Gen Hewett

From: Karen Pratt [redacted]
Sent: Wednesday, 10 May 2017 3:10 p.m.
To: TTRLApplication; Christina Smits
Subject: DMC request minute 41, not met
Attachments: image004.emz; image019.emz; image026.emz

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Responses to DMC Minute 43

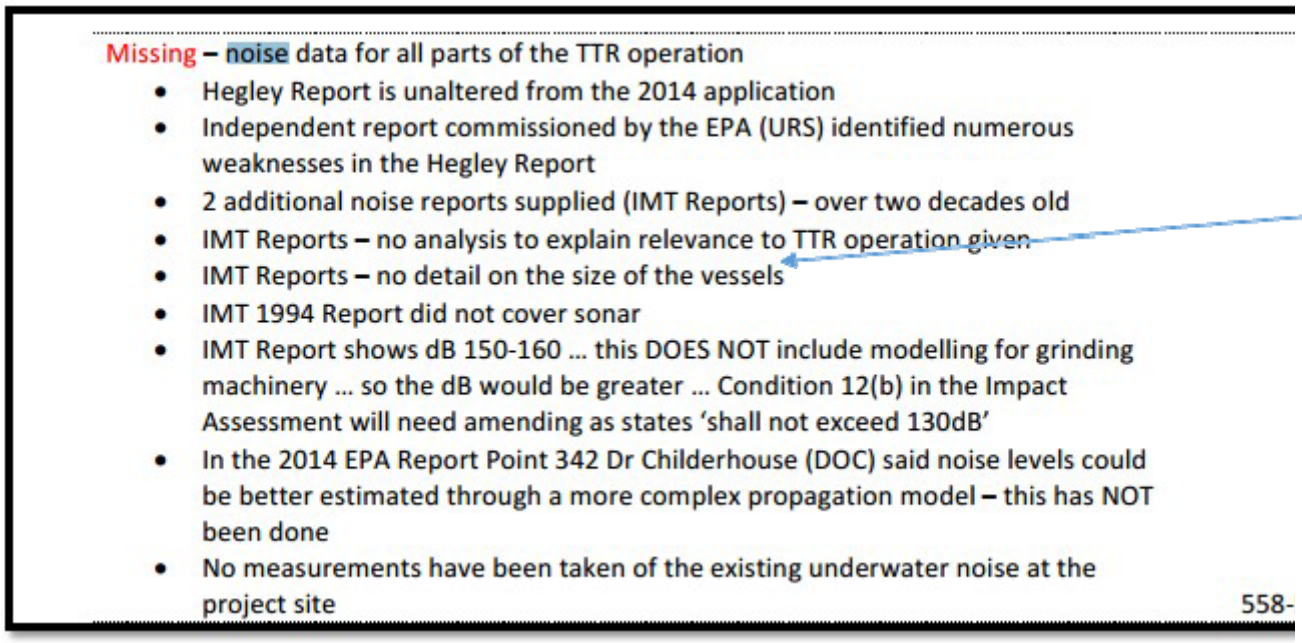
Good morning,

Could I please alert the DMC to the fact that their request for information (Minute number 41) for acoustic information has not been met. I have a number of points, fully supported, to evidence why.

Thank you,
Karen Pratt

1. On the 3rd or 4th of May, I rang the EPA and spoke with Christina – to alert the EPA to the fact that the **DMC request had NOT BEEN MET** – The DMC requested ***Define all likely noise sources*** *associated within the project, and incorporate them into an acoustic model.*
   K Pratt comment: **THIS WAS NOT D**ONE, AS THE GRINDING MACHINERY & DESALINATION PLANT HAS NOT BEEN CONSIDERED BY CHILDERHOUSE – DESPITE MY POWERPOINT (PG 37)PRESENTATION TO THE DMC PROVIDING DETAIL ON GRINDER NOISE, AND DESALINATION PLANT NOISE FROM THE CURRENT SINO IRON PROJECT IN AUSTRALIA . A link was provided in my PowerPoint, to make it easy for TTR to utilise the data.

