OCEANAGOLD

PROJECT MARTHA

Response (2) to Request for Further Information pursuant to s92 of the Resource Management Act 1991 - WRC

27 July 2018

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1. INTRODUCTION

1.1 On 17 July 2018, Oceana Gold (New Zealand) Ltd ("OGNZL") provided a response to Waikato Regional Council ("WRC") following a request for further information dated 3rd July 2018.

1.2 Following a review of the information, WRC replied seeking more information relating to questions 4 and 5 (renumbered to 2.2 and 2.3 in OGNZL's response).

1.3 The following paragraphs respond to that request.

2. QUESTION 4 (2.2)

Thank you for your response received which has partly resolved this query. However, WRC staff were of the understanding that data relating to regular monitoring of underground air quality for Worksafe purposes is available – refer to page 27 of Appendix L. Is this comment in the Appendix based on the emission testing undertaken in 2007 in which case it is correct to refer to it as regular monitoring or is there additional data specifically relating to Worksafe's requirements? Please advise.

Question 4 of the request for further information dated 3 July 2018 was centred around ambient air concentrations of NO_2, CO and PM_{10} arising from blast emissions and our response discussed the results of testing carried out on the concentration of contaminants in the discharge from the ventilation stacks during and immediately after a blast. During blasting the mine is evacuated and no vehicles are operating.

We confirm that OGNZL also carries out regular monitoring of NO_2, CO, and respirable dust/respirable quartz and inhalable dust for Worksafe purposes, within the mine when vehicles are operating and the data collected to date confirms that the Workplace Exposure Standards (WES) are consistently met.

The data from the 2018 monitoring of NO_2, CO and respirable dust/respirable quartz and inhalable dust within the underground mine is summarised on the pages overleaf.

The NO_2 and CO monitoring was carried out within the cab of various pieces of mobile plant, and personal dust monitoring of employees was carried out as described in the following summary tables. The reports conclude that there was no exceedance of the Workplace Exposure Standards for NO_2, CO, and respirable dust/respirable quartz and inhalable dust.

The monitored results for NO_2, CO, silica and dust reported in the following tables do not represent levels that members of the public are exposed to from current underground mining, or will be exposed to with underground mining as part of Project Martha. The

concentrations of contaminants in the plume from the vents due to vehicle movements underground are dispersed and diluted as the plume travels downwind and will be substantially less (several orders of magnitude) than the concentration in the discharge and the relevant ambient air quality standards and guidelines at locations where members of the public may be exposed. Consequently, the risk of emissions from vent shafts resulting in exceedances of ambient air quality standards or guidelines at off-site locations is considered to be minimal.

NO_2

Sampling Date	Equipment	Location	Workplace Exposure Limits ppm		Results		
			12 hr Average	15 min average	Peak ppm	Min ppm	Average ppm
19-03-18	Truck 192	Normal operations in 920-801, 952-ROM, 915-ROM	1.5	5	3.7	0.0	0.3
11-12-17	Bogger 121	Normal operations in 816, 885, 890, 938, 900, 915-1-N	1.5	5	2.8	0.0	0.5
12-12-17	Bogger 123 & 127	Normal operations in 827, 816, 905, 83	1.5	5	2.7	0.0	0.2
13-12-17	Truck UT 192	Normal operations in 915, Surface, Gladstone Decline, 795	1.5	5	1.9	0.0	0.2
14-12-17	Underground Service IT		1.5	5	1.8	0.0	0.1
20-11-17	Truck UT194	875, 953, surface.	1.5	5	3.1	0.0	0.4

CO

Sampling Date	Equipment	Location	Workplace Exposure Limits ppm			Results		
			15 mins	30 mins	60 mins	Peak ppm	Min ppm	Average ppm
19-03-18	Truck 192	Normal operations in 920-801, 952-ROM, 915-ROM	200	100	50	17	0	1
11-12-17	Bogger 121	Normal operations in 816, 885, 890, 938, 900, 915-1-N	200	100	50	28	0	4
12-12-17	Bogger 123 & 127	Normal operations in 827, 816, 905, 83	200	100	50	32	0	6
13-12-17	Truck UT 192	Normal operations in 915, Surface, Gladstone Decline, 795	200	100	50	11	0	1
14-12-17	Underground Service IT		200	100	50	34	0	4
20-11-17	Truck UT194	875, 953, surface.	200	100	50	16	0	2

