

BRConard

Consulting, Incorporated

metals • environment • health • toxicology

**REPLY TO COMMENTS
BY WATTERS ENVIRONMENTAL GROUP
AND THE PUBLIC LIAISON COMMITTEE
ON
VALE'S (INCO'S) INTEGRATION REPORT
REGARDING PORT COLBORNE'S CBRA**

Submitted to Vale Limited
by
Bruce R.Conard

October, 2010

As part of the Community-Based Risk Assessment (CBRA) carried out by Vale (previously Vale Inco or Inco) in Port Colborne, Ontario, a risk management report, termed the Integration Report (dated June 1, 2008) was submitted by Vale to the Ministry of the Environment (MOE). Consistent with practices followed during the CBRA process, this Report was reviewed by Watters Environment Group (WEG), which provides technical consulting services to the City of Port Colborne and its Public Liaison Committee (PLC) for the CBRA. WEG's comments were submitted to the PLC in a draft report dated March 9, 2009. In addition, the PLC itself submitted its report on the CBRA to the MOE dated July 8, 2010.

The purpose of the comments made herein is to reply to issues raised by both WEG and the PLC. This is done in the expectation that the MOE desires such replies in order to execute its comprehensive review of all matters pertaining to the CBRA, its conclusions and required further actions.

1 Re: Reliance of the Integration Report on technical risk assessments

WEG comments that *“The current structure of the Integration Report assumes that the findings of each of the three study reports are correct. In our opinion, this is not a reasonable assumption.”*

Reply: WEG maintains that the risk assessment technical reports submitted by Jacques Whitford (JW, now Stantec) contained errors and WEG does not agree with the reports' conclusions regarding the natural environment, agricultural crops and/or human health. WEG would have written different risk assessment reports and would, accordingly, have written a different Integration Report. What is Vale reasonably expected to do in these circumstances? Would it have been reasonable for Vale to have thrown out JW's risk assessments and applied all of WEG's beliefs and conclusions in writing the Integration Report? No, such action is unreasonable.

Vale received a comprehensive and, in its opinion, valid set of technical risk assessments from its consultant, JW. Vale then set about to write an Integration Report that dealt with the identified risks on a property-by-property basis. This approach was logical and reasonable. If the conclusions of the technical risk assessments are found to

be in error by the MOE and, upon discussion with Vale or by other means available to the MOE, modifications to the technical risk assessments are found to be necessary, then a revised Integration Report would be submitted. A suggestion that Vale should have anticipated such occurrences and their quantitative effects in the Integration Report is very unrealistic.

2. Re: Lead as a Chemical of Concern (CoC)

WEG and the PLC contend that Pb should have been a CoC for the CBRA.

Reply: Vale has consistently disagreed with WEG and the PLC that Pb is a CoC for the CBRA. While Vale acknowledges that Pb is a chemical of interest for Port Colborne, Vale does not accept that its airborne emissions of Pb contributed significantly to the levels found in certain Port Colborne soils. Extensive discussions of Pb in the early stages of the CBRA, and comprehensive reports on Pb by JW, led Vale to the conclusion that Pb in soil was an issue that faced most of North America's older communities due to the widespread societal use of Pb in gasolines, paints, and secondary batteries during the middle part of the 20th century. Data supplied by the MOE supported that conclusion.

The PLC has stated that all three of the criteria for a CoC were met by Pb. Vale's opinion regarding these criteria is spelled out as follows.

- (a) the CoC was used or generated by the Vale refinery processes. Vale knows that Pb was in the feed to the refinery and some of this Pb likely was emitted. This criterion is therefore met.
- (b) Pb is present in soils at levels above the MOE Guidelines. Vale accepts that this criterion is met.
- (c) Pb shows a scientific link to Vale's operations. This is the criterion that has generated considerable debate. On the one hand, the PLC states that any emission of Pb by Vale should make it a CoC for the CBRA; on the other hand, Vale maintains that scientifically linking Pb in soil to Vale requires that a significant portion of the Pb found in soils could be assigned as coming from Vale. Intensive emission inventory and emission dispersion studies done early in the CBRA

showed that Pb emissions from Vale were an extremely small fraction of the Pb appearing in soils, even under the most aggressive emission estimate scenarios. Accordingly, Vale's position is that holding Vale responsible for all the Pb in soils is neither scientifically, legally, or morally correct, and therefore this criterion is not met and Pb fails as a CoC for the CBRA.

