ATTACHMENT 5
SECTION 7

Depletions Plan, Platte River Basin, Wyoming (Wyoming's Depletions Plan)

October 24, 2006

Revised August 11, 2009

Template Biological Assessment & Biological Opinion Updated December 3, 2019

Outline

CHAPTER 1-GENERAL INFORMATION

I. Purposes

Wyoming's Depletions Plan serves the following purposes of the Platte River Recovery Implementation Program (PRRIP) as described in subsection I.A.4 of the Program Document:

"Mitigating the adverse impacts of new water related activities on (a) the occurrence of FWS target flows (as described in Section E.1.a) and (b) the effectiveness of the Program in reducing shortages to those flows, such mitigation to occur in the manner and to the extent described in Section E.3 and in the approved depletions plans;"

This depletions plan serves these Program purposes by:

I.A. Specifying the existing water related activities in Wyoming that are covered by the PRRIP;

I.B. Identifying the means by which new water related activities, both those subject to and those not subject to Section 7(a)(2) of the Endangered Species Act (ESA) will be addressed; and

I.C. Describing depletion mitigation measures Wyoming intends to implement.

II. Description of Principles

II.A. Cooperative Agreement-On July 1, 1997, the "Cooperative Agreement for Platte River Research and other Efforts relating to Endangered Species Habitats along the Central Platte River, Nebraska" (Cooperative Agreement) was executed by the Governors of Colorado, Nebraska and Wyoming and the Secretary of the Department of Interior (collectively referred to as the "Signatories").

II.B. Platte River Recovery Implementation Program (PRRIP) – The PRRIP describes the basin-wide cooperative program envisioned in the Cooperative Agreement. The PRRIP will provide Endangered Species Act (ESA) compliance relative to the four federally listed target species (whooping crane, piping plover, least tern and pallid sturgeon) and their associated habitats for existing and new water related activities in the Platte River Basin. The term of the PRRIP is thirteen (13) years after its approval by the Governors of the three states and the Secretary of the DOI.

II.C. ESA compliance-"ESA compliance" means: (1) serving as the reasonable and prudent alternative to offset the effects of water-related activities that the U.S Fish and Wildlife Service (FWS) found were likely to cause jeopardy to one or more of the target species or to adversely modify critical habitat before the Program was in place; (2) providing offsetting measures to avoid the likelihood of jeopardy to one or more of the target species or adverse modification of the critical habitat for new or existing water-related activities evaluated under the ESA after the Program was in place; and (3) avoiding any prohibited take of target species.

II.D. Associated habitats-With respect to the interior least tern, whooping crane, and piping plover, "associated habitat" means the Platte River Valley beginning at the junction of U.S. Highway 283 and Interstate 80 near Lexington, Nebraska, and extending eastward to Chapman, Nebraska, including designated critical habitat for the whooping crane and that portion of any designated critical habitat for piping plover within that Lexington to Chapman reach. With respect to the pallid sturgeon, the term "associated habitat" means the lower Platte River between its confluence with the Elkhorn River and its confluence with the Missouri River.

II.E. Water related activities-"Water related activities" means activities and aspects of activities which (1) occur in the Platte River Basin upstream of the confluence of the Loup River with the Platte River; and (2) may affect Platte River flow quantity or timing, including, but not limited to, water diversion, storage and use activities, and land use activities. Changes in temperature and sediment transport will be considered impacts of a "water related activity" to the extent that such changes are caused by activities affecting flow quantity or timing. Impacts of "water related activities" do not include those components of land use activities or discharges of pollutants that do not affect flow quantity or timing.

II.F. Existing water related activities-"Existing water related activities" include surface water or hydrologically connected groundwater activities implemented on or before July 1, 1997. The PRRIP will provide ESA compliance for the following existing water related activities in Wyoming:

II.F.1. The existing operations of federal and other reservoirs in Wyoming.

II.F.2. Wyoming's allocation of Glendo storage water in accordance with Appendix C of the Final Settlement Stipulation and the Modified North Platte Decree entered in Nebraska v. Wyoming, No. 108 Original (hereafter referred to as the Final Settlement Stipulation and the Modified North Platte Decree).

II.F.3. Pathfinder Modification Project as described in Appendix F of the Final Settlement Stipulation and Modified North Platte Decree.

II.F.4. Transfers approved by the Wyoming Board of Control as long as only the historic consumptive use is transferred, thereby preventing approved transfers from causing increases in depletions.

II.F.5. Water conservation projects to the extent they do not increase depletions or consumptive use. Any increases in consumptive use resulting from irrigation conservation projects will be considered in periodic updates of unit consumptive use rates.

II.F.6. Existing water related activities as defined by the baselines set forth below and further described in this depletions plan.

II.F.6.a. North Platte River Basin (NPRB) Existing Water Related Activities Baseline No. 1-The baseline for irrigation water related activities above Guernsey Reservoir includes some water related activities allowed by the Final Settlement Stipulation and Modified North Platte Decree.

II.F.6.b. NPRB Existing Water Related Activities Baseline No. 2-This baseline covers water use categories and geographic areas not covered by Baseline No. 1. The water use categories under this baseline are: (1) irrigation, (2) municipal, (3) industrial, and (4) "other" water uses as defined in this depletions plan. If a water use under this baseline becomes obsolete and there is evidence that the use occurred in 1992 through 1996, a new use may be substituted for that obsolete use and that new use will be considered an existing water related activity covered by the PRRIP. The standards for implementing these substitutions are set forth in this depletions plan.

II.F.6.c. South Platte River Basin (SPRB) Existing Water Related Activities Baseline-This baseline is discussed in Chapter 3 of this depletions plan.

II.G. New water related activities-"New water related activities" include new surface water or hydrologically connected groundwater activities including both new projects and expansion of existing projects, both those subject to and not subject to section 7(a)(2) of the ESA, which may affect the quantity or timing of water reaching the associated habitats and which are implemented after July 1, 1997.

II.H. Timing of depletions and mitigation-Depletions in excess of existing water related activities baselines and new water related activities will be quantified for the irrigation season (May 1 through September 30) and the non-irrigation season (October 1 through April 30). Mitigation for these depletions will be provided to ensure that the benefits of that mitigation will occur at the state line in the same season as the impacts of the corresponding excess or new depletions, with one possible exception. It may be necessary to time replacement water during September for excess or new depletions that impact flows at the state line in the non-irrigation season because Guernsey Dam on the North Platte River, the Wheatland Irrigation District's dams on the Laramie River, and the Hawk Springs Dam on Horse Creek are basically closed in the non-irrigation season.

II.I. Hydrologically connected groundwater well-A well so located and constructed that if water were withdrawn by the well continuously for 40 years, the cumulative stream depletion would be greater than or equal to 28% of the total volume of groundwater withdrawn from that well. Use from groundwater wells in Wyoming that are not hydrologically connected does not effect the purposes of the PRRIP, is not a new water related activity, and requires no mitigation.

