1.02	1.56	Yes	2	0.54	0.287	30.08	1,140,000	114,000	80	1.37	0.69	0.10
May	30.05	13.43	1.02	0.71	No	0	N/A	N/A	0	1,140,000	114,000	80	0	0	0
June	26.48	11.84	1.02	0.63	No	0	N/A	N/A	0	1,140,000	114,000	80	0	0	0
July	36.29	16.22	1.02	0.86	No	0	N/A	N/A	0	1,140,000	114,000	80	0	0	0
August	25.60	11.44	1.02	0.61	No	0	N/A	N/A	0	1,140,000	114,000	80	0	0	0
September	73.74	32.96	1.02	1.75	Yes	6	0.73	0.529	48.83	1,140,000	114,000	80	6.68	3.34	0.50
October	65.68	29.36	1.02	1.56	Yes	1	0.54	0.287	30.08	1,140,000	114,000	80	0.69	0.34	0.05
November	67.48	30.17	1.02	1.60	Yes	1	0.58	0.335	33.90	1,140,000	114,000	80	0.77	0.39	0.06
December	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	1,140,000	114,000	80	0	0	0
Annual Wind Erosion Emissions from Waste Dump - West (tonnes/year)													**9.65**	**4.83**	**0.72**

Notes:

- Maximum fastest mile for each month were taken from Merian Weather Station at the Mine Site in Suriname (data from Jan 2006 to Dec 2011).

- The number of wind erosion events per month was estimated based on the recorded daily fastest mile values and the calculated friction velocity.

- Total exposed surface area of 114 ha was based on GIS measurements from site/ infrastructure layout maps.

- Total disturbed area was estimated by assuming 10% of the exposed surface area would be disturbed at any given time.

- Assumed a 80% control factor to account for concurrent reclamation of waste dumps (both planned and natural), high moisture content of the waste material (approx. 20% for saprolite and 6% for rock), and the high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station).

Table 16-1-13. Wind Erosion Emissions from Exposed North Dump Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.5, Industrial Wind Erosion - Equation 2, US EPA November 2006.

EF = k x Sum(Pi), sum is from 1 to N (Equation 2)

where:
EF = emission factor ($g/m^2/yr$)
k = particle size multiplier (unitless)
N = number of disturbances per year
Pi = erosion potential function based on fastest mile between disturbances (g/m^2)
$P = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*)$ (equation 3)

$P = 0$ for $u^* < u_t^*$

u^* is the friction velocity (= 0.053 times the fastest mile at a reference anaemometer height of 10 m, u_{10}^+ (m/s))

u_t^* = threshold friction velocity (m/s) = 1.02 m/s for overburden from AP-42 Table 13.2.5-2.

The fastest mile is defined as the fastest observed one mile of wind from the Merian Mine Site in Suriname for the period Jan 2006 - Dec 2011.

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Threshold friction velocity (u_t^*)	m/s	1.02	US EPA AP-42, Table 13.2.5-2
Frequency of disturbance, N	day/yr	365	Assume surface is disturbed daily
Particle size multiplier (k), particle size <30 µm	-	1	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <10 µm	-	0.5	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <2.5 µm	-	0.075	US EPA AP-42, Section 13.2.5

1m/s = meters per second; days/yr = days per year

C. Calculations

Month	Erosion Potential Emission Factors				Does Wind Erosion Occur? (Yes/No)	# of Wind Erosion Events Per Month	$(u^*-u_t^*)$	$(u^*-u_t^*)^2$	P (g/m^2)	Total Exposed Surface Area (m^2)	Total Disturbed Surface Area (m^2)	Control Factor (%)	Controlled Wind Erosion Emissions (tonnes)		
	Fastest Mile, u_{10}^+ (mph)	Fastest Mile, u_{10}^+ (m/s)	Threshold Friction Velocity for Overburden, u_t (m/s)	Friction Velocity, u^* (m/s)									TSP	PM_{10}	$PM_{2.5}$
January	29.16	13.04	1.02	0.69	No	0	N/A	N/A	0	1,940,000	194,000	80	0	0	0
February	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	1,940,000	194,000	80	0	0	0
March	50.56	22.60	1.02	1.20	Yes	1	0.18	0.032	6.28	1,940,000	194,000	80	0.24	0.12	0.018
April	65.68	29.36	1.02	1.56	Yes	2	0.54	0.287	30.08	1,940,000	194,000	80	2.33	1.17	0.18
May	30.05	13.43	1.02	0.71	No	0	N/A	N/A	0	1,940,000	194,000	80	0	0	0
June	26.48	11.84	1.02	0.63	No	0	N/A	N/A	0	1,940,000	194,000	80	0	0	0
July	36.29	16.22	1.02	0.86	No	0	N/A	N/A	0	1,940,000	194,000	80	0	0	0
August	25.60	11.44	1.02	0.61	No	0	N/A	N/A	0	1,940,000	194,000	80	0	0	0
September	73.74	32.96	1.02	1.75	Yes	6	0.73	0.529	48.83	1,940,000	194,000	80	11.4	5.68	0.85
October	65.68	29.36	1.02	1.56	Yes	1	0.54	0.287	30.08	1,940,000	194,000	80	1.17	0.58	0.09
November	67.48	30.17	1.02	1.60	Yes	1	0.58	0.335	33.90	1,940,000	194,000	80	1.32	0.66	0.10
December	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	1,940,000	194,000	80	0	0	0
Annual Wind Erosion Emissions from Waste Dump - North (tonnes/year)													**16.4**	**8.21**	**1.23**

Notes:

- Maximum fastest mile for each month were taken from Merian Weather Station at the Mine Site in Suriname (data from Jan 2006 to Dec 2011)
- The number of wind erosion events per month was estimated based on the recorded daily fastest mile values and the calculated friction velocity
- Total disturbed area of 194 ha was based on GIS measurements from site/ infrastructure layout maps
- Total disturbed area was estimated by assuming 10% of the exposed surface area would be disturbed at any given time
- Assumed a 80% control factor to account for concurrent reclamation of waste dumps (both planned and natural), high moisture content of the waste material (approx. 20% for saprolite and 6% for rock), and the high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station).

Table 16-1-14. Wind Erosion Emissions from Exposed Central Dump Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.5, Industrial Wind Erosion - Equation 2, US EPA November 2006.

EF = k x Sum(Pi), sum is from 1 to N (Equation 2)

where:

EF = emission factor ($g/m^2/yr$)

k = particle size multiplier (unitless)

N = number of disturbances per year

Pi = erosion potential function based on fastest mile between disturbances (g/m^2)

$P = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*)$ (equation 3)

$P = 0$ for $u^* < u_t^*$

u^* is the friction velocity (= 0.053 times the fastest mile at a reference anaemometer height of 10 m, u_{10}^+ (m/s))

u_t^* = threshold friction velocity (m/s) = 1.02 m/s for overburden from AP-42 Table 13.2.5-2.

The fastest mile is defined as the fastest observed one mile of wind from the Merian Mine Site in Suriname for the period Jan 2006 - Dec 2011.

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Threshold friction velocity (ut*)	m/s	1.02	US EPA AP-42, Table 13.2.5-2
Frequency of disturbance, N	day/yr	365	Assume surface is disturbed daily
Particle size multiplier (k), particle size <30 µm	-	1	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <10 µm	-	0.5	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <2.5 µm	-	0.075	US EPA AP-42, Section 13.2.5

1m/s = meters per second; days/yr = days per year

C. Calculations

Month	Erosion Potential Emission Factors				Does Wind Erosion Occur? (Yes/No)	# of Wind Erosion Events Per Month	$(u^*-u_t^*)$	$(u^*-u_t^*)^2$	P (g/m^2)	Total Exposed Surface Area (m^2)	Total Disturbed Surface Area (m^2)	Control Factor (%)	Controlled Wind Erosion Emissions (tonnes)		
	Mile, u_{10}^+ (mph)	Mile, u_{10}^+ (m/s)	Friction Velocity for Overburden,	Velocity, u* (m/s)									TSP	PM_{10}	$PM_{2.5}$
January	29.16	13.04	1.02	0.69	No	0	N/A	N/A	0	2,260,000	226,000	80	0	0	0
February	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	2,260,000	226,000	80	0	0	0
March	50.56	22.60	1.02	1.20	Yes	1	0.18	0.032	6.28	2,260,000	226,000	80	0.28	0.14	0.021
April	65.68	29.36	1.02	1.56	Yes	2	0.54	0.287	30.08	2,260,000	226,000	80	2.72	1.36	0.20
May	30.05	13.43	1.02	0.71	No	0	N/A	N/A	0	2,260,000	226,000	80	0	0	0
June	26.48	11.84	1.02	0.63	No	0	N/A	N/A	0	2,260,000	226,000	80	0	0	0
July	36.29	16.22	1.02	0.86	No	0	N/A	N/A	0	2,260,000	226,000	80	0	0	0
August	25.60	11.44	1.02	0.61	No	0	N/A	N/A	0	2,260,000	226,000	80	0	0	0
September	73.74	32.96	1.02	1.75	Yes	6	0.73	0.529	48.83	2,260,000	226,000	80	13.24	6.62	0.99
October	65.68	29.36	1.02	1.56	Yes	1	0.54	0.287	30.08	2,260,000	226,000	80	1.36	0.68	0.10
November	67.48	30.17	1.02	1.60	Yes	1	0.58	0.335	33.90	2,260,000	226,000	80	1.53	0.77	0.11
December	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	2,260,000	226,000	80	0	0	0
Annual Wind Erosion Emissions from Waste Dump - East (tonnes/year)													**19.1**	**9.57**	**1.44**

Assumptions:

- Maximum fastest mile for each month were taken from Merian Weather Station at the Mine Site in Suriname (data from Jan 2006 to Dec 2011)
- The number of wind erosion events per month was estimated based on the recorded daily fastest mile values and the calculated friction velocity
- Total disturbed area of 226 ha was based on GIS measurements from site/ infrastructure layout maps
- Total disturbed area was estimated by assuming 10% of the exposed surface area would be disturbed at any given time
- Assumed a 80% control factor to account for concurrent reclamation of waste dumps (both planned and natural), high moisture content of the waste material (approx. 20% for saprolite and 6% for rock), and the high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station).

Table 16-1-15. Wind Erosion Emissions from Exposed East Dump Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.5, Industrial Wind Erosion - Equation 2, US EPA November 2006.

EF = k x Sum(Pi), sum is from 1 to N (Equation 2)

where:
EF = emission factor ($g/m^2/yr$)
k = particle size multiplier (unitless)
N = number of disturbances per year
Pi = erosion potential function based on fastest mile between disturbances (g/m^2)
$P = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*)$ (equation 3)

P = 0 for $u^* < u_t^*$

u^* is the friction velocity (= 0.053 times the fastest mile at a reference anaemometer height of 10 m, u_{10}^+ (m/s))

u_t^* = threshold friction velocity (m/s) = 1.02 m/s for overburden from AP-42 Table 13.2.5-2.

The fastest mile is defined as the fastest observed one mile of wind from the Merian Mine Site in Suriname for the period Jan 2006 - Dec 2011.

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Threshold friction velocity (ut*)	m/s	1.02	US EPA AP-42, Table 13.2.5-2
Frequency of disturbance, N	day/yr	365	Assume surface is disturbed daily
Particle size multiplier (k), particle size <30 µm	-	1	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <10 µm	-	0.5	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <2.5 µm	-	0.075	US EPA AP-42, Section 13.2.5

1m/s = meters per second; days/yr = days per year

C. Calculations

Month	Erosion Potential Emission Factors				Does Wind Erosion Occur? (Yes/No)	# of Wind Erosion Events Per Month	$(u^*-u_t^*)$	$(u^*-u_t^*)^2$	P (g/m^2)	Total Exposed Surface Area (m^2)	Total Disturbed Surface Area (m^2)	Control Factor (%)	Controlled Wind Erosion Emissions (tonnes)		
	Fastest Mile, u_{10}^+ (mph)	Fastest Mile, u_{10}^+ (m/s)	Threshold Friction Velocity for Overburden, u_t (m/s)	Friction Velocity, u^* (m/s)									TSP	PM_{10}	$PM_{2.5}$
January	29.16	13.04	1.02	0.69	No	0	N/A	N/A	0	2,520,000	252,000	80	0	0	0
February	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	2,520,000	252,000	80	0	0	0
March	50.56	22.60	1.02	1.20	Yes	1	0.18	0.032	6.28	2,520,000	252,000	80	0.32	0.16	0.024
April	65.68	29.36	1.02	1.56	Yes	2	0.54	0.287	30.08	2,520,000	252,000	80	3.03	1.52	0.23
May	30.05	13.43	1.02	0.71	No	0	N/A	N/A	0	2,520,000	252,000	80	0	0	0
June	26.48	11.84	1.02	0.63	No	0	N/A	N/A	0	2,520,000	252,000	80	0	0	0
July	36.29	16.22	1.02	0.86	No	0	N/A	N/A	0	2,520,000	252,000	80	0	0	0
August	25.60	11.44	1.02	0.61	No	0	N/A	N/A	0	2,520,000	252,000	80	0	0	0
September	73.74	32.96	1.02	1.75	Yes	6	0.73	0.529	48.83	2,520,000	252,000	80	14.8	7.38	1.11
October	65.68	29.36	1.02	1.56	Yes	1	0.54	0.287	30.08	2,520,000	252,000	80	1.52	0.76	0.11
November	67.48	30.17	1.02	1.60	Yes	1	0.58	0.335	33.90	2,520,000	252,000	80	1.71	0.85	0.13
December	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	2,520,000	252,000	80	0	0	0
Annual Wind Erosion Emissions from Waste Dump - East (tonnes/year)													**21.3**	**10.7**	**1.60**

Assumptions:

- Maximum fastest mile for each month were taken from Merian Weather Station at the Mine Site in Suriname (data from Jan 2006 to Dec 2011)
- The number of wind erosion events per month was estimated based on the recorded daily fastest mile values and the calculated friction velocity
- Total disturbed area of 252 ha was based on GIS measurements from site/ infrastructure layout maps
- Total disturbed area was estimated by assuming 10% of the exposed surface area would be disturbed at any given time
- Assumed a 80% control factor to account for concurrent reclamation of waste dumps (both planned and natural), high moisture content of the waste material (approx. 20% for saprolite and 6% for rock), and high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station).

