UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Ref: 8EPR-EP

Art Compton, Divison Administrator
Planning, Prevention & Assistance Division
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Re: TMDL Approvals
Sage Creek (salinity)
Big Sandy Creek (salinity)

Dear Mr. Compton:

We have completed our review of the total maximum daily loads (TMDLs) as submitted by your office for Sage Creek and Big Sandy Creek. The TMDLs are included in the documents entitled Salinity TMDL for Sage Creek, Montana (January 16, 2001*; Montana Department of Environmental Quality) and Big Sandy Creek Salinity TMDL & Water Quality Restoration Plan (January 16, 2001*; Montana Department of Environmental Quality). These documents were initially sent to us in correspondence dated December 31, 2001 signed by Ron Steg of your staff and subsequently transmitted to us for review and approval in correspondence dated February 21, 2002 and signed by you. In accordance with the Clean Water Act (33 U.S.C. 1251 *et. seq*.), we approve all aspects of the TMDLs as developed for the water quality limited waterbodies as described in Section 303(d)(1). Enclosure 1 to this letter provides a summary of the elements of the TMDLs and Enclosure 2 provides details of our review of the TMDLs.

Based on our review, we feel the separate TMDL elements listed in Enclosure 2 adequately address the pollutants of concern, taking into consideration seasonal variation and a margin of safety. In approving these TMDLs, EPA affirms that the TMDLs have been established at a level necessary to attain and maintain the applicable water quality standards and has the necessary components of an approvable TMDL.

Finally, we wish to inform you that our office has received concurrence from the U.S. Fish and Wildlife Service regarding our biological evaluations of the approval of the Sage Creek and Big Sandy TMDLs. Our biological evaluations were submitted to the Service in accordance with Section 7 of the Endangered Species Act. In our evaluations, we assessed the effects of our

* Although the TMDL documents for Sage Creek and Big Sandy Creek were dated January 16, 2001, EPA believes that actual date of the documents is January 16, 2002. Drafts of these documents were received in December 2001. Further, dates referenced in the documents such as the date referenced on the figures are November or December of 2001.

approval on the threatened, endangered, proposed, and candidate species in the area of the TMDLs. Our conclusion was that the TMDL approval would either have no effect or would not likely have an adverse effect on the species of concern. Any effect of the TMDL approvals was seen as either insignificant or beneficial to the species.

The Sage Creek and Big Sandy Creek TMDLs call for nonpoint source controls to be put in place to achieve and maintain water quality goals. We acknowledge the complexity of the programs associated with nonpoint source controls and the need to use a phased approach. We also acknowledge the use of voluntary, incentive-based methods to implement many aspects of the TMDLs along with the solid commitment to perform post-implementation monitoring.

Thank you for your submittal. If you have any questions concerning this approval, feel free to contact Bruce Zander of my staff at 303/312-6846.

Sincerely,

Max H. Dodson
Assistant Regional Administrator
Office of Ecosystems Protection and Remediation

Enclosures

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Enclosure 1 - **TMDL Summary Information**

