



CANADIAN ZINC CORPORATION

PRAIRIE CREEK MINE SITE

FLIGHT IMPACT MANAGEMENT PLAN

1.0 BACKGROUND

This Flight Impact Management Plan (FIMP) has been developed to address the potential for disturbance to Dall's sheep from operation of air traffic related to construction updates and operation of the Prairie Creek Mine. This FIMP was prepared initially as part of CZN's commitment to the Government of the Northwest Territories (GNWT), as stated in a letter dated October 14, 2005, and was subsequently updated to address a request from the Mackenzie Valley Land and Water Board, dated May 11, 2012.

2.0 WILDLIFE OF CONCERN

The principal species of concern is thinhorn sheep (Dall's sheep), due to their distribution in the Prairie Creek mine site area and vicinity, and their sensitivity to disturbance while on lambing (parturition) range in the spring (typically mid-April to mid-June). Sheep are known to frequent the steep slopes immediately above the mine site in summer. These sheep ruminate on the slopes, and periodically come down into the mine site area to lick broken soda ash sacks. The sheep appear to be attenuated to site activities. Therefore, this FIMP is directed at those sheep that occupy other locations in the Prairie Creek valley in proximity to the mine workings and specifically the Prairie Creek airstrip, and that are not attenuated to human presence.

Earlier wildlife surveys (early 1980s and mid-1990s) identified four specific areas as being used by ewe-lamb groups:

- Folded Mountain north of the Prairie Creek Mine camp;
- Peaks immediately east of the Prairie Creek airstrip;
- Peaks immediately west of the Prairie Creek airstrip; and
- Slopes north of Harrison Creek (immediately below Adit #3).

Of these, the first three were believed to be lambing areas. One sighting of a group of 50 ewes and lambs was made at the Prairie Creek airstrip on June 4, 1994, suggesting that a substantial population inhabits the general area around the mine site and camp.



Another key life cycle activity is related to the use of mineral licks, particularly during the post-lambing period, when ewes are lactating. A possible lick was previously identified below Adit #3 (970 m level); however, the information that this was based on is inconclusive as to its actual use as a lick by sheep. Sheep are presently attracted to the mine site to lick for soda ash stored in the equipment storage yard at the mine site.

Other sensitive wildlife species that occur, or may occur, in the mine site area include caribou, grizzly bear, wolverine and peregrine falcon.

3.0 OBJECTIVES OF THE FIMP

The objectives of the FIMP are to:

- Minimize the potential for impacts to sensitive wildlife species and populations in the Prairie Creek mine site and airstrip area and vicinity; and
- Enable effective management of operations to optimize efficiency of equipment, manpower and aircraft support.

The intent of this FIMP is to develop a working procedure that can be incorporated into CZN's standard operating policy. The FIMP is a work in progress, and is to be amended as further information becomes available, using the adaptive management approach as outlined in the Wildlife Mitigation and Monitoring Plan (WMMP). As more site-specific data on actual lambing locations become available, the FIMP will be modified to take the new location and behaviour data into account.

4.0 GENERAL GUIDELINES FOR DISTURBANCE MITIGATION

The following guidelines pertain to avoiding or reducing impacts to the principal species of concern (Dall's sheep), and are intended to promote preferred conditions rather than being considered as rules:

- The greatest reaction to aircraft is to the first flight of the day, so this flight needs to be coordinated with the Wildlife Monitor on site prior to aircraft departure so that disturbance is minimized. The Wildlife Monitor will have up-to-date information on sheep presence in the mine area and specifically near the airstrip;
- There is no evidence that sheep become habituated to aircraft operation; therefore, do not assume sheep on the slopes proximal to the mine cannot be disturbed;
- The general recommendation is to remain >3.5 km from any known sheep concentrations (where these have been confirmed) and 2.0 km from known sheep range, where possible;
- Try to plan a route that places a ridge between the aircraft and known sheep locations;
- Fly below known locations of sheep, rather than above or at the same elevation, where possible;
- Fly a minimum of 400 m above known locations of sheep or on sheep ranges where there is a high likelihood of sheep occurrence, unless a lesser distance is unavoidable during landing;



