



MEMORANDUM

August 15, 2012

TO: Bruce Olenick, Regional Administrator
Tom Hepworth, Engineering Manager, Pocatello Regional Office

FROM: Scott MacDonald, EIT, MBA, Associate Engineer *SM*

SUBJECT: **Staff Analysis for Draft Municipal Wastewater Reuse Permit for the City of McCammon, Idaho - Permit WRU M-0192-02**

1 Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400.05, "Recycled Water Rules," for issuing wastewater reuse permits. This memorandum addresses draft permit WRU M-0192-02, for the municipal wastewater treatment and reuse system owned and operated by the City of McCammon, Idaho. The city's treatment and reuse system is currently permitted under the terms of permit LA-000192-01. Staff recommends the issuance of WRU M-0192-02 (the new permit numbering format), as attached.

2 Process Description

The City of McCammon is located just off of Interstate 15 approximately 25 miles south of Pocatello in Bannock County. It is a community of 865 residents as of 2009, which is an increase in population of 7.5% since 2000. The city has operated their evaporative and facultative sewage lagoon system since the 1970's when the city's treatment system was initially constructed. The treatment facility is designed to treat municipal effluent through the biological removal of a majority of the organic waste and other contaminants, providing treated water suitable for sprinkle irrigated land application.

Although the original system was constructed in the 1970's, the city completed significant upgrades in 2006. Facility upgrades include construction of three new lagoons for the treatment of the city's sanitary wastewater and a new pump station at the lagoon site. The city now has a three-cell treatment system, with an additional winter storage lagoon. The city's current permit became active in 2007. Following project completion the city began land applying wastewater under their reuse permit in 2008.

The city's 2006 facility planning study estimated effluent flows to the lagoons at approximately 98,610 gallons per day (gpd), with the projection that wastewater effluent would increase to around 117,250 gpd by 2022. Current inflows in 2010 are estimated between 90,000 and 100,000 gpd.

The wastewater collection system includes four lift stations throughout the city that collect and send wastewater to the first of the three HDPE-lined treatment lagoons. The lagoons are operated in series, with the first two lagoons having surface aerators. Wastewater flows sequentially through the first two aerated cells, into cell 3. Effluent then flows by gravity into the 13 million gallon winter storage lagoon. Aerial photos show that there are three cells for winter storage, but only the largest cell is currently used for storing wastewater. Figure 1 shows the lagoon location.