   In 3.2 of Childerhouse he states: *A large moving ship will typically have a source level of 170 - 180 dB re 1µPa at 1m. It is considered that extraction and processing activities will generate a worst case sound pressure level similar to that of the crawler, i.e. ~170 dB re 1µPa.* ***Again this source data is supported by the De Beers empirical data****.*
   K Pratt comment: The De-Beers information DID NOT include grinders, or desalination plant. Furthermore the ships were of considerably smaller size than contemplated by this operation (see my submission on this)



Missing – noise data for all parts of the TTR operation

- Hegley Report is unaltered from the 2014 application
- Independent report commissioned by the EPA (URS) identified numerous weaknesses in the Hegley Report
- 2 additional noise reports supplied (IMT Reports) – over two decades old
- IMT Reports – no analysis to explain relevance to TTR operation given
- IMT Reports – no detail on the size of the vessels
- IMT 1994 Report did not cover sonar
- IMT Report shows dB 150-160 … this DOES NOT include modelling for grinding machinery … so the dB would be greater … Condition 12(b) in the Impact Assessment will need amending as states 'shall not exceed 130dB'
- In the 2014 EPA Report Point 342 Dr Childerhouse (DOC) said noise levels could be better estimated through a more complex propagation model – this has NOT been done
- No measurements have been taken of the existing underwater noise at the project site

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Extract above from K Pratt's submission, Index:
http://www.epa.govt.nz/EEZ/EEZ000011/Pratt_K_Section1_123055.pdf

In my submission, I presented information on the weaknesses and limitations of the DeBeers Reports. Below is one on the small size of ships used for the study, and another on the limitations noted within the DeBeers report.

There is no detail on the size of the vessels in the IMT reports.

I had to look up details for the two ships – and have found them to be significantly smaller than the TTR vessles. The Louis G Murray is 77m and the Grand Banks is less than 138metres. The Coral Sea 122m in length. So the relevance is conditional on understanding they are very much smaller than TTR operations – the IMV is 345metres in length.

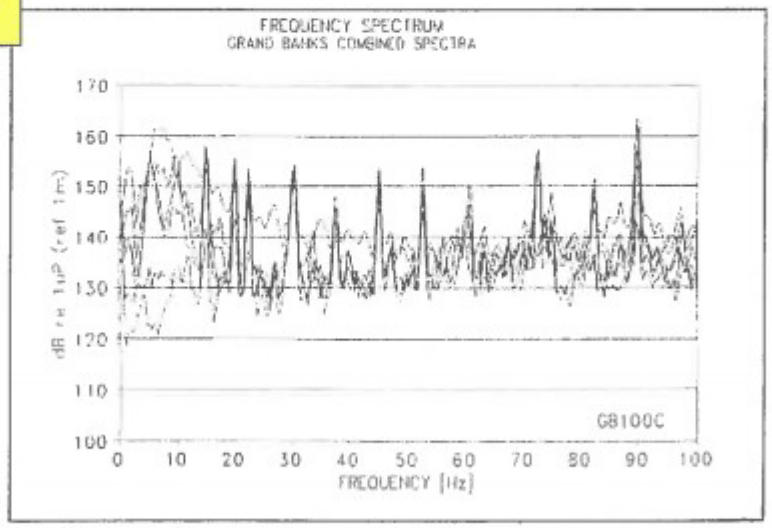
Extract above from K Pratt's submission
http://www.epa.govt.nz/EEZ/EEZ000011/Pratt_K_Section5_123055.pdf

KAREN PRATT SUBMISSION 2016

Noise from the machinery has a "significantly large" variation at 10Hz and "is worth further study"

7.1 GB 100 Hz spectrum

This spectrum is dominated by tonals produced by the rotating machinery. The drill and the vessel's operating noise levels cannot be distinguished from each other. There is a large variation in the noise level at 10 Hz the reason for this is unknown. This higher level is both present in the vessel recording and the vessel plus the drill. It is also absent from one of the vessel recordings. This noise component is significantly large and is therefore worth further study.



http://www.epa.govt.nz/EEZ/EEZ000011/Report_37_IMT_Environmental_Impact_Underwater_Radiated_Noise_1994.pdf page 13

http://www.epa.govt.nz/EEZ/EEZ000011/Pratt_K_Section5_123055.pdf pg 565

2. I note that the DMC also requested that: ***Review and comment on the noise related evidence of other parties**, already provided to the DMC during the course of the hearing.*

K Pratt comment: Childerhouse **did not comment on my presentation of evidence on noise** from Grinding Mills and Desalination Plant.

