



December 14, 2016

Mr. Chuck Hubert
Senior Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
5102 50th Avenue,
Yellowknife, NT
X1A 2N7

Dear Mr. Hubert

RE: Environmental Assessment EA1415-001, Prairie Creek Mine All Season Road Grey and Brown Water, NNPR Camps

We refer to the December 1, 2016 letter from Parks Canada regarding information on the above noted subject. Canadian Zinc Corporation (CZN) provides answers to the information requests below.

1. A schedule for all season road construction was provided in Allnorth's Supplemental Report (Section 2.9) dated September 2015, submitted as Appendix A to the DAR Addendum ([PR#101](#)). Based on this schedule, Table 1 below provides operating periods and capacities for temporary camps within the Nahanni National Park Reserve in support of all season road construction.
2. In "Design Specifications for Sewage Disposal Systems, A Guide to their Design and Maintenance" issued by the Yukon Territorial Government, June 2016, Appendix A lists estimated sewage flows. For construction camps, a sewage flow (grey and brown water) of 190 L/day/person is estimated. For campground facilities, with flush toilets but no showers, a flow of 90 L/day/person is estimated. We can assume that the majority of the 90 L is for the toilets, say 60 L, and the remainder for wash basins. Therefore, by subtraction, we estimate 130 L/day/person for grey water and 60 L/day/person for brown water in connection with construction camps. Daily camp flows will then be as follows:

	Grey Water L/day	Brown Water L/day
12 man camp	1,560	720
50 man camp	6,500	3,000

3. At the camp at Km 23, both grey and brown water will be collected in a tank for later transfer to the Mine for treatment/disposal.

At the camp at Km 40, brown water will be collected in a tank for later transfer to the Mine for treatment/disposal. Grey water will be disposed of in a sump a suitable distance from Sundog Creek after the water has passed through a settling tank.

**TABLE 1
CONSTRUCTION CAMP OPERATION
IN THE NAHANNI NATIONAL PARK RESERVE**

Camp	Operating Period	Capacity	Comments
23	Year 2 summer/fall/early winter	30 man	Support construction of major bridge structures 23.5, 25.3 and 28.6 and subgrade construction from 23 to 39
40	Year 2 winter	12 man	Support construction of major bridge structure 39.2 and approaches
	Year 2 summer/fall/early winter	12 man	Support subgrade construction from 39 to 23 including Sundog re-alignment
	Year 3 winter	12 man	Support subgrade construction from 39 to 59
	Year 3 summer	12 man	Support crushing/aggregate production between 43 to 30 Support surfacing of subgrade from 39 to 59 and 39 to 30
65	Year 2 winter	12 man	Support subgrade construction from 59 to 95
	Year 3 winter	50 man	Support subgrade construction from 59 to 39 Support construction of major bridge structures 53 and 43 Support borrow pit development and production 59 to 43
	Year 3 summer	12 man	Support crushing/aggregate production Support surfacing of subgrade from 59 to 39
87	Year 2 winter	50 man	Support subgrade construction from 95 to 59 Support construction of major bridge structures 95, 89.8, and 87.4 Support borrow pit development and production at sources between 95 to 59
	Year 2 summer	12 man	Support borrow pit development and production at sources between 95 to 59
	Year 2 fall	12 man	Support surfacing of subgrade from 97 to 59
	Year 3 summer	12 man	Support surfacing of subgrade from 97 to 59 (if required)

At the camps at Km's 65 and 87, grey water will be disposed of in a sump after the water has passed through a settling tank. Brown water will either be collected in a tank for later transfer to the Mine for treatment/disposal, or treated on-site in a plant with the effluent being sent to the same sump as grey water.

4. For on-site brown water treatment, wastewater would be piped to a collection point and pumped into the treatment plant. Sewage treatment will be by standard biological digestion and solids filtration. Flows and effluent disposal are described above. Monitoring will be required to confirm that adequate sewage treatment is occurring. The typical parameters for this are TSS and BOD. Suitable objectives will be defined during the detailed design phase.
5. Grey and brown water disposal systems are very simple and commonplace. Preliminary designs are not required. Further details of the proposed treatment systems will be provided once these have been provided by the successful road construction bidder based on defined requirements in the bid package.
6. Potable water management at the Mine site is not a subject for this EA. Wastewater management at the Mine was described in EA0809-002. Sewage will be treated in a refurbished and expanded on-site sewage treatment plant (STP). The capacity of the STP will be based on mine site demand. However, sewage from the road camps can be treated in the STP during daily periods of lower site flows (i.e. outside of the peak early morning and evening periods).
7. Brown water treatment effluent can be monitored at the discharge line to the disposal sump. As noted in 4. above, plant function is normally checked using TSS and BOD. Since the effluent will be discharged to sumps and will readily dissipate in the ground well before reaching distant watercourses, monitoring of other parameters is not justified. Non-phosphate based detergents will be used in the camps, however it would be appropriate to monitor phosphorous on grey water discharge from 50 man camps as a check.

If you have any questions, please contact us at 604 688 2001.

Yours truly,
CANADIAN ZINC CORPORATION



David P. Harpley, P. Geo.
VP, Environment and Permitting Affairs