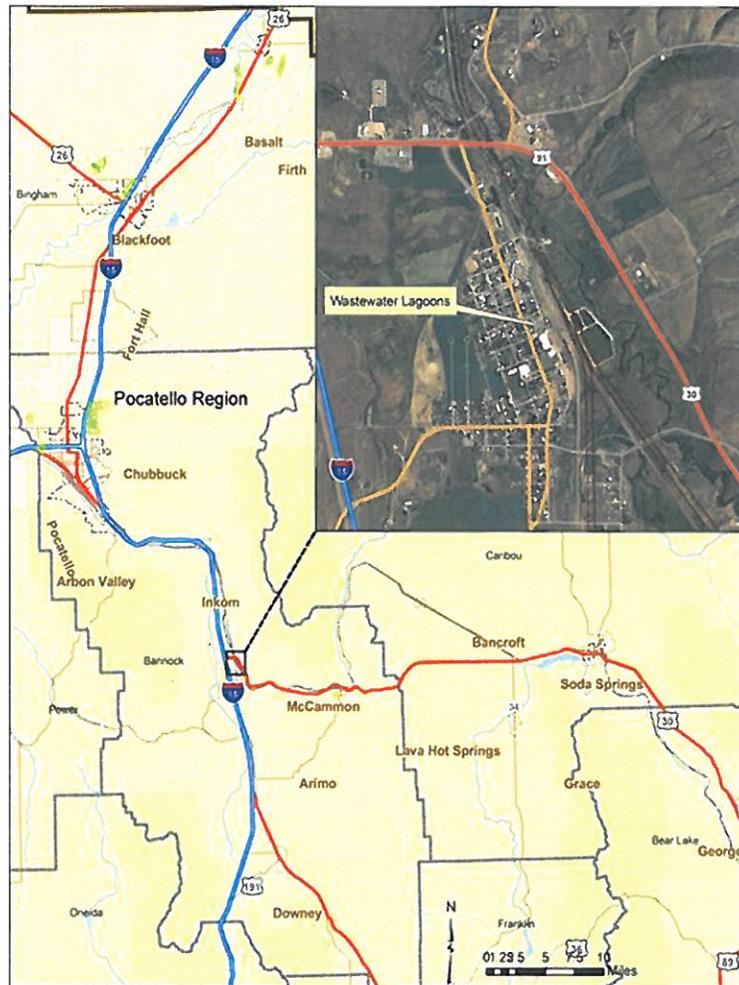


Figure 1. City of McCammon Wastewater Facilities

The facility pump building at the lagoon site houses the pumps, filter, and electrical control panels. The pump building also contains the chlorinator. The flow proportioning chlorinator adds a mixed chlorine solution to the wastewater, using a Pulsafeeder Series E-DC Model LS44 chemical metering pump. The chlorine pump uses a liquid sodium hypochlorite injection of 1.4 mg/l to 14.1 mg/l at 250 gpm. The city chlorinates to a Class-D wastewater disinfection goal of <math><230\text{ CFU}/100\text{ mL}</math> of water. The chlorinated effluent is pumped to the land application site approximately 1/2 mile to the south of the lagoons. The effluent pipeline provides the chlorine contact time without having to incorporate a separate chlorine contact chamber. A recording flow meter measures effluent flow volume to the land application site. Effluent from the third treatment cell generally flows to the winter storage lagoon, but the effluent can also be pumped directly from the third cell, through the pump house and chlorinator to the land application site.



Figure 2. Land Application Site Location

The City of McCammon acquired their land application site in March 2006, as a permanent management unit for municipal wastewater application. The majority of the management unit is suitable for land application. Five acres are not as suitable for wastewater application due to steeper slopes and proximity to a rail line easement. Those five acres are irrigated with supplemental irrigation water (Keller 2006). There are otherwise no features of concern such as public water supply wells, domestic wells, or surface water features that would further reduce the useable acreage within the property acquired by the city.

The land application site is managed primarily as a wastewater treatment site for the uptake of wastewater nutrients through crop production. Municipal wastewater is applied to 30 usable acres of the site which is permitted as a single management unit. Effluent is applied using wheel lines in four sets across the site. Wastewater application makes up only about 15% of the irrigation water requirement (IWR) for the crop produced (Keller 2010).

The facility is permitted to land apply municipal effluent consisting of the sources described in the permit application; including effluent from homes, the school, and businesses. The permit prohibits land application of any industrial sources of wastewater or other waste streams not specifically permitted or identified in the permit or permit application. Effluent will be land applied only during the growing season; which is April 1 through October 31.

The land application site shown in Figure 2 above is owned by the city, but a farmer is contracted to cut and bale the alfalfa grass. Supplemental irrigation water is available for use by the city and is supplied from the Townsite Lateral Canal next to the site. The supplemental irrigation water source will be sampled as a monitoring point listed in the permit section 5.1.2.

3 Summary of Events

The permit history, inspection findings, annual report review information, and relevant permit information is presented in this section.

3.1 Permit History

The Department of Environmental Quality (DEQ) issued Permit No. LA-000192-01 to the City of McCammon on January 12, 2007. The permit is for continued operation of the wastewater treatment and reuse system serving the City of McCammon. These facilities are located within the City of McCammon, with the land application site located to the south of the city's lagoon area. The purpose of the draft permit is to renew the previous permit which has an expiration date of January 12, 2012, to the new format under Permit WRU M-0192-02.

- August 15, 2002 – Meeting between Keller Associates and the Department to discuss a temporary, emergency land application permit to land apply approximately 5.1 million gallons of treated wastewater.
- August 23, 2002 – The Department received an application for a temporary permit.
- August 30, 2002 – The Department issued a temporary permit for emergency wastewater land application.
- May 17, 2005 – The City of McCammon and the Department participated in a preliminary permit application conference.
- May 24, 2005 – Site Visit to proposed sprinkle application area.
- June 6, 2006 – The Department received a formal permit application including a preliminary technical report.
- June 12, 2006 – The Department requested additional application materials.
- June 21, 2006 – The Department received supplemental application materials.
- December 8, 2006 – The Department issued a completeness determination and draft permit for review and comment.
- January 12, 2007 – The Department Deputy Director signed the new permit.
- October 21, 2008 – The Department handed off the new Permit.
- March 14, 2012 – The Department received an application for permit renewal; no changes requested
- March 14, 2012 – The Department issued a completeness determination
- August 15, 2012– The Department issued a draft permit for review and comment.

A permit renewal application from the City of McCammon was received on March 14, 2012, and largely serves as the basis for the terms and conditions contained in the draft permit. As required by the *Reuse Rules*, the draft permit will be presented for a public comment period. After the comment period has closed, DEQ will provide written responses to all relevant comments and prepare a final permit for the City of McCammon wastewater reuse facilities.

3.2 Inspection and Annual Report Review Findings

Facility inspections have revealed no issues of noncompliance with the land application practices, but they do need to improve on their reporting requirements. There have been two scheduled facility inspections since permit issuance, representing the two years of the permit

lifespan when effluent was land applied. The initial inspection conducted on June 3, 2010 by Pocatello Regional Office personnel and an inspector from Technical Services, revealed that the city had not yet completed the specific reporting requirements listed in the permit.