II.J. FWS target flows-These target flows are species and annual pulse flow recommendations for the Platte River at Grand Island, Nebraska developed by U.S. Fish and Wildlife Service as described in Attachment 5, Section 11. Wyoming has not agreed that these target flows are biologically or hydrologically necessary to benefit or recover the target species. These target flows will be under review during the PRRIP.

II.K. Governance Committee-The Committee is established to oversee implementation of the PRRIP. The approval of this depletions plan by the Governance Committee warrants that it meets the goals, objectives and purposes of the PRRIP and the requirements of subsection III.E.3 of the Program Document. During the term of the PRRIP, the Governance Committee will

review implementation of this depletions plan. Amendments to this depletions plan must be reported to and approved by the Governance Committee.

II.L. Scheduled Reports:

December 31, 2007-Complete the Interim Depletions Mitigation Plan described in subsection II.B of Chapter 2. The plan will address any new depletions that commenced between the beginning of the 1997 water year (October 1, 1996) and the end of the 2007 water year (September 30, 2007).

March 15, 2009-Complete the first annual report describing the implementation of this depletions plan addressing water year 2008 (October 1, 2007 through September 30, 2008)

March 15, 20XX-Complete subsequent annual reports for the preceding water year.

III. FWS and State of Wyoming Coordination

This section of Wyoming's Depletion Plan explains the coordination that will occur between the U.S. Fish and Wildlife Service (FWS) and its consultations and the State of Wyoming (state) and its evaluations of water related activities during the PRRIP under this depletions plan. If the FWS, project proponent and State of Wyoming do not concur on a particular issue, the parties will work together to resolve the disagreement and may refer the matter to the Governance Committee for guidance.

III.A. Definitions

The following subsection describes the coordination process with a narrative and schematic. The following definitions are offered to clarify the terms used in the description:

III.A.1. "New water related activities" are defined in subsection II.G of Chapter 1.

III.A.2. New water related activities subject to a consultation with the FWS under section 7(a)(2) of the ESA have a "federal nexus."

III.A.3. The "State Coordinator" is the state employee within the Wyoming State Engineer's Office responsible for administering this depletions plan.

III.A.4. A "project proponent" is the party seeking approval of a water related activity. A federal agency may be a project proponent under this depletions plan.

III.A.5. "Federal Action Agency" is the agency responsible for providing the necessary federal clearances or approvals for a project proponent's proposed action. The Federal Action Agency must assure that a project proponent complies with the ESA through consultation with the FWS.

III.B. Description

The following narrative corresponds with the brief descriptions displayed in the schematic provided after page 9 of this plan.

Box 1. Platte River Basin Water-Related Activities

The FWS Representative will become aware of water related activities through communications with project proponents or Federal Action Agencies. The State Coordinator will become aware of water related activities through the permitting process for new water rights or through the Wyoming Water Development Office. Go to Box 2. (Is there a federal nexus?)

Box 2. Is there a federal-nexus?

The Federal Action Agency, FWS Representative and State Coordinator will determine if the water related activities have a federal nexus.

If no, go to Box 3. (Use Wyoming's Depletions Plan.)
If yes, go to Box 4. (Initiate ESA consultation.)

Box 3. Use Wyoming's Depletions Plan.

Does the water related activity conform to the definition of an existing water related activity provided in subsection II.F of Chapter 1 of this depletions plan? If yes, document the activity and stop.

Does the water related activity conform to the definition of a new water related activity provided in subsection II.G of Chapter 1 of this depletions plan? If yes, go to section II of Chapter 2 or section II of Chapter 3 of this depletions plan depending on whether the new water related activity is located in the North Platte River basin or South Platte River basin, respectively.

Box 4. Initiate ESA consultation

All proposed water related activities with a federal nexus are subject to ESA consultation with the FWS. Go to Box 5. (Existing or new water related activity?)

Box 5. Existing or new water related activity?

Does the water related activity with the federal nexus conform to the definition of an existing water related activity provided in subsection II.F of Chapter 1 of this depletions plan? If yes, the activity is covered by the PRRIP. Go to Box 6. (Existing Water Related Activity-Streamlined ESA consultation)

Does the water related activity with the federal nexus conform to the definition of a new water related activity provided in subsection II.G of Chapter 1 of this depletions plan? If yes, go to Box 7. (Depletions analyses)

Box 6. Existing water related activity-Streamlined ESA consultation.

The activity is covered by the PRRIP. A streamlined ESA consultation will be completed. Attachment No. III to this depletions plan provides a description of the streamlined ESA consultation and provides template documents that will be used. Stop.

Box 7. Depletions analyses

The Federal Action Agency, consulting with the water user, is responsible for providing a project description of the proposed federal action, including a monthly estimate of the annual depletions at the location of the proposed action resulting from the new water related activity. The Federal Action Agency will provide the State Coordinator with a copy of the depletions analyses and other information pertinent to the new water related activity. Go to Box 8. (Proponent desire State assistance?)

Box 8. Proponent desire state assistance?

Because the PRRIP is voluntary, the applicant or project proponent must request that the new water related activity with a federal nexus be addressed by this depletions plan and the PRRIP.

If yes, go to Box 9. (State proposal for coverage?)
If no, go to Box 13. (Independent ESA Section 7 consultation)

Box 9. State proposal for coverage?

The State Coordinator will review and comment on the depletions analyses. In addition, the State Coordinator, in consultation with the Director of the Wyoming Water Development Office (Director), may recommend to the Federal Action Agency and FWS Representative that the new water related activity be covered by the state's mitigation process described in subsection II.D of Chapter 2 of this plan. Working with the project proponent and the Director, the State Coordinator will provide a proposal outlining the terms of that coverage using the parameters of subsection II.D of Chapter 2 of this plan.

The proposal will be developed using Template No. 1-Wyoming Platte River Recovery Agreement, provided in Attachment III.

If yes, go to Box 10. (Federal concurrence with state proposal?)

If no, go to Box 13. (Independent ESA Section 7 consultation)

Box 10. Federal concurrence with state proposal?

The Federal Action Agency and FWS Representative will determine if the state's proposal meets the requirements of section III.E.3 of the Program Document and the programmatic biological opinion (PBO) issued by the FWS on June 16, 2006. The Federal Action Agency and FWS Representative may work with the State Coordinator to develop a mutually acceptable proposal.

The FWS Representative and State Coordinator may elevate the discussions to the Regional Director of the FWS, the Wyoming State Engineer, and Director of the Wyoming Water Development Office.

If yes, go to Box 11. (New water related activity-Streamlined ESA consultation)

If no, go to Box 12. (G.C. approved amendment?)