APPENDIX A

Canadian Zinc Corporation Prairie Creek Mine Site Flight Impact Management Plan

- When sheep are known to be at a certain location and a flight line near them is not avoidable, plan the route to fly at an angle to the sheep, rather than directly toward them;
- Avoid flying near sheep on exposed slopes as this will prompt them to flee at greater distances compared to their presence on or near escape terrain, and thereby increase the risk of falls;
- Avoid sudden exposure of aircraft to sheep, such as turning a corner or coming over a ridge;
- When flying within 2 km of sheep congregations, minimize flying between 1100 and 1500 hours when sheep are generally bedded down and ruminating;
- Concentrate flights as much as possible, as opposed to many flights throughout the day (shorter periods of more intense flights are preferred); and
- Avoid lambing areas between May 1 and June 15 (2 km buffer) and preferably do not carry out intensive activity near (within 2 km) sheep range until July 1.

Some of the guidelines above also have general relevance to other species, such as caribou and grizzly bear; however, if caribou are known to rut in a particular location, flights should not take place over or near rutting caribou after October 1.

5.0 FIMP DEVELOPMENT STRATEGY

The following steps are recommended for FIMP development:

- The Wildlife Monitor is to compile known sheep ranges and actual sighting locations onto a 1:50,000 scale NTS base map, with geographic coordinates where possible, and enter these into a database to be maintained by CZN.
- Once the Wildlife Monitor is on site, interview CZN personnel to gain updates and prepare a map that is to be posted in a well-used common area. This map is to be continually updated with new sightings, along with the database.
- The Wildlife Monitor is to complete an aerial survey to identify sheep ranges, locate known sheep occurrences, and find additional sheep in the exploration area and vicinity. NOTE: CAUTION IS TO BE USED ON THIS FLIGHT, WHICH IS TO BE CARRIED OUT AT AN ALTITUDE OF AT LEAST 100-150 m ABOVE GROUND, AND PREFERABLY HIGHER. IF ANY SHEEP ARE SIGHTED, THE PILOT IS TO IMMEDIATELY BACK-OFF AND CHANGE THE FLIGHT PATH TO AVOID THE SHEEP. THE INTENT OF THE INITIAL SURVEY IS TO IDENTIFY LOCATIONS, SO THAT THESE CAN LATER BE OBSERVED FROM THE GROUND TO DOCUMENT AGE AND SEX CLASSIFICATION, DISTRIBUTION, AND HABITAT USE.
- Once the flight is completed, the Wildlife Monitor is to summarize results, update the base map and database, and share these with the Mine Manager, pilots and transport support crews.



APPENDIX A

Canadian Zinc Corporation Prairie Creek Mine Site Flight Impact Management Plan

- The Wildlife Monitor is to revise the FIMP to reflect new data, and in consultation with the Mine Manager and pilots, formulate a flight plan strategy whereby contact with known sheep locations can be avoided using the general guidelines listed above. Where avoidance is not possible, a strategy will be formulated for carrying out flights that will minimize the potential for impacts to sheep.
- A qualified Wildlife Biologist is to provide training to the Wildlife Monitor; this is to include methods for observation and data recording, updating data, providing feedback to the Mine Manager and pilots, updating the base map and database, transmitting the new information to the Wildlife Monitor, and how to provide assistance to mine operations for specific instances where a potential for impact may occur.
- The Wildlife Monitor is to revise the FIMP to update information and formulate a strategy and plan for operations, including provisions for periods when multiple flights will arrive and depart from site daily, and identify which flight paths and approach angle and height are preferred, and how daily flights are to be scheduled, carried out and managed. The Wildlife Monitor is to prepare contingency plans for specific potential occurrences where sensitive wildlife may be encountered unintentionally, and to explain these to the Mine Manager, pilots and transport support crews.
- The Wildlife Monitor is to update the FIMP when needed to incorporate new information and data and to communicate results of the monitoring program to the GNWT ENR Regional Biologist for review and comment, and to provide explanation and clarification, as necessary.

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