

MEMORANDUM

CH2MHILL

Water Quality Issues Associated with Relocation of Stable Concession

TO: Bob Toll/Cherry Creek State Park
FROM: Jim Wulliman/CH2M HILL
DATE: March 10, 1998

This memorandum discusses water quality issues associated with the relocation of the stable concession at Cherry Creek State Park. Several recommendations are provided for reducing pollutant loading from the new stable site.

Proposed Facilities

The stable concession is to be relocated from approximately one-third of a mile south of the East Gate to about two miles south of the East Gate. The current location is along the Perimeter Road on the south bank of the Quincy Outfall. The proposed location is along the west side of Parker Road north of Orchard Road. The proposed stable location drains generally to the northwest to Cherry Creek. A portion of the site appears to drain north to a small tributary to Cherry Creek named the Lewis Cemetery drainage. Slopes at the proposed site range from about 10-percent near Parker Road to 1-percent adjacent to Cherry Creek.

The proposed stable operation is to consist of permanent stalls for horses, several riding arenas, fenced enclosures and stables, and the expansion of an existing parking lot. We understand that the total area of the stable complex is to be about 15 acres.

A site plan prepared by the stable concessionaire shows a general layout of the proposed complex, with the existing parking lot extended to the north, a main arena just north and east of parking lot, stalls along the north end of the site, and stables and fenced enclosures making up the remainder of the site. In addition, a number of equestrian trails are shown on the plan.

The stable complex, as drawn on the site plan, appears to occupy about 30 acres, based on a map scale of 1-inch equals 200-feet (from scaling plan features to other maps, the site plan appears to be drawn at a scale of approximately 1-inch equals 200-feet, even though the approximate map scale indicated on the plan is 1-inch equals 270-feet). If the area of the complex is to total 15 acres, the complex would need to measure about 800-feet by 800-feet (or an equivalent rectangular area). If the total take area is 15 acres, there will be less ground disturbed, with additional buffer areas adjacent to the drainages, compared to what is shown on the plan.

Possible Water Quality Concerns

Pollutants of concern from the stable complex may include sediment, nutrients, and bacteria. Sources of these pollutants include erosion of ground areas where vegetation has been disturbed, yielding sediment and phosphorus, and animal waste, yielding additional

nutrients and bacteria. It is desired that pollutants such as these are not delivered from the new stable site to Cherry Creek Reservoir in sufficient quantities to degrade the water quality of the reservoir.

The location of the new stable site provides a longer flow distance to the reservoir. The current site has a flow path to the reservoir of approximately 1900 feet, while the proposed site has a path of about 10,000 feet (about five times as long). Runoff from the current stable site passes through a constructed pollutant reducing facility (PRF) on the Quincy Outfall, while runoff from the proposed site would be conveyed through natural grassy areas and the Cherry Creek wetlands prior to entering the reservoir. In general, there appears to be at least as many opportunities for pollutant reduction through infiltration, settling, and uptake in plant communities for the proposed stable location as there are for the current location. Since the current stable operation has not been identified as a significant pollutant source, it seems likely that the proposed stable concession will not contribute a substantial amount of pollutants either. However, controlling pollutants at their source is prudent practice.

Recommendations for Possible Best Management Practices

We recommend that best management practices (BMPs) be considered to control pollutants at their source to the extent practicable. The following BMPs each offer some potential for reducing pollutant loads, and may be considered for the stable site.

1. Providing gravel surfacing for the parking lot (currently bare soil) will reduce the potential for raindrop erosion and rill erosion in the lot.
2. Flattening the grades of the parking lot and other non-vegetated areas will reduce the potential for erosion of non-vegetated areas by reducing the velocity of runoff. Cut and fill slopes adjacent to flattened areas will need to be mulched and grassed.
3. Reducing the down-gradient length of disturbed areas (orienting disturbed areas with a short dimension running east-west and a long dimension running north-south) will reduce the potential for rill erosion by shortening the flow path.
4. Preserving grass buffer areas to break up the down-gradient length of disturbed areas (orient buffer strips generally in a north-south direction) will reduce the potential for rill erosion by shortening the flow path. The buffers will also help to trap sediments eroded from up-gradient areas.
5. Providing good housekeeping practices in cleaning up animal waste will reduce the potential for washoff of the waste from the site.
6. Providing a means to line the animal waste holding area will reduce the potential for infiltration of the waste.
7. Providing berming or swales will help to direct site runoff in a controlled manner.
8. Providing a settling basin at the downstream end of the site will provide an opportunity to reduce runoff-borne pollutants conveyed from the site.

Please call me at 713-5583 if you would like to discuss these observations and recommendations in additional detail.