

CHAPTER 5

PRE-MINING SURVEYS, EXPLORATION AND PLANNING

The Regulations of the Surface Mining Control and Reclamation Act (1977) contain specific pre-mining planning requirements which are part of the application and permit process [Parts 779, 780, and 785]. However, besides requiring preplanning, the Regulations dictate stringent performance standards [Subchapter K] containing contemporaneous reclamation requirements and other measures which make preplanning essential if the operation is to meet the requirements. Because the requirements of the Act were recognized by Congress to place a financial burden on the SMO, "provisions were made for the RA to pay a qualified laboratory to make certain hydrologic and geologic analyses" required by the Regulations (Section 507(c) of the Act). The small operator is still required to meet these Regulations.

The Regulations differentiate between exploration operations involving the removal of less than 250 tons of coal [776.11] and those involving the removal of more than 250 tons of coal [776.12]. Operators removing less than 250 tons in an area to be explored need only file a written notice of their intention to explore [776.11(a)] but their actual operations are subject to exploration performance standards [Part 815]. If the exploration is successful the operator must follow the normal application procedure to obtain a permit to extract the coal.

Premining surveys should seek to maximize the amount of information gained during each stage of exploration and subsequently at each stage of the operation. "For instance it should be possible to justify follow-up investigations based on the few bore holes made while looking for a coal prospect" (1). EPA (1978) suggests that drill holes should be maintained as observation points in case mining is feasible. The exploration holes should be plugged only if it is decided that mining is not feasible or when the necessary data has been obtained from them. Even then some should be maintained as observation wells to monitor groundwater during mining operations. Thus the cost of premining surveys can be minimized by coordinating the requirements with exploration efforts. Parizek also emphasizes that a manual of practice to guide premining planning cannot be written with a series of hard and fast rules for each proposed mine no matter what the hydrological and geochemical setting. Rather he suggests the planners and developers of modern surface mines must be fully aware of the principles of geology, hydrology, and geochemistry and they must carefully apply these principles during premining planning. Parizek calls for innovation and creativity both in the design of mines and remedial programs associated with mine reclamation (1).

REFERENCES

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PERFORMANCE STANDARDS FOR EXPLORATION

The performance standards for exploration require that unique habitats for fish or wildlife should not be disturbed [816.15(a)]. The standards also require that vehicular traffic should be minimized and restricted to graded and surfaced roads during periods when excessive damage to vegetation would occur [815.15(c)(1)]. Depending on whether new roads in the exploration area are used more or less than 6 months, they need to comply with 816.150-816.166 or 816.170-816.176. Existing roads used during exploration shall, after exploration activities are completed, be reclaimed so that the requirements in 816.150-816.166 are met. All areas disturbed by exploration shall be revegetated with a cover sufficient to stabilize the soil surface in regards to erosion. Requirements for handling and disposal of acid-forming toxic-forming materials in 816.48 and 816.103 must be met. Also the requirements for casing and sealing bore holes in 816.13, 816.14 and 816.15 must be met.

PLANNING

If compliance with the Act is first approached with the procedure of interpreting the Regulations one by one, individually, the process becomes very complex. Table 7 serves to capsule this stage of premining planning in order to communicate more easily what needs to be done. The context in which this Table was prepared is that premining planning is an essential and critical stage of the surface mining process because, given that certain environmental criteria are required by law, this stage allows the SMO to comply as effortlessly and as economically as possible. The aspects of planning as they are presented in the Table are, roughly, in the order in which they should be approached so that the broadest areas are covered first. In the actual planning process the SMO will jump back and forth between stages in order to tie it all together.

TABLE 7

**ASPECTS
OF
PLANNING**

*(In chronological order)
A narrative description of each aspect needs to be included in the Permit Application.*

INFORMATION NEEDED*

(To carry out premining planning)

This column introduces the process of Data Gathering and the process of Data Presentation, which are required in the Surface Mining Permit Application process.

COMMENTS

This column points out the benefits which result from compliance with the Regulations, thereby providing some incentive for the SMO.