Table 16-1-16. Wind Erosion Emissions from Exposed South Dump Area
Merian Gold Mine Project, Suriname, South America
Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.5, Industrial Wind Erosion - Equation 2, US EPA November 2006.

EF = k x Sum(Pi), sum is from 1 to N (Equation 2)

where:
EF = emission factor ($g/m^2/yr$)
k = particle size multiplier (unitless)
N = number of disturbances per year

Pi = erosion potential function based on fastest mile between disturbances (g/m^2)
$P = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*)$ (equation 3)

$P = 0$ for $u^* < u_t^*$
u^* is the friction velocity (= 0.053 times the fastest mile at a reference anaemometer height of 10 m, u_{10}^+ (m/s))

u_t^* = threshold friction velocity (m/s) = 1.02 m/s for overburden from AP-42 Table 13.2.5-2.

The fastest mile is defined as the fastest observed one mile of wind from the Merian Mine Site in Suriname for the period Jan 2006 - Dec 2011.

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Threshold friction velocity (ut*)	m/s	1.02	US EPA AP-42, Table 13.2.5-2
Frequency of disturbance, N	day/yr	365	Assume surface is disturbed daily
Particle size multiplier (k), particle size <30 μm	-	1	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <10 μm	-	0.5	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <2.5 μm	-	0.075	US EPA AP-42, Section 13.2.5

1m/s = meters per second; days/yr = days per year

C. Calculations

Month	Erosion Potential Emission Factors: Fastest Mile, u_{10}^+ (mph)	Erosion Potential Emission Factors: Fastest Mile, u_{10}^+ (m/s)	Erosion Potential Emission Factors: Threshold Friction Velocity for Overburden, u_t (m/s)	Erosion Potential Emission Factors: Friction Velocity, u^* (m/s)	Does Wind Erosion Occur? (Yes/No)	# of Wind Erosion Events Per Month	$(u^*-u_t^*)$	$(u^*-u_t^*)^2$	P (g/m^2)	Total Exposed Surface Area (m^2)	Total Disturbed Surface Area (m^2)	Control Factor (%)	Controlled Wind Erosion Emissions (tonnes): TSP	Controlled Wind Erosion Emissions (tonnes): PM_{10}	Controlled Wind Erosion Emissions (tonnes): $PM_{2.5}$
January	29.16	13.04	1.02	0.69	No	0	N/A	N/A	0	1,040,000	104,000	80	0	0	0
February	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	1,040,000	104,000	80	0	0	0
March	50.56	22.60	1.02	1.20	Yes	1	0.18	0.032	6.28	1,040,000	104,000	80	0.13	0.065	0.010
April	65.68	29.36	1.02	1.56	Yes	2	0.54	0.287	30.08	1,040,000	104,000	80	1.25	0.63	0.094
May	30.05	13.43	1.02	0.71	No	0	N/A	N/A	0	1,040,000	104,000	80	0.00	0.00	0.00
June	26.48	11.84	1.02	0.63	No	0	N/A	N/A	0	1,040,000	104,000	80	0	0	0
July	36.29	16.22	1.02	0.86	No	0	N/A	N/A	0	1,040,000	104,000	80	0	0	0
August	25.60	11.44	1.02	0.61	No	0	N/A	N/A	0	1,040,000	104,000	80	0	0	0
September	73.74	32.96	1.02	1.75	Yes	6	0.73	0.529	48.83	1,040,000	104,000	80	6.09	3.05	0.46
October	65.68	29.36	1.02	1.56	Yes	1	0.54	0.287	30.08	1,040,000	104,000	80	0.63	0.31	0.047
November	67.48	30.17	1.02	1.60	Yes	1	0.58	0.335	33.90	1,040,000	104,000	80	0.71	0.35	0.053
December	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	1,040,000	104,000	80	0	0	0
					Annual Wind Erosion Emissions from Waste Dump - South (tonnes/year)								**8.81**	**4.40**	**0.66**

Assumptions:

- Maximum fastest mile for each month were taken from Merian Weather Station at the Mine Site in Suriname (data from Jan 2006 to Dec 2011)
- The number of wind erosion events per month was estimated based on the recorded daily fastest mile values and the calculated friction velocity
- Total disturbed area of 104 ha was based on measurements from site/infrastructure layout maps
- Total disturbed area was estimated by assuming 10% of the exposed surface area would be disturbed at any given time
- Assumed a 80% control factor to account for concurrent reclamation of waste dumps (both planned and natural), high moisture content of the waste material (approx. 20% for saprolite and 6% for rock), and the high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station).

Table 16-1-17. Wind Erosion Emissions from Exposed Tailing Storage facility Area

Merian Gold Mine Project, Suriname, South America

Project Proponent: Surgold

A. Emission Estimation Methodology

Reference - AP-42, Section 13.2.5, Industrial Wind Erosion - Equation 2, US EPA November 2006.

EF = k x Sum(Pi), sum is from 1 to N (Equation 2)
where:
EF = emission factor ($g/m^2/yr$)
k = particle size multiplier (unitless)
N = number of disturbances per year
Pi = erosion potential function based on fastest mile between disturbances (g/m^2)
$P = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*)$ (equation 3)
P = 0 for $u^* < u_t^*$
u^* is the friction velocity (= 0.053 times the fastest mile at a reference anaemometer height of 10 m, u_{10}^+ (m/s))
u_t^* = threshold friction velocity (m/s) = 1.02 m/s for overburden from AP-42 Table 13.2.5-2.
The fastest mile is defined as the fastest observed one mile of wind from the Merian Mine Site in Suriname for the period Jan 2006 - Dec 2011.

B. Input Data

Parameter	Units[1]	Value	Source/ Assumption
Threshold friction velocity (ut*)	m/s	1.02	US EPA AP-42, Table 13.2.5-2
Frequency of disturbance, N	day/yr	365	Assume surface is disturbed daily
Particle size multiplier (k), particle size <30 μm	-	1	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <10 μm	-	0.5	US EPA AP-42, Section 13.2.5
Particle size multiplier (k), particle size <2.5 μm	-	0.075	US EPA AP-42, Section 13.2.5

1m/s = meters per second; days/yr = days per year

C. Calculations

	Erosion Potential Emission Factors												Controlled Wind Erosion Emissions (tonnes)		
Month	Fastest Mile, u_{10}^+ (mph)	Fastest Mile, u_{10}^+ (m/s)	Velocity for Overburden, u_t (m/s)	Friction Velocity, u^* (m/s)	Does Wind Erosion Occur? (Yes/No)	# of Wind Erosion Events Per Month	$(u^*-u_t^*)$	$(u^*-u_t^*)^2$	P (g/m^2)	Total Exposed Surface Area (m^2)	Total Disturbed Surface Area (m^2)	Control Factor (%)	TSP	PM_{10}	$PM_{2.5}$
January	29.16	13.04	1.02	0.69	No	0	N/A	N/A	0	11,300,000	1,130,000	80	0	0	0
February	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	11,300,000	1,130,000	80	0	0	0
March	50.56	22.60	1.02	1.20	Yes	1	0.18	0.032	6.28	11,300,000	1,130,000	80	1.42	0.71	0.11
April	65.68	29.36	1.02	1.56	Yes	2	0.54	0.287	30.08	11,300,000	1,130,000	80	13.6	6.80	1.02
May	30.05	13.43	1.02	0.71	No	0	N/A	N/A	0	11,300,000	1,130,000	80	0	0	0
June	26.48	11.84	1.02	0.63	No	0	N/A	N/A	0	11,300,000	1,130,000	80	0	0	0
July	36.29	16.22	1.02	0.86	No	0	N/A	N/A	0	11,300,000	1,130,000	80	0	0	0
August	25.60	11.44	1.02	0.61	No	0	N/A	N/A	0	11,300,000	1,130,000	80	0	0	0
September	73.74	32.96	1.02	1.75	Yes	6	0.73	0.529	48.83	11,300,000	1,130,000	80	66.2	33.1	4.97
October	65.68	29.36	1.02	1.56	Yes	1	0.54	0.287	30.08	11,300,000	1,130,000	80	6.80	3.40	0.51
November	67.48	30.17	1.02	1.60	Yes	1	0.58	0.335	33.90	11,300,000	1,130,000	80	7.66	3.83	0.57
December	30.95	13.83	1.02	0.73	No	0	N/A	N/A	0	11,300,000	1,130,000	80	0	0	0
Annual Wind Erosion Emissions from TSF (tonnes/year)													**95.7**	**47.8**	**7.18**

Assumptions:

- Maximum fastest mile for each month were taken from Merian Weather Station at the Mine Site in Suriname (data from Jan 2006 to Dec 2011)
- The number of wind erosion events per month was estimated based on the recorded daily fastest mile values and the calculated friction velocity
- Total disturbed area of 1,130 ha was based on measurements from site/infrastructure layout maps
- Total disturbed area was estimated by assuming 10% of the exposed surface area would be disturbed at any given time
- Control factor of 80% was assumed to account for periods when the TSF area would be in slurry form/wet, concurrent reclamation of the TSF (both planned and natural), and the high frequency of rainfall events in the Project area (approx. 183 days in a year experience rainfall above 0.254 mm - Merian Weather Station).

Table 16-1-18. Wind Speed Data and Number of Days with Precipitation Over 0.254 mm (Dec 2005 to Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Month	Average Wind Speed		Average Wind Direction (Degrees)
	kph	m/s	
January	2.74	0.76	149.9
February	2.65	0.73	168.9
March	2.39	0.66	159.2
April	2.85	0.79	169.2
May	2.77	0.77	201.4
June	3.04	0.84	195.9
July	2.84	0.79	200.2
August	3.03	0.84	199.2
September	3.31	0.92	172.6
October	3.39	0.94	170.1
November	3.07	0.85	176.8
December	2.55	0.71	154.6
Annual Average		**0.80**	**176.5**

Year	Months	# of days with rainfall over 0.254 mm
2005	Dec only	17.0
2006	Jan-Dec	211
2007	Jan-Dec	181
2008	Jan-Dec	149
2009	Jan-Dec	202
2010	Jan-Dec	255
2011	Jan-Dec	100
Avg. from 2006 to 2011		**183**

Table 16-1-19a. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

				Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
Period/ Year	Month	Day	Fastest Mile, u_{10}^+ (m/s)	Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	January	1	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	2	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	3	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	4	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	5	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	6	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	7	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	8	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	9	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	10	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	11	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	12	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	13	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	14	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	15	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	16	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	17	13.04	1.02	1.12	0.69	1.17	0.78	0.26	No	Yes	N/A	N/A	0	0.05	0.003	1.49
2006-2010	January	18	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	19	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	20	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	21	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	22	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	23	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	24	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	25	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	26	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	27	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	28	11.84	1.02	1.12	0.63	1.07	0.71	0.24	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	29	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	30	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	January	31	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19b. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^+ (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	February	32	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	33	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	34	7.06	1.02	1.12	0.37	0.64	0.42	0.14	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	35	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	36	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	37	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	38	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	39	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	40	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	41	13.83	1.02	1.12	0.73	1.25	0.83	0.28	No	Yes	N/A	N/A	0	0.13	0.016	4.03
2006-2010	February	42	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	43	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	44	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	45	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	46	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	47	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	48	7.06	1.02	1.12	0.37	0.64	0.42	0.14	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	49	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	50	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	51	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	52	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	53	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	54	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	55	7.06	1.02	1.12	0.37	0.64	0.42	0.14	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	56	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	57	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	February	58	13.04	1.02	1.12	0.69	1.17	0.78	0.26	No	Yes	N/A	N/A	0	0.05	0.003	1.49
2006-2010	February	59	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19c. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^+ (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	($u^*-u_t^*$)	($u^*-u_t^*)^2$	P (g/m^2)	($u^*-u_t^*$)	($u^*-u_t^*)^2$	P (g/m^2)
2006-2010	March	60	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	61	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	62	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	63	11.84	1.02	1.12	0.63	1.07	0.71	0.24	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	64	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	65	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	66	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	67	7.06	1.02	1.12	0.37	0.64	0.42	0.14	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	68	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	69	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	70	6.26	1.02	1.12	0.33	0.56	0.38	0.13	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	71	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	72	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	73	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	74	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	75	22.60	1.02	1.12	1.20	2.03	1.36	0.45	Yes	Yes	0.18	0.032	6.28	0.91	0.835	71.30
2006-2010	March	76	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	77	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	78	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	79	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	80	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	81	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	82	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	83	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	84	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	85	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	86	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	87	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	88	16.22	1.02	1.12	0.86	1.46	0.97	0.32	No	Yes	N/A	N/A	0	0.34	0.116	15.21
2006-2010	March	89	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	March	90	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19d. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

				Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
Period/ Year	Month	Day	Fastest Mile, u_{10}^+ (m/s)	Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	April	91	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	92	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	93	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	94	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	95	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	96	13.43	1.02	1.12	0.71	1.21	0.81	0.27	No	Yes	N/A	N/A	0	0.09	0.008	2.69
2006-2010	April	97	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	98	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	99	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	100	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	101	7.06	1.02	1.12	0.37	0.64	0.42	0.14	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	102	7.06	1.02	1.12	0.37	0.64	0.42	0.14	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	103	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	104	6.66	1.02	1.12	0.35	0.60	0.40	0.13	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	105	7.06	1.02	1.12	0.37	0.64	0.42	0.14	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	106	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	107	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	108	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	109	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	110	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	111	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	112	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	113	29.36	1.02	1.12	1.56	2.64	1.76	0.59	Yes	Yes	0.54	0.287	30.08	1.52	2.318	172.52
2006-2010	April	114	29.36	1.02	1.12	1.56	2.64	1.76	0.59	Yes	Yes	0.54	0.287	30.08	1.52	2.318	172.52
2006-2010	April	115	7.62	1.02	1.12	0.40	0.69	0.46	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	116	9.20	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	117	13.04	1.02	1.12	0.69	1.17	0.78	0.26	No	Yes	N/A	N/A	0	0.05	0.003	1.49
2006-2010	April	118	9.08	1.02	1.12	0.48	0.82	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	119	8.33	1.02	1.12	0.44	0.75	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	April	120	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19e. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^{+} (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	May	121	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	122	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	123	9.28	1.02	1.12	0.49	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	124	8.23	1.02	1.12	0.44	0.74	0.49	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	125	8.95	1.02	1.12	0.47	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	126	9.42	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	127	8.93	1.02	1.12	0.47	0.80	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	128	13.43	1.02	1.12	0.71	1.21	0.81	0.27	No	Yes	N/A	N/A	0	0.09	0.008	2.69
2006-2010	May	129	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	130	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	131	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	132	6.66	1.02	1.12	0.35	0.60	0.40	0.13	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	133	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	134	7.85	1.02	1.12	0.42	0.71	0.47	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	135	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	136	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	137	5.86	1.02	1.12	0.31	0.53	0.35	0.12	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	138	7.46	1.02	1.12	0.40	0.67	0.45	0.15	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	139	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	140	6.66	1.02	1.12	0.35	0.60	0.40	0.13	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	141	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	142	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	143	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	144	6.26	1.02	1.12	0.33	0.56	0.38	0.13	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	145	6.66	1.02	1.12	0.35	0.60	0.40	0.13	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	146	8.25	1.02	1.12	0.44	0.74	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	147	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	148	8.49	1.02	1.12	0.45	0.76	0.51	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	149	9.37	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	150	9.20	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	May	151	9.13	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19f. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^{+} (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	June	152	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	153	9.18	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	154	9.53	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	155	9.62	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	156	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	157	9.13	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	158	9.08	1.02	1.12	0.48	0.82	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	159	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	160	9.38	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	161	9.42	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	162	8.74	1.02	1.12	0.46	0.79	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	163	9.53	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	164	9.40	1.02	1.12	0.50	0.85	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	165	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	166	9.13	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	167	8.65	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	168	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	169	9.17	1.02	1.12	0.49	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	170	11.84	1.02	1.12	0.63	1.07	0.71	0.24	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	171	8.33	1.02	1.12	0.44	0.75	0.50	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	172	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	173	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	174	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	175	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	176	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	177	9.28	1.02	1.12	0.49	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	178	9.22	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	179	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	180	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	June	181	8.44	1.02	1.12	0.45	0.76	0.51	0.17	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19g. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^+ (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	July	182	9.42	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	183	9.35	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	184	9.48	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	185	9.17	1.02	1.12	0.49	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	186	16.22	1.02	1.12	0.86	1.46	0.97	0.32	No	Yes	N/A	N/A	0	0.34	0.116	15.21
2006-2010	July	187	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	188	9.25	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	189	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	190	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	191	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	192	9.52	1.02	1.12	0.50	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	193	9.32	1.02	1.12	0.49	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	194	9.17	1.02	1.12	0.49	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	195	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	196	9.01	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	197	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	198	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	199	9.27	1.02	1.12	0.49	0.83	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	200	9.21	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	201	15.43	1.02	1.12	0.82	1.39	0.93	0.31	No	Yes	N/A	N/A	0	0.27	0.072	10.90
2006-2010	July	202	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	203	9.53	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	204	13.04	1.02	1.12	0.69	1.17	0.78	0.26	No	Yes	N/A	N/A	0	0.05	0.003	1.49
2006-2010	July	205	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	206	14.23	1.02	1.12	0.75	1.28	0.85	0.28	No	Yes	N/A	N/A	0	0.16	0.026	5.52
2006-2010	July	207	9.55	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	208	9.37	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	209	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	210	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	211	9.48	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	July	212	9.52	1.02	1.12	0.50	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19h. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^+ (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	August	213	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	214	9.37	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	215	9.10	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	216	9.07	1.02	1.12	0.48	0.82	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	217	8.95	1.02	1.12	0.47	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	218	9.60	1.02	1.12	0.51	0.86	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	219	8.71	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	220	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	221	9.30	1.02	1.12	0.49	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	222	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	223	9.48	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	224	9.13	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	225	9.18	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	226	9.30	1.02	1.12	0.49	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	227	9.47	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	228	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	229	8.98	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	230	9.15	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	231	9.90	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	232	8.98	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	233	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	234	9.48	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	235	9.82	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	236	9.77	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	237	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	238	9.89	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	239	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	240	9.87	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	241	9.73	1.02	1.12	0.52	0.88	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	242	9.68	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	August	243	9.73	1.02	1.12	0.52	0.88	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19i. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^{+} (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	September	244	9.60	1.02	1.12	0.51	0.86	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	245	9.94	1.02	1.12	0.53	0.89	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	246	9.75	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	247	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	248	10.04	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	249	10.15	1.02	1.12	0.54	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	250	9.68	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	251	32.96	1.02	1.12	1.75	2.97	1.98	0.66	Yes	Yes	0.73	0.529	48.83	1.85	3.410	243.96
2006-2010	September	252	30.97	1.02	1.12	1.64	2.79	1.86	0.62	Yes	Yes	0.62	0.386	37.92	1.67	2.779	202.89
2006-2010	September	253	9.55	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	254	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	255	10.03	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	256	9.80	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	257	10.05	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	258	9.77	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	259	9.97	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	260	9.80	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	261	9.65	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	262	29.36	1.02	1.12	1.56	2.64	1.76	0.59	Yes	Yes	0.54	0.287	30.08	1.52	2.318	172.52
2006-2010	September	263	9.79	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	264	12.24	1.02	1.12	0.65	1.10	0.73	0.24	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	265	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	266	9.78	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	267	29.36	1.02	1.12	1.56	2.64	1.76	0.59	Yes	Yes	0.54	0.287	30.08	1.52	2.318	172.52
2006-2010	September	268	9.72	1.02	1.12	0.52	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	269	29.36	1.02	1.12	1.56	2.64	1.76	0.59	Yes	Yes	0.54	0.287	30.08	1.52	2.318	172.52
2006-2010	September	270	29.78	1.02	1.12	1.58	2.68	1.79	0.60	Yes	Yes	0.56	0.312	32.03	1.56	2.434	180.14
2006-2010	September	271	9.97	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	272	10.04	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	September	273	9.78	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19j. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^{+} (m/s)	Threshold Friction Velocity, u_t (m/s) Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Friction Velocity, u^* (m/s) Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Does Erosion Occur? (Yes/No) Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Flat Storage Areas (u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	Conical Stockpiles (u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	October	274	9.78	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	275	10.65	1.02	1.12	0.56	0.96	0.64	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	276	10.09	1.02	1.12	0.53	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	277	9.92	1.02	1.12	0.53	0.89	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	278	9.75	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	279	9.75	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	280	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	281	9.80	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	282	29.36	1.02	1.12	1.56	2.64	1.76	0.59	Yes	Yes	0.54	0.287	30.08	1.52	2.318	172.52
2006-2010	October	283	9.88	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	284	9.99	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	285	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	286	9.99	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	287	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	288	10.14	1.02	1.12	0.54	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	289	10.14	1.02	1.12	0.54	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	290	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	291	10.04	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	292	10.09	1.02	1.12	0.53	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	293	10.09	1.02	1.12	0.53	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	294	9.79	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	295	9.67	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	296	9.99	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	297	10.07	1.02	1.12	0.53	0.91	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	298	10.05	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	299	9.92	1.02	1.12	0.53	0.89	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	300	10.14	1.02	1.12	0.54	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	301	9.32	1.02	1.12	0.49	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	302	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	303	9.83	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	October	304	10.31	1.02	1.12	0.55	0.93	0.62	0.21	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19k. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

Period/ Year	Month	Day	Fastest Mile, u_{10}^{+} (m/s)	Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
				Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	November	305	10.36	1.02	1.12	0.55	0.93	0.62	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	306	10.27	1.02	1.12	0.54	0.92	0.62	0.21	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	307	10.12	1.02	1.12	0.54	0.91	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	308	8.51	1.02	1.12	0.45	0.77	0.51	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	309	9.65	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	310	9.25	1.02	1.12	0.49	0.83	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	311	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	312	9.62	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	313	9.89	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	314	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	315	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	316	9.60	1.02	1.12	0.51	0.86	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	317	9.60	1.02	1.12	0.51	0.86	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	318	30.17	1.02	1.12	1.60	2.71	1.81	0.60	Yes	Yes	0.58	0.335	33.90	1.59	2.544	187.40
2006-2010	November	319	9.96	1.02	1.12	0.53	0.90	0.60	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	320	13.04	1.02	1.12	0.69	1.17	0.78	0.26	No	Yes	N/A	N/A	0	0.05	0.003	1.49
2006-2010	November	321	9.68	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	322	9.43	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	323	13.43	1.02	1.12	0.71	1.21	0.81	0.27	No	Yes	N/A	N/A	0	0.09	0.008	2.69
2006-2010	November	324	9.05	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	325	9.37	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	326	9.50	1.02	1.12	0.50	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	327	11.84	1.02	1.12	0.63	1.07	0.71	0.24	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	328	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	329	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	330	9.75	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	331	9.72	1.02	1.12	0.52	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	332	15.03	1.02	1.12	0.80	1.35	0.90	0.30	No	Yes	N/A	N/A	0	0.23	0.054	8.96
2006-2010	November	333	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	November	334	9.77	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0

Table 16-1-19l. Fastest Mile Recorded at the Merian Weather Station, Suriname (Dec 2005 - Dec 2011)
Merian Gold Mine Project, Suriname South America
Project Proponent: Surgold

				Threshold Friction Velocity, u_t (m/s)		Friction Velocity, u^* (m/s)				Does Erosion Occur? (Yes/No)		Flat Storage Areas			Conical Stockpiles		
Period/ Year	Month	Day	Fastest Mile, u_{10}^+ (m/s)	Flat Storage Areas (overburden)	Conical Stockpiles (ore/coal)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	Conical Stockpiles (u_s/u_r = 0.6)	Conical Stockpiles (u_s/u_r = 0.2)	Flat Storage Areas	Conical Stockpiles (u_s/u_r = 0.9)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)	(u^*-u_t^*)	(u^*-u_t^*)^2	P (g/m^2)
2006-2010	December	335	9.86	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	336	9.62	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	337	9.53	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	338	8.18	1.02	1.12	0.43	0.74	0.49	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	339	9.03	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	340	9.40	1.02	1.12	0.50	0.85	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	341	9.57	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	342	9.08	1.02	1.12	0.48	0.82	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	343	9.77	1.02	1.12	0.52	0.88	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	344	9.70	1.02	1.12	0.51	0.87	0.58	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	345	9.38	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	346	9.50	1.02	1.12	0.50	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	347	9.38	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	348	9.12	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	349	13.83	1.02	1.12	0.73	1.25	0.83	0.28	No	Yes	N/A	N/A	0	0.13	0.016	4.03
2006-2010	December	350	8.66	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	351	11.44	1.02	1.12	0.61	1.03	0.69	0.23	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	352	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	353	9.37	1.02	1.12	0.50	0.84	0.56	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	354	9.53	1.02	1.12	0.51	0.86	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	355	8.98	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	356	8.88	1.02	1.12	0.47	0.80	0.53	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	357	11.04	1.02	1.12	0.59	0.99	0.66	0.22	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	358	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	359	10.25	1.02	1.12	0.54	0.92	0.61	0.20	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	360	7.93	1.02	1.12	0.42	0.71	0.48	0.16	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	361	9.10	1.02	1.12	0.48	0.82	0.55	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	362	8.64	1.02	1.12	0.46	0.78	0.52	0.17	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	363	8.99	1.02	1.12	0.48	0.81	0.54	0.18	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	364	9.45	1.02	1.12	0.50	0.85	0.57	0.19	No	No	N/A	N/A	0	N/A	N/A	0
2006-2010	December	365	9.85	1.02	1.12	0.52	0.89	0.59	0.20	No	No	N/A	N/A	0	N/A	N/A	0

Appendix 16-B

Evaluation of Ambient Air Quality Impacts for a Mining Project in Suriname

ENVIRONMENTAL RESOURCES MANAGEMENT

DRAFT REPORT

Merian Gold Mine Project, Suriname, South America

Evaluation of Ambient Air Quality Impacts for a Mining Project in Suriname

August 2012

Environmental Resources Management
200 Harry S Truman Pkwy., Suite 400
Annapolis, MD 21401

ERM

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1.0 INTRODUCTION AND PURPOSE

Suriname Gold Company LLC (Surgold) holds the mineral processing rights for exploration in the Merian Concession, which is located south of the City of Moengo. The project will result in emissions of various air pollutants including particulate matter (TSP, PM_{10}, and $PM_{2.5}$), nitrogen oxides (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), and volatile organic compounds (VOC) from various operations at the facility. As a part of the environmental and social impact assessment (ESIA) for this project, Surgold determined the air quality impacts resulting from the air emissions associated with the project. The purpose of the ESIA is to identify and mitigate, as necessary the environmental and social impacts resulting from the project. In addition to Newmont (Surgold) Corporate Standards, the Equatorial Principles (EP) will be complied with for environmental and social impacts. The EP requires that the impacts of the project were compared with applicable international standards such as the World Health Organization (WHO) standards and the International Finance Corporation (IFC) standards for all applicable air pollutants. In addition to the above standards, the applicable USEPA National Ambient Air Quality Standards (NAAQS) were reviewed for completeness, which is summarized in Table 1 below.

