

## RECLAMATION LAND USE OBJECTIVES

### A PANEL DISCUSSION INCLUDING:

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Ministry of Energy, Mines and Petroleum Resources.

John Errington  
Ministry of Energy, Mines and Petroleum Resources

John Dick  
Ministry of Environment and Parks

Jim Lant  
Crow's Nest Resources Ltd.

Hennie Velhuizen  
Noranda Inc.

The panelists' presentations have been transcribed from recordings with limited editing.

Jake McDonald. Ministry of Energy. Mines and Petroleum Resources

- My own thoughts on land use objectives are somewhat prejudiced by the fact that I'm a mining engineer and I think that if we're going to mine, then let's mine. I feel that maybe our objective should be to mine and do what's necessary and what's good for the environment after mining is completed.
- I think we have some very good examples in British Columbia where we have totally reclaimed the land. We've removed the plant and reclaimed the roads, but this is not always possible. I think that we sometimes forget that mining may very well be the best land use for a particular area. Take the Sullivan Mine for example, where the total value of minerals produced to date is about four billion dollars. Although the Sullivan mine is an underground mine, it does have a problem with its tailings pond because it's very acidic, and this has to be addressed at some point in time. The value per acre of mining, if you relate it to the Sullivan mine, can be many millions of dollars.
- If we're talking about reclaiming the land for wildlife, then the value of most habitats is very low. What we should look at is how to arrive at land use objectives. I think that in the Highland Valley the best use is for mining. Other land uses in this valley were generally of low value and the land use should be mining. There's nothing wrong with those beautiful symmetrical dumps that you can see in the Highland Valley. I personally think that tourists would appreciate visiting the area too.

John Dick. Ministry of Environment and Parks

- I think when we consider reclamation land use objectives we're looking at two different levels. The first level is not negotiable and constitutes the basic legal requirement. This is the level at which you consider things like public safety, the minimization of externalities (impacts that go beyond the mine boundary) and even John Errington's rather nebulous "neat and tidy" criteria. In short, the major goal of this level of reclamation is to stabilize the mine site.
- Where I would part company with Bruce Switzer in his presentation yesterday is in his attitude to resloping. On one hand he discounts the very idea of slope reduction, but adds, almost as an after-thought, that this would apply only "as long as there's no erosion problem and the dumps are stable". All of us who have any experience with overburden dumps in the northeast and southeast coal blocks must recognize that erosion and instability are the most significant concerns relating to this first level of reclamation and thus "no slope reduction" isn't really a viable option.
- Once you've established the basic requirement, then I think you can begin to consider returning the area to a particular end land use or even to no land use at all. I think this decision will depend primarily on potential land use values and on the physical and chemical properties of the mine site materials involved. We've talked a lot about the benefits and costs of incremental reclamation but I think we've been a little too glib

on the subject. Given the huge values of mining per unit area that Jake McDonald has pointed out, these incremental reclamation costs seem insignificant and as I'll discuss later may have benefits to the industry well beyond those strictly related to the values of the land use.

- Up until now when we've talked about land use objectives, we've used statements like "Let's return it to wildlife habitat". This is basically a useless statement unless we define what species of wildlife we're targeting and define clearly the characteristics of the particular component of the species' annual habitat requirements we aim to restore. Only then can we begin to address design considerations such as site configuration, desired watershed characteristics and species mixes.
- I think John Errington was quite correct when he said that in many cases returning to wildlife use is an excuse for seeding with commercial grass and legume mixtures. Wildlife may use these simple man-made communities but they're unlikely to provide anything more than transitory benefits. For example, I would take issue with anyone who claims to have restored ungulate winter range, even in the Southeast Coal Block where I think there's been major strides in reclamation technology. I seriously doubt whether this is within our current capability because winter ranges are very diverse plant communities and we simply don't yet have the range of planting materials available to even come close to approximating them. I think what has happened in many cases is that we have reclaimed areas within or adjacent to existing winter ranges, and that much of the wildlife use is in the early spring because of the early green-up characteristics of species like alfalfa. We may have improved the capacity of the annual habitat by providing nutritious forage at a time when animals are coming off winter ranges in depleted condition, but we have not restored winter range. And the commercial mixes available to us now are soft-tissued and bred for hay, and thus will not sustain wild animals over a severe winter because they tend to lose nutrients very quickly under "field" conditions.
- Several years ago I attended a symposium in Spokane on reclamation for recreational use. I was the only Canadian at the conference and one "happy hour" I was buttonholed by a vice-president of Peabody Coal who said "You people in Canada still have a lot of options open to you in accessing land for mine exploration and development. In the States we're haunted by something called the "Orphan Lands". Every time we tell the public how easy it is to reclaim and how we're only a temporary user of the land and therefore should be able to mine anywhere, they point to the "orphan lands" and say 'If it's so easy, why didn't you do it then?' As a result we're facing significant restrictions on what we can do and where we can do it".
- I think this is an issue that goes beyond benefit/cost analysis. The mining community has always used the temporary use argument and claimed that it is possible to reclaim to a productive use. If you start backsliding too far on that commitment, I think you're going to lose your freedom of action to explore and mine in many areas of the province and I think that loss of trust, credibility and opportunity is something you can't measure solely in economic terms.