A six month period was provided for the city to contact their consultant and complete the reporting requirements. Since that time, the facility inspections and annual reporting requirements have been submitted as required in the permit, although the annual reports have been submitted after the required date. The reports indicate that the city is operating their land application site as required by the permit. There have been operational issues such as the failure of the surface aerators, but these maintenance issues are being addressed with the installation of replacement aeration devices.

4 Discussion

This section presents relevant issues concerning site conditions, data, historical and proposed management practices that are used as the basis for determining permit conditions. Discussion items include; operations, hydraulic management unit configuration, site soils, groundwater, surface water, historic and proposed site loading, wastewater quality and quantity, storage structures, site management, and compliance activities.

4.1 Plan of Operation

The facility plan of operation is required to be updated or modified as operations and regulatory requirements change, and must be made current within 12 months following issuance of the new permit. The facility will complete an updated plan of operation which will detail the operations of the chlorine system, and flow measurement equipment, along with detailed operating practices and agricultural management activities at the land application site. The plan should clearly explain system operations as well as standard permit reporting requirements. The permittee may submit management plans required in CA-192-01 as individual documents or as sub-parts incorporated into a comprehensive, system-wide plan of operation.

4.2 Hydraulic Management Unit Configuration

The city owns 35 acres for their land application site approximately ½ mile south of the lagoon area. Land application site elevations range from 4805 feet to 4831 feet. The site has been managed as farm ground and serves as an effective land application site for final wastewater treatment by growing crops for wastewater nutrient removal.

The facility uses wheel lines for irrigation. The three wheel lines are each 880 feet long, with 22 Rain Bird impact sprinkler heads per line. Each line applies 5 to 10 gpm, per sprinkler in a 20 foot radius at 70% efficiency. Sprinkler system efficiency is designated as E_i in the permit Section 4.1, reflecting permit application materials. The sprinkler header risers are set at 40 foot intervals to allow each of the three lines to be connected to one of four positions per line.

The city plans to grow alfalfa or an alfalfa hay mix. The permit application indicates that the current 35 acre site will meet the city's land application needs for many years to come (Keller 2006). The management unit serial number MU-19201, remains unchanged from the previous permit, with the exception of one less leading zero (previously MU-019201).

The single compliance activity in the new permit will require submittal of a runoff management plan within 12 months of permit issuance for the land application site. The plan will be submitted to DEQ for review and approval. The plan should show that the management unit is designed for control and mitigation of site run off, and diversion of site run-on. Wastewater will be applied in the summer months during the growing season when infiltration is highest, and chances for runoff from spring thaws are minimal. Application during the growing season will allow for a significant period following effluent application when only fresh water is applied to the crops so that winter precipitation or spring thaws will minimize effluent runoff.

4.3 Site Soils

Site soils are generally well suited for the sprinkle application of wastewater. Figure 3 shows the configuration of soil types as determined by NRCS soil mapping unit designations. The north-east corner of the property shows the 5 acres that are less suitable for irrigated farming due to the slope and encroachment on the rail line easement.

Table 1 below identifies specific soil types and mapping unit symbols for soils found on the management unit. The NRCS soil survey information is unchanged from the previous permit application materials. The management unit consists of soil mapping units as described by the United States Department of Agriculture, National Resources Conservation Service - USDA-NRCS.

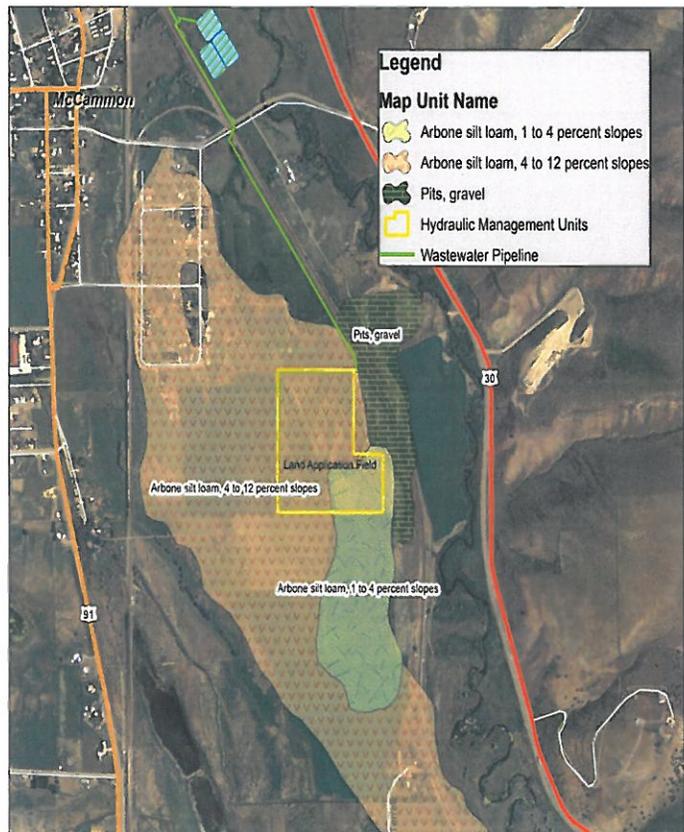


Figure 3. Soil Mapping Units (NRCS-Ssurgo)