Table 1 Applicable Ambient Air Quality Standards

Pollutant	Averaging Period	Measurement Units	USEPA NAAQS	WHO
PM_{10}	24-hour	ug/m3	150	50
	Annual	ug/m3	-	20
$PM_{2.5}$	24-hour	ug/m3	35	25
	Annual	ug/m3	15	10
NO_2	1-hour	ug/m3	188.7	200
	Annual	ug/m3	100	40
SO_2	10-min	ug/m3	-	500
	1-hour	ug/m3	196	-
	3-hour	ug/m3	1,300	-
	24-hour	ug/m3	-	20
CO	1-hour	ug/m3	40,000	-
	8-hour	ug/m3	10,000	-

1.1 OVERVIEW OF AMBIENT IMPACT METHODOLOGY

The methodology used in this analysis is based on policies and procedures recommended in USEPA's guidelines for air quality modeling. The ambient air quality analysis involves identifying and quantifying air emissions associated with potential sources; modeling the impacts of these emission sources on ambient air quality for comparison with applicable air quality standards. The air quality model used in this analysis was AERMOD, which is the current regulatory dispersion model for all near source ambient impact analyses. The key elements of the modeling analysis include:

- Estimate emissions of PM_{10}, $PM_{2.5}$, NO_x, SO_2, and CO from the air emission sources at the facility;
- Use of the latest version of AERMOD (version 12060);
- Use of surface meteorological data from Zanderij airport, Suriname (Station ID: 10509) and on-site measurements; and upper air data from Cayenne/ Rochambeau weather station in French Guinea (Station ID: 80405) for the years 2005 through 2009;

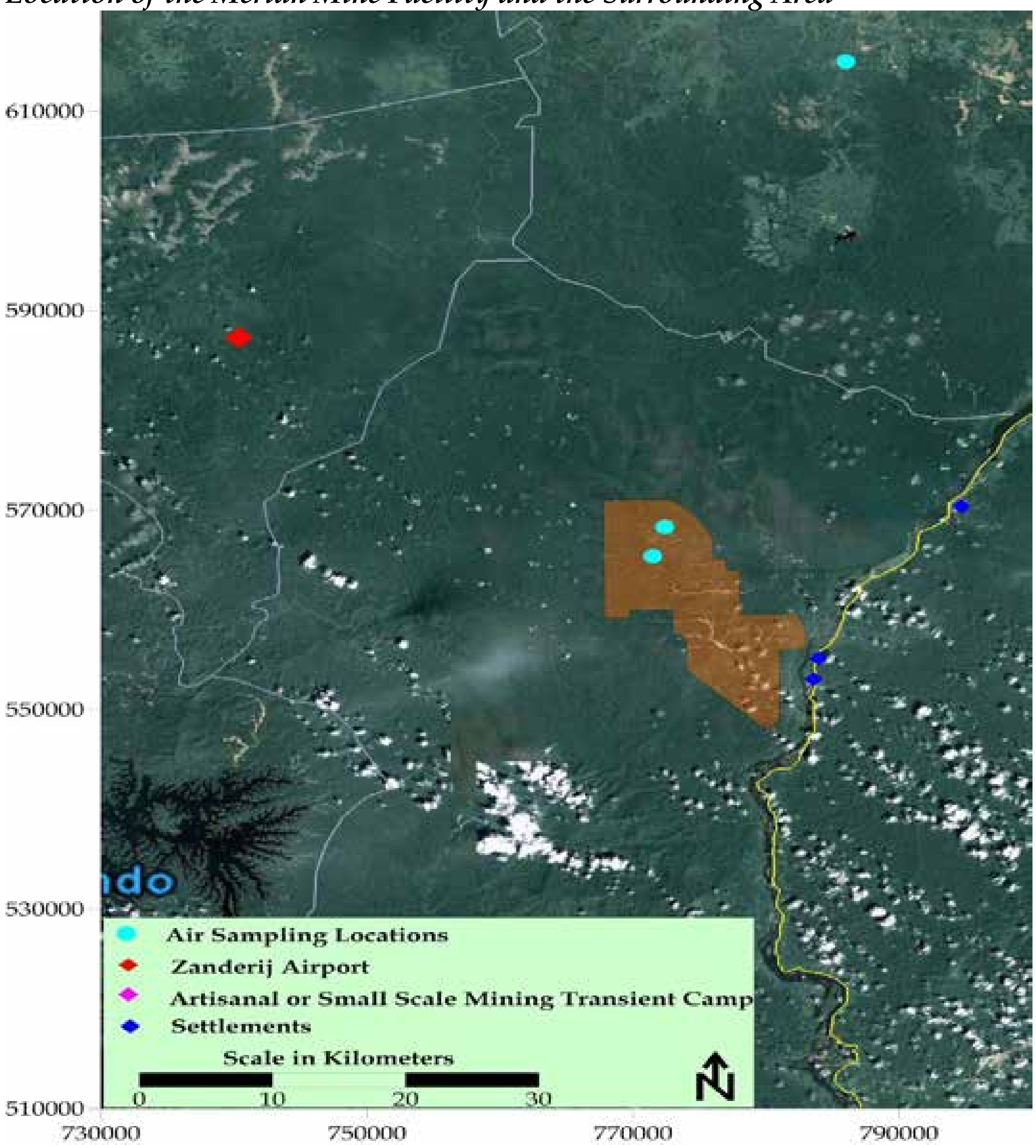
- Use of an extensive receptor grid extending up to 15 kilometers (km) from the facility designed to identify maximum predicted concentrations in the vicinity of the facility and the settlement areas; and
- Conduct air quality modeling analysis to determine the magnitude and location of ambient PM_{10}, $PM_{2.5}$, NO_x, SO_2, and CO concentrations due to emissions from Merian mine for comparison with relevant air quality standards.

2.0 PROJECT DESCRIPTION

2.1 FACILITY LOCATION

The proposed Merian mine is located in northeast Suriname, approximately 65 kilometers south of the City of Moengo. The Zanderij airport is located close to Paramaribo, which is close to Moengo and north of the proposed mine location. The area surrounding the facility is predominantly forest land. Figure 1 displays the location of the Merian mine facility and the surrounding area.

Figure 1 Location of the Merian Mine Facility and the Surrounding Area



2.2 *SOURCE CHARACTERIZATION AND EMISSION RATES*

As described in detail in the Project Description section of the ESIA, the project will involve mining of gold in three primary pits – Merian I, Merian II, and the Maraba Pit. Mining will be open-pit mining and be conducted using trucks and shovels. The project will also involve blasting of fresh rocks. The waste rock generated during the mining operation will be dumped in one of five waste rock dump areas – east, west, central, north, and south areas. The capacities of each of the waste rock dump areas is provided in the ESIA. The mined ore will be processed in a processing area located to the south of the west waste rock dump area. The mined ore will be transported using trucks to the processing area. The ore will initially be stored in open stockpiles at the process area. The ore will then be taken to the crushing and screening area, which includes a primary crusher and screens. The crushed material will then be conveyed to a grinding circuit comprised of a semi-autogenous grind (SAG) mill, a pebble crusher, and a ball mill, where the ore would be ground (wet grinding) followed by separation into different particle sizes. Lime and cyanide are added to the separated material to form a slurry, which is then sent to tailings processing area. The processed tailings is stored in the Tailing Storage Facility (TSF).

In addition to the storage, processing, and waste disposal facilities, the facility will also include a power plant to provide electricity and steam for the mining operation. The power plant will comprise of initially four 10.5 megawatt-electric (MWe) each reciprocating internal combustion (IC) engine generators; a fifth generator of same capacity will be added subsequently. The air dispersion modeling was based on five 10.5 MWe generators operating concurrently i.e., total of 52.5 MWe. The primary fuel to be used in the generators is heavy fuel oil (HFO), which will be restricted to less than 2% sulfur content (actual HFO sulfur content based on fuel analysis is <1%). Emission controls on the generators are currently being designed and will meet applicable IFC EHS Performance Standards.

The following unit operations will be associated with the mining operation and support facilities:

- Truck transport within the facility;
- Drilling and blasting operations;
- Loading/unloading and bulldozing operations associated with the waste rock dump and stockpile storage areas;

- Wind erosion associated with storage piles and waste rock dump areas;
- Grinding and crushing operations at the processing area; and
- Exhausts associated with the power plant generators and non-road mobile engines.

The emissions associated with the drilling, blasting, unloading/loading, material transfer and transport, and wind erosion were based on USEPA AP-42 emission factors. The emissions associated with the power plant sources were based on IFC emissions guidelines for thermal plant and USEPA AP-42 emission factors for large stationary diesel engines. Stack characteristics, including height, diameter, exhaust flow and temperature, were also provided by the project engineers. Table 2 provides a complete listing of the emissions and stack characteristics of all sources modeled. The locations of all sources included in this modeling analysis are shown in Figure 2.

Table 2 Stack Parameters and Emission Rates

(a) Source Parameters

(a) Point Sources

Source ID	Source Name	Stack Height (m)	Diameter (m)	Exit Temperature (deg K)	Exit Velocity (m/s)	UTM Easting	UTM Northing
PW1	Power Plant Recip. Generator No.1	30	1.2	586.2	32.8	771339.7	565302.3
PW2	Power Plant Recip. Generator No.2	30	1.2	586.2	32.8	771342.5	565301.3
PW3	Power Plant Recip. Generator No.3	30	1.2	586.2	32.8	771341.0	565297.2
PW4	Power Plant Recip. Generator No.4	30	1.2	586.2	32.8	771366.4	565295.2
PW5	Power Plant Recip. Generator No.5	30	1.2	586.2	32.8	771369.2	565294.0

(b) Area Sources

Source ID	Source Name	Release Height (m)	Area (sq.m)	Number of Vertices	UTM Easting	UTM Northing
MRB	Maraba_pit	0.50	1,038,383	47	772044	568715.3
ME1	Merian1_pit	0.50	869,706	104	773178	563762.2
ME2	Merian2_pit	0.50	2,107,262	114	771099	566896.9
TSF	TSF	0.50	13,265,446	164	768565	565485.2
WDA	Waste Dump Central	3.00	2,260,295	21	773567	568624.3
WDB	Waste Dump East	3.00	2,518,808	25	773210	566584.8
WDN	Waste Dump North	3.00	1,935,749	16	772046	570167.0
WDS	Waste Dump South	3.00	1,037,283	23	773535	564103.8
WDW	Waste Dump West	3.00	1,140,551	18	770114	567277.6

(c) Volume Sources

Source ID	Source Name	Release Height (m)	Sigma-Y (m)	Sigma-Z (m)	UTM Easting	UTM Northing
PPS	Process Plant - Stockpile	5	18.6	4.65	771464	565662.2
PPC	Process Plant - Crushing	8	4.65	7.44	771412	565488.0

1. The 52.5 MWe Power Plant consist of five reciprocating generators, each rated at 10.5 MWe; each generator has its own separate stack.

(b) Emission Rates

(a) Point Sources

Source ID	Source Name	TSP	PM_{10}	$PM_{2.5}$	NOx	CO	VOC	SO_2
PW1	Power Plant Recip. Generator No.1		0.42	0.42	15.61	3.53	0.34	3.12
PW2	Power Plant Recip. Generator No.2		0.42	0.42	15.61	3.53	0.34	3.12
PW3	Power Plant Recip. Generator No.3		0.42	0.42	15.61	3.53	0.34	3.12
PW4	Power Plant Recip. Generator No.4		0.42	0.42	15.61	3.53	0.34	3.12
PW5	Power Plant Recip. Generator No.5		0.42	0.42	15.61	3.53	0.34	3.12

(b) Area Sources

Source ID	Source Name	TSP	PM_{10}	$PM_{2.5}$	NOx	CO	VOC	SO_2
MRB	Maraba Pit	15.15	4.90	0.50	0.052	0.021	0.0013	0.00022
	Merian1 Pit	5.65	1.94	0.22	0.051	0.017	0.0013	0.00011
ME2	Merian2 Pit	14.38	5.11	0.51	0.053	0.024	0.0013	0.00032
TSF	Tailing Storage Facility	3.03	1.52	0.23				
WDA	Waste Dump Central	0.95	0.37	0.081				
WDB	Waste Dump East	1.02	0.40	0.086				
WDN	Waste Dump North	0.94	0.36	0.078				
WDS	Waste Dump South	0.62	0.21	0.057				
WDW	Waste Dump West	0.64	0.22	0.058				

