

Reclamation Certification Criteria
Coal Mining Disturbances
An Overview of Requirements and Standards

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The mines in the Edson Area are relatively young in terms of mining in the area and so the actual results of reclamation are just starting to show. Cardinal River Coals is the oldest, having commenced operations in 1969 and have been the first in my area to ask for and receive, reclamation certificates on disturbed lands. Because the time of mining being done was prior to the year 1976, the certificates were issued on the reclamation standards in effect at that time & these being basic levelling, removal of hazards and a vegetative cover.

My responsibility as a Reclamation Officer, is to ensure the objectives of final reclamation on these mines will meet those conditions as agreed to at time of approval, or later updated submissions. To accomplish this, a close working relationship must be established with the mines to enable a free exchange of ideas, information, concerns and proposals.

This open communication is essential for staying in the know of the day to day operations of topsoil salvage and placement, new disturbances, erosion control measures, and emergencies.

As many of the certificates to date pertain to the pre 76 years, information required by the Reclamation Officers is dependent upon the background information available and their knowledge of the area. Therefore, specific information required may change from application to application; however, the basic documentation submitted with the request should include the following:

- #1) length of time since fertilization. On crown land, approximately 3-5 years should be allowed to pass before making a request to ensure the vegetation is "self supporting". On private land, the use of fertilizer is quite normal to increase the yields above average so other criteria may come into play.
- #2) some history of the area should be included to confirm what the area was like originally and how it was changed to its present state and its impact upon the use of the area.
- #3) support data in the form of a) soil test results and comparisons (the magnitude of these will be dependent upon discussions held with our technical advisors) and, b) confirmation that the conditions of approval have been met. and lastly,
- #4) a map showing the area requested. This must be tied in the D&R boundary or sufficient measures taken to ensure permanent boundaries are visible in the field. Where possible, a tie-in with the present legal system is recommended.

Discussions with the company will normally be held prior to their submission to reduce the number of deficiencies which may arise after review. If familiarity of the area disturbed & the reclamation procedure have been maintained, than the actual issuance of the certificate becomes a formality, rather than the beginning of a long process to tie-up loose ends.

Reclamation practices done to date on areas for future certification have been concerted efforts and further knowledge from the research being done will confirm or amend today's thinking. This continual change can only improve the end product, for which we all have a common interest.

My mines, as I've said, are in the foothills and mountain regions. These regions pose operational difficulties which have a direct impact upon the final product. In many instances, the accepted final reclamation may be completely different to what was there in the beginning. The basis of mining, open pit verses strip, creates hills out of flat land and lakes out of hills. The blending in of these "new features" to the surrounding terrain and having something that is useful, even if the end use will be different than the original, is one of the challenges. The altitude and climate play a large role in the availability of topsoil for salvage and plant growth & vigor due to the short growing season. These factors are accepted, dealt with and overcome with minimal

impact noticed to date on the reclamation of the area.

Slides have been made on accepted reclamation practices in my area, end of mine conceptual plans which will change the present land use, areas which certification has been requested and areas which have received a reclamation certificate.

For the reclamation of exploration programs a heavy drag was developed especially for loosening compacted soils such as access roads, etc. This drag was actually an old cutting roller from an underground miner with heavy drag-line link chain with cross bars and a large steel doughnut on end for levelling. Rollback is another method used that works effectively with both short and long term benefits derived in the reduction of traffic by recreationalists.

Bulk sample sites are another disturbance which require reclamation certification. Reclamation of these areas require the material to be replaced in reverse order of removal. The topsoil (humus layer, A horizon) is salvaged & placed on last with any other debris to create micro sites. Actual site disturbance can be minimized with effort and with reclamation, is part of the surrounding landscape.

The ability to take this land, significantly disturb the landform and return it to a state which is comparable, or in some instances better than what existed prior to mining, is the joint responsibility of both government and industry and the reclamation efforts made to date confirm that this commitment is not taken lightly.

Topsoil is a word which is all encompassing in the mountainous region. Because of the often thin layers of growth mediums over rock which cannot be economically retrievable, significant soil testing programs are conducted prior to disturbance to delineate what the growth material is & where the best is situated. Pockets of organic material and those mixtures of silts & sand & clay with little or no rock content are salvaged for replacement after final levelling is done. In areas where it is of sufficient depth to salvage, dozers push up the material & then it is hauled away with a shovel/truck operation. Where terrain is more level such as in the foothills, the use of earth movers enable far more flexibility in selective hauling of materials.

The final end use of the reclaimed area must be considered, as it may be desirable in some instances to change from the pre-mining use to something else which may be of a greater benefit. Open pit mining in the mountains has, I would say, the ability to most drastically change the landscape. What was there before mining cannot always be returned.

In the pre-76 years no topsoil salvage was required with only levelling, removing of hazards and seeding required. A reclamation certificate has been requested on lands in which mining was started prior to 73, completed in 75 with reclamation work completed in 1979. Very little erosion occurs because of the porosity of the material; however this medium is not conducive to the establishment of a good vegetative cover. In this instance issuance of a reclamation certificate is based on the standards in effect at the time of mining.

Today backsloping of dumps is done to angle not exceeding 27° or 2:1 slope. After backsloping is done, a specified thickness of topsoil is spread over the area in preparation for seeding and planting. The capping of the porous rock dump with topsoil, which is almost impervious to rain storms, tends to erode away and must therefore be cross ditched to slow down the surface flow of water and enable it to soak into the topsoil and dump rock.

Settling ponds play a necessary role during the mining phase for the treatment of pit water and equally as important, they are required to treat the run off water from dumps until a vegetative cover is established. After revegetation of the slopes is accomplished, these settling ponds will also be reclaimed to a maintenance free acceptable standard prior to the issuance of a certificate for the area.

Types of mining have an impact on reclamation procedures. Strip mining in the foothills lends itself well to being recontoured to match the surrounding terrain. The overburden removed from one cut can be cast into a previous one. This not only saves an out of pit dump but reclamation is then an actual part of the mining operation and the reclamation costs are considerably reduced. Contouring for water shed management and final land usage can be easily done without altering the landscape significantly.

Sometimes due to terrain or mining sequence, a pit can neither be back-filled or feasibly backsloped. Concerted efforts are now being made by the mines to turn these water filled holes into productive lakes. Continued liason between government and industry as to how these goals can be achieved, will be another benefit derived from the resource industry.

PROCEEDINGS

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C.B. Powter
R.J. Fessenden
D.G. Walker
Compilers



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For more information on the Alberta Chapter or the Canadian Land Reclamation Association please write to CLRA, Box 682, Guelph, Ontario, Canada N1H 6L3.

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