Table 1. Soil Mapping Unit Symbols

Map Unit Legend	
Map	Bannock County Area, Idaho
Mapping Unit Symbol (MUSYM)	Description
Arbone silt loam; 1-4 percent slopes	root zone depth is 60 inches or more, well-drained, moderate permeability
Arbone silt loam; 4-12 percent slopes	root zone depth is 60 inches or more, well-drained, moderate permeability

Soil Monitoring

The permit requires annual soil monitoring for pH, plant available P (Olsen Method), NO₃-N (nitrate nitrogen), NH₄⁺-N (ammonium nitrogen), EC, and %OM monitored annually. The permit also requires that SAR, DTPA-Fe, and DTPA-Mn be monitored and reported the first year of the permit. The annual reports have not indicated elevated levels of constituents in the soil profile that would warrant additional constituent sampling or monitoring. The quantity of supplemental irrigation water applied to the site makes up over 85% of the total water applied to the site (Keller 2010). This greater proportion of supplemental water leads to dilution of applied wastewater constituents and less chance for soils to become clogged or overloaded.

4.4 Groundwater

The 2002 permit application reports groundwater flowing toward the northwest, similar to the surface water flow direction. Measurements of groundwater near the site have shown groundwater to vary from 15 feet to 52 feet below ground surface (Keller 2006). There are no drilling records for wells in the same township, range, and section as the land application site, and no reported domestic wells within ¼ mile of the site.

Groundwater Monitoring Data:

The permittee is required to conduct standard groundwater monitoring at the lagoon site from the three monitoring wells installed near the winter storage lagoon. The permit requires groundwater level measurement, as well as sampling to determine any potential interactions between the lagoons and surface waters. No wells are required to be installed for monitoring groundwater at the land application site at this time. There are no requirements or recommendations in the permit to sample domestic wells in the area since none have been identified within ¼ mile of the land application site.

4.5 Surface Water

The nearest surface water to the site is the Townsite Lateral canal supplying supplemental irrigation water (SIW or IW in the new permit) to the 20 hp irrigation water pump. The canal lies 265 feet from the eastern edge of the management unit. The Portneuf River is approximately 2,000 feet from the eastern edge of the land application site, and flows on the eastern side of the Union Pacific Railroad tracks. There are no springs reported in the area, but the West Townsite - Joel Green Lateral Canal is exposed on the west portion of the site.

To help protect surface waters from contact with wastewater, compliance activity CA-192-01 in the new permit will require the facility to submit a runoff management plan. The runoff plan will describe how wastewater applied to the permitted HMU will be contained on-site and not allowed to flow to nearby surface waters.

4.6 Historic and Proposed Site Loading

Loading rates for individual management units are determined by crop requirements. The permit limits growing season hydraulic loading to the crop specific IWR, in any combination of process

water and supplemental water. Calculations require specific methodology to determine the crop IWR. The permittee may use either thirty-year data or current climatic and agronomic information, but whatever method is used it must be used consistently throughout the permit period.

4.6.1 Historic Flows and Proposed Hydraulic Loading Rate

Staff used data available from ETIdaho¹ to compare past application rates with the IWR of the crops grown on the management unit. The IWR (P_{def}) for alfalfa for the site is reported at nearly 44 inches of combined wastewater and supplemental irrigation water. The management unit was loaded up to 13.57 MG, or 16.65 inches of wastewater in 2010 on the 30 acre site. Staff does not envision the city being limited by hydraulic loading for the foreseeable future.

The current permit limit is 34 MG of wastewater applied annually. The most recent reporting information lists only 7 MG of wastewater applied during previous reporting periods. Generated wastewater quantities are not expected to exceed the IWR of the available acreage. Annual IWR calculations are required to proactively plan for the most effective use of wastewater and SIW (or IW) to ensure efficient crop growth to maximize wastewater nutrient uptake.

4.6.2 Wastewater Quality and Sampling

The city monitors constituent characteristics for land application permit reporting to DEQ. The overall wastewater characteristics appear to remain consistent from year to year. Table 2 below lists recent wastewater constituent data.

Table 2. Water Constituent Data (Keller 2010).