Box 11. New water related activity-Streamlined ESA consultation

If a mutually acceptable proposal (Wyoming Platte River Recovery Agreement) is reached, a streamlined ESA consultation will be completed. Attachment No. III to this depletions plan provides a description of the streamlined ESA consultation and provides template documents that will be used. Stop. Annual reporting of all streamlined ESA consultations will be provided to the Governance Committee.

Box 12. G.C. approved amendment?

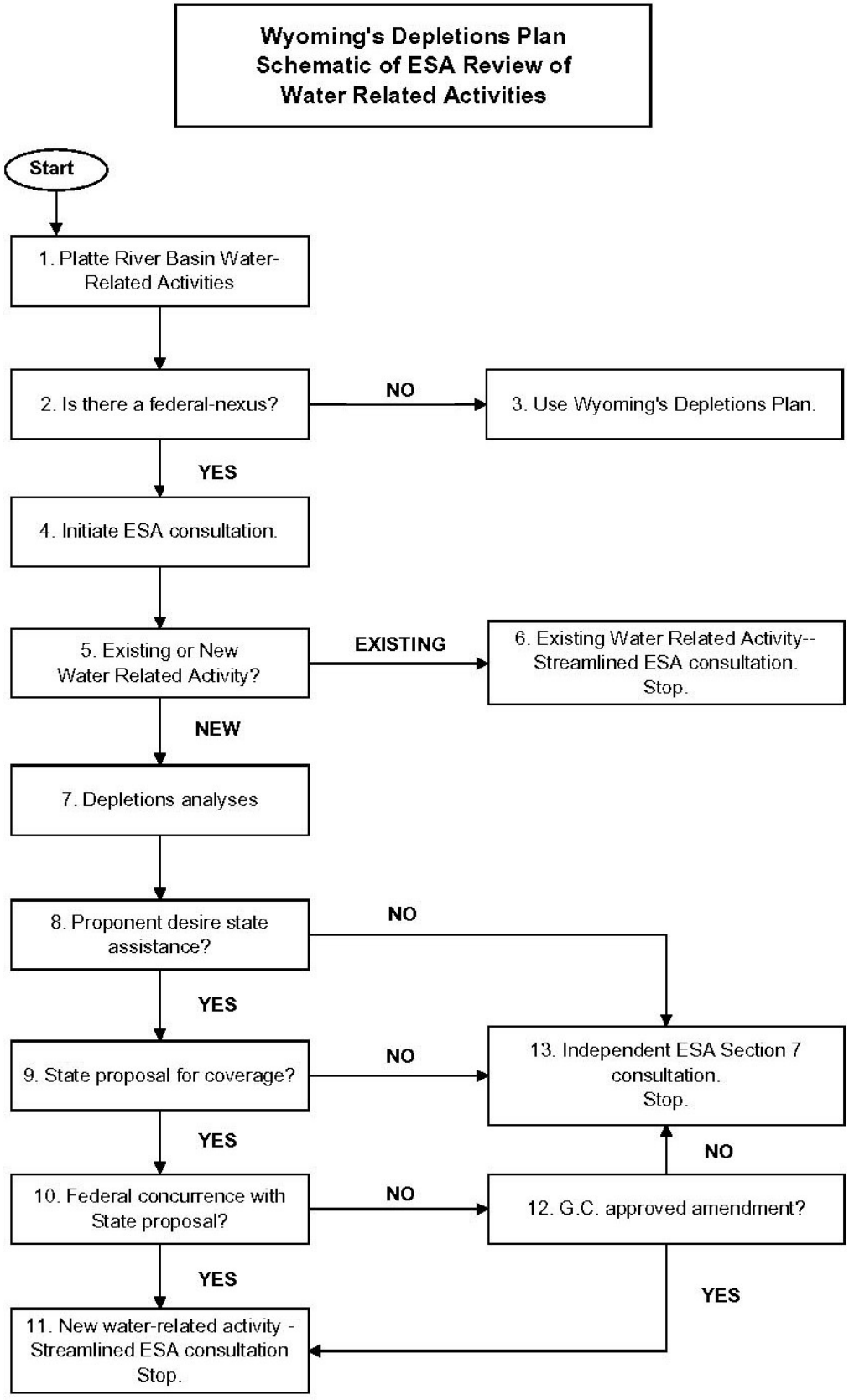
If a mutually acceptable proposal within the parameters of subsection II.D of Chapter 2 of this plan cannot be developed, the FWS Representative and State Coordinator may offer amendments to this plan to the Governance Committee for approval. The amendments would include changes to this plan needed to address specific new water related activities with a federal nexus.

If yes, go to Box 11. (New water related activity-Streamlined ESA consultation)

If no, go to Box 13. (Independent ESA Section 7 consultation)

Box 13. Independent ESA Section 7 consultation

The new water related activity will be subject to a ESA Section 7 consultation conducted "outside of the PRRIP" by the FWS. Upon completion of the FWS consultation, the project proponent will be required to independently provide mitigation as required by that consultation. Stop.


Wyoming's Depletions Plan
Schematic of ESA Review of
Water Related Activities
Start
1. Platte River Basin Water-Related Activities
2. Is there a federal-nexus?
NO
3. Use Wyoming's Depletions Plan.
YES
4. Initiate ESA consultation.
5. Existing or New Water Related Activity?
EXISTING
6. Existing Water Related Activity-- Streamlined ESA consultation. Stop.
NEW
7. Depletions analyses
8. Proponent desire state assistance?
NO
YES
9. State proposal for coverage?
NO
13. Independent ESA Section 7 consultation. Stop.
YES
NO
10. Federal concurrence with State proposal?
NO
12. G.C. approved amendment?
YES
YES
11. New water-related activity - Streamlined ESA consultation Stop.

CHAPTER 2-NORTH PLATTE RIVER BASIN, WYOMING

I. Existing Water Related Activities

I.A. Description

The existing water related activities covered by Wyoming's Depletions Plan and the PRRIP are defined in subsection II.F of Chapter 1. Wyoming's Depletion Plan contains two (2) independent existing water related activities baselines for the North Platte River basin (NPRB) in Wyoming. That means that any "overruns" in one baseline cannot be offset by "under-runs" in the other baseline.

I.B. NPRB Existing Water Related Activities Baseline No. 1

I.B.1. Description

The only water use category under Baseline No. 1 is irrigation water use in the NPRB above Guernsey Reservoir. Wyoming's compliance with the Final Settlement Stipulation and Modified North Platte Decree will provide confirmation that Wyoming has not exceeded this baseline for purposes of the PRRIP. The activities that are required as part of Wyoming's reporting obligations under the Final Settlement Stipulation and Modified North Platte Decree will serve as Wyoming's monitoring for Baseline No. 1.