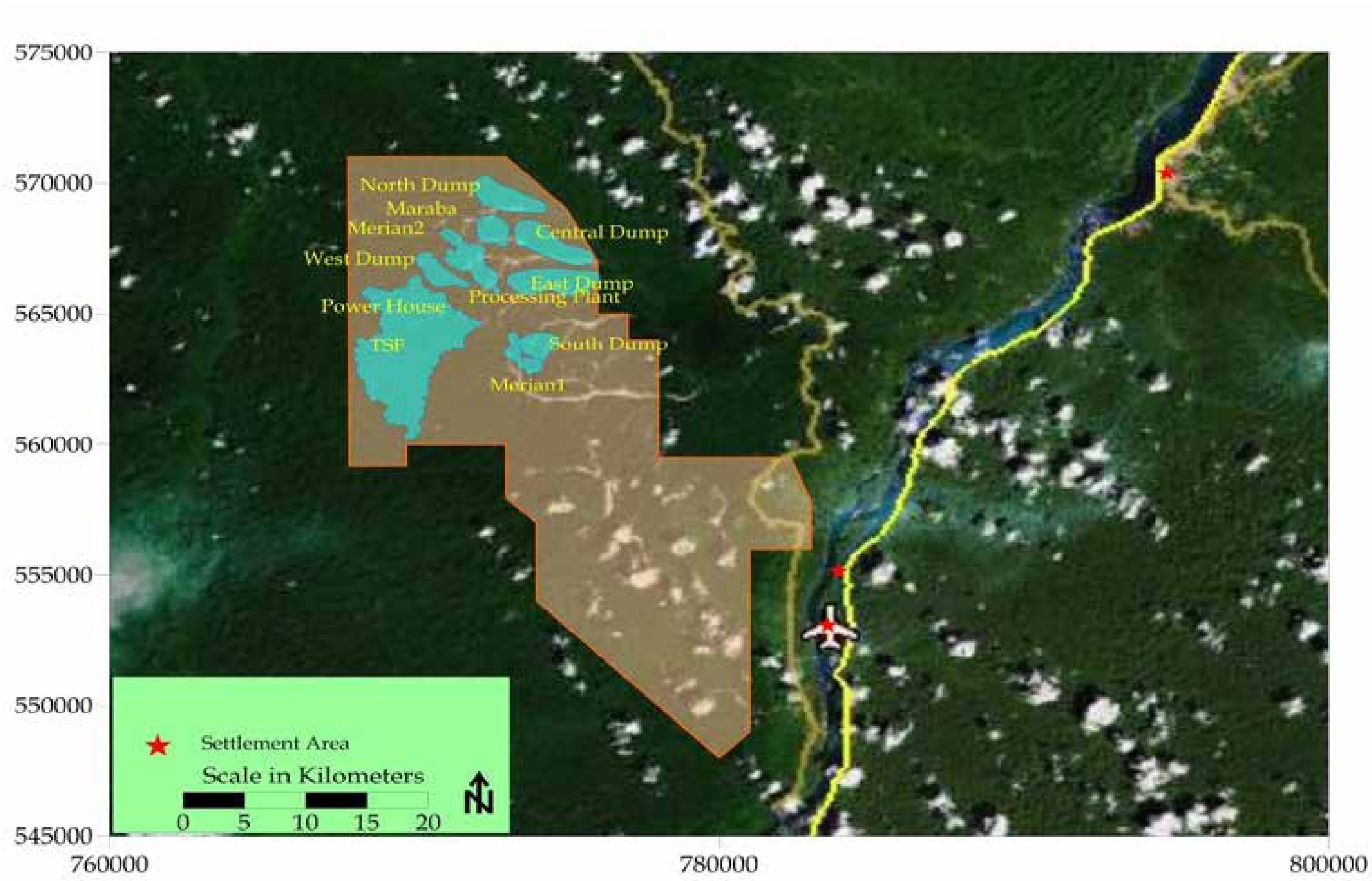
(c) Volume Sources

Source ID	Source Name	TSP	PM_{10}	$PM_{2.5}$	NOx	CO	VOC	SO_2
PPS	Process Plant - Stockpile	0.68	0.34	0.051				
PPC	Process Plant - Crushing	10.18	3.57	0.76				

Notes:

1. The 52.5 MWe Power Plant consist of five reciprocating generators, each rated at 10.5 MWe; each generator has its own separate stack.
2. Point and volume source emissions are in units of grams per second (g/s)
3. Area source emissions are in units of grams per second per square meter (g/s-m^2)

Figure 2   Location of Emission Sources within Merian Mine Facility Boundary



3.0 MODEL SELECTION AND MODELING METHODOLOGY:

The modeling analysis to evaluate ambient concentrations from the Merian mine facility was conducted using the USEPA guideline regulatory model, AERMOD. AERMOD was added by the U.S. Environmental Protection Agency (EPA) to the agency's guideline on air quality models (GAQM) on 9 November 2005, following a development, testing, and validation process that spanned nearly a decade. It is a state-of-the-science air quality model that is applicable to assessing near-field impacts of stack releases. AERMOD was selected over the previous EPA guideline model because of its ability to predict impacts in the "cavity" region formed due to the downwash effects from buildings close to the stack.

The AERMOD model was developed by a committee of scientists representing EPA and the American Meteorological Society. The AMS/EPA Regulatory Model Improvement Committee (AERMIC) undertook an extensive model development process that emphasized model validation with real-world measurements. The result of their efforts was the AERMIC Model or AERMOD. It is publicly available (www.epa.gov/ttn/scram) and is listed in Appendix A of EPA's *Guideline on Air Quality Models* (GAQM – 40 CFR Part 51, Appendix W).

The latest version of the model (version 12060), which was published on EPA's website on 29 February 2012, was used in this modeling analysis. The model was run using EPA's regulatory default options.

The steps involved in this modeling analysis include:

- Processing five years (2005-2009) of representative meteorological data for the facility;
- Developing a comprehensive receptor grid extending up to 15 kilometers from the facility;
- Compile ambient measurement data collected to provide representative background air quality information;
- Conducting modeling analysis using AERMOD for Merian facility; and
- Comparing the model predicted impacts to various air quality standards for applicable pollutants and representative averaging periods.

3.1 *METEOROLOGICAL DATA*

The meteorological pre-processor to AERMOD – AERMET (11059) was used in this analysis for developing inputs to AERMOD. AERMET requires, at a minimum, hourly surface data and once-daily upper air sounding profiles. The processing program produces two files for input to AERMOD: a surface file containing calculated micrometeorological variables (heat flux, stability, and turbulence parameters) that represent the dispersive potential of the atmosphere, and a profile file that provides vertical profiles of wind speed, wind direction, and temperature. In this analysis, two sources of concurrent surface meteorological data for the years 2005 through 2009 were used. First, the data from the Zanderij airport (Station ID: 10509), which is located close to Paramaribo and approximately 65 meters from the mine location. Secondly, on-site meteorological data was collected for wind speed and wind direction and on-site meteorological data for the time period February 2005 through December 2009. There were no upper air stations in Suriname with concurrent meteorological data for the same time period. So, the upper air data from Cayenne/Rochambeau weather station (Station ID: 80405) was used in this analysis.

In Stage 3 of the AERMET processing, information on landuse characteristics surrounding the measurement site is required to be provided. Landuse surrounding the meteorological site is characterized by the following parameters – albedo, bowen ratio, and surface roughness. The landuse surrounding the Merian facility was determined to be predominantly deciduous rainforest. Therefore, representative parameters for all four seasons (winter, spring, summer, fall) for all three parameters were obtained from the AERMOD users guide and are summarized in Table 3 below.

Table 3 Landuse Surrounding Merian Mine Facility

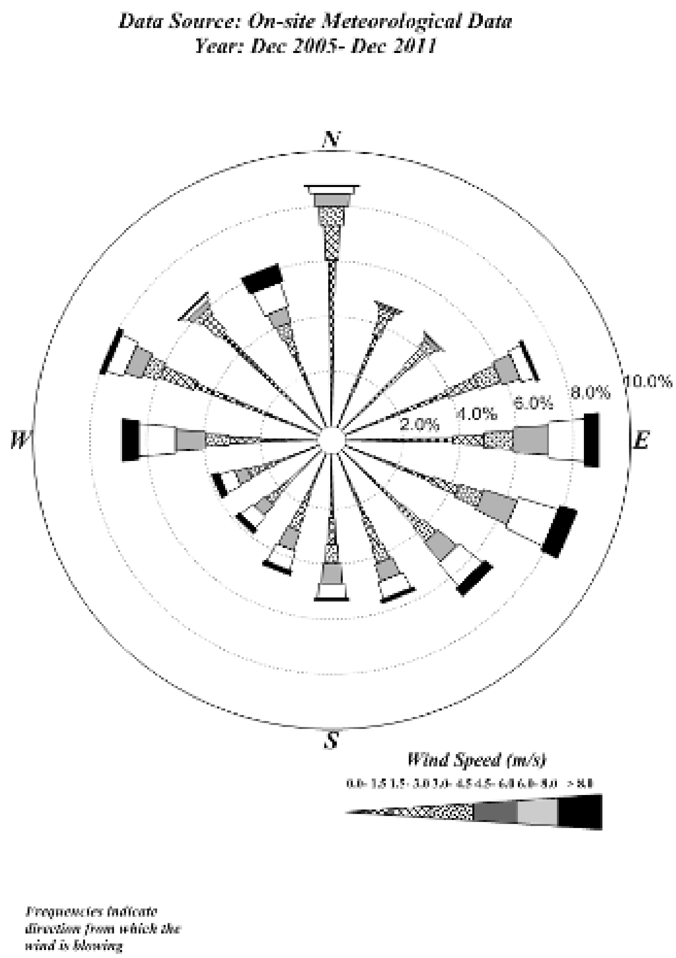
Season[1]	Albedo	Bowen Ratio	Surface Roughness
Winter	0.12	0.3	1.0
Spring	0.12	0.2	1.3
Summer	0.12	0.4	0.8
Fall	0.50	0.5	0.5

Note:
[1] Suriname dry and wet seasons are different from the season types programed within the AERMOD model. Surface characteristics were developed with the understanding that this project

is located in Evergreen forest. As this project is located in Evergreen forest there is no much change in surface characteristics between the seasons. This is also reflected in the values. In addition, surface characteristics were also assumed to be average of dry and wet conditions and therefore, the values used in the table above closely reflects the conditions in Suriname.

The changes in wind speed and wind direction is typically represented using wind rose plots. Wind rose depicts the frequency of wind speeds in different directions. The wind rose for the on-site measurement site is shown in Figure 3. As seen from Figure 3, it can be seen that the wind direction is not localized in any given direction, which shows that the terrain does not have a significant impact on the winds. In addition, the the frequency of low wind speed values is high.

Figure 3 Wind Roses for On-site Measurement Site



3.2 RECEPTOR GRID DEVELOPMENT

A comprehensive receptor grid was developed to capture the maximum impacts from the Merian mine facility emissions sources. A receptor grid extending up to 10 kilometers (km) from the facility was developed with

500 meter spacing. In addition to the gridded receptor grid, discrete receptors were placed at locations representing the settlement areas as shown in Table 4. Though, the impacts at all locations outside of disturbed area is evaluated in this study, only the impacts at receptors representing the settlement areas were considered for comparison with the air quality standards. Terrain elevations were assigned to each receptor. Receptor elevations were assigned using data from the Shuttle Radar Topography Mission (SRTM) archive for the area surrounding the facility. Figure 4 displays receptor locations close to the site.

Figure 4 Receptor Locations

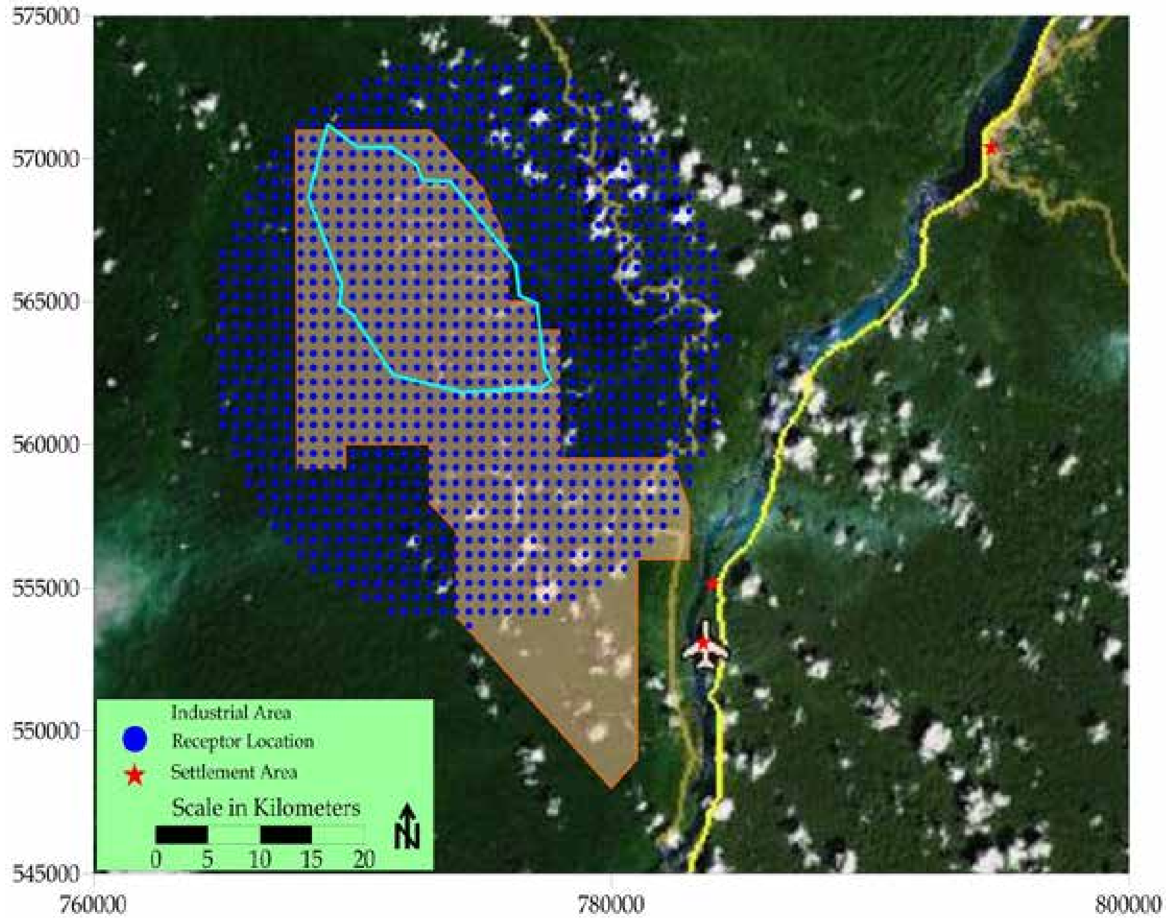


Table 4 Locations representing the settlement areas

Settlement Name	UTM Easting (mt)	UTM Northing (mt)
Langa Tibiki	783554.19	553068.13
Apatou	794668.88	570388.19
Akati	783921.31	555137.81

3.3 *MODELING METHODOLOGY*

AERMOD was run with five years of hourly meteorological data, and the receptor grid and source inputs developed as described previously. Concentrations for different averaging periods appropriate for each pollutant were estimated by the model at each receptor, and maximum concentrations over all receptors were identified to compare to ambient standards.