Parameter	Sample Date MM/DD/YY
	06/21/2010
Total Kjeldahl Nitrogen (TKN) (ppm)	12.2
Nitrate (ppm)	
Ammonia (ppm)	8.72
Biological Oxygen Demand (BOD) (ppm)	
Chemical Oxygen Demand (COD) (ppm)	90
Sodium Adsorption Ratio (SAR)	
pH (S.U.)	7.6
Sodium (ppm)	
Chloride (ppm)	
Chlorine Residual (ppm)	
Potassium (ppm)	
Phosphorus (ppm)	
Total Coliform (count/100ml)	
Specific Conductance (umhos/cm)	758
Total Dissolved Solids (ppm)	464
Total Suspended Solids (ppm)	14
Volatile Dissolved Solids (ppm)	174

¹ (<http://www.kimberly.uidaho.edu/ETIdaho/>)

Calculations indicate that the site will approach hydraulic loading limits before any land limiting constituents have been reached. The 2010 annual report lists loading rates for COD and nitrogen based on the measured constituent concentrations above. Nitrogen and COD loading are the limiting constituents and are reported in more detail below.

Wastewater monitoring parameters remain unchanged from the previous permit. The permit requires the facility to monitor the volumes of wastewater and supplemental irrigation water applied on the land application site on a daily basis. Wastewater sampling is required on a monthly basis when effluent is being applied to the site.

4.6.3 Nitrogen Loading

The 2010 annual report lists crop nitrogen uptake as 5.8 lb/ac. This value is well below the standard table value of 140 lb_N/ac nitrogen removal rate for alfalfa or an alfalfa grass mix. Using reported values, nitrogen loading would be limited to 150% of the reported crop uptake, or 8.7 lb_N/ac. The nitrogen loading rate in the 2010 annual report, Table 2 was 9.7 lb_N/ac-yr; which coincidentally equals the calculated nitrogen removal. Using 12.2 ppm TKN instead, which is the combination of organic nitrogen, ammonia, (NH₃), and ammonium (NH₄⁺) in the chemical analysis of wastewater; the total nitrogen loading is between 14.5 lb_N/ac (using 4.28 MG of WW) or 46.05 lb_N/ac (using 13.57 MG of WW). Staff concludes that some of the values in the 2010 annual report are calculated incorrectly. Using the reported TKN constituent concentration and 'standard' crop uptake values, site loading does not exceed permit limits.

The permitted nitrogen loading limit is 150% of the median three-year crop uptake for all sources, including fertilizer application. The city reported no fertilizer application in the 2010 annual report. The annual report must list supplemental fertilizer application if applied on site.

4.6.4 Hydraulic Flow, and Storage

Growing season wastewater application is reported in the 2010 annual report Table 2, as 4.28 MG (below) and as 13.57 MG on Page 4 of the same report. Staff used the higher reported value as a measurement of wastewater applied to the management unit during the growing season. At 13.57 MG, the site would be loaded at 16.65 inches of wastewater over the 30 acre site, which is within the permit limits. This would lead to a higher nitrogen loading rate than the values reported in the table below. Nitrogen loading estimates are shown in red below and are likely closer to 46 lb_N/ac. The value listed in Table 3 below for supplemental irrigation water loading at 85.6 inches of water appears inaccurate. Flow meter calibration for wastewater and supplemental irrigation water application is a requirement in the new permit.

Table 3. Estimated Total Land Application Constituent Loadings (Keller 2010)

Constituent	Estimated Loading
Wastewater Application (MG)	4.28 (13.57 DEQ estimate)
Wastewater Application (ac-inches/ac)	5.26 (16.65 DEQ estimate)
Supplemental Water Application (MG)	69.73
Total Water Application (ac-inches/ac)	85.60
Total Nitrogen Loading (lb/ac/yr)	9.7 (46 DEQ estimate)
Total Phosphorus loading (lb/ac/yr)	29.8
COD Loading (lb/ac/d)	2.29

The treatment lagoon pump house contains the effluent flow meter used to record the effluent volume listed above. Effluent volume is measured at as it is pumped to the land application site, but samples are not taken at the pump house. Following chlorination, city personnel collect grab samples from a sampling point at the land application site.

The permit lists four active containment structures. The four wastewater storage structures and capacities are listed in Table 4 below. The three treatment cells are HDPE lined while the winter storage lagoon is clay lined. The three treatment lagoons have an operating capacity of 2 MG each. The winter storage lagoon has a design capacity of 13 MG.

Table 4. Wastewater Storage Structures.

Storage Structure	Serial Number	Design Capacity (Million Gallons)
Cell1	LG-19201	2.0
Cell 2	LG-19202	2.0
Cell 3	LG-19203	2.0
Winter Storage Lagoon	LG-19204	13

4.6.5 COD Loading

The 2010 annual report lists COD loading as 2.29 lb_{COD}/ac per day. The previous permit required monthly sampling for COD. However, since the maximum COD levels have been shown to be only 4.5% of the standard limit of 50 lb/ac/day, the new permit will not include requirements for monthly wastewater monitoring for COD or a COD loading limit.