The following is a summary of those provisions of the Final Settlement Stipulation and Modified Decree that define Baseline No. 1:

I.B.1.a. Wyoming is enjoined from diverting or permitting the diversion of water from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, upstream of Guernsey Reservoir for the intentional irrigation of more than a total of 226,000 acres of land in Wyoming during any one irrigation season, exclusive of the Kendrick Project. In the year 2012, this injunction will be replaced with two injunctions, one that limits the number of acres that can be irrigated above Pathfinder Dam and one that limits the number of acres that can be irrigated between Pathfinder Dam and Guernsey Reservoir; the two injunctions will total 226,000 acres. (See Modified North Platte Decree, ¶ II(c) and Exhibit 4 to the Final Settlement Stipulation.)

I.B.1.b. Wyoming is enjoined from diverting or permitting the diversion of water for irrigation from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, upstream of Pathfinder Dam for the consumption in any period of ten consecutive years of more than 1,280,000 acre feet. Wyoming is enjoined from diverting or permitting the diversion of water for irrigation from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, between Pathfinder Dam and Guernsey Reservoir for the consumption in any period of ten consecutive years of more than 890,000 acre feet exclusive of the Kendrick Project. (See Modified North Platte Decree, ¶ II(a) and (b) and Exhibit 6 of the Final Settlement Stipulation.).

I.B.1.c. No more than 35,000 acres of land in the First Unit of the Kendrick Project may be irrigated. (See ¶ VII of the Final Settlement Stipulation.) The Wyoming water rights held by the Casper Alcova Irrigation District, the contractor for storage water from the Kendrick Project, restricts its irrigated acreage to 24,248.23 acres. The acreage limitation in the water rights will serve as the existing water related baseline for monitoring the operations of the Casper Alcova Irrigation District.

I.B.2. Reporting of Existing Water Related Activities-Baseline No. 1

The Modified North Platte Decree requires Wyoming to annually report acreage irrigated by surface water and hydrologically connected groundwater wells in the area above Guernsey Reservoir, excluding those lands irrigated within the Kendrick Project. In addition, Wyoming is required to annually report the consumptive use resulting from the irrigation of these lands within the area covered by the acreage limitation. These reports are provided to the North Platte Decree Committee (NPDC). The purpose of these reports is to monitor compliance with the provisions in the Modified Decree, described in subsections I.B.1.a. and I.B.1.b. above.

Wyoming's compliance with the Final Settlement Stipulation and Modified North Platte Decree will provide confirmation that Wyoming has not exceeded this baseline for purposes of the PRRIP, with the exception of the irrigated acreage limitation for the Kendrick Project that is specific to this depletions plan. If Wyoming's reports to the NPDC indicate that the acreage and consumptive use limitations were not exceeded, the annual report to the Governance Committee will simply note that Wyoming complied with the Modified Decree.

If Wyoming exceeds the acreage or consumptive use limitations for the areas above Guernsey Reservoir as defined in the Modified Decree, Wyoming will have exceeded Baseline No. 1, independent of the acreage limitation for the Kendrick Project. The annual report to the Governance Committee will include the excess depletions resulting from the overruns to the limitations in the Modified Decree. The effects of overruns will be translated to the Wyoming/Nebraska state line using the methodology described in Attachment I.

The annual report to the Governance Committee will also indicate whether the Kendrick Project exceeded the acreage limitation described above in B.1.c. Kendrick irrigated acreage will be monitored by the Wyoming State Engineer's Office and through reports available through the Bureau of Reclamation.

If the acreage limitation (24,248.23 acres) for the Kendrick Project is exceeded, the annual report to the Governance Committee will quantify the excess acreage and calculate the excess depletions. The effects of excess depletions will be translated to the Wyoming/Nebraska state line using the methodology described in Attachment I to this depletions plan.

Under-runs to the acreage and consumptive use limitations in the Modified Decree or under-runs to the acreage limitation for the Kendrick Project will not be used to offset overruns to Baseline No. 2, described in section I.C of this plan. However, if revisions to the Modified Decree or Kendrick operations result in permanent reductions in depletions, Wyoming reserves the right to seek credit for such reductions through the Governance Committee.

I.B.3. Mitigation of Excess Water Related Activities-Baseline No. 1

If the acreage limitations or consumptive use limitations, described respectively in subsections I.B.1.a.and I.B.1.b, are exceeded, it will mean that Wyoming did not meet the limits of the Modified Decree. The North Platte Decree Committee (NPDC) will need to address the situation. The deliberations of NPDC will be independent of the PRRIP and this depletions plan. The NPDC resolution of the matter may or may not meet the program purposes described in subsection I.A.4 of the Program Document. If resolution by the NPDC is not satisfactory for program purposes, Wyoming will remain obligated to mitigate the effects of the excess depletions at the state line.

If the acreage limitation for the Kendrick Project, described in subsection B.1.c., is exceeded, it will mean that the Casper Alcova Irrigation District did not comply with its water rights. The Wyoming State Engineer's Office (WSEO) will need to address this situation. The deliberations by the WSEO will be independent of the PRRIP and this depletions plan. The WSEO resolution of the matter may or may not meet the program purposes described in subsection I.A.4 of the Program Document. If resolution by the WSEO is not satisfactory for program purposes, Wyoming will remain obligated to mitigate the effects of the excess depletions at the state line.

Mitigation for the depletions in excess of Baseline No. 1 will be provided in the same manner as depletions in excess of Baseline No. 2, described in subsection I.C.3. However, if Baseline No. 1 is exceeded in a water year in which there is a spill routed over or through Guernsey Dam or Kingsley Dam, Wyoming reserves the right to present evidence to the Governance Committee that exceeding the baseline or acreage limitation did not adversely affect the program purposes identified in subsection I.A.4 of the Program Document. A finding by the Governance Committee that the replacement of excess depletions is not necessary or could be reduced will have precedence over any mitigation described in this depletions plan.

I.C. NPRB Existing Water Related Activities Baseline No. 2

I.C.1. Description

For purposes of this depletions plan, the NPRB is broken down into the following sub-basins. (See Figure No. 1)

Sub-basin	Description
1.	NPRB from the CO/WY state line to Pathfinder Dam
2.	NPRB from Pathfinder Dam to Guernsey Dam.
3.	NPRB from the Guernsey Dam to the WY/NE state line, the southern boundary being the Gering/Ft. Laramie Canal, with the exception that lands above the canal, but irrigated from that canal, will be included.
4.	Upper Laramie River Basin, upstream of Wheatland Irrigation District's tunnel no. 2
5.	Lower Laramie River Basin, downstream of Wheatland Irrigation District's tunnel no. 2 and upstream of the Gering/Fort Laramie Canal, including those lands between the Horse Creek and Laramie River drainages, and excluding lands above the Gering/Ft. Laramie Canal, but irrigated from that canal.
6.	Horse Creek Drainage, following its topographic boundary until it intersects with the Gering/Fort Laramie Canal, then the canal becomes the drainage boundary for purposes of this plan.

