007/019

November 27, 1987

TO: File

FROM: Kent Wheeler, Reclamation Hydrologist

RE: Determination of Completeness of the Centennial Project, Andalex Resources Inc., Application for Permit Renewal (dated September 22, 1987), ACT/007/019, Carbon County, Utah

SUMMARY:

The above-referenced document was reviewed for completeness and determined to be incomplete. This document is poorly written, poorly edited and poorly presented, making it difficult to review. The hydrology-related material is found in three areas: in the text, in the consultant's report, and in Appendix L. Most of the material in the text is outdated or general in nature and not site-specific. The material in the consultant's report does a fair job of describing the regional hydrology; however, the ground water report is incomplete and the water monitoring plan is in shambles. In Appendix L there are responses to some of the previous DOC deficiencies requests. Many of the previous DOC deficiencies were not addressed. In any case there should be responses to all DOC deficiencies and these should be removed from the appendices and placed in the text.

UMC 771.23 Permit Application - General Requirements - KW

The document submitted cannot be considered complete because it is not clear, current or concise. The entire discussion found under UMC 771.23 - KW of the previous DOC, dated August 19, 1987, still applies. Furthermore, all responses to the determination of completeness should be inserted into the text at the appropriate location. Appendices are for cataloging data (i.e., Water Quality Data), NOT for integral sections of the MRP.

UMC 783.13-16 Description of Hydrology and Geology: General Requirements - KW

**Determination of Completeness:**

This section will not be considered complete until the following is addressed:

II. 783.15 (a and b)

The permit application is insufficient in delineating the depth to ground water and the horizontal extent of the aquifers in the mine area. The inability of the wells to sustain high pumping rates does not indicate that the aquifer/aquifers are small, perched or lenticular. Plate 6 shows five water wells located at the mine site. Data from these wells should be used to determine the nature of the aquifer in the mine area (also see UMC 783.25(f) of this document).

The operator must submit a map of the aquifer and sufficient data on the wells, so that the Division can evaluate the depth to ground water, direction of flow, and areal extent of the aquifer. This data should include the following:

1) Location of each well, clearly shown on a topographic map.
2) Elevation of each bore hole.
3) Depth to static water level.
4) Lithology of aquifer.
5) Drill logs of each well.
6) Results of all tests performed on each well.
7) Any other pertinent information on the aquifer that the operator has available. This should include the results of deepening Well #1.

UMC 783.17 Alternative Water Supply Information - KW

**Determination of Completeness:**

This section must contain a narrative identifying how the applicant would mitigate or replace any water rights that could be damaged, either in quality or quantity, by the mining operation.

UMC 783.25 Cross Sections, Maps and Plans - KW

**Determination of Completeness:**

This section will not be considered complete until the following information is submitted:

UMC 783.25(b)
Map showing elevation and location of all water monitoring stations. The present map is incorrect or outdated.

UMC 783.25(f)
A map showing the location and extent of the subsurface water.

UMC 783.25(j)
Plate 6 shows five water wells. However, descriptions of these wells are needed to determine the ground-water regime in the area (see UMC 783.13-16 - KW of this document).

UMC 783.25(k)
Plate 8 is an attempt to show the topography at the mine site. However, the contours are so poorly shown in the southern half of the map that determining the topography and channel slopes is impossible. Furthermore, there are unconnected contours near the Old Workings Area.

UMC 784.13 Reclamation Plan: General Requirements - KW

**Determination of Completeness:**

(b) (1) This section has been addressed. However, the permit will not be considered clear or concise until the response to this section (found on page 169A) is inserted into the Reclamation Plan, starting on page 61.

UMC 784.14 Reclamation Plan: Protection of Hydrologic Balance - KW

**Determination of Completeness:**

(b)(3) This section is incomplete and in serious disarray. A completely new and updated Water Monitoring Plan needs to be submitted and all

references to the old plan removed. This plan should include a map showing all monitoring stations, NPDES stations, and correct station identification numbers. This Water Quality Monitoring Plan should also have a commitment to submitting the results of the quarterly monitoring within sixty days of the end of each quarter.

The monitoring plan should then list the parameters that will be measured at each location. The list of parameters shown on page 133 is fairly complete; however, the Division feels that boron, selenium, and arsenic should be included in this list. These metals should be monitored because they are soluble in neutral to basic waters, as characterized by the water at the mine site.

In the present list of parameters, the applicant commits to monitoring pH, E.C., and to discharge in the field; however, from the analysis it appears that discharge is not being measured and that pH and E.C. are being measured in the laboratory. These parameters are important and should be determined in the field.

Furthermore, to help define the seasonal variability of the ground water system, the Division feels that the static water level needs to be measured in the monitoring well. This requirement will require the applicant to designate a single well to be used in its monitoring program. This well should not be pumped for use as a water supply. However, the Division recommends that the monitoring well be determined after the direction of ground-water flow has been determined, as required by UMC 783.15 and UMC 783.25(f) of this document.