4.6.6 Other Constituent Loading - Trace Element Management

The previous permit required monitoring of the supplemental irrigation water source. The new permit will require that the quantity of supplemental irrigation water from the Townsite Lateral canal be monitored on a daily basis when being applied to the site, and sampled twice per year in the first year of the permit for TKN, ammonium nitrogen, total-P, EC, pH, and TDS.

4.7 Site Management and Related Permit Recommendations

4.7.1 Buffer Zones

Buffer zones for the new permit WRU M-0192-02 reflect the standard municipal buffer zone distances for Class D municipal effluent, (Secondary effluent quality–disinfected to <230 CFU/100 ml¹), listed in Figure 6 below.

Table 5. Level of Wastewater Disinfection and Resulting Buffer Zones.

<i>FEATURE OF INTEREST</i>	<i>MINIMUM DISTANCE (FEET)</i>
Inhabited Dwellings	300
Areas Accessible to Public	50
Public Water Supply	1,000
Private Potable Water Supply	500
Natural Surface Water Bodies	100
Man-made Surface Water (Irrigation canals, reservoirs)	50
FENCING TYPE	Three-Wire Pasture Fence
Required	Yes
POSTING ⁽²⁾	Class D
Required	Yes

(1) The median number of total coliform organisms does not exceed two hundred thirty (230) per one hundred (100) milliliters, as determined from the bacteriological results of the last three (3) days for which analyses have been completed. No sample shall exceed two thousand three hundred (2300) per one hundred (100) milliliters in any confirmed sample.

(2) When using Class D recycled water for irrigation, the personnel at the use area must be notified that the water used is recycled water and is not safe for drinking. For the public, signs must be posted around the perimeter of the irrigation site stating that recycled water is used and is not safe for drinking or human contact. Signs shall be posted and must state "Warning: Recycled Water - Do Not Enter", or equivalent signage both in English and in Spanish, posted every 500 feet and at every corner of the outer perimeter of the site.

4.7.2 Crop Management

The land application site is planted with an alfalfa hay mix and was managed effectively over the term of the previous permit. The 2010 annual report shows 83 tons of hay produced in two cuttings for an average production of 2.8 tons per acre, which is average production for two cuttings. The city will continue to grow the alfalfa hay mix on the site and may rotate in other crops as necessary to maintain healthy crop production. The new permit will require an update to the plan of operation, including an agricultural management plan. The city has not proposed any grazing on the site, and they do not have an approved grazing management plan.

4.7.3 Nuisance Plan

The new permit will not include a compliance activity requirement for submittal of a nuisance odor management plan for wastewater reuse land application activities. The effluent composition is not known to produce nuisance odors. The treatment lagoons must continue to be managed without causing nuisance conditions according to standard permit requirements.

4.8 Compliance Schedule for Required Activities – Permit Section 3

Current Permit LA-000192-01

The current wastewater reuse permit for the City of McCammon includes two compliance activities. Compliance activity CA-192-01-1 required submittal of an Operations and Maintenance Manual, a Sampling & Analysis Plan, and a Nuisance Odor Management Plan. The 2006 permit application included a preliminary plan of operation, and a brief maintenance description, but the completed plans have not been approved. The requirement for plan submittal will continue into the next permit. The second compliance activity CA-192-01-2 required seepage testing on all storage structures 6 months prior to permit expiration. The required compliance activities have either been satisfied or will be required to be completed in the new permit.

New Permit WRU M-0192-02

CA-192-01 requires submittal of an updated plan of operation within one year of permit issuance to include a runoff management plan, a quality assurance project plan, an agricultural management plan, and a site instrumentation plan. The permittee may submit the required plans in CA-192-01 as individual documents or as sub-parts incorporated into a comprehensive, system-wide plan of operation. Individual management plans will be reviewed and approved separately.

4.8.1 Permit Limits and Conditions – Section 4

The City of McCammon wastewater reuse facilities constitute a municipal wastewater land application system. Current standards for municipal wastewater reuse systems are incorporated into the draft permit. The wastewater reuse permit is for the land application of treated municipal effluent. Industrial effluent is not described in the permit application and is not permitted to be sent to the treatment lagoons or to the land application system.

The buffer zone criteria in the previous permit will remain unchanged in the new permit. Operating plan updates and buffer zone maps should reflect the recommended buffer distances.

4.8.2 Monitoring and Reporting – Sections 5 & 6

The permit requires the facility to monitor the volume of wastewater and supplemental irrigation water applied on the land application site on a daily basis, wastewater composite sampling and reporting is required on a monthly basis when effluent is being applied.

The facility is required to calibrate wastewater and supplemental irrigation water flow measuring equipment annually or as required by the manufacturer. Other monitoring requirements listed in Section 6.1.2 of the draft permit include calculation of the monthly irrigation water requirement for each crop, annual hydraulic loading rates, annual nutrient loading rates, crop yield, and crop nutrient uptake as the crop is removed from the site.