Baseline No. 2 covers water use categories not covered by Baseline No. 1. The following are the water use categories under Baseline No. 2:

Water Use Categories

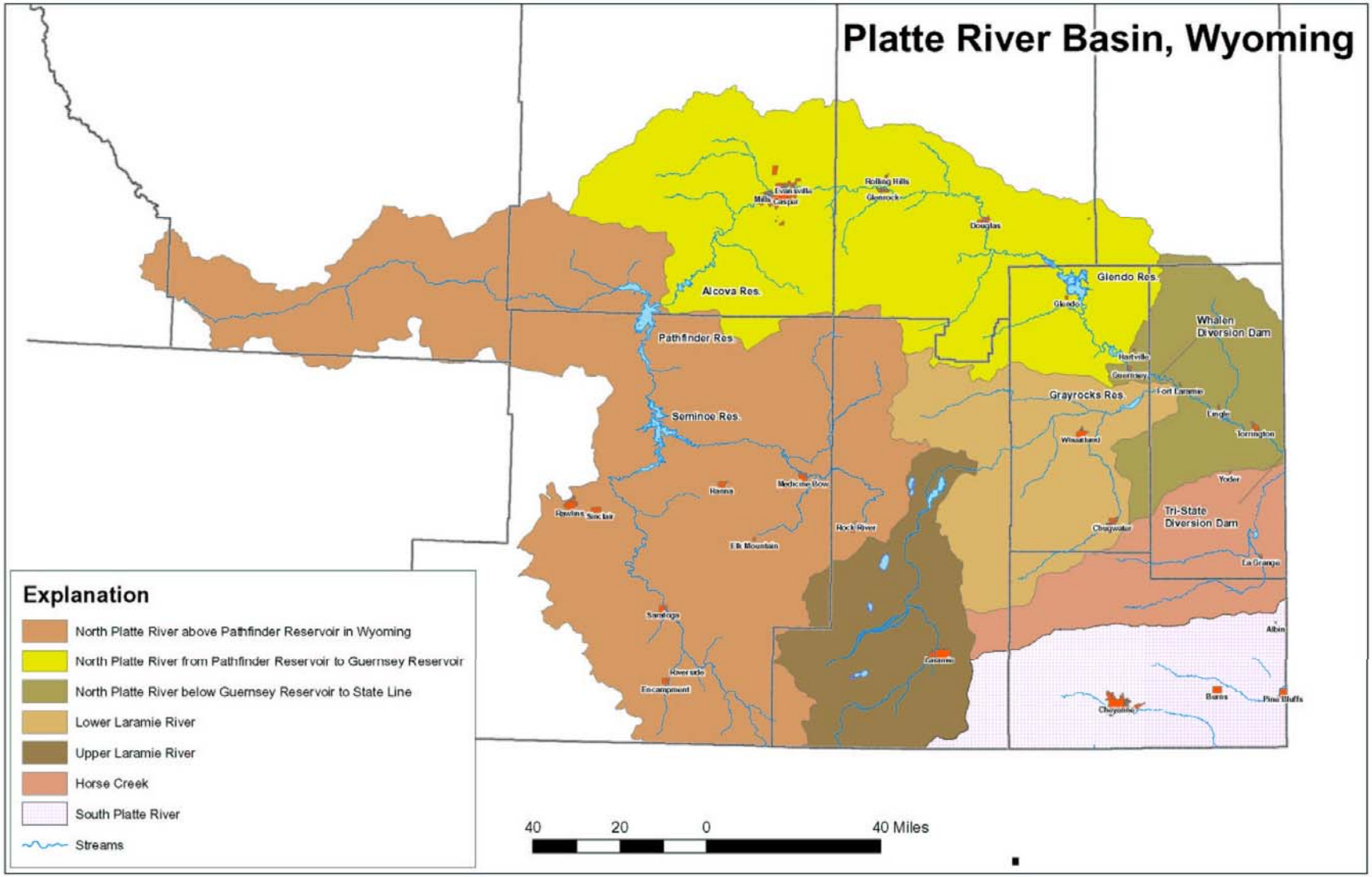
1. Irrigation use in sub-basins 3 through 6. Irrigation use in sub-basins 1 and 2 is covered by Baseline No. 1.

2. Municipal use in sub-basins 1 through 6.

3. Industrial use in sub-basins 1 through 6.

4. Other uses in sub-basins 1 through 6.

The following describes the water use categories and Benchmarks that are included under the existing water related activities Baseline No. 2.


Platte River Basin, Wyoming
Explanation
North Platte River above Pathfinder Reservoir in Wyoming
North Platte River from Pathfinder Reservoir to Guernsey Reservoir
North Platte River below Guernsey Reservoir to State Line
Lower Laramie River
Upper Laramie River
Horse Creek
South Platte River
Streams
Alcova Res.
Pathfinder Res.
Seminoe Res.
Glendo Res.
Grayrocks Res.
Whalen Diversion Dam
Tri-State Diversion Dam
Douglas
Rolling Hills
Glenrock
Glendo
Hartville
Guernsey
Fort Laramie
Lingle
Torrington
Wheatland
Yoder
Chugwater
La Grange
Albin
Hanna
Medicine Bow
Rawlins
Sinclair
Rock River
Elk Mountain
Saratoga
Riverside
Encampment
Cheyenne
Burns
Pine Bluffs
40 20 0 40 Miles

I.C.1.a. Irrigation Water Use

The Benchmark Acreages for sub-basins 3 through 6 are based on field inspections completed by State Engineer Office personnel in 1995 through 1997. The field inspectors were provided 7.5 minute quadrangles that depicted irrigated acreage obtained from infrared photography purchased by the Wyoming Water Development Commission (WWDC). The WWDC obtained this photography in the summers of 1983 and 1984. The field inspectors added and deleted lands depicted on the quadrangles to accurately represent lands irrigated from 1995 to 1997 by surface water and groundwater. The following table depicts the results of the field inspections:

Sub-basins (as defined above)	Benchmark Acreage
NPRB-Guernsey Dam to the WY/NE state line	106,221
Upper Laramie River Basin	91,255
Lower Laramie River Basin	85,711
Horse Creek Basin	41,179

Wyoming will annually complete field inspections of irrigated acreage for each sub-basin and compare the results to the Benchmark Acreages listed above. By the end of year 7 of the PRRIP, a comprehensive inspection will be completed using aerial photography or satellite imagery and field verifications.

