3.1.6 Wellfield and Process Wastes

All well development water will be captured in water trucks specifically labeled and dedicated for such purpose, and equipped with signage indicating that these trucks may only discharge their contents for injection into the DDW. Alternatively, these fluids may be transported to the CPF evaporation ponds, but only if there are fluid separation equipment issues at the MEA satellite facility. The operation of the satellite facility will result in a production bleed stream that is continuously withdrawn from the recovered lixiviant stream at an expected rate of 0.5 to 2.0 percent of the total volume of recovered lixiviant. The production bleed stream is taken following the recovery of uranium by IX and has the same chemical characteristics as the lixiviant. The production bleed waste stream will be managed by using a DDW, which will be constructed and operational at the satellite facility prior to commencement of production.

The other source of wastewater resulting from uranium mining activities in the MEA is the eluent bleed stream at the CPF. This existing source of wastewater at the CPF is currently produced at a rate of approximately 5 to 10 gpm. It is likely that the eluent bleed stream will increase by a maximum of 10 percent due to processing of IX resin from the satellite facility. The eluent bleed waste stream will be managed by reuse in the processing facility DDW injection at the CPF.

All byproduct material produced as a result of the operation of the satellite facility will be disposed of at a licensed facility approved for disposal of 11e.(2) byproduct material, similar to provisions made for the byproduct material currently produced. All solid waste will be disposed of in an approved landfill in accordance with current practice. There will be no onsite disposal of these materials.

3.1.7 MEA Water Balance

From 2015 to 2020~~2~~, the majority of the wastewater produced at the MEA satellite facility will be the production bleed. Starting in 2021~~2~~, the wastewater flows will rise sharply as the bleed from the RO process must be addressed. Other liquid wastewater generated will consist of process liquids (e.g., affected well development water, laundry water and plant wash down water). These waste streams will account for an intermittent discharge with a~~n~~ maximum average of 1 to 2 gpm. The disposal water balance discussed below is of such a magnitude that these small quantities of wastewaters will be small enough to be easily managed in the proposed disposal system. The well development water will be collected using a dedicated vacuum truck and delivered to the well work-over fluid tank located in the satellite building (**Figure ~~5~~5.7-2**). The other liquid wastes (i.e., laundry and plant wash water originating in restricted areas) described above will flow to plant sumps and be transferred to a wastewater tank located within the satellite building. All of the above waste streams will be disposed of through the DDWs.

Liquid waste will be generated from process bleed and groundwater restoration water (approximately 96 percent), plant cleanup water (miscellaneous non-hazardous water; approximately 2 percent), and water originating from fresh water well(s) (approximately 2 percent). The detailed MEA water balance for production and restoration for the life of the project is shown in **Appendix T**. The project required disposal water balance is presented **Table 3.1-7** and depicted graphically in **Figure 3.1-7**. These water balances illustrate the anticipated water management and disposal capacity needed for production bleed and restoration activities. These schedules are based on installation of two wells prior to commencing operation, with the assumption that each well will have an injection capacity of approximately 45 gpm. The 45 gpm injection capacity assumption is based upon the Crow Butte well with lower flow. Both of the DDWs at the existing plant are drilled into the same formations proposed for the MEA.

Two DDWs will accommodate all wastewater generated from startup in 2015 through the end of 2020. In 2021, groundwater restoration will result in increased wastewater volumes, which will require additional disposal capacity. Considering the capacity of the two DDWs, the need to install additional deep disposal well(s) and/or new surge/evaporation ponds will be evaluated to supply long-term wastewater disposal. Additional deep disposal well(s) or surge/evaporation ponds will be installed to satisfy the wastewater capacity requirements. CBR has submitted ~~-~~an area permit application for multiple Class I nonhazardous waste injection wells at the MEA site.

Operating procedures at the MEA site that will minimize the amount of water requiring disposal via DDW include: designing wellfields to maximize the ability to continuously minimize the amount of production bleed through continuous and effective wellfield balancing; minimizing the consumptive use of process water by injecting all of the ISR fluids except for the small production and restoration bleed streams necessary to maintain an inward hydraulic gradient in each wellfield configuration; and if necessary, using two stages of RO to treat restoration fluids and reduce the total required wastewater disposal capacity.

As shown in **Appendix T**, only five mine units will be in production mode at any one given time. Total production flow over the life of the project will be variable, ranging from 1,100 to 5,400 gpm. The production bleed (1.2 percent) and the RO bleed, over the life of operations, will vary from approximately 13~~25~~ to 65 gpm and 75 to 225~~80 to 250~~ gpm, respectively. Permeate flows will vary from 500 to 750 gpm, with 750 gpm being the estimated average flow from 2022 to 2037. The amount of brine sent to DDW will range from approximately 150~~167~~ to 225~~250~~ gpm beginning in year 2021~~2~~ and continuing until 2037.

Figure 3.1-8 depicts the water balance at MEA during the third quarter of 2024 when maximum production and restoration flows will occur (5,400 gpm and 1,800 gpm, respectively). As illustrated in **Figure~~s~~ 3.1-8**, up to an additional 290~~315~~ gpm (65 gpm production bleed plus 225~~250~~ gpm RO bleed) of disposal capacity is needed to accommodate groundwater restoration. DDWs are expected to provide all of the disposal capacity needed at each expansion area. As has been demonstrated at the CPF, DDW injection rates may vary from the assumed 45 gpm per well at the MEA site

Until the capacity of the first two DDWs is known, the exact needs for additional water disposal wells beyond 2020 are not understood. Additional disposal options required for use during production and restoration activities will be dependent on the volume of wastewater generated, the efficiency of production and restoration activities including the RO process, and the actual injection capacity of DDWs, e.g., surge/evaporation ponds and/or land application.

For the years 2015 through 2020~~-~~, two DDWs will be used. Each DDW can act as a backup for the other if maintenance is required. At the same time, plant operations can be curtailed as needed to ensure that an inward hydraulic gradient is maintained. A third option would be trucking water to the CPF evaporation ponds.