The permittee is required to submit an annual report that includes 1) all monitoring conducted under the terms of the permit, 2) the status of compliance activities required by the permit, and 3)

an interpretive discussion of the monitoring data with particular respect to any potential environmental impacts. The annual report is due by January 31 of each year, and will address operations conducted from November 1 through October 31 of the preceding years.

5 Recommendation for Issuance of Permit

Based on review of applicable state rules, staff recommends that DEQ issue Draft Permit WRU M-0192-02 for a public review and comment period. The draft permit contains effluent quality requirements for the wastewater treatment system, as well as terms and conditions required for operation of the reuse system.

6 References

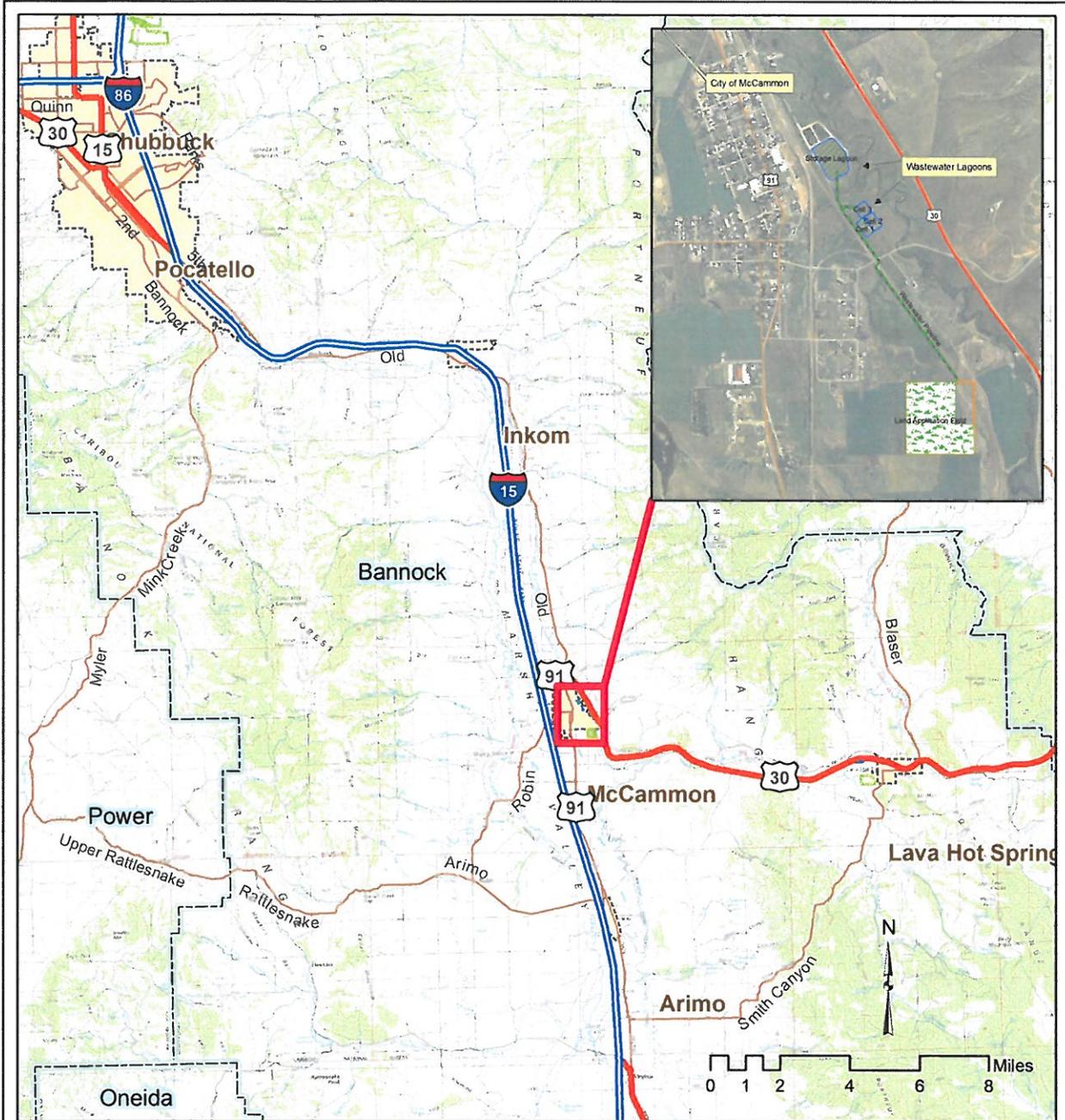
Keller Associates, March 14, 2012, Wastewater Reuse Permit Technical Report (Permit Application), City of McCammon, March.