The total annual depletions resulting from the irrigation of the Benchmark Acreages listed above will not be calculated. However, the unit consumptive use rates (acre feet/acre) for each sub-basin will be used in this plan in order to calculate the volumetric effects of "overruns" and "under-runs" to the Benchmark Acreages. Unit consumptive use rates have been developed using methods similar to those agreed upon for assessment of compliance with the consumptive use provisions of the settlement of Nebraska v. Wyoming. That methodology was applied to local climatic data and surveys of crop yields and cropping patterns published by the National Agricultural Statistics Service. To capture average climate conditions, unit consumptive use rates for individual crops were averaged over a baseline period, i.e. the most recent 20-30 years, depending upon data availability. These average unit values for each crop were then applied to the actual crop mix (i.e. the proportions of corn, beets, alfalfa, etc.) for a 20-year baseline period (1982-2001). The result is average unit annual consumptive use values for each sub-basin which reflect the application of the long-term, average climate to the most recent 20-year cropping patterns. The following table provides these average unit values which were developed by TriHydro Corporation for the Wyoming Water Development Commission's "Platte River Basin Plan" and will be used for purposes of this plan:

Unit Consumptive Use Rates

Sub-basin (as defined above)	acre feet/acre
NPRB-Guernsey Dam to the WY/NE state line	1.32
Upper Laramie River Basin	0.79
Lower Laramie River Basin	1.31
Horse Creek Basin	1.16

Cropping patterns; irrigation practices, such as increases in supplemental supplies; and other factors that may affect the average unit consumptive uses in each sub-basin will be reviewed every five years. The average annual unit consumptive use rates will be revised if the review indicates that changes are warranted.

As explained in the discussion related to Baseline No. 1, the Final Settlement Stipulation and Modified North Platte Decree place consumptive use limitations on Wyoming in the areas above Pathfinder Dam and between Pathfinder Dam and Guernsey Reservoir. As the administration of these limitations evolves, information may become available which will warrant changes to the methods used to calculate the average unit consumptive use rates listed above.

I.C.1.b. Municipal Water Use

A Benchmark has been developed for municipal water use for each of the six (6) sub-basins defined in Chapter 2, Section I.C.1. The Benchmarks are based on water use information for each municipality within the respective sub-basins. The water use information was used to determine each of the 26 municipality's maximum annual depletions from 1992 through 1996. The majority of the water use calculations were based on actual diversion records. In the event that records were not available, diversions were estimated using populations and estimated per capita use. Some municipalities have expanded their service areas beyond their corporate limits to serve adjacent rural domestic water users. Some industries obtain water from municipal water systems. These factors were included in the water use for the municipalities, rather than the Benchmarks for rural domestic and industrial water use. Return flow factors were used to convert diversions to depletions. The depletions were calculated using effluent records or other available information. The following table depicts the Benchmarks for each of the six (6) sub-basins:

Municipal Water Use-Benchmarks

Sub-basin	Benchmark (Annual Depletions in acre feet)	
	Irrigation Season	Non-irrigation season
1. Above Pathfinder Dam	2,290	1,040
2. Pathfinder Dam to Guernsey Dam	8,265	1,555
3. Guernsey Dam to the WY/NE state line	2,405	860
4. Upper Laramie River Basin	2,990	670
5. Lower Laramie River Basin	935	325
6. Horse Creek Drainage	95	55

Additional baseline information will be used to monitor future water related activities. This additional baseline information for each municipal system addresses the status of the water supply as of July 1, 1997 and includes information relating to the water system, water rights, population, water use, and the wastewater system. The information will be used to estimate the depletive or accretive impacts of changes in operations. For example, a municipality may convert from a surface water supply to non-hydrologically connected groundwater wells. A municipality may convert from a zero discharge wastewater system to a flow-through system,

thereby reducing depletions. These types of changes may allow municipalities to accommodate additional growth without increasing depletions. This baseline information will also be used to determine if increased population or a particular change in operations will cause a municipality to permanently exceed its 1992-1996 water use and, therefore, should be considered a new water related activity.

I.C.1.c. Industrial Water Use

The major industrial water user in the NPRB in Wyoming is the Basin Electric Power Cooperative (BEPC), who owns and operates the Laramie River Station near Wheatland, Wyoming. On December 4, 1978, an Agreement of Settlement and Compromise (Agreement) was executed by the BEPC, the State of Nebraska, the Rural Electricification Administration (REA), the U.S. Army Corps of Engineers (USCOE) and several environmental groups to resolve disputes regarding the issuance of loan guarantees by the REA and the issuance of the dredge and fill permit by the USCOE for BEPC's Grayrocks Dam and Reservoir. The Agreement contains annual consumptive use limitations on the Laramie River Station, places operating conditions on the water supplies for the power plant, and established the "Platte River Whooping Crane Habitat Maintenance Trust." The parties agreed that compliance with the Agreement satisfies the requirements of the Endangered Species Act. The Benchmark for this existing water related activity, the various water supplies for the Laramie River Station, is to comply with the 1978 Agreement of Settlement and Compromise. Wyoming will monitor any amendments to the Agreement or issues related to non-compliance resolved by the parties to ensure conformance with the purposes of the PRRIP. If BEPC seeks to amend its water rights or operations in a manner that would permanently reduce depletions, Wyoming reserves the right to seek credit for the reduced depletions under this plan through the Governance Committee.

There are six (6) other significant industrial water users in the NPRB in Wyoming: the Sinclair Refinery, the former Amoco Refinery, the former Texaco Refinery, the Little America Refinery, the Dave Johnson Power Plant, and a sugar beet processing plant in Torrington. Each of these six industrial water supply systems has a Benchmark. The Benchmarks are based on each system's maximum depletions during the 1992-1996 water years. The following table depicts the Benchmarks for the six industrial water supply systems:

Industrial Water Use-Benchmarks for Major Industries

Sub-basin	Benchmark (Annual Depletions in acre feet)	
	Irrigation Season	Non-irrigation season
1. Above Pathfinder Dam		
Sinclair Refinery	1,110	1,340
2. Pathfinder Dam to Guernsey Dam		
Amoco Refinery	2,050	1,015
Texaco Refinery	320	140
Little America Refinery	505	700
Dave Johnson Power Plant	4,640	5,520
3. Guernsey Dam to the WY/NE state line		
Sugar beet processing plant	40	1,140

Additional baseline information will be used to monitor future water related activities. This additional baseline information for each of the above systems will address the status of their water supply as of July 1, 1997 and will include information relating to the water system, water rights, water use, and the wastewater system. The information will be used to estimate the depletive or accretive impacts of proposed changes in operations to determine if those changes can be accommodated under the existing Benchmark or if they should be considered new water related activities.