Waterbody Name*	**TMDL Parameter/ Pollutant**	**Water Quality Goal/Endpoint**	**TMDL**	**Section 303(d)(1) or 303(d)(3) TMDL**	**Supporting Documentation** *(a partial list of supporting documents)*
Sage Creek* MT40G001_010 Milk River basin HUC 10050006)	salinity	Narrative Standard: *"State surface waters must be free from substances attributable to municipal, industrial, agricultural practices or other discharges that will create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life" (ARM 17.30.637(1)(d).)* Beneficial Use Standard: *"...suitable for culinary and food process purposes, after conventialn treatment, and for bathing, swimming and recreation, growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply." (ARM 17.30.625).* A goal of approximately **1250 mg/l total dissolved solids (TDS) or 1600 µmhos/cm specific conductance (SC).** (These metrics reflect about the same amount of salinity in Sage Creek.)	The Sage Creek TMDL is expressed in pounds per day of TDS using the following formula based on flow: **TMDL =** **1250 mg/l x flow x 5.39** where, flow = stream flow in cfs 5.39 = conversion factor TMDL partially implemented by reducing groundwater levels in saline seep recharge areas.	Section 303(d)(1)	Salinity TMDL for Sage Creek, Montana (January 16, 2001(sic)); MT DEQ. Protocol for Developing Sediment TMDLs (First Edition); EPA 841-B-99-004; October 1999. Water Quality Restoration Plan for Sage Creek Watershed (November 2001; Sage Creek Watershed Alliance, Liberty County Conservation District, Hill County Conservation District, Montana Bureau of Mines and Geology)
Big Sandy Creek* MT40H001_010 Milk River Basin (HUC 10050005)	salinity	Narrative Standard: *"State surface waters must be free from substances attributable to municipal, industrial, agricultural practices or other discharges that will create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life" (ARM 17.30.637(1)(d).)* A goal of approximately **1000 mg/l total dissolved solids (TDS) or 1600 µmhos/cm specific conductance (SC) at 25 ^{0} C.** (These metrics reflect about the same amount of salinity in Big Sandy Creek.)	The Big Sandy Creek TMDL is expressed in pounds per day of TDS using the following formula based on flow: **TMDL =** **1000 mg/l x flow x 5.39** where, flow = stream flow in cfs 5.39 = conversion factor TMDL partially implemented by applying agricultural best management practices (BMPs) in saline seep recharge areas.	§303(d)(1)	Big Sandy Creek Salinity TMDL & Water Quality Restoration Plan; (January 16, 2001(sic)); MT DEQ. Protocol for Developing Sediment TMDLs (First Edition); EPA 841-B-99-004; October 1999. Big Sandy Creek Watershed: Aerial Assessment; (May 24-25, 2000); Big Sandy Creek Project Coordination by Big Sandy Conservation District, Big Sandy, Montana.

* An asterisk indicates the waterbody has been included on the State's Section 303(d) list of waterbodies in need of TMDLs.

Enclosure 2 - **TMDL Review Table**

The following table provides a summary of EPA's review of TMDLs submitted to it from Montana Department of Environmental Quality in correspondence dated February 21, 2002 (Sage Creek TMDL and Big Sandy TMDL). Each TMDL is reviewed according the EPA Region VIII's criteria which include:

A. Water Quality Standards TMDLs result in maintaining and attaining water quality standards *(including the numeric, narrative, use classification, and antidegradation components of the standards; the "phased" TMDL can be used where there is a level of uncertainty; in addition, TMDLs can rely on either regulatory or voluntary approaches to attain standards);*

B. Water Quality Targets TMDLs have a quantified target or endpoint *(a numeric water quality standard often serves as the target, but any indicator or set of indicators which represent the desired condition would suffice);*

C. Significant Sources TMDLs must consider all significant sources of the stressor of concern *(all sources or causes of the stressor must be identified or accounted for in some manner; this accounting can lump several sources of unknown origin together; the TMDL need only address the control of a subset of these sources as long as the water quality standards are expected to be met);*

D. Technical Analysis TMDLs are supported by an appropriate level of technical analysis *(allocations for nonpoint sources are often best professional estimates whereas waste load allocations for point sources are often based on a more detailed analysis);*

E. Margin of Safety/Seasonality TMDLs must contain a margin of safety and consider seasonality *(a margin of safety can be either explicit or implicit in the analysis or assessment);*

F. TMDL TMDLs include a quantified pollutant reduction target, but this target can be expressed in any appropriate manner *(According to EPA reg (see 40 C.F.R. 130.2(i)) TMDLs need not be expressed in pounds per day or concentration when alternative means of expression are better suited to the waterbody problem; TMDLs can be expressed as mass per unit of time, toxicity, % reduction in sediment or nutrients, or other measure);*

G. Allocation TMDLs apportion responsibility for taking actions *(allocations may be expressed in a variety of ways such as by individual discharger, by tributary watershed, by source or land use category, by land parcel, or other appropriate scale or dividing responsibility);*

H. Public Participation TMDLs involve some level of public involvement or review *(public participation should fit the needs of the particular TMDL).*