3.4 *AMBIENT MEASUREMENT SUMMARY*

There were no ambient measurement stations in the vicinity of the Merian mine facility. The ambient measurement serves two purposes – established a baseline air quality before initiation of the project and second, serves as a background air quality to be added to the model predicted impacts to estimate the total impacts from the project for comparison with air quality standards. As a part of this ESIA, Surgold conducted a field sampling study to compile ambient air quality data for TSP, PM_{10}, $PM_{2.5}$, NO_2, SO_2, and CO. Two separate sampling events were conducted- the first one in November through December 2011 and the second in February through March 2012. Three sampling locations were identified for this analysis – Maraba Pit, Plant Site, and Pelgrin Kondre. Figure 1 shows the location of the sampling points selected for this study. Samples of TSP and PM_{10} were weighed once every three days. $PM_{2.5}$ was sampled using a new technique called E-Samplers, which is based on using light scatter and measures at 1-minute frequency which is reduced to 24-hour averages. NO_2 and SO_2 were sampled using Radiello passive diffusive tubes and were sampled for a period for seven days. CO sampling was conducted using passive personal samplers to obtain minute-averaged data. A summary of the background ambient concentrations for all pollutants is summarized in Table 5.

Table 5 *Summary of Background Ambient Air Quality*

Pollutant	Averaging Period	Measurement Units	Measured Values			Background Con-centration	USEPA NAAQS	WHO
			Maraba Pit	Plant Site	Pelgrin Kondre			
PM10	24-hour	ug/m3	20.6	20.0	68	21.10	150	50
	Annual	ug/m3	-	-	-	15.35	-	20
PM2.5	24-hour	ug/m3	10.5	11.8	4.9	7.00	35	25
	Annual	ug/m3	-	-	-	5.37	15	10
NO2	1-hour	ug/m3	-	15.0	-	16.77	188.7	200
	Annual	ug/m3	-	-	-	6.02	100	40
SO2	10-min	ug/m3	-	-	-	13.85	-	-
	1-hour	ug/m3	-	23.0	-	-	196	-
	3-hour	ug/m3	-	-	-	-	1,300	-
	24-hour	ug/m3	-	-	-	4.97	-	20
CO	1-hour	ug/m3	-	4,580	-	4,066.25	40,000	-
	8-hour	ug/m3	-	4,237	-	4,066.25	10,000	-

Notes:
1. If more than one samples are available, average of the measured values is reported.
2. For SO2 and NO2, 7-day averaged sample value is used to represent 1-hour averaged; a scaling factor of 0.4 is used.

4.0 MODELING RESULTS AND DISCUSSION

A modeling analysis was conducted to evaluate ambient impacts of all applicable pollutants from the Merian mine for comparison with air quality standards. Surgold completed the modeling analysis using the meteorological, source, and receptor information described above. The latest version of the AERMOD model and associated processors was used, along with four years of meteorological data obtained from the nearest complete meteorological data station. Modeling results are summarized in tabular and graphic format. Tables 6A through 6D provides an overall summary of the concentrations predicted by AERMOD. The results presented reflect the maximum overall impacts of each pollutant. A brief discussion of the model results for each pollutant is provided below.

Particulate Matter less than 10 microns in diameter (PM10)

Figures 5 and 6 display contour plots for PM10 24-hour and annual repectively. The modeled PM10 concentrations do not meet the published IFC standards at Langa Tibiki and Akati with background ambient monitor values included. The IFC standards are exceeded for both 24-hour and annual averaging period and their exceedances extend beyond the Industrial Zone boundary, under the assumption of Level 1 dust control (i.e., $2L/m^2/hr$ irrigation rates for unpaved roads, which is equivalent to 50 percent dust control). One major reason for the exceedances at the settlement areas is due to the slightly high background PM10 concentrations relative to the IFC limit. For example, the background annual PM10 concentration is 15.4 micrograms per cubic meter ($\mu g/m^3$) and the IFC standard for annual PM10 is 20 $\mu g/m^3$, which means the Merian Project annual PM10 concentrations should not exceed 4.6 $\mu g/m^3$ in order to meet the IFC standard. PM10 emissions are dominated by crushing activities and wheel generated dusts via haul trucks on unpaved roads at the Mine Site. Mitigation measures recommended in the ESIA such as increased watering of unpaved haul roads and adding more sprayer/misters at the crusher area is expected to reduce the PM10 concentrations to acceptable levels.

Particulate Matter less than 2.5 microns in diameter (PM2.5)

Figure 7 and 8 presents the highest modeled 24-hr and annual concentrations of PM2.5. The modeled PM2.5 concentrations meet the published IFC standards with background ambient monitor values included at all settlement areas including Langa Tibiki, Akati, and

Apatou. PM2.5 emissions are dominated by crushing activities and wheel generated dusts via haul trucks on unpaved roads at the Mine Site. Both annual and 24-hour $PM_{2.5}$ concentrations met the IFC standards at all settlement areas, but the concentrations for both averaging periods extend beyond the Industrial Zone boundary. Mitigation measures recommended in the ESIA such as increased watering of unpaved haul roads and adding more sprayer/misters at the crusher area is expected to reduce the PM2.5 concentrations to acceptable levels.

Nitrogen Dioxide and Sulfur Dioxide (NO2 and SO2)

Figures 9, 10, 11, and 12 present the highest modeled annual NO2, 1-hour NO2, 24-hour SO2, and 10-minute SO2 concentrations, respectively. Modeled NO2 and SO2 concentrations are all below the published IFC standards at the settlement areas with background ambient monitor values included. NO2 and SO2 emissions are dominated by the HFO power plant located at the center of the facility and the predicted concentrations decrease rapidly with distance from the Industrial Zone boundary. Both NO2 and SO2 concentrations met the IFC standards for all averaging period but but the IFC standards for 1-hr NO2 and 24-hour SO2 concentrations slightly extend beyond the western portion of the Industrial Zone boundary. Mitigation measures recommended in the ESIA such as adjusting or fine-tuning the fuel-to-air ratio for the HFO reciprocating engines during start-up and adequate maintenance of mine fleet and vehicles is expected to reduce the 1-hour NO2 and 24-hour SO2 concentrations to acceptable levels.

Carbon Monoxide (CO)

Figures 13 and 14 presents the highest modeled 8-hour and 1-hour concentrations of CO. Modeled 1-hr and 8-hr CO concentrations are all below the NAAQS published by US EPA with background ambient monitor values included. No mitigation measures are required for CO concentrations.

Table 6A Model Results Summary – PM10 and PM2.5

	PM10 24-hr				PM10 Annual				PM2.5 24-hr				PM2.5 Annual			
Settlement Name	**Background**	**Modeled**	**Total Impact**	**IFC**	**Background**	**Modeled**	**Total Impact**	**IFC**	**Background**	**Modeled**	**Total Impact**	**IFC**	**Background**	**Modeled**	**Total Impact**	**IFC**
Langa Tibiki	21.1	29.95	**51.05**	50	15.4	7.63	**22.99**	20	7	4.81	11.81	25	5.37	1.10	6.47	10
Apatou	21.1	10.31	31.41	50	15.4	2.08	17.43	20	7	2.26	9.26	25	5.37	0.32	5.69	10
Akati	21.1	36.47	**57.57**	50	15.4	10.02	**25.37**	20	7	6.34	13.34	25	5.37	1.44	6.81	10

Note: PM10 24-hr is based on the 99th percentile (5th highest)

Table 6B Model Results Summary - NOx

	NOx 1-hr				NOx Annual			
Settlement Name	**Background**	**Modeled**	**Total Impact**	**IFC**	**Background**	**Modeled**	**Total Impact**	**IFC**
Langa Tibiki	15	42.60	57.60	200	15	0.89	15.89	40
Apatou	15	20.78	35.78	200	15	0.35	15.35	40
Akati	15	47.40	62.40	200	15	1.17	16.17	40

Table 6C Model Results Summary – SO2

		SO2 10-min					SO2 24-hr		
Settlement Name	Background	1-hr Modeled	10-min	Total Impact	IFC	Background	Modeled	Total Impact	IFC
Langa Tibiki	13.85	7.09	10.15	24.00	500	4.97	3.51	8.48	20
Apatou	13.85	3.47	4.96	18.81	500	4.97	2.09	7.06	20
Akati	13.85	7.97	11.40	25.25	500	4.97	4.17	9.14	20

Table 6D Model Results Summary - CO

		CO 1-hr			CO 8-hr			
Settlement Name	Background	Modeled	Total Impact	USEPA	Background	Modeled	Total Impact	USEPA
Langa Tibiki	4,066.25	10.84	4077.09	40000	4,066.25	2.64	4068.89	10000
Apatou	4,066.25	5.32	4071.57	40000	4,066.25	1.22	4067.47	10000
Akati	4,066.25	11.98	4078.23	40000	4,066.25	2.99	4069.24	10000