Lack of specific data on the annual water use of the other industries within the basin makes it difficult to establish a meaningful history of their industrial water use. However, each of the industries has a portfolio of water rights under which they operate. These portfolios would have to be revised if the industries were to replace or modify their water supplies. The Benchmark for these other industries is based on their water rights. A tabulation of the industrial water rights issued on or before July 1, 1997 has been developed. If one of these industrial water users wants to replace or modify their water supplies, the depletions resulting from those projects would be considered existing water related activities if they do not increase the depletions beyond those that occurred from 1992 through 1996. If the projects result in depletions beyond this threshold, the excess depletions would be considered new water related activities.

I.C.1.d. Other Water Uses

This water use category includes those uses that do not fit under the irrigation, municipal or industrial permitting processes. The following is a description of other uses that will be considered by this depletions plan.

I.C.1.d.i. Rural Domestic Water Use

This category addresses the water use by the population in each sub-basin outside the service areas of the municipal water supply systems, which are served by individual wells or centralized systems for rural subdivisions. A Benchmark has been developed for the rural domestic water use in each of the sub-basins within the NPRB.

The Wyoming Department of Administration and Information provided estimates of the population in each of the sub-basins. The populations served by municipal water systems were subtracted from the estimates to determine the rural population in each sub-basin from 1992 through 1996. It is estimated that depletions resulting from personal use, including irrigation of lawns and gardens, equates to 100 gallons per capita per day or 0.11 acre feet per year. For purposes for this depletions plan, this use is reduced to 0.10 acre feet per person per year to account for the fact that approximately 10% of the rural population is served by non-hydrologically connected groundwater wells. The following Benchmarks were established using the rural population estimates and a depletion factor of 0.1 acre feet per person per year:

Rural Domestic Water Use-Benchmarks

Sub-basin	Benchmark (Annual Depletions in acre feet)	
	Irrigation Season	Non-irrigation season
1. Above Pathfinder Dam	160	80
2. Pathfinder Dam to Guernsey Dam	360	180
3. Guernsey Dam to the WY/NE state line	270	130
4. Upper Laramie River Basin	270	130
5. Lower Laramie River Basin	200	100
6. Horse Creek Drainage	80	40

I.C.1.d.ii. Livestock Use

In Wyoming, there is a simplified water right permitting process for stock wells as long as the proposed capacity of the well does not exceed 25 gallons per minute. This depletions plan considers the use of stock wells permitted under this process to be non-depletive. If the proposed capacity of a well exceeds 25 gallons per minute, the water user must undergo a more detailed water rights permitting process and seek a permit for a miscellaneous use well.

There is also a simplified water right process for stock watering reservoirs as long as the proposed storage capacity of the reservoir does not exceed 20 acre feet in capacity and 20 feet in dam height. If the proposed stock water reservoir exceeds these limitations, the water user must undergo a more detailed water right permitting process for the reservoir. Both categories of stock watering reservoirs will be administered under this plan in the same manner as miscellaneous uses.

Water supplies for feed lots and hog farms are permitted as miscellaneous wells or miscellaneous surface water diversions. Miscellaneous uses will be addressed by this plan as described below.

I.C.1.d.iii. Miscellaneous Uses

* Miscellaneous Use Wells-This designation for ground water rights is used for the following: 1) domestic wells, 2) stock/domestic and 3) stock wells with a permitted capacity greater than 25 gallons per minute. This use designation is also used for rural commercial establishments, cemeteries, golf courses, dewatering, and uses that do not fit other defined water right categories.

* Miscellaneous Surface Water Diversions-There is no formal "miscellaneous" permit category for surface water diversions within the WSEO. However, permits for surface water diversions are issued for recreational, commercial, and other uses that do not fit under the irrigation, municipal or industrial permitting categories.

* Fish and Recreation Reservoirs-This designation is used for impoundments that serve fish propagation, wetlands development, golf courses, and aesthetic purposes. Small reservoirs in this category are treated like stock reservoirs in that there is a

simplified water right permitting process if the proposed storage capacity does not exceed 20 acre feet or the proposed dam height does not exceed 20 feet. If the proposed project exceeds these limitations, the water user must undergo a more detailed permitting process.

There is no annual water use information available on stock watering reservoirs or the miscellaneous uses described above. The Benchmark for these water uses is based on their water rights. Tabulations of the water rights issued on or before July 1, 1997 for these uses have been developed. If one of these water users wants to replace or modify their water supplies, the depletions resulting from those projects would be considered existing water related activities if they do not increase the depletions beyond those that occurred from 1992 through 1996. If the projects result in depletions beyond this threshold, the excess depletions would be considered new water related activities.

I.C.2. Reporting of Existing Water Related Activities-Baseline No. 2

Wyoming will generate an annual report to describe its water use during the previous water year. The depletions from the annual water use will be compared against the Benchmarks. Overruns and under-runs to these Benchmarks will be quantified. The effects of the overruns and under-runs will be translated to the state line using the tracking factors described in Attachment I. If it cannot be demonstrated that there were sufficient under-runs to offset the overruns, Wyoming will be responsible for mitigating the effects of the net overruns at the state line in the manner described in subsection I.C.3 of this chapter.

In circumstances where water related activities shift among various categories, but depletions remain within baseline quantities, it may be necessary to modify the Benchmarks under Baseline No. 2. For example:

I.C.2.a. Changes in water use may occur formally, as water right transfers. Under Wyoming law, the consumptive use from the use of existing water rights can be transferred to new or different beneficial uses. These changes of use are reviewed and approved by the Wyoming Board of Control (WBOC). These transactions do not increase depletions and are not new water related activities subject to mitigation. However, these changes of use may result in modified Benchmarks under Baseline No. 2.

I.C.2.b. Similarly, but without an explicit water right transfer, if an existing water use becomes obsolete and there is evidence that the use occurred in the 1992-1996, an alternative use may be substituted and thus be covered by Wyoming's Depletions Plan and the PRRIP. These substitutions may be made between Benchmarks in those categories under Baseline No. 2. For example, a municipality may increase its service area and, as a result, use of individual domestic wells may decline. The Benchmark for the municipality should increase, while the Benchmark for rural domestic water use would decrease. The standard for such substitutions will be to ensure that reassigning the use between Categories and Benchmarks will not increase overall depletions.

Data and information used to develop the benchmarks under Baseline No. 2 will be provided for inclusion in PRRIP files. Wyoming's annual reports will advise the Governance Committee of any changes to the Benchmarks.

I.C.3. Mitigation of Excess Depletions-Baseline No. 2

There are differences between excess existing water related activities and new water related activities. In general, if an existing water related activity baseline is exceeded, it will typically be a one-time event or a limited number of sporadic events caused by above-average water supply conditions. New water related activities result in the depletion of additional water on a regular basis. Section II of Chapter Two of this plan describes how new water related activities will be reported and mitigated.
The following describes how Wyoming would mitigate excesses to the existing water related activities Baseline No. 2.