To help in the analysis of water quality data, a summary of the past monitoring program needs to be included. This table should give the station number, the station location, and each quarter that data was collected. The applicant also needs to include the Water Quality Data collected in 1983 in the MRP.

UMC 784.16 Reclamation Plan: Ponds, Impoundments, Dams and Embankments - KW

(1)(i) This section is not complete. A detailed map and cross sections of Sediment Pond E during reclamation is needed. Part II of this section allows the applicant to commit to submitting these designs at a later date. The current submittal states that these will be submitted after the concept is approved. The concept of allowing all the drainage above the sediment pond to be collected in one large pond is acceptable if there is room at the location. Therefore, the Division feels that the applicant should commit to having these details submitted with the MRP so that the entire Reclamation Plan can be approved.

The maps and cross section of Basin B need to be changed to reflect the actual configuration of the ponds, including the location of the culverts.

UMC 784.22 - Diversions - KW

**Determination of Completeness:**

This section is not complete. The following mistakes, contradictions, and inadequacies must be cleared up before this section can be considered complete.

Plate 6 (labeled 'as constucted') shows two undisturbed diversions as being riprapped. However, field investigations show these diversions are not riprapped.

Diversion DD-4 is not labeled on Plate 7.

Plate 8 is labeled "Surface Area Drainage." However, UD-1 and UD-2 are not shown on this map.

The drainage ditches from the upper area in Basin B, the Old Workings drainages, and one road drainage ditch to Sediment Pond C (as well as a third undisturbed diversion) are not shown on Plate 8 or labeled on any of the maps, or discussed in the text.

Since the topography on the southern half of Plate 8 is so poorly defined, watershed slopes and channel velocities cannot be determined (also see UMC 783.25(k) of this document).

Plate 9 still has the watershed boundaries incorrectly defined. The more detailed Plate 6 shows a large undisturbed drainage of 35 acres at the northeast end of the permit area draining into the mine area. A second large undisturbed area on the northwest side of the permit is incorrectly shown as draining into undisturbed diversion UD-1 instead of Sediment Pond C. This is due to Plate 9 incorrectly showing the location of Culvert C-4. The more detailed Plate 6 shows that Culvert C-4 is located several hundred feet further north, thus a much larger area drains into Sediment Pond C than is shown on Plate 9.

UMC 784.23 Operational Plan: Maps and Plans - KW

**Determination of Completeness:**

(b) (12) This section is not complete. The map submitted is incorrect and this section will not be considered complete until this map and the water quality monitoring plan are updated (also see Section UMC 783.25(b) and UMC 784.14(b)(3) of this document).

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations - KW

**Determination of Completeness:**

This section is not complete. There are no approved small area exemptions at this time. The permit should clearly delineate the areas that do not drain to sediment pond and then clearly detail what alternative measures are being taken to ensure that runoff meets effluent standards. This includes the reestablishment of vegetation on the roadcut leading to the offices. This revegetation plan should clearly outline a timetable for planting and a commitment to use an approved seed mix.

In order to show compliance with this section and with the hydraulic structure design specifications, the applicant needs to commit to the installation and maintenance of a standard large capacity 8-inch rain gauge or a continuous recording rain gauge. This will allow for the determination of precipitation events that exceed the 10yr - 24hr design event (1.82 inches).

UMC 817.43, 44 Hydrologic Balance: Diversions - KW

**Preliminary Observations:**

Division calculations show 49 acres of area which drain into Pond C. The MRP shows 20 acres. This discrepancy results in large differences in the peak flow in the diversion ditches.

Although no sizing of ditches or flow velocity calculations were done in this review, the Division feels that the calculated peak flows and velocities are seriously underestimated due to the miscalculation of drainage areas. Calculations are also needed for the diversions that are outlined in UMC 784.22 of this document.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds - KW

**Preliminary Observations on Sediment Ponds:**

The sizing for Pond C is incorrect. The pond must be able to contain 100% of the expected sediment, not 60%.

The disturbed area drainage for Pond E is approximately 20% less than the Division's calculated disturbed area.

A detailed location of the grouted riprap or conveyor belts used for energy dissipation at the points where the diversion enters the pond must be shown. If conveyor's belts are used, details must show how they will be secured. If grouted riprap is used, the narrative must detail average thickness of the dissipator and commit to the use of nonslaking, nonerodible rock. In either event, all discharge points into the pond need to be identified as to the specific type of dissipator that will be used.

UMC 817.55 Hydrologic Balance: Discharge of Water into an Underground Mine - KW

This section has not been addressed.

jr
cc: D. Darby
S. Linner
R. Summers
1239R/76:82
[Also documented as: 1368R/1:6]