3. Re: Unrestricted use of land.

Both WEG and the PLC talk about the rights of land-owners for unrestricted use of their land and they complain that the Integration Report states that land-owners will have to contact Vale to have their backyard vegetable gardens sampled. They assert that this contravenes their rights.

Reply: The very regulation (*O.Reg 153/04*) WEG uses as the foundation of the right of unrestricted land use is the regulation that discusses at length the use of a Record of Site Condition where remediation has been carried out on a brownfield site to prepare it for its new more sensitive land use. Under this regulation, analysis of soils prior to and after remediation are compelling features of knowing whether risks exist and whether those risks have been satisfactorily removed. While *O.Reg 153/04* is not applicable to the CBRA situation because the sites being studied are not brownfield sites, nevertheless, all the stakeholders in the CBRA agreed that the CBRA should follow the spirit of *O.Reg 153/04*. It is exactly in this way that the Integration Report anticipates certain sites will be sampled to determine risk and will need to be declared as "satisfactorily remediated". Instead of contravening a land-owner's rights, the Integration Report is specifying exactly how those rights will be respected.

4. Re: Documentation for land owners

WEG states that documentation provided to land owners after sampling and remediation (if it is needed) is important. WEG believes the Integration Report is unclear about several things in this regard, namely:

- (a) Exactly what documentation is going to be provided?

- (b) Does the land owner have to accept Vale's remediation proposal for their land?
- (c) If a Record of Site Condition is required by the MOE for a site, will it be made clear that Vale is only taking responsibility for analyzing four elements and that the land owner will have to pay for any other elements/chemicals that are required?

Reply:

- (a) The precise form of the documentation from the governmental authority (MOE) regarding remediation is not completely specified in the Integration Report because that is a matter for the MOE to decide. Vale has been informed that the MOE is not currently thinking of requiring a Record of Site Condition. Instead, it appears that the MOE will issue a notification to each land owner after the MOE is assured that the remediation satisfactorily removed the risk that had been identified for that site.
- (b) The land owner ultimately has complete jurisdiction over what happens on his/her land. Vale will make a proposal and will seek agreement with the land owner. A form of mediation will be present by having the MOE participate in all discussions between the land owner and Vale. Any more formal mediation would be possible upon the consent of both parties.
- (c) With the MOE going away from a Record of Site Condition, it appears that no extra costs will have to be borne by the land owner.

5. Re: domestic animals

WEG states that no supporting evidence is provided that risks to pets and other domestic animals have been evaluated.

Reply: It is common practice in risk assessment to use a surrogate species to represent other species close to it in size and behaviour. The requirement is that the surrogate must be a more sensitive receptor, which means the surrogate must have a higher exposure to the CoCs. The surrogate for domestic animals in the CBRA were species like raccoons and foxes. These wild animals get food directly from the affected

lands and would consequently have higher exposures to the CoCs than domestic animals, which receive a substantial portion of their food from commercial feed. It is for this reason that JW maintains it has evaluated the risk to domestic animals.

6. Re: MOE as advisor to Vale.

WEG states that the MOE should advise whether it can be an advisor to the proponent (Vale) during Phase II of the CBRA

Reply: Vale does not consider that the Integration Report is suggesting the MOE act as an advisor to Vale. The involvement of the MOE in discussions between Vale and each land owner is anticipated as aiding both parties in reaching a mutually acceptable remediation strategy for each property. Vale would not request, nor does Vale think it would be appropriate, that the MOE be an advisor to Vale.

7. Re: Vale being the proponent of CBRA-related activities

The PLC has objected to the CBRA having Vale as the proponent. They further object to Vale being the proponent in the remediation phase of the CBRA.

Reply: A proponent is one who proposes something. Vale proposed the CBRA as a means to determine risk and Vale is proposing a process to be used for those properties which need remediation to reduce identified risks. Because it is making these proposals, Vale is unambiguously the proponent of them.