Figure 5 *Highest Modeled PM10 Concentrations: 24-hr averages*

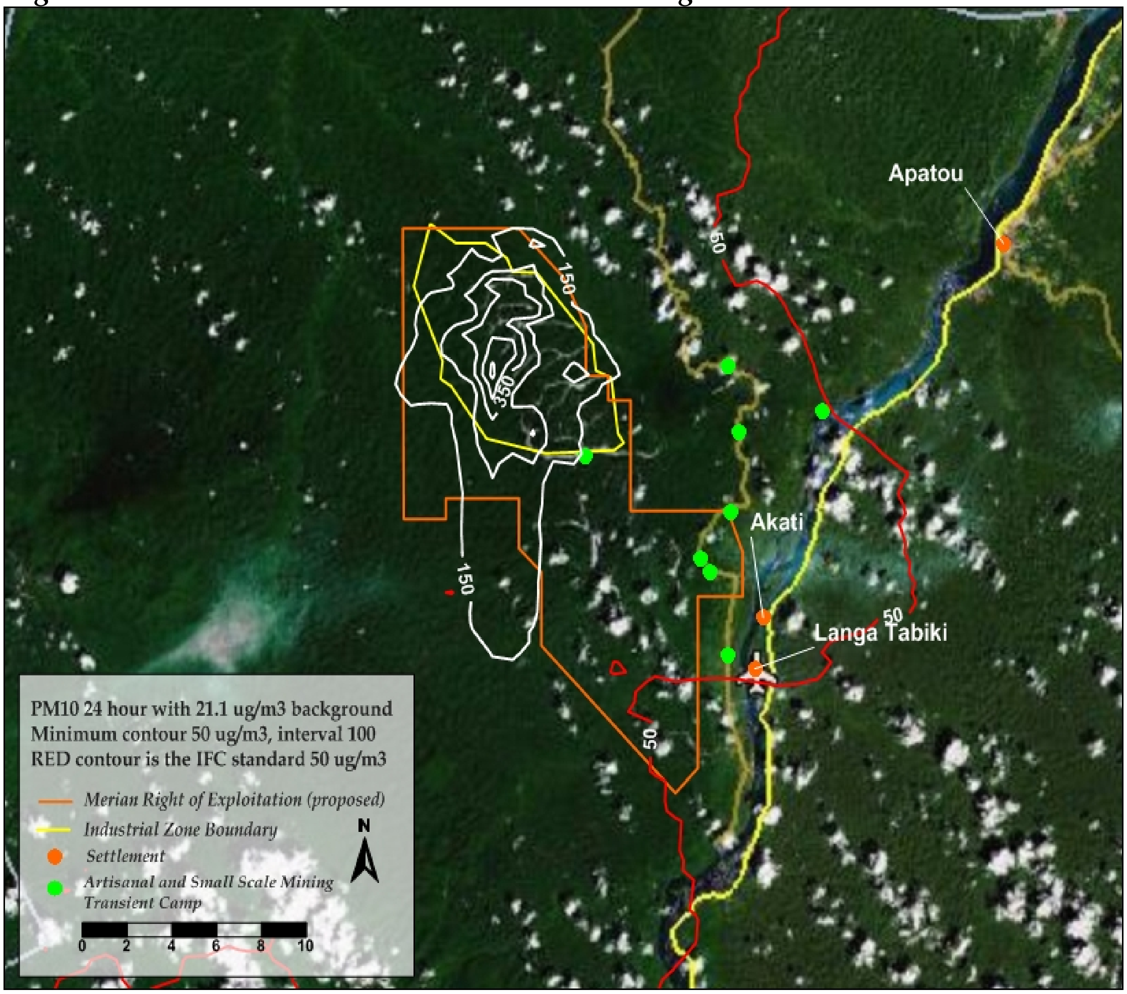


Figure 6 Highest Modeled PM10 Concentrations: Annual averages

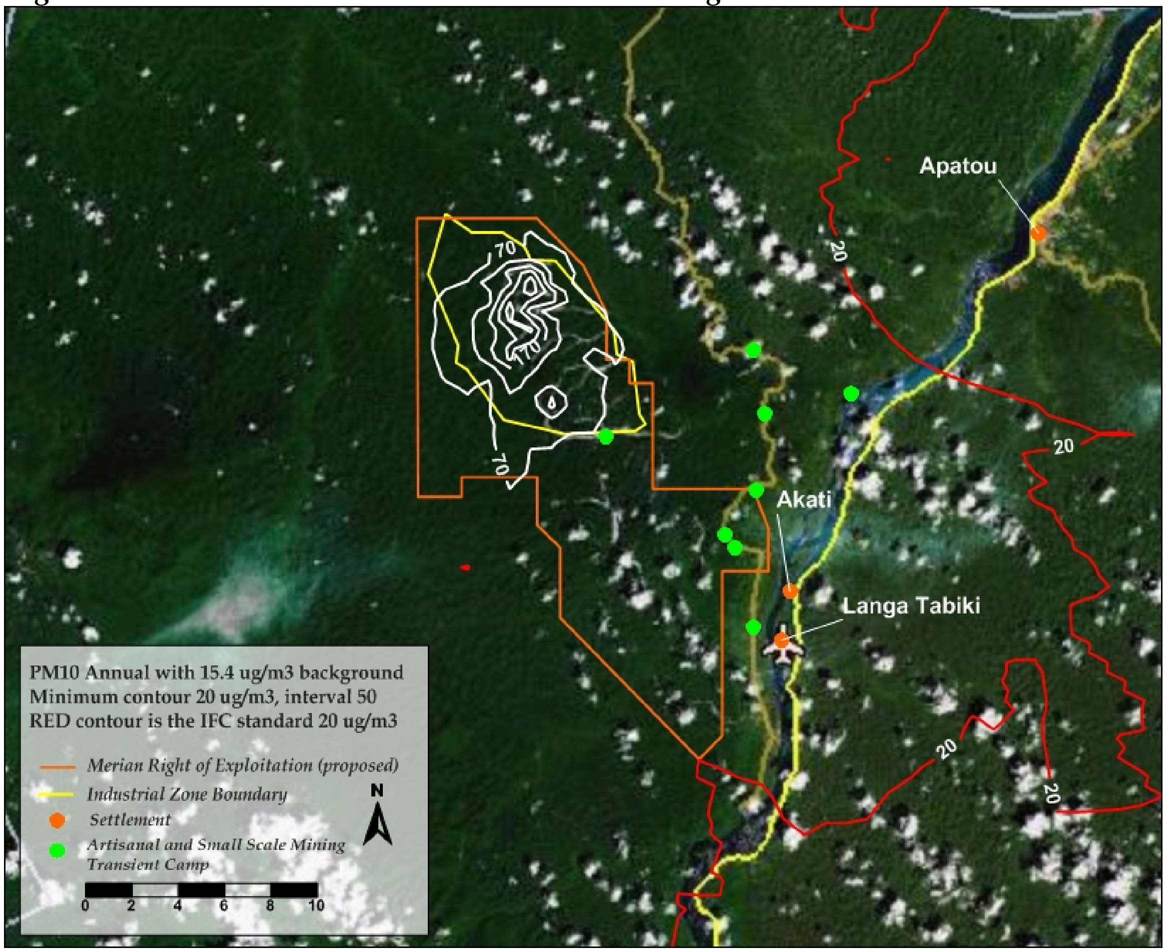


Figure 7 Highest Modeled PM2.5 Concentrations: 24-hr averages

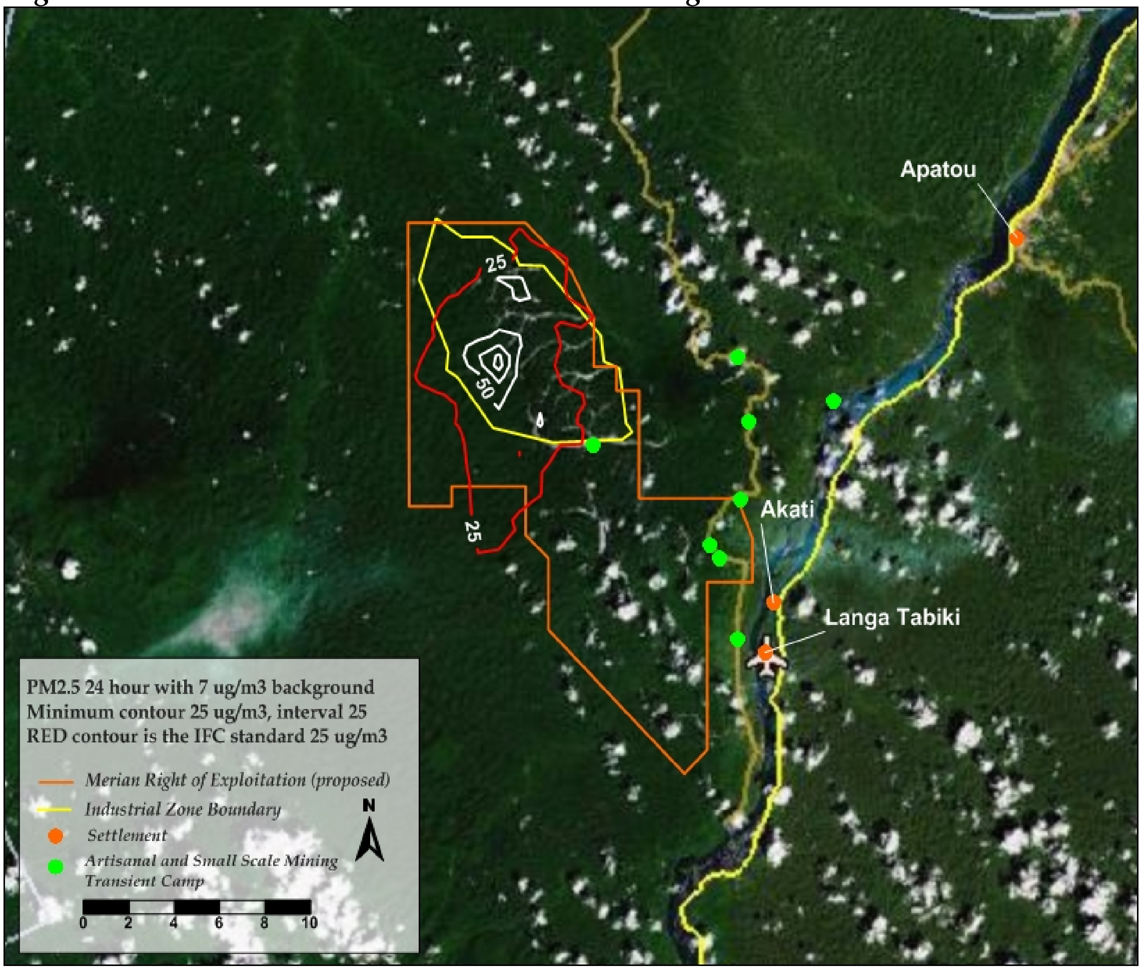


Figure 8 *Highest Modeled PM2.5 Concentrations: Annual averages*

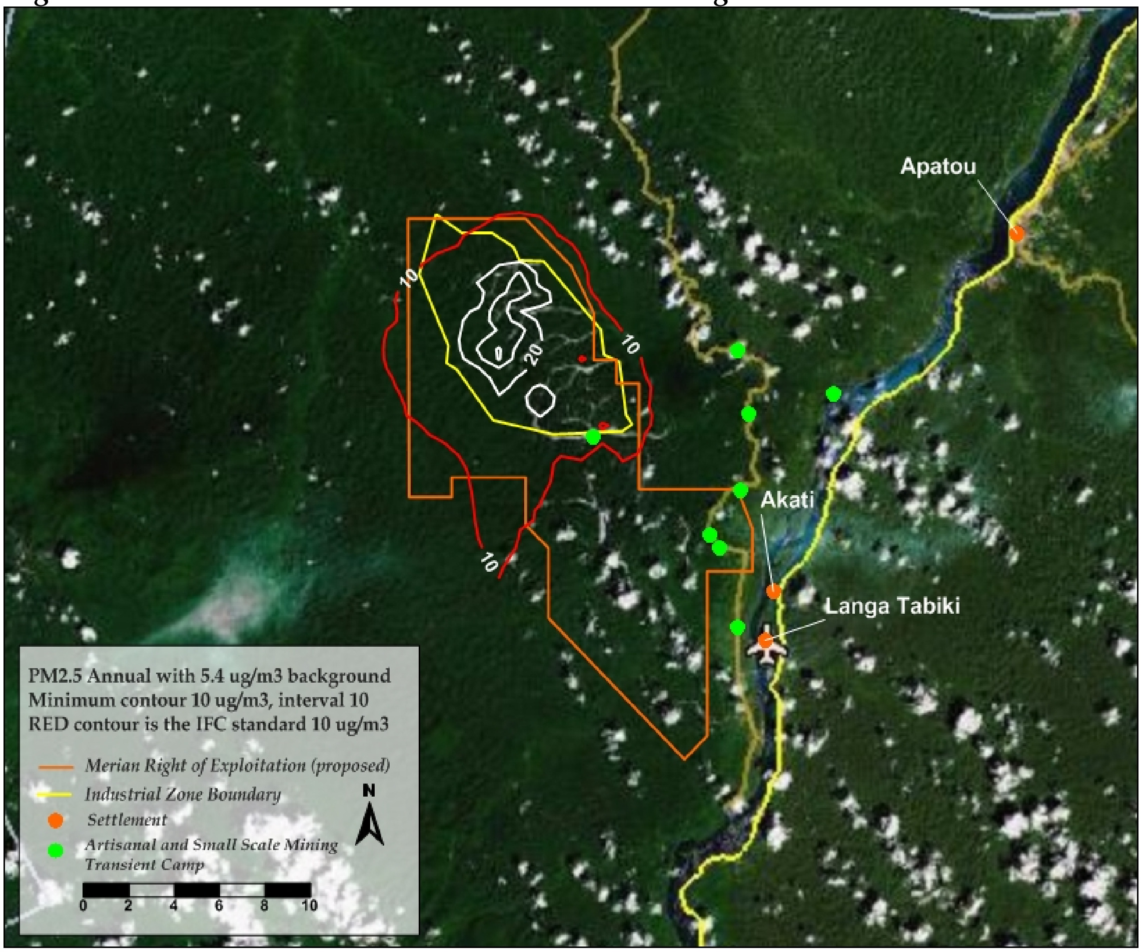


Figure 9 Highest Modeled NO2 Concentrations: 1-hr averages