Sage Creek Salinity TMDL Review (see Salinity TMDL for Sage Creek, Montana (January 16, 2001(sic))	
A. Water Quality Standards	The State's submittal provides a good description of the geographic scope of the TMDL as well as information on the watershed and land use characteristics of Sage Creek. Sage Creek is classified by the State as a B-3 waterbody which means it is "suitable for bathing, swimming and recreation, growth and propagation of nonsalmonid fishes and associated aquatic life, waterfowl and furbearers." (See ARM 17.30.629(l)) There are indications that the current water quality of Sage Creek, when flowing, already meets the salinity water quality goals established in the TMDL. This TMDL, then, focuses on maintaining water quality standards in the Creek as well as addressing the saline buildup associated in groundwater seeps. This buildup occurs both during times of flow and no flow in the Creek.
B. Water Quality Standards Targets	Water quality targets for this TMDL are based on narrative provisions within the State standards including: Narrative Standard: *"State surface waters must be free from substances attributable to municipal, industrial, agricultural practices or other discharges that will create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life" (ARM 17.30.637(1)(d).)* Beneficial Use Standard: *"...suitable for culinary and food process purposes, after conventional treatment, and for bathing, swimming and recreation, growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers, and agricultural and industrial water supply." (ARM 17.30.625).* A goal of approximately **1250 mg/l total dissolved solids (TDS) or 1600 µmhos/cm specific conductance (SC).** (These metrics reflect about the same amount of salinity in Sage Creek.) The relationship between TDS and SC is site specific. These numeric targets are based on protection of aquatic life, but also provide a level of protection of stockwater and irrigation uses.
C. Significant Sources	The primary source of salinity in Sage Creek is from saline seeps. Salts in glacial deposits are mobilized through dryland cropping practices in recharge areas. Groundwater from these recharge areas eventually discharges into Sage Creek, itself.
D. Technical Analysis	The source and cause of salinity in Sage Creek has been linked to groundwater flow into the Creek. Saline seeps associated with this groundwater flow is linked to land use practices in groundwater recharge areas. Identification of critical recharge areas were identified, in part, through the use of color infrared photography. Implementation of practices designed to reduce the salinity have already started in the watershed. For example, practices designed to reduce seeps, decrease concentrations of groundwater salinity, increase soil organic matter, and decrease water table elevations have begun.
E. Margin of Safety & Seasonality	A margin of safety was incorporated in this TMDL by using an implicit conservative approach to implementing the provisions of the TMDL. First, there will be post-

	implementation monitoring of stream health to determine the effectiveness of the TMDL and the need to apply further control practices. Post-implementation monitoring used in conjunction with adaptive management is a "safety net" for the TMDL, addressing uncertainties and assuring attainment of water quality targets. Second, the salinity water quality targets established in this TMDL are thought to be more protective than needed for aquatic life. Seasonality was considered in this TMDL by assessing the seasonal variation in groundwater phenomon that contribute to salinity in Sage Creek. Further, seasonality was considered by expressing the TMDL as a function of flow. Flow is one of the more important factors that changes with the season and has an effect on the amount of salinity in the Creek.
F. TMDL	The TMDL for salinity in Sage Creek is a function of flow and TDS. The acceptable pounds per day of TDS in Sage Creek is given as: **TMDL = 1250 mg/l x flow x 5.39** (flow = stream flow in cfs and 5.39 = conversion factor) Also, the TMDL during periods of no-flow is expressed as a reduction in saline seep discharge acreage near the Creek.
G. Allocation	There are no point sources within this watershed that contribute to the selinity load. Therefore, the wasteload allocation (WLA) component for the TMDL is zero and all the acceptable salinity load can be allocated to the load allocation (LA) of the TMDL. All significant sources have been considered in this TMDL. EPA regulations at 40 C.F.R. 130. 2(g) state that load allocations (i.e., that portion of a receiving water's loading capacity that is attributed either to nonpoint sources such as salinity sources in Sage Creek) may be expressed in a range of ways from reasonable accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. The TMDL in this case is equal to the load alloction for nonpoint and background sources. EPA's protocol for sediment TMDLs states on page 7-4 that allocations can be expressed in terms of maximum allowable loads, percentage reduction targets, or performance-based actions or practices. The Sage Creek TMDL focuses on performance-based actions as a method of expressing the TMDL. The protocol on page 7-5 further describes the performance-based method as a way of describing practices to be implemented to address specific sources of concern. The Sage Creek TMDL accomplishes this by identifying recharge areas in the watershed as areas in need of priority practices.
H. Public Participation	The State's submittal includes a summary of the public participation process that has occurred which describes the ways the public has been given an opportunity to be involved in the TMDL development process. In particular, the State has encouraged participation through public meetings in the watershed and widespread solicitation of comments on the draft TMDL. The State also employed the Internet to post the draft TMDL and to solicit comments. The level of public participation is found to be adequate.