Respirable Silica (Quartz) Levels

Sampling Date	Similar Exposure Group (SEG)	Position	Laboratory Sample Number	Respirable Quartz (TWA) mg/m^3	WES (shift adjusted)
14-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	40	0.014	0.072
15-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	32	0.018	0.072
15-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	34	0.028	0.072
16-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	21	0.007	0.072
17-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	30	0.023	0.072
17-05-18	U/G – Maintenance – Heavy Mobile Equipment	UG Electrician	33	0.018	0.072
14-05-18	U/G – Charge-Up & Services	Charge Up	37	0.015	0.072
15-05-18	U/G – Charge-Up & Services	Service Crew	-	-	Filter used twice
16-05-18	U/G – Charge-Up & Services	Service Crew	29	0.027	0.072
17-05-18	U/G – Charge-Up & Services	Service Crew	23	0.026	0.072
14-05-18	U/G – Closed Cab Mobile Equipment	Truck Operator	36	0.003	0.072
15-05-18	U/G – Closed Cab Mobile Equipment	Bogger Operator	26	0.011	0.072
16-05-18	U/G – Closed Cab Mobile Equipment	Truck Operator	-	-	Filter used twice
16-05-18	U/G – Closed Cab Mobile Equipment	Bogger Operator	27	0.030	0.072
17-05-18	U/G – Closed Cab Mobile Equipment	Jumbo Operator	31	0.019	0.072
14-05-18	U/G – Open Cab Drilling	Jumbo Operator	39	0.023	0.072
16-05-18	U/G – Open Cab Drilling	Jumbo Operator	25	0.059	0.072
17-05-18	U/G – Open Cab Drilling	Jumbo Operator	35	0.015	0.072
16-05-18	U/G – Supervisors; Mining Tech	Surveyor	28	0.015	0.072
17-05-18	U/G – Supervisors; Mining Tech	Geo	22	0.019	0.072

Respirable Dust Levels

Sampling Date	Similar Exposure Group (SEG)	Position	Laboratory Sample Number	Respirable Quartz (TWA) mg/m^3	WES (shift adjusted)
14-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	40	0.200	2.2
15-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	32	0.236	2.2
15-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	34	0.324	2.2
16-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	21	0.449	2.2
17-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	30	0.306	2.2
17-05-18	U/G – Maintenance – Heavy Mobile Equipment	UG Electrician	33	0.228	2.2
14-05-18	U/G – Charge-Up & Services	Charge Up	37	0.213	2.2
15-05-18	U/G – Charge-Up & Services	Service Crew	-	-	Filter used twice
16-05-18	U/G – Charge-Up & Services	Service Crew	29	0.424	2.2
17-05-18	U/G – Charge-Up & Services	Service Crew	23	0.429	2.2
14-05-18	U/G – Closed Cab Mobile Equipment	Truck Operator	36	0.119	2.2
15-05-18	U/G – Closed Cab Mobile Equipment	Bogger Operator	26	0.214	2.2
16-05-18	U/G – Closed Cab Mobile Equipment	Truck Operator	-	-	Filter used twice
16-05-18	U/G – Closed Cab Mobile Equipment	Bogger Operator	27	0.256	2.2
17-05-18	U/G – Closed Cab Mobile Equipment	Jumbo Operator	31	0.233	2.2
14-05-18	U/G – Open Cab Drilling	Jumbo Operator	39	0.187	2.2
16-05-18	U/G – Open Cab Drilling	Jumbo Operator	25	0.303	2.2
17-05-18	U/G – Open Cab Drilling	Jumbo Operator	35	0.128	2.2
16-05-18	U/G – Supervisors; Mining Tech	Surveyor	28	0.179	2.2
17-05-18	U/G – Supervisors; Mining Tech	Geo	22	0.201	2.2

Inhalable Dust Levels

Sampling Date	Similar Exposure Group (SEG)	Position	Laboratory Sample Number	Respirable Quartz (TWA) mg/m^3	WES (shift adjusted)
14-05-18	U/G – Exploration – Underground Drilling	Exploration Drilling	46	0.428	7.2
14-05-18	U/G – Maintenance – Heavy Mobile Equipment	UG Fitter	50	0.253	7.2
14-05-18	U/G – Charge-Up & Services	Charge Crew	43	1.050	7.2
14-05-18	U/G – Charge-Up & Services	Service Crew	45	1.033	7.2
14-05-18	U/G – Closed Cab Mobile Equipment	Bogger Operator	42	0.723	7.2
14-05-18	U/G – Open Cab Drilling	Jumbo Operator	44	0.627	7.2
14-05-18	U/G – Supervisors; Mining Tech	Geo	47	0.330	7.2

3. QUESTION 5 (2.3)

The response received does not really address the main issue raised in the s92(1) request which relates to the proportion of vehicles for Project Martha. This question asked "…does the similarity in vehicles (with respect to frequency and concentration of vehicle movements) mean that there is a similar proportion of vehicles i.e. similar proportion of excavators to trucks to light vehicles etc?" The reason to ask this question is that if there is going to be a large proportion of light vehicles compared to previous vehicle fleets than vehicle emissions will not be as comparable to a fleet of vehicles that is made up of a high proportion of heavy trucks which would be expected to have greater emissions. WRC staff do not have the information/data that backs up the statements relating to "minimal effects on air quality" from Project Martha when comparing it with previous activities at the site.

The Martha pit and Development site has operated over the last two decades using a mobile fleet consisting of:

- conventional large backhoe excavators of the order of 110 tonne to 190 tonne weight;
- light backhoe excavators of the 20 to 30 tonne capacity for works around the tailings dam;
- drills based on a Cat 20 tonne excavator chassis with montabert booms, gross weight 20 tonne;
- 85 tonne capacity dump trucks (Cat 777 or generic), gross weight 146 tonne;
- water carts (Cat 769 or generic), empty weight 31 tonne;
- large tracked dozers of capacity 46 tonne operating weight (Cat D9 or generic); and
- Cat 992 wheel loader rated at 64 tonne.

Support vehicles include compactors Cat 815 (17 tonne), ITC (7 tonne) refuelling vehicle, explosive delivery truck which are based on a medium sized road truck.

Light vehicles comprise the blast crew (2No.), supervisors (2No.), survey, geotechnical and geology (3No). Maintenance and electrical (5No.), Geotechnics (1No.) and samplers (1No.)

The table overleaf shows a comparison in terms of number of vehicles estimated for the Martha pit from 2006 to 2014 and the Martha Project proposal. The table provides a ratio of fleet numbers i.e. number of heavy vehicles to number of light vehicles and a weight ratio in terms of weight of heavy vehicles to the weight of the light vehicles. The fleet is split into the Martha pit and the TSF 1A / TSF 2 site (the development site).

Primary Activity	Manufacturer/ Model	Estimated Fleet 2006 to 2014		Estimated Fleet Project Martha		Empty
		Pit	Development Site	Pit	Development Site	Weight
Loading ore, waste	HITACHI EX1200 EXCAVATOR, HITACHI ZX1900 EXCAVATOR	2	1	1	1	120
Drill	ATLAS COPCO T35 DRILL RIG or 20t Montebert	6		2		20
ROM operations	CAT 992 LOADER (ROM FEED)	1	1	1		64
Haulage ore, waste	Cat 777F	6	6	3	3	60
Explosive loading	MMU EXPLOSIVES TRUCK	1		1		10
bench clean-up	CAT D9 DOZER	1	1	1		46
Development roadway maintenance	CAT 14H GRADER	1	1	1	1	18
Refuelling / Mobile Maint	CAT INTEGRATED TOOL CARRIER IT38,		1		1	7
Compactor	Cat 815		1		1	17
Water cart	Cat 769 or 763	1	1	1	1	31
Light backhoe excavators	Cat 20t to Cat 30t weight	1		1		20
Refuelling Vehicle	Modified road truck Nissan	1		1		10
Supv, Blast Crew, Transport Light Vehicles	Toyota Hilux / Landcruiser	4	4	2	2	1.5
Geology / Samplers Transport Light Vehicles	Toyota Hilux / Landcruiser	5		1		1.5
Maintenance and Electrical and Crusher	Toyota Hilux / Landcruiser	4	1	3	1	1.5
Fleet Number Ratio Heavy : Light by No.		**1.9**		**2.3**		
Fleet Number Ratio Heavy : Light by Weight		**59**		**68**		