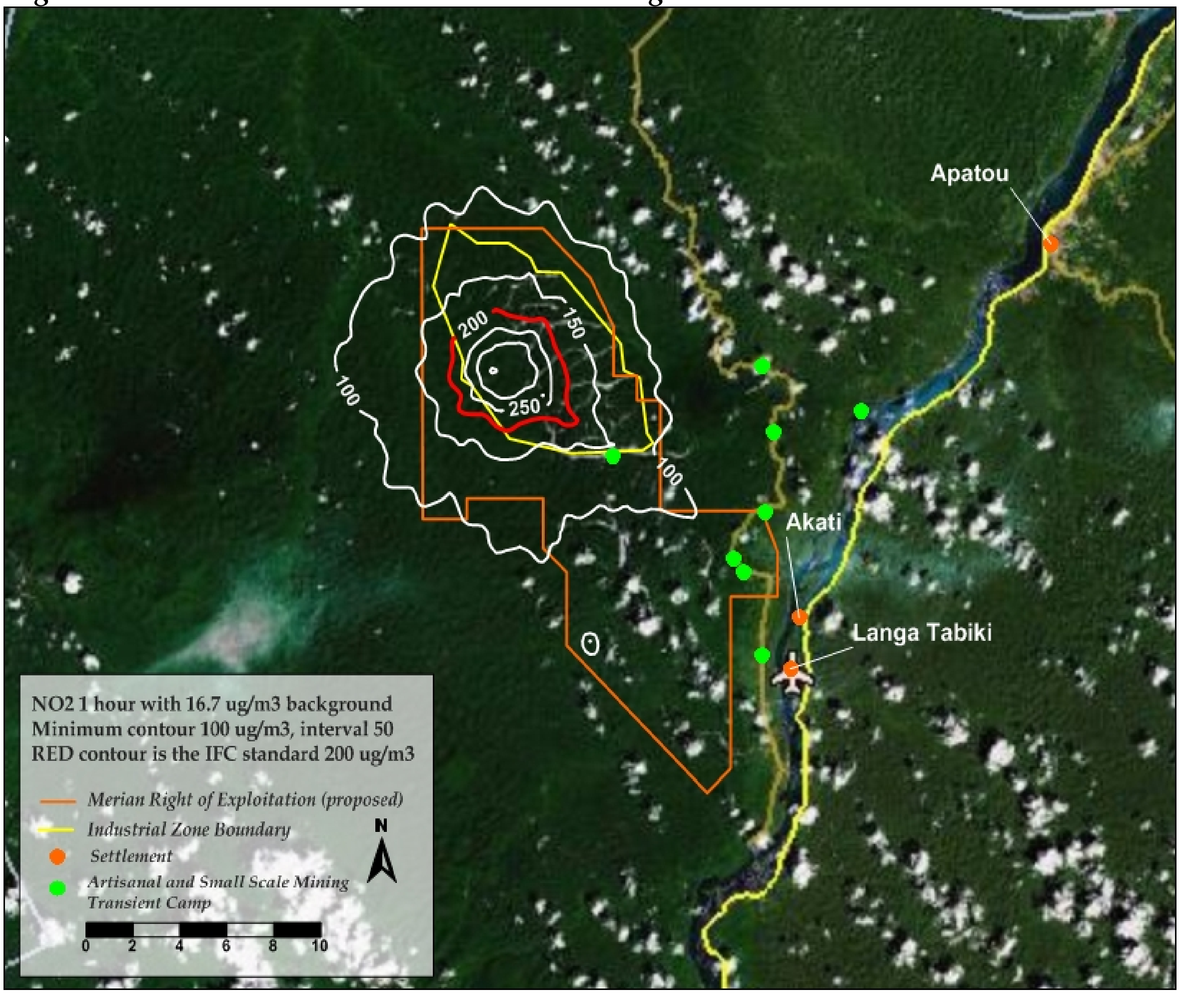


Figure 10 Highest Modeled NO2 Concentrations: Annual averages

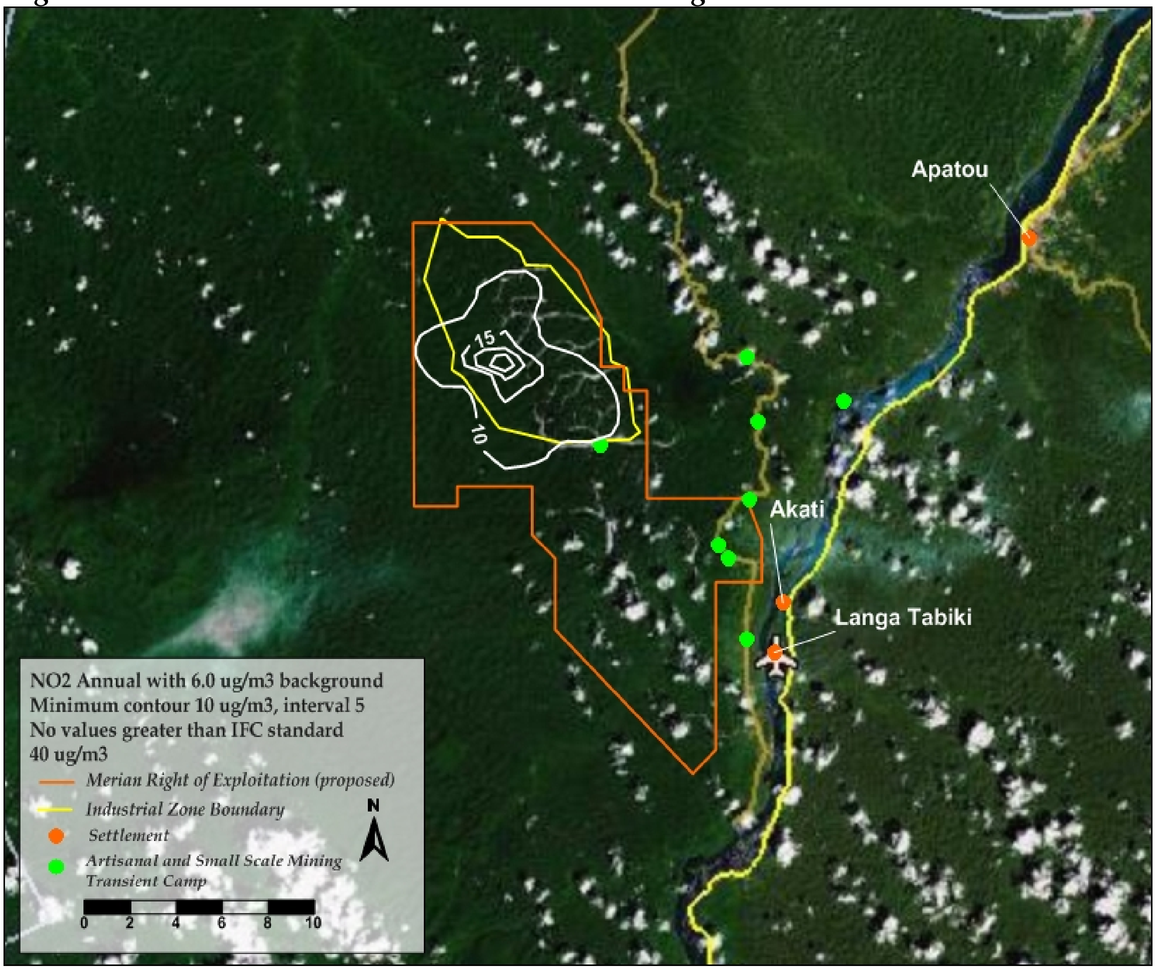


Figure 11 Highest Modeled SO2 Concentrations: 10-min averages

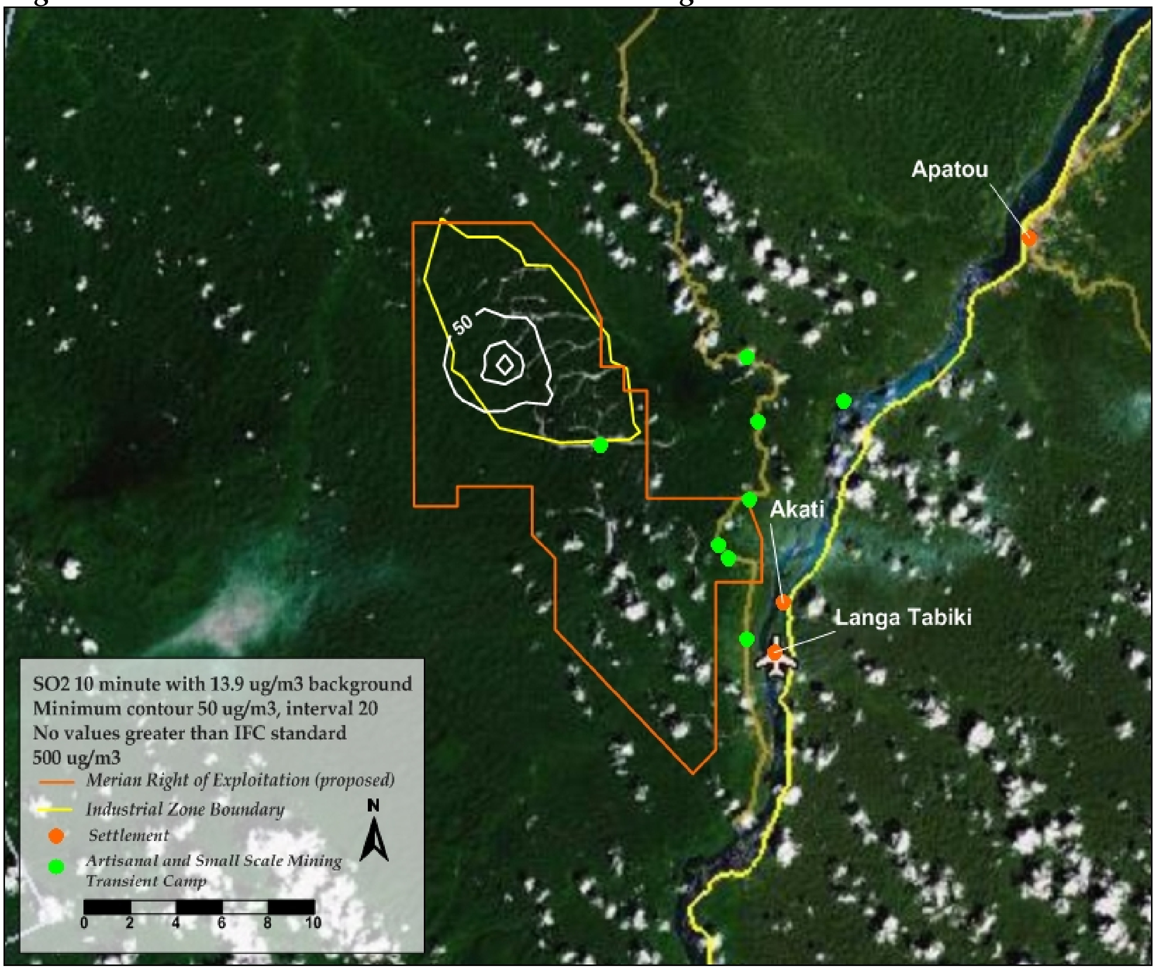


Figure 12 Highest Modeled SO2 Concentrations: 24-hr averages

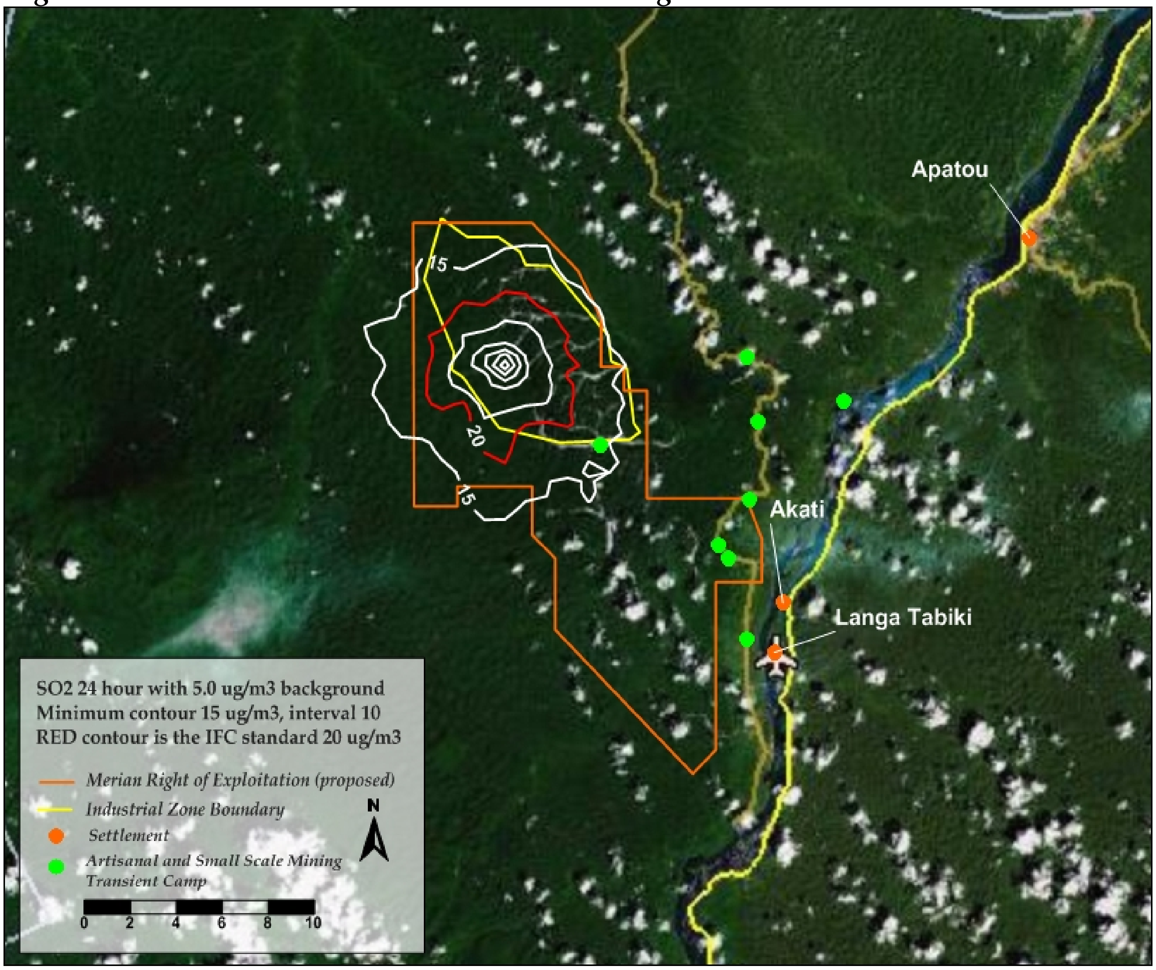


Figure 13 Highest Modeled CO Concentrations: 1-hr averages

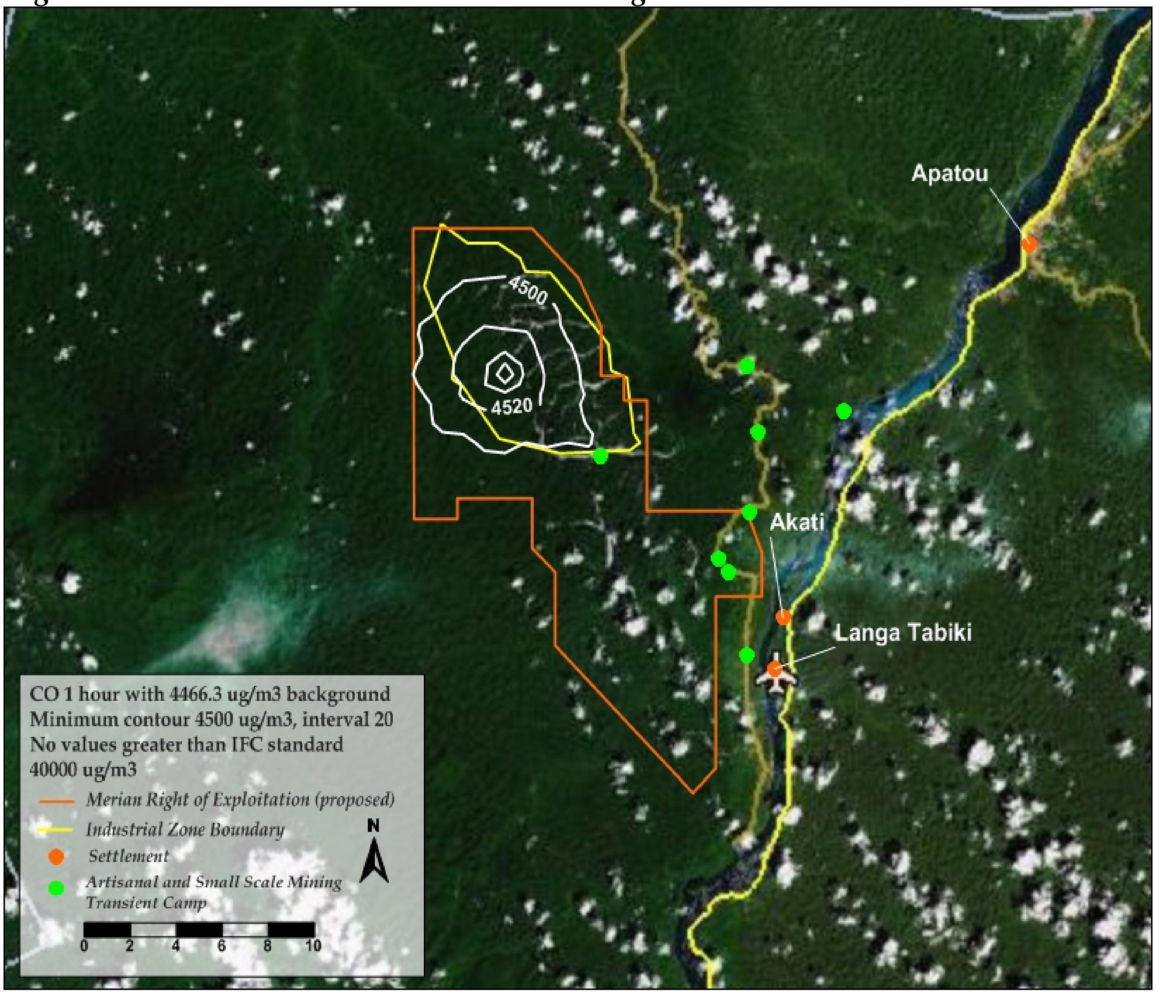


Figure 14 Highest Modeled CO Concentrations: 8-hr averages