Wyoming will annually monitor and report water uses covered by Existing Water Related Baseline No. 2 in the manner described in Section I.C of Chapter 2 of the depletions plan. The depletions from annual water use will be compared against the Benchmarks included under this baseline. Overruns and under-runs to these Benchmarks will be quantified. The effects of overruns and under-runs will be translated to the state line using the methods described in Attachment I for irrigation season and non-irrigation season overruns and under-runs. If the overruns are not offset by under-runs, Wyoming will provide a mitigation plan for the review and approval of the Governance Committee. The mitigation plan will:

I.C.3.1. Identify the net overruns at the state line that occurred in the irrigation season and offer a means to replace those overruns in the irrigation season of the year following the year the overruns occurred.

I.C.3.2. Identify the net overruns at the state line that occurred in the non-irrigation season and offer a means to replace those overruns in the non-irrigation season of the year following the year the overruns occurred. It may be necessary to time replacement water during September for excess or new depletions that impact flows at the state line in the non-irrigation season because Guernsey Dam on the North Platte River, the Wheatland Irrigation District's dams on the Laramie River, and the Hawk Springs Dam on Horse Creek are basically closed in the non-irrigation season.

If there is a system spill routed over or through Guernsey Dam or Kingsley Dam, Wyoming reserves the right to present evidence to the Governance Committee that Wyoming's excess depletions did not adversely affect the program purposes identified in subsection I.A.4 of the Program Document and that replacement water is not required or could be reduced. A finding by the Governance Committee that the replacement of excess depletions is not necessary or could be reduced will have precedence over any mitigation described in this depletions plan.

II. New Water Related Activities

II.A. Description

"New water related activities" are defined in subsection II.G of Chapter 1.

II.B. Interim Depletions Mitigation Plan

Wyoming has provided annual reports to the Governance Committee relating to water right permitting activities that have occurred since July 1, 1997. The WSEO has advised anyone seeking new water rights of the proposed PRRIP and that mitigation may be required for new depletions occurring after July 1, 1997.

Wyoming will review the permitting activities and pertinent water use information to quantify any new depletions that commenced between the beginning of the 1997 water year (October 1, 1996) and the end of the 2007 water year (September 30, 2007). Wyoming will also determine if the existing water related baselines are being exceeded by existing water related activities in the year the PRRIP is implemented. An "Interim Depletions Mitigation Plan" (IDMP) will be provided to the Governance Committee. The IDMP will quantify new and excess depletions and propose a mitigation plan for those depletions. The Governance Committee must approve the IDMP before any required mitigation is implemented.

II.C. State Evaluations of New Water Related Activities

New water related activities that are not subject to a consultation with the FWS under section 7(a)(2) of the ESA will undergo state evaluations. Wyoming will use the following process to define, quantify, and mitigate new water related activities:

II.C.1. The Wyoming State Engineer's Office (SEO) is responsible for the following activities related to water rights: 1) appropriation (permitting); 2) adjudication (confirmation of beneficial use by the Wyoming Board of Control (WBOC) and issuance of certificates); 3) amendments (changes to water rights as approved by the WBOC); and 4) administration (regulation under the prior appropriation doctrine). The SEO and WBOC will decide whether permits for new water rights should be approved. These decisions will consider compliance with Wyoming law and the Modified North Platte Decree, as well as impacts to other appropriators. The determination as to whether approval of permits for new water right related activities should be granted is independent of this depletions plan.

II.C.2. If the Surface Water or Groundwater Divisions of the SEO concludes that a permit for a new water right related activity should be approved, the State Coordinator will be provided a copy of the permit application and any other pertinent information. The Administrator will complete the following initial review:

II.C.2.a. If it is evident that the new water related activity will not increase depletions, the State Coordinator will document that there are no new depletions associated with the activity for potential future reporting related to the depletions plan. Examples of such

activities are changes of use approved by the Wyoming Board of Control (WBOC) or Wyoming State Engineer (WSE) or replacement of an existing water supply that was active in 1992 through 1996. The documentation could be in the form of a copy of the order by the WBOC or WSE, a copy of a permit condition, an affidavit or other evidence documenting that the project is a replacement for an existing water related activity that has been or will be abandoned.

II.C.2.b. If it is apparent that the new water right activity will result in increased depletions, the State Coordinator will estimate the associated increase in depletions that would occur in the irrigation season and non-irrigation season using information on the application for the water right and, if necessary, additional information provided by the proponent. As an alternative, the SEO may require the proponent to complete a form that would accompany the applications for new water rights that would provide the State Coordinator information from which to determine the increased depletions and other information that would be helpful in the deliberations relating to this depletions plan.

II.C.3. The State Coordinator will contact the proponent of the new water right activity to determine if that proponent has existing uses in the same sub-basin as the new depletion that could be transferred or retired to offset anticipated new depletions that would occur during the irrigation season and non-irrigation season, respectively. If the proponent cannot offset new depletions in this manner, they will be advised that mitigation will be required. The mitigation may be achieved through the following processes:

II.C.3.a. The proponent may be allowed to participate in the Wyoming Water Bank, described below.

II.C.3.b. If the new depletions cannot be covered by the Wyoming Water Bank, the proponent will be required to submit a mitigation plan to the Administrator. The plan must document the means by which the increased depletions would be mitigated. The State Coordinator will receive and review the plans and submit the plan to the Surface Water or Groundwater Divisions to determine what, if any, permitting actions are required to implement the plan.

II.C.4. If the increased depletions can be mitigated as described above, a Recovery Agreement will be developed and executed by the project proponent and the State Coordinator. The State Coordinator will notify the appropriate permitting division within the SEO. The division may condition authorization for the new water right to ensure compliance with the approved means of mitigation.

II.D. Mitigation for New Water Related Activities

The following mitigation process will be used for the following: 1) new water related activities undergoing state evaluations, or 2) new water related activities with a federal nexus in which the FWS has approved the use of this process in the manner described in Section III of Chapter 1 of this plan. In either event, the mitigation responsibilities under the PRRIP are described in subsection I.A.4 of the Program Document. The mitigation must occur in the

manner and to the extent described in subsection III.E.3 of the Program Document and this depletion plan.

Wyoming will meet its obligations to the PRRIP by translating the net depletions from new water related activities and the benefits from the corresponding point of mitigation to the Wyoming/Nebraska state line using the tables in Attachment I with one notable exception. If the delivery of replacement water is protected by state water law, the conveyance losses established by the SEO will be used to translate the benefits of the replacement water at the state line. The impacts of new water related activities occurring at the state line in the irrigation season must be mitigated during the same irrigation season and the impacts of new water related activities occurring in the non-irrigation season must be mitigated in the same non-irrigation season. However, it may be necessary to time replacement water during September for excess or new depletions that impact flows at the state line in the non-irrigation season because Guernsey Dam on the North Platte River, the Wheatland Irrigation District's dams on