Keller 2006; Municipal Wastewater Reuse Permit Application, City of McCammon, Idaho, Keller Associates, May.

Keller 2002, Wastewater Reuse Permit Technical Report (Emergency Application), City of McCammon, August.

Keller 2010; City of McCammon, Idaho, 2010 Land Application Report.

Appendix A: Site Maps



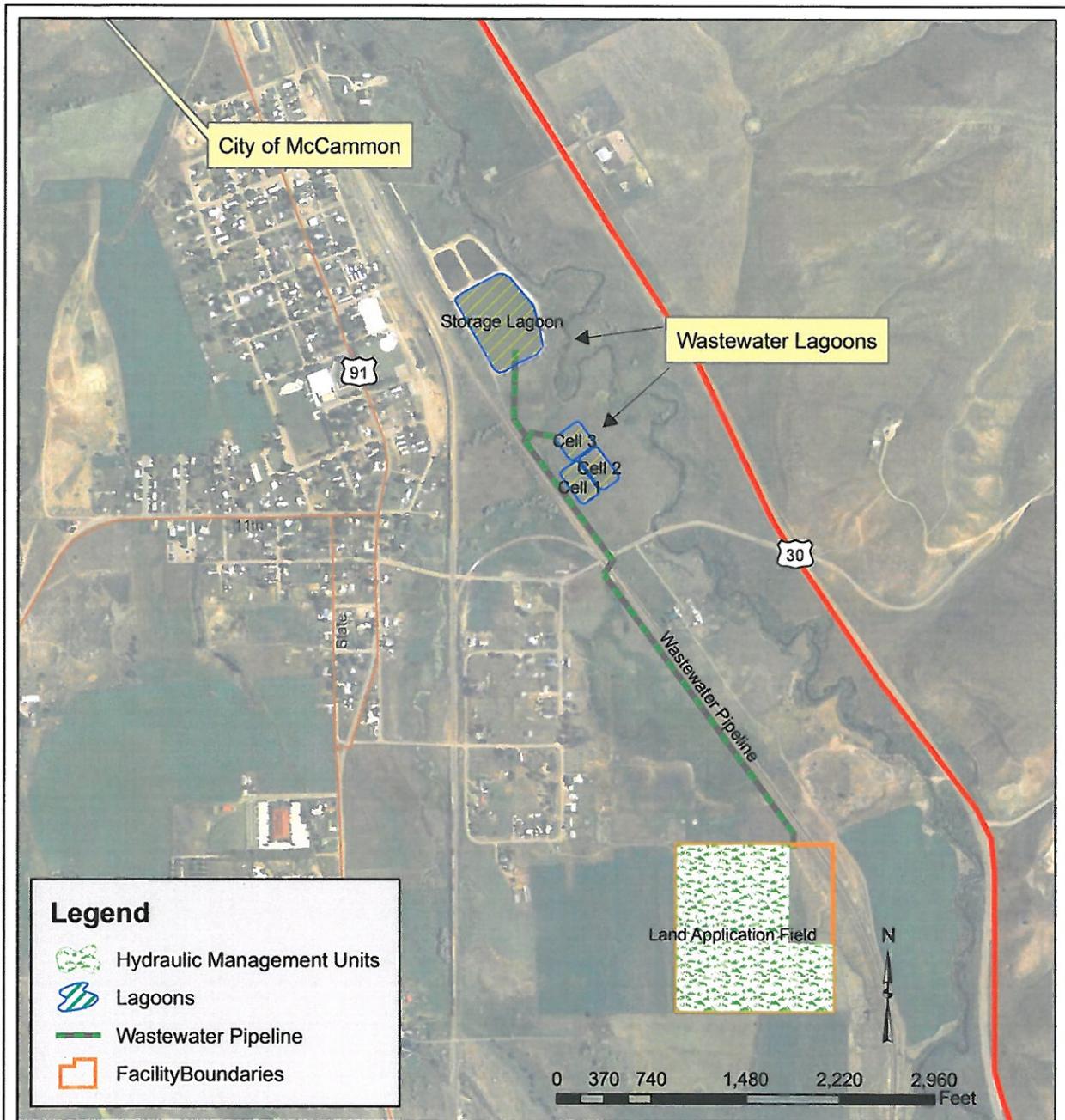
City of McCammon Wastewater Beneficial Reuse Vicinity Map

Prepared by Tom Hepworth, IDEQ using ArcGIS ArcView 9.1
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 Data Sources: IDEQ SDE and Local Feature Classes and Layers
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State of Idaho
 Department of Environmental Quality
 444 Hospital Way, #300
 Pocatello ID 83201 236-6160

Wastewater Beneficial Reuse Permitting Program
 Pocatello Regional Office



City of McCammon Wastewater Beneficial Reuse Site Map

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 Data Sources: IDEQ SDE and Local Feature Classes and Layers
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