

In the Allegiance Executive summary of the Tenas Project on page x is

“Emissions of criteria air contaminants (CACs) were estimated for all Project activities during a select peak year (Year 5) of the Operation Phase. Estimated emissions were then input in the CALPUFF dispersion modelling system to estimate maximum ambient concentrations and dustfall deposition rates in the air quality Local Study Area (LSA). Project contribution to maximum predicted concentrations of PM and NO₂, as well as maximum predicted dustfall deposition rates, may exceed the relevant ambient air quality criteria in a small area surrounding the Minesite and CPP. Maximum predicted concentrations for all contaminants are expected to remain below the relevant ambient air quality criteria at sensitive receptors including the

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“Section 4.0 Environmental Effects Assessment

Chapter 1 Atmospheric Environment Valued Component

Telkwa Coalmine Recreation Camp (TCRC) and nearby residences. In the populated area of Telkwa, maximum predicted concentrations of PM may exceed the ambient air quality criteria due to high background concentrations; however, the Project contribution is very low, less than 3% of background particulate matter less than 10 microns in diameter (PM₁₀) and particulate matter less than 2.5 microns in diameter (PM_{2.5}) concentrations.”

In Section 3. Scope of the Assessment, on page 6 is, “3.

Section 4.0 Environmental Effects Assessment

Chapter 1 Atmospheric Environment Valued Component

SCOPE OF THE ASSESSMENT

The assessment of Project-related effects and cumulative effects was conducted according to the methods set out in S3.0 Assessment Methodology of the EAC Application. Methodologies specific to Atmospheric Environment VC are described in their relevant sections. The assessment boundaries specific to Atmospheric Environment VC are provided in 2.4 and the characterisation criteria specific to this VC are provided at the start of 5.4.

Assessment of effects on the Atmospheric Environment VC focuses on the Operation Phase of the Project as this phase is associated with the greatest effects on the Air Quality, GHG Emissions, and Noise subcomponents. Potential effects associated with the Construction, Decommissioning and Reclamation, and Post-closure phases are expected to be bounded by (i.e., less than) effects presented herein for the Operation Phase.

The assessment has been informed by the engagement and consultation process, including an air quality model plan¹ submitted to and approved by the British Columbia Ministry of Environment and Climate Change Strategy (BC MECCS) (Orchard 2019-2020).”

Section 3.2.4.34 Technical Boundaries, say in part, “Limitations are inherent in the assessment of Project-related effects on the Atmospheric Environment VC.

These include limitations in estimating air emissions and sound power levels of Project activities, and limitations in modelling of ambient concentrations and noise levels in the LSA and RSA.” p. 14

1 NB a model plan, this does not constitute a modeling exercise or allow assessment based on it

and continues below, “ Air quality dispersion models and noise propagation models can only approximate atmospheric processes.

Many assumptions and simplifications are required to describe real phenomena using mathematical equations. Model uncertainties can result from:

- simplifications and accuracy limitations related to source inputs to represent Project activities;
- extrapolation of meteorological data from selected locations to a larger region; and/or
- simplification of model physics to replicate the nature of atmospheric processes.
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To overcome these limitations, conservative assumptions were made and are described in Appendix 4.1-A Noise Modelling Report and 4.1-B Air Quality Report.”

Before moving to the aq appendix, here’s the reference to Trina Orchard, “Orchard, T. 2019-2020. Personal communication. Air Quality Meteorologist, British Columbia Ministry of Environment and Climate Change Strategy. E-Mail. December 2019 to June 2020.”

It’s reasonable to point out that the personal communication is not given so this is a shortcoming in the ability of the public to assess the air pollution assessment. This is the same Trina Orchard Ben W said was working on this. I’ve emailed for more details and she has not got back to me, but it’s only been a couple of days. It’s entirely possible to phone her and ask, 250-420-6461.

On p. 58, section 4 is this remarkable paragraph,

High Confidence: Cause-effect relationships between the Project and the VC are fully understood and all the necessary data are available to support the assessment. For example, external variables and/or data for the Project is both complete and comprehensive, the effectiveness of the mitigation measures is highly proven, and the modeling results hold a low degree of variance given the data inputs. Consequently, there is generally a high degree of uncertainty in the conclusions of the assessment.

It’s striking not only for its presence but that the part between **High Confidence:** and ...the data inputs would lead one to think that there is, let’s see, what should I call it, *High Confidence* perhaps – but the concluding sentence says that there is, “... a high degree of uncertainty in the conclusions of the assessment.”

I don’t have any problem with the last sentence, which is presumably a mistake resulting from a rush job and poor proofreading, but those characteristics make this document an unsuitable basis for an environmental assessment.

Anyway on to the Appendix, 4.1-B

This is a report by a firm called Hemmera for Telkwa Coal. It specifies CALPUFF as the modeling tool. It is widely used and its inputs, assumptions and outputs are set out in some detail. The modeling results are to some degree reported elsewhere in the report, esp. appendix 8.1, Human Health. Section 4.2.5.6 on page 27 contains Table 4.2-1, Contaminants of Potential Concern (COPC) Selected for Assessment for Human Health in Local Study Area (LSA). Immediately following is section 4.2.6, Concentration Ratios for Criteria Air Contaminants (CACs) under Existing Conditions, which in its first paragraph says, “There are no major industrial facilities within the LSA.” That’s an exercise in boundary drawing if you like. Air is the most mobile environmental medium and the adequacy of a specific geographic boundary needs to be an output of their modeling, not an input.

In section 5.2.2.1 – Air Quality – Operations Phase, is this paragraph - “The potential Human Health effects resulting from inhalation of metals in dust involve the body’s respiratory system and may range from mild functional impairment to chronic obstructive lung disease, asthma, emphysema, and other lung conditions, depending on the metal compound, its physicochemical form, the dose, exposure conditions, and susceptibility factors in the human receptor (Nemery 1990). Some metals, such as arsenic, cadmium, chromium, and nickel, are considered carcinogenic via the inhalation route (Health Canada 2021).”

This understates the effects of arsenic. It occurs in both trivalent and pentavalent forms and they have substantially different effects in the human body depending on methylation (further details forgotten but part of the research record.) Substantially = two orders of magnitude. I suggest a question to Josette Wier who was involved for several years in an environmental case that hinged on this point. The primary researcher was Bill Cullen (Phd, emeritus prof of chemistry UBC, if he’s still alive) whose research was published in 1999 with colleague Maas – don’t have the reference, ask Josette. This research was decisive in Bill Clinton drastically reducing the acceptable level of arsenic in drinking water in the US² as one of his last acts in office³. The effect is not only carcinogenicity but also teratogenicity, depending on valency

For the carcinogenicity of cadmium ask Biz Bastian who’s all over it.

I’ve mentioned arsenic because inhalation is an exposure pathway, but two other considerations apply. One is that natural occurrences of arsenic are said to be high throughout the Bowser Basin and so existing exposures will be additive to those originating with the project – there is no pristine population who will be harmed by a teeny increment – all exposures must be considered as additive and in the context of existing harm. A second consideration is of course that it will wind up in water and so we can reasonably expect exposure through the GI tract. The interacting effects are not, as far as I can see, mentioned here. The information provided does not allow for a fully informed decision, a common theme in the reading I’ve done.

2 From 25 ppm to 1ppm

3 And good old GW Bush bumped it right back up to 25 but the outcry from the public and EPA caused it to be left at 5ppm. I don’t know what it is now.