

SITE PREPARATION METHODS EMPLOYED
AT COLEMAN COLLIERIES LIMITED

Paper Presented

by:

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INTRODUCTION

Coleman Collieries is a relatively small coal mining firm located in south western Alberta. The company mines and exports to Japan one million tons of metallurgical coal yearly. The coal is extracted from three mines: one underground mine, and two surface mines both located on Tent Mountain. One of these mines is situated directly on the boundary between British Columbia and Alberta, and at all times the operation is governed by two sets of Provincial Regulations. Fortunately the conditions are quite similar.

In the field of reclamation there are a number of differences, the major one being in the site preparation of exploration roads. In the following sections I will briefly review the site preparation methods utilized by Coleman Collieries during the treatment of their exploration roads, refuse dumps and mine sites.

TREATMENT OF EXPLORATION ROADS

In Alberta, on certain programs, total recontouring is specified as a condition of approval. We recontour using a small dozer and an excavator to move the downhill side cast material back into the road cut. In general, work usually begins on the furthest most drill site and regresses back to the main access road. On side hill slopes greater than 23° and in forested areas, the excavator is utilized. The small crawler tractor is employed on slopes it can negotiate freely and in pushing back switchbacks.

At Coleman we have employed two types of excavators - a tracked Warner Swasey Gradall 880 and a Case Drott Cruz Air 40 on rubber.

Both have some advantages and disadvantages and a brief comparison chart follows.

| | <u>Gradall 880</u> | <u>Drott Cruz Air 40</u> |
|---------------------|--------------------|---|
| Mobility | Poor Slightly | Excellent Slightly |
| Reach | Longer | Shorter |
| Production | Equal | Equal |
| Cost/Hour | More Expensive | Less Expensive |
| Mechanical Problems | Virtually None | Some |
| Stability | Excellent | Fair (Requires a good road crown to operate from.) |

The second step after recontouring is a treatment which we call "combing". Basically this is similar to scarification with striations being formed by the teeth on the excavating bucket. These striations are parallel to the contour and are created in the following manner:

1. The boom and bucket assembly are fully extended.
2. The bucket is set parallel to the hill.

The boom is lowered so that the teeth enter the soil (approximately 4").

The boom is retracted toward the operator with the result being the formation of striations.

These striations act as wonderful moisture and seed entrapments.

The immediate application of seed and fertilizer is the third step. After each day's mechanical production a selected grass and fertilizer mix is manually applied. Past observations indicate that prompt dispersal of seed and fertilizer results in greater seed germination. The suspected reason being that the seed is able to settle into the freshly loosened soil, resulting in a reduced seed loss to wind. The seeding employees, while in the area, also measure and map each day's production and lay out the following day's seed and fertilizer requirement on the high side bank. This format is continued until the program has been completed.

The amount and type of fertilizer is determined by soil analysis. Seed mixtures vary but generally are a combination of grasses and legumes. We have found that Fescues, Brome Grass, Blue Grass and Timothy do quite well.

We apply our seed at rates between 50 to 100 lbs. per acre. This may seem high, but we have discovered that our seed losses are at times excessive because of the ever present wind.

Our cost per foot of treatment varies between 75¢ to 98¢ per foot. These values include pre-organization, mechanical, administration, seed, fertilizer and dispersal costs.

SITE PREPARATION OF REFUSE DUMPS

The first operation is to lower the slope from the angle of repose (37°) to the biological angle of repose or lower (26°). This is necessary to obtain slope stabilization. We have utilized D8 Caterpillars equipped with U blades to perform this function. In future programs we intend to use larger crawlers equipped with a U blade or modified blades because we feel we can accomplish the recontouring in a more efficient manner.

Again, as in the treatment of exploration roads, we employ, in the second step, a local treatment termed "tracking". This is accomplished by running the crawler tractor up and down the recontoured slopes to create track cleat marks or indentations in the slope which act as moisture and seed entrapments. Inspection of all past programs indicate that the seed establish better in these indentations than on flat unmarked areas. This site preparation treatment was recommended by our local Energy & Natural Resources Land Use Officer, Mr. Harold Ganske.

The third stage is the application of seed and fertilizer. Coleman has applied seed by both the manual and hydroseeding methods. Once

applied manually, the seed is harrowed in to reduce the loss to wind. Large industrial harrows drawn by a small crawler tractor have accomplished this quite well.

On slope areas that cannot be worked manually conventional hydro-seeding is employed. During the past summer Coleman Collieries Limited conducted an interesting trial by hydroseeding raw sewage in combination with seed and fertilizer onto a refuse pile. Germination was excellent in the fall. As a note of caution, if you ever intend to utilize sewage, apply it directly if possible and do not store or impound the substance; re-handling problems are a reality.

TREATMENT OF OLD MINE SITES

The site preparation treatment employed by Coleman Collieries Limited on old mine sites is basically a combination of exploration road and refuse dump reclamation procedures. The main differences are the larger size and composition of the materials to be recontoured, and the road systems are generally wider and more compacted. These factors dictate the use of larger machines and, in most cases, a ripping treatment must precede recontouring. Again careful co-ordination of the machines is necessary to insure that one machine does not impair the production of the other. For example, in blocking access to areas.

CONCLUSION

I must emphasize that project timing is one of the greatest influences of whether or not the site preparation will be successful. Moisture, temperature and wind are the most critical factors in our area and they are all inter-related.

Programs initiated and conducted at the factor extremes are most likely to fail and should be carefully studied beforehand. In closing, the old adage with an added phrase applies completely, "You will reap what you sow on the basis of when and how you prepare and sow it".

DISCUSSIONS RELATED TO J. LANT'S PAPER

John Railston - Student, University of British Columbia. How did you break up the roads?

ANS. We used rippers.

John Railston - Student, University of British Columbia. How deep did you go with a ripper?

ANS. On some of the main haul roads we had to rip down to three feet to break the compaction.

Nick Agnew - B.P. Canada Ltd. You indicated that you were manipulating the site to create microrelief, have you done anything with a dozer basin or with gouging on an experimental basis? You also mentioned using a binder, what type did you use?

ANS. No, we have not done anything with gouging. The binder we used was a Dow Chemical Binder. I think it's a latex chemical called J197.

Don Graham, - Lornex Mining Corporation. I would like to add a comment as a private citizen who has worked and grown up in remote areas. My first impression when I see someone filling in a road is one of shock. I know when living in remote areas you depend a lot on resource roads for fishing and hunting. In the Kootenays we often used the logging roads to go berry picking. Even though realizing that the mining industry leaves a lot of scars, I hope you are letting a few roads stay open because they are important to the general enjoyment of British Columbians.

ANS. Your comment is taken to heart. Lately, we have had some meetings to discuss the use of forestry roads, and some very good representations were made by four-wheel drive clubs. They strictly oppose the closure of all the roads. Believe me, we are experiencing pressure to leave a lot of roads open.