SITE INFORMATION Mine location Size Breakdown of Area to be Disturbed Estimated Duration of Activities	Primarily information from existing maps (e.g. topography, geology) [General review of these sections: 779.24, 779.25, 780.14]; Criteria for designating lands as unsuitable [Part 762]; Sequence and timing of activities [779.12(a)]; Cultural and Historic Resources [779.12(b), 780.31]; Land-use [770.22(a)(1)], especially prime farmland investigation [779.27(a), 785.17]; General information on Hydrology and Geology [779.13(b)(1)], Climate [779.18(a)] and Vegetation [779.19], and Fish and Wildlife Resources [779.20].	Getting an overview of all the environmental data at the outset enables the SMO to anticipate problems which are likely to occur and to plan his operation to meet the requirements. SMO will discover if there are any areas which he will not be allowed to mine. Enables SMO to have a more certain schedule, to be more efficient in his overall operation, to plan for his next job. A disadvantage of advanced planning is that the SMO will not be as flexible in responding to the severe fluctuations in demand on the spot market. Discovering all the information about the factors which affect degree of environmental degradation enables the SMO to sequence and time his activities so that his costs of reclamation are not excessive.
MINING TYPE TO BE PRACTICED Area Contour Mountaintop Removal Auger Experimental	Detailed analysis of Geology [779.14], including Groundwater [779.15] and the Coal Seam [779.22(b), 780.11(a), 779.25(c)]; Detailed review of Sections 779.24, 779.25, and 780.14. Study the requirements for Permits for special categories of mining [Part 785].	SMO will have clarity in scheduling activities; after this choice is made he can be more specific about the "breakdown of area to be disturbed" and the "estimated duration of activities." SMO can see <i>what</i> equipment is needed <i>where</i> and <i>when</i> . This information also will show whether the SMO must apply for a permit for a special category of mining. This stage is an opportunity for the SMO to plan to reclaim any abandoned surface-mine land in the area and to apply for grants for that. Also, careful attention needs to be given to any abandoned underground mines in the area so that they are not accidentally broken into.
POST-MINING LAND-USE	Analysis of productivity of existing soils [779.21(a)(4)]; Details of Land-use [779.22]; State and Local Land-use Plans [780.23(a)(4)]; A description of alternative uses and the supporting details of proposed use [780.23].	Waste-land will be eliminated as an end product. The SMO will have land that has a marketable value. There is the potential that the restored land may be more productive than before mining. After this choice is made, all operations can be planned to efficiently provide for the land-use. Compatibility with the local community and long-term community needs.
SITE PREPARATION Erosion Control Vegetation Clearing Topsoil Conservation Other Premining Activities	Slopes analysis [779.25(k)]; Surface water information [779.16]; Alternative sources of water supply [779.17]; Degree of soil erodibility [779.21]; Water resources protection measures [780.11(b), 780.14(b)]; Details of Climate [779.18], Vegetation [779.19], and Fish and Wildlife [779.20].	Enables SMO, with little effort as possible to preserve water quality and to control erosion and sedimentation. Enables SMO to plan for the use of vegetation debris for mulch for soil preparation for revegetation and to conserve topsoil. Improves public relations through the appreciation of clean streams and the overall aesthetic quality.
OVERBURDEN REMOVAL Blasting Handling Overburden Overburden Placement	Physical properties of each stratum within overburden [779.14(b)(1)] and Chemical Analyses; Details of blasting procedures [780.13]; Dust control practices [780.15]; Overall Hydrologic balance protection [780.21]; Earthworks [780.18(b)(3), 780.18(b)(4)]; Disposal plan for excess spoil [780.35].	Maintains SMO's position in public eye through care for environmental quality. Minimizes earthmoving/regrading to produce reclaimed land. Minimizes costs. Minimizes costs in preventing acid-mine drainage. Accelerates time in which land is again productive. This planning opens up the possibility for the burial of Solid Wastes within the regraded surface-mined land.
COAL RECOVERY	Extent of Coal [779.22(b), 779.25(c)]; Outline Coal Seam [779.25(d)]; Mining [780.11(a)]; Maximize Use and Conservation [780.18(b)(6)].	SMO can estimate quantity and quality of coal deposit so that he is prepared for the spot market. SMO can maximize the amount of coal mined with least disturbance.
HAULAGE Road Construction Road Maintenance	Description of surface drainage system [779.16(a)]; Public road location [779.24(h)]; Relocation or use of public roads [780.33]; Road construction [780.37].	Maximizes SMO's ability to control erosion and sedimentation from roads. Enables SMO to incorporate the time it takes to load and haul coal into his sequence plan; and to do this with the least amount of disruption of public transportation arteries.
RECLAMATION AND REVEGETATION	Biotic inventory and assessment of ecological criteria [779.19, 779.20]; Backfilling and regrading plan [780.18(b)(3)]; Revegetation plan [780.18(b)(5)]; Plan for drainage control structures [780.25, 780.29].	Enables SMO to comply with Regulations requiring contemporaneous reclamation. Enables SMO to plan for treating of reclaimed land with sewage effluent and/or sludge from local populations. Insure the immediate success of revegetation.

*This is not a complete list of the requirements for Permit Application [See Subchapter G].