Below is the extract on page 10.

http://www.epa.govt.nz/EEZ/EEZ000011/Childerhouse_Response_to_DMC_Questions_Appendix_3_and_4.pdf

6.0 Noise Evidence

This section considers in part the DMC's paragraph 7 request for review and comment on the noise evidence of others.

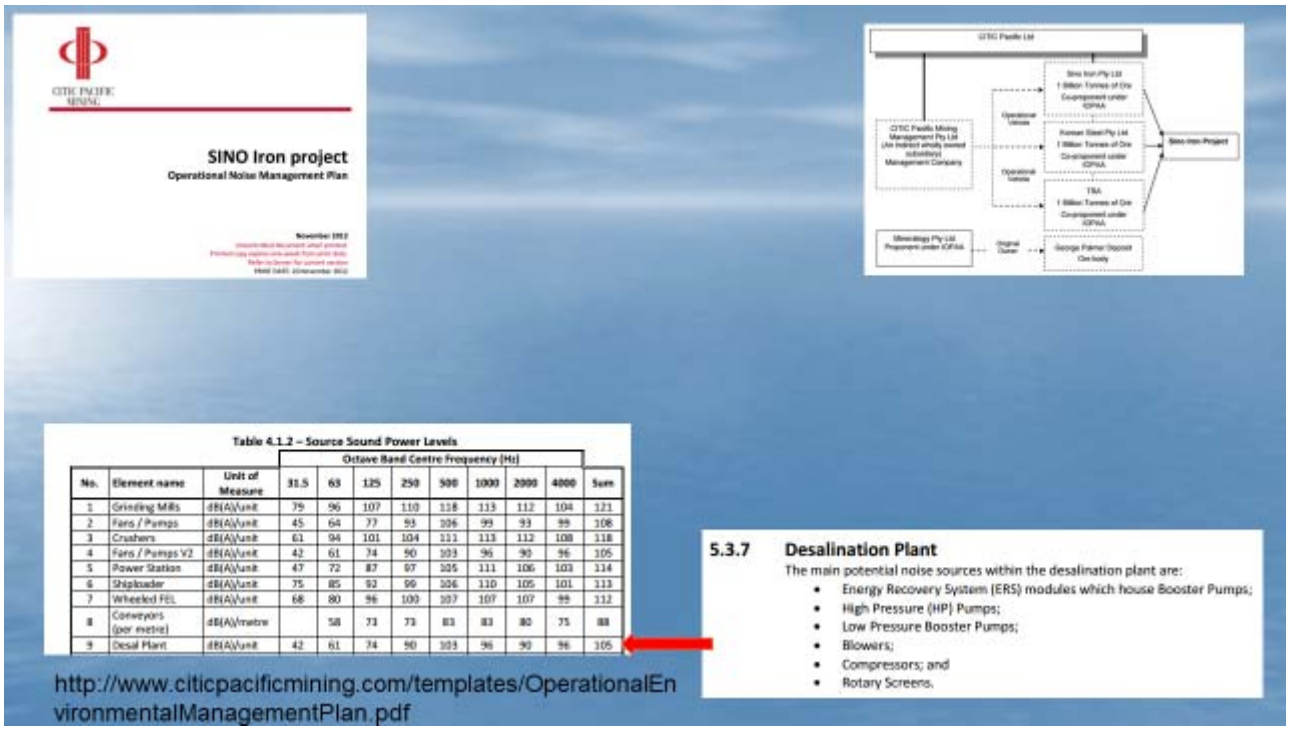
I have reviewed the empirical source level data obtained from De Beers Marine (measured crawler noise) and I continue to support the use of this data, as was the case in the 2014 hearing. I have undertaken a conservative assessment of underwater noise using the commercially available dBSea software and used the most appropriate calculation algorithm applicable to the local conditions of the STB and those of the project.

I have reviewed the evidence of others and there are various comments made about noise and noise effects, much of it without reference to specific analysis and empirical data. I am satisfied that my assessment quantifies the issues they have raised and addresses the queries raised by the DMC.