Jim Lant. Crow's Nest Resources Ltd.

- Some statements make my hair come up and one of those is every time the Ministry of Environment and Parks talks about winter range. Don't tell Tony Milligan that you can't create winter range, because I know that those elk have done very well.
- We've been asked to comment on how reclamation land use objectives should be expressed. It's my feeling that any objective should be expressed as simply as possible, yet definable. "Wildlife habitat" does not adequately describe the objective, whereas "elk summer range" does.
- What is the range of choice regarding these objectives? I think any land use objective that is deemed environmentally compatible with the surrounding area and, if possible, incorporates the public's needs and desires is appropriate. Some reclamation land use objectives can be achieved in the short-term; others take time.
- I feel that reclamation can be considered a success and is complete when the surrounding natural environment accepts your reclaimed area, the area is providing the end use objective, and there are no evidences of "bleeding". By "bleeding", I mean that no contaminated water comes forth, no foul air is emitted and the area is safe and stable.

John Errington. Ministry of Energy. Mines and Petroleum Resources

- Land use objectives have, in the past, been expressed by most mining companies as a general concept only. I'm quite optimistic that we'll see a lot more substance to objectives for new projects, and in fact in the last four or five years that has happened.
- The Mine Development Review Process has really improved development of integrated mine and reclamation plans. A land use objective is finally set when a company applies for a reclamation project. However, objectives have usually been discussed at all of the review stages from prospectus, through Stage I, to Stage II. Given this continuing discussion during project review, by the time we get to the reclamation permit stage, everyone's fairly clear about what the appropriate land use objectives should be. I can see only benefits from such a process.
- Wildlife habitat objectives should really be more fully defined, as John Dick mentioned. The same can be said about forestry objectives. I've always felt that reclamation programs should incorporate a system similar to the Canada Land Inventory and expresses capabilities in terms of location, climate, soil and other limiting factors. Potential capability could be established prior to mining and then projected as part of the reclamation plan. It seems to be a very simple concept which would address a multitude of potential land uses, but I can't recall ever seeing it in a reclamation plan.

- If land capability analysis were used, you would have an overall estimate of pre-mining land use capabilities and potential gains or losses as a result of mining. What happens now is that we approve a general concept and then sit back and rely on fate, technology, chance and voodooism to achieve the required productivity objective. This works fine if the company is really sincere and pursues the concept in a meaningful way. However, we all run into problems when a company doesn't make an honest effort and simply resorts to spreading standard grass/legume mixes on unprepared ground.
- There is a clear need to look at final topography in relation to land use objectives. I should make some mention of the 26° slope criteria referred to by Bruce Switzer yesterday. This criterion is a general guideline; considered the maximum slope angle at which a productive, self-sustaining vegetation cover can be established under the majority of circumstances. If a company feels confident that acceptable vegetation cover can be established at a steeper angle, they are free to experiment. It may also be that a given land use objective dictates a steeper slope. Wildlife winter ranges often occur on steep slopes where snow blows off and doesn't accumulate. I am all in favour of trying to achieve such ranges if they are well designed and constructed, however, a 1200 foot high, south-facing dump slope without any vegetation at all, isn't my idea of a winter range either.
- One final comment on aesthetics. I've always liked to think in technical terms of productivity and land use objectives and to discount appearance, however, in the end visual aesthetics are very important. To paraphrase, "Reclamation must not only be done, but I think it has to be "seen" to be done.

#### Hennie Veldhuizen. Noranda Inc.

- Noranda operates a large number of mining operations all across Canada, including British Columbia, and we're dealing with reclamation problems at many different properties. Some of these properties in British Columbia are now only a few years away from decommissioning and closure. We have been experimenting with different types of reclamation activities, including the direct preparation of tailings ponds with fertilizer and seed, and also lime where acid tailings are involved, and this technique has worked reasonably well.
- Addressing the question of reclamation land use objectives, I think our first objective in reclamation at Noranda is to establish a stable and safe environment on each of our operations. That means securing critical areas, such as open adits and unstable slope surfaces, and making sure the site is clean and tidy. A second objective is to address the water quality issue. We have spent a lot of money and a lot of effort on water quality at many of our operations. The most important water quality issue results from the acidification of sulphide materials. It's not much of a problem for us in British Columbia although we have some small areas where acid generation is taking place. In eastern Canada we have some massive sulphide areas containing 30 to 70%

sulphides. It is a very great challenge to prevent acidification and control discharge quality on such areas.

- The third area of objectives, and the one which is important to John Errington, is the productivity part of reclamation. I've always had considerable difficulty with this aspect of it. I visualize the mines that we have in British Columbia and elsewhere, where you have an open pit operation over a fairly large area of perhaps 50 acres involving massive disturbance, and generally in these areas we really do not have that much of a soil structure or depth to work with. Waste rock slopes are certainly a problem area. Again, it's a completely different environment to what was there before. You have a very coarse material that doesn't have the same water retention properties. To expect an equivalent level of productivity from the mine site is a concept that I have a great deal of difficulty accepting. Economically it's just not something that can be achieved on many of our operations unless you have very favourable spoil conditions.