

APPENDIX F

SAMPLE PROCEDURE FOR DELINEATING THE CUMULATIVE IMPACT AREA (CIA)

Step I. Define the maximum upstream and downstream extent of CIA

- Develop criteria for excluding operations from the CIA that are spatially remote from the proposed operation but that are within the same major surface drainage system.
- Apply criteria to locate maximum extent of working CIA, both upstream and downstream from the proposed operation. (Note: In the case of a first order watershed, there will be no upstream point. The CIA will be, in part, defined by the watershed boundary.) This may include extending the CIA to a nearby public water-supply intake.
- Delineate the watershed area enveloping these two points. This is the first approximation of the CIA.

Step II. Delineate the working CIA within area defined in Step 1

- Identify all anticipated mining operations. This includes life-of-mine area of proposed operation, existing operations, operations with submitted applications, and Federal leases with diligence requirements within the area defined in step 1.
- Identify the downstream limit of the surface-water CIA. Identify on a receiving stream common to two or more anticipated mining operations a point downstream from all tributary stream channels whose flows are likely to be affected by mining. Consider this point as the downstream limit of the surface-water CIA on that stream. Repeat on other receiving streams, as necessary.

Step III. Identify the downgradient limit of the ground-water CIA

- Identify all geologic strata likely to be affected by the anticipated mining operations. Also, identify recharge and discharge areas for the aquifers.
- Delineate area over which ground-water quantity and quality may be affected by the identified mines. (Requires determining, or making reasonable estimates, of the direction(s) and rate(s) of ground-water movement.)
 - a. Delineate area of ground-water drawdown (cone of depression) caused by each operation in each aquifer.
 - b. For each aquifer, delineate the potential area that ground-water pollution from each operation would pass through in moving from the mine to probable discharge points.
- 3. Identify probable stream reaches that discharge into, or receive discharge from, aquifers affected by the identified mining operations.

Step IV. Delineate working CIA

- a. Surface-water CIA. Delineate surface-water CIA boundary along natural drainage boundaries which completely encompass all the impact areas of the operations in Step 2.
- b. Ground-water CIA. Delineate ground-water CIA boundary to encompass the maximum potential extent of pollution and areas of drawdown. Include all cones of depression and areas of potential pollution that may affect or discharge to common surface streams or alluvial aquifers, or are contiguous with cone or plume of proposed operation.
- c. The composite of the ground- and surface-water CIAs is the working CIA for the proposed operation.