Big Sandy Creek Salinity TMDL Review (see Big Sandy Creek Salinity TMDL & Water Quality Restoration Plan (January 16, 2001(sic))	
A. Water Quality Standards	The State's submittal provides a good description of the geographic scope of the TMDL as well as information on the watershed and land use characteristics of Big Sandy Creek. Big Sandy Creek is classified by the State as a B-3 waterbody which means it is "suitable for bathing, swimming and recreation, growth and propagation of nonsalmonid fishes and associated aquatic life, waterfowl and furbearers." (See ARM 17.30.629(l)) The impaired uses include aquatic life support and warm water fisheries.
B. Water Quality Standards Targets	Water quality targets for this TMDL are based on narrative provisions within the State standards including: Narrative Standard: *"State surface waters must be free from substances attributable to municipal, industrial, agricultural practices or other discharges that will create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life" (ARM 17.30.637(1)(d).)* A goal of approximately **1000 mg/l total dissolved solids (TDS) or 1600 µmhos/cm specific conductance (SC) at 25 ^{0} C.** (These metrics reflect about the same amount of salinity in Big Sandy Creek.) The relationship between TDS and SC is site specific. These numeric targets are based on protection of aquatic life, but also provide a level of protection of stockwater and irrigation uses.
C. Significant Sources	The primary source of salinity in Big Sandy Creek is from saline seeps. Salts in glacial deposits are mobilized through dryland cropping practices in recharge areas. Groundwater from these recharge areas eventually discharges into Big Sandy Creek, itself.
D. Technical Analysis	The source and cause of salinity in Big Sandy Creek has been linked to groundwater flow into the Creek. Saline seeps associated with this groundwater flow is linked to land use practices in groundwater recharge areas. Identification of critical recharge areas were identified, in part, through the use of aerial photography and geologic mapping. Practices designed to reduce seeps in the groundwater and the surface water include 1) adopt a 5 to 10 year rotation from crop to perennial forage for haying/grazing, 2) place recharge areas into the Conservation Reserve Program, and 3) switch from crop/fallow to annual or flex cropping.
E. Margin of Safety & Seasonality	A margin of safety was incorporated in this TMDL by using an implicit conservative approach to implementing the provisions of the TMDL. First, there will be post-implementation monitoring of stream health to determine the effectiveness of the TMDL and the need to apply further control practices. Post-implementation monitoring used in conjunction with adaptive management is a "safety net" for the TMDL, addressing uncertainties and assuring attainment

	of water quality targets. Second, the salinity water quality targets established in this TMDL are thought to be more protective than needed for aquatic life. Seasonality was considered in this TMDL by assessing the seasonal variation in groundwater phenomenon that contribute to salinity in Big Sandy Creek. Further, seasonality was considered by expressing the TMDL as a function of flow. Flow is one of the more important factors that changes with the season and has an effect on the amount of salinity in the Creek.
F. TMDL	The TMDL for salinity in Big Sandy Creek is a function of flow and TDS. The acceptable pounds per day of TDS in Sage Creek is given as: **TMDL = 1000 mg/l x flow x 5.39** (flow = stream flow in cfs and 5.39 = conversion factor)
G. Allocation	There are no point sources within this watershed that contribute to the salinity load. Therefore, the wasteload allocation (WLA) component for the TMDL is zero and all the acceptable salinity load can be allocated to the load allocation (LA) of the TMDL. All significant sources have been considered in this TMDL. EPA regulations at 40 C.F.R. 130. 2(g) state that load allocations (i.e., that portion of a receiving water's loading capacity that is attributed either to nonpoint sources such as salinity sources in Big Sandy Creek) may be expressed in a range of ways from reasonable accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. The TMDL in this case is equal to the load allocation for nonpoint and background sources. EPA's protocol for sediment TMDLs states on page 7-4 that allocations can be expressed in terms of maximum allowable loads, percentage reduction targets, or performance-based actions or practices. The Big Sandy Creek TMDL focuses on performance-based actions as a method of expressing the TMDL. The protocol on page 7-5 further describes the performance-based method as a way of describing practices to be implemented to address specific sources of concern. The Big Sandy Creek TMDL accomplishes this by identifying recharge areas in the watershed as areas in need of priority practices.
H. Public Participation	The State's submittal includes a summary of the public participation process that has occurred which describes the ways the public has been given an opportunity to be involved in the TMDL development process. In particular, the State has encouraged participation through public meetings in the watershed and widespread solicitation of comments on the draft TMDL. The State also employed the Internet to post the draft TMDL and to solicit comments. The level of public participation is found to be adequate.