Extracts below are from my Power-Point to the DMC at the Hearing, on noise that had been omitted from TTR's noise information. http://www.epa.govt.nz/EEZ/EEZ000011/Karen_Pratt_Presentation.pdf *pg 37*

Table 4.1.2 – Source Sound Power Levels

No.	Element name	Unit of Measure	Octave Band Centre Frequency (Hz) 31.5	63	125	250	500	1000	2000	4000	Sum
1	Grinding Mills	dB(A)/unit	79	96	107	110	118	113	112	104	121
2	Fans / Pumps	dB(A)/unit	45	64	77	93	106	99	93	99	108
3	Crushers	dB(A)/unit	61	94	101	104	111	113	112	108	118
4	Fans / Pumps V2	dB(A)/unit	42	61	74	90	103	96	90	96	105
5	Power Station	dB(A)/unit	47	72	87	97	105	111	106	103	114
6	Shiploader	dB(A)/unit	75	85	92	99	106	110	105	101	113
7	Wheeled FEL	dB(A)/unit	68	80	96	100	107	107	107	99	112
8	Conveyors (per metre)	dB(A)/metre		58	73	73	83	83	80	75	88
9	Desal Plant	dB(A)/unit	42	61	74	90	103	96	90	96	105



3. *Extracts from Childerhouse* http://www.epa.govt.nz/EEZ/EEZ000011/Childerhouse_Response_to_DMC_Questions_Appendix_3_and_4.pdf *with K Pratt's comments in red.*

- *Source levels have been based upon empirical data obtained from De Beers Marine (**measured crawler and support vessel noise**)*

INCORRECT, ONLY A SUBSET GIVEN OF SUPPORT VESSEL NOISE

- ***If the totality of noise is considered** , i.e. the noise contribution of other support ships and dynamic positioning thrusters on-board the integrated mining vessel, then noise levels **increase by approximately 8 dB**, i.e. a level of 120 dB re 1µPa is achieved at approximately 23 km from the mining area.*

NO TOTALITY OF NOISE HAS BEEN GIVEN

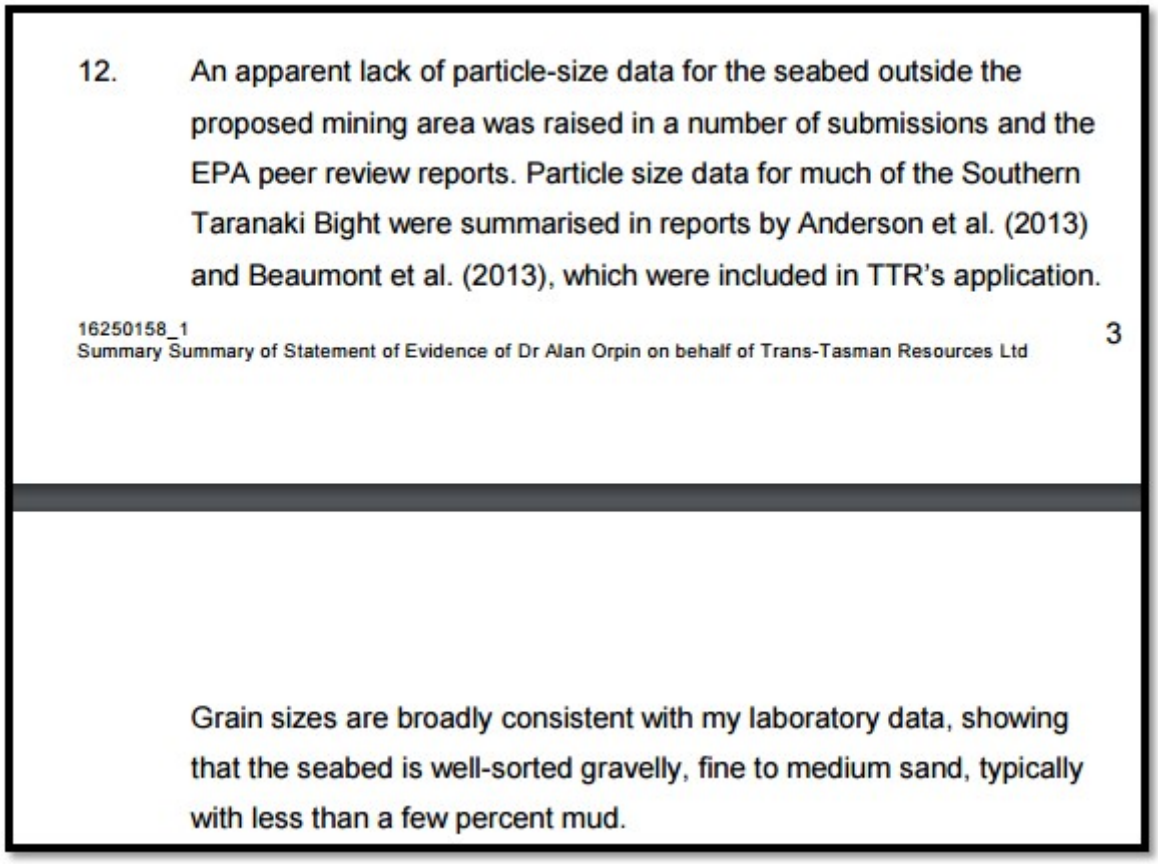
- Pg 5: *sea floor properties – which in the case of the South Taranaki Bight (STB) is **predominantly silty sands**. Properties are the density, speed of sound and various attenuation factors.*

INCORRECT: In none of the TTR Hearings (previous and this one) has the seafloor ever been categorised as 'silty sand'.

- Pg 7: *Negligible current and standard temperature and salinity profile for New Zealand waters as a neutral condition has been modelled to assess the long term effects of sound propagation. A sensitivity analysis has been performed for a current of 0.25 m/s*

INCORRECT, TEMPERATURE AND SALINITY PROFILES WERE RUN FOR THE AREA BY NIWA

- Orpin has not characterised the seafloor ever as 'silty sand'



12. An apparent lack of particle-size data for the seabed outside the proposed mining area was raised in a number of submissions and the EPA peer review reports. Particle size data for much of the Southern Taranaki Bight were summarised in reports by Anderson et al. (2013) and Beaumont et al. (2013), which were included in TTR's application.

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Summary Summary of Statement of Evidence of Dr Alan Orpin on behalf of Trans-Tasman Resources Ltd 3

Grain sizes are broadly consistent with my laboratory data, showing that the seabed is well-sorted gravelly, fine to medium sand, typically with less than a few percent mud.

- The Coastal Stability report, does not describe as silty sand: In the north at Ohawe and Hawera, the beach sediments are overall coarser than those to the south, being largely **poorly sorted gravelly medium to coarse sands and fine gravels**, with much of the coarser material appearing to derive from cliff collapse. In **the south the beaches are sandier being primarily moderately sorted gravelly medium sands**
  http://www.epa.govt.nz/EEZ/EEZ000011/Report_5_NIWA_Coastal_stability_PHASE_1_November_2015.pdf

- The Geological Desktop survey never described the seafloor as silty sand:The **inner and mid-shelf shoals are predominantly gravel sands, rich in shell material,** with **The Rolling Ground and Patea Bank comprising >50% carbonate**. **Graham Bank is a coarser grained, carbonate-rich (>50%) sandy gravel**. Sandy sediments dominate to >100 m water depth on the low gradient, wide shelf offshore of Hawera. Sandy sediments also occur as a shore-connected belt around 12-15 km wide that follows the coast.

http://www.epa.govt.nz/EEZ/EEZ000011/Report_11_NIWA_Geological_Desktop_Summary_November_2015.pdf pg 21

- NIWA never referred to the seafloor as predominantly silty sand:

> The seabed is initially populated with a combination of coarse sand (500–1000 µm, 20%), fine–medium sand (128–500 µm, 72%), very fine sand (63–128 µm, 6%), coarse silt (16–63 µm, 1.5%) and fine silt (4–16 µm, 0.5%). The proportions were initially based on seabed particle size distribution (PSD) data from the extraction area, and the fine sediment fractions were then adjusted so that the model produces surface SSCs of approximately the correct magnitude in the near-shore area (Sections 4.2 and 4.1). The seabed composition was assumed to be uniform over the model domain.

http://www.epa.govt.nz/EEZ/EEZ000011/NIWA_Sediment_Plume_Modelling_Report_Full_version.pdf