The PLC believes that a CBRA activity should have been done without Vale as the proponent. People and institutions are free to act. Vale acted. Nobody else took the initiative. As a consequence, Vale is the proponent.

8. Re: Sufficiency of information on remedial options

The PLC states that there is insufficient information on remedial options.

Reply: The Integration Report devotes 8.5 pages to a discussion of remediation options. Included in this discussion are pros and cons associated with:

- (a) removal of CoCs from soils by soil excavation, soil leaching and phytoextraction;
- (b) reducing CoC exposure by capping the soil so that pathways of exposure are blocked;
- (c) reducing the bioavailability (and, hence, exposure) by adding amendments to the soil to either increase pH or to form more stable compounds of the CoCs.

The practice of many of the options is impractical, technically uncertain or prohibitively expensive. It would appear that the PLC, instead of needing more information, simply doesn't like the conclusions reached on viable and effective remedial options. The authors of the Integration Report are not aware of other general information that is germane to the discussion. If there exists other information relevant to a particular site, such information will be made available to the land owner during discussions of the remediation strategy for that particular property.

9. Re: Efficacy of applying CBRA results to individual properties.

The PLC and WEG state that it is unclear how to transfer or apply findings of the CBRA to individual properties.

Reply: A great amount of time was devoted to writing the Integration Report so that all property owners could understand whether their property was suspected as having a risk and exactly what step-by-step process was to be followed to identify what the risk was.

- (a) There was an overall decision flowsheet (Fig 1 of the Integration Report), which showed owners of farms, rural residences, woodlots, or urban residences where to find decision flowsheets for each type of property.
- (b) There were detailed maps enabling each property owner to see whether their property fell within a area requiring more detailed soil sampling.
- (c) Decision flowsheets showed whether remediation was necessary for each type of property or whether additional soil sampling was required to make that decision.

(d) The most complicated additional work anticipated is sampling of agricultural fields. The strategy for sampling was spelled out in detail.

The final form of the Integration Report was the result of four drafts that underwent considerable discussion and comment by the Technical Sub-Committee. Virtually all suggestions made by the TSC to improve the clarity and sufficiency of the Report were incorporated in the final Report. It is frustrating to Vale that this amount of detail and review would result, according to WEG and the PLC, in a Report that is unclear or insufficient.

10. Re: Degree of precaution used in the Integration Report.

The PLC states that the Integration Report is based on risk assessments that are not conservative enough.

Reply: The size of safety factors to be applied in risk assessments is an on-going issue. The conventional wisdom among risk assessors across the world, and wisdom that Vale believes was used by JW, is that one should be sure to avoid under-estimating risk, but one should strive to be as close to the true risk as is possible. The CBRA resulted in risk assessments that are conservative. It is not surprising that some people would have applied safety factors that would be more conservative. In JW's professional opinion, the amount of precaution and extra safety applied in the risk assessments were appropriate.

Errors of fact in the PLC Report

- ◆ In the Background section of the PLC report, it is stated that the MOE issued an order in March 2001 for Vale to remediate 11 properties that had soils in excess of 8000ppm Ni. This is incorrect for the following reasons:
 - The MOE issued a draft order in March 2001.
 - The draft order concerned 16 properties in excess of 10,000ppm Ni.
 - The basis of the draft order was an MOE Rodney St. Report issued in March 2001, but this report was withdrawn shortly after its release due to an error it contained.

- A subsequent MOE report on Rodney St. properties was released in March 2002 and was accompanied by an order for Vale to remediate 25 properties (16 original plus 9 additional properties) in excess of 8000ppm Ni.
- ◆ Also in the Background section, the PLC states that an MOE study in 1997 identified that “...*an adverse environmental affect [sic] occurred due to release of Chemicals of Concern (CoC) from Inco’s operations...*” and that “...*there were four CoCs identified above the Ministries [sic] Generic Guideline levels...*” The facts are:
 - The MOE identified three CoCs (Ni, Cu and Co).
 - The MOE did not identify an environmental effect due to these CoCs, but instead specified that a comprehensive risk assessment would be needed to determine what risks to the environment and human health might exist.
 - Arsenic as a CoC for the CBRA was identified by JW in 2001 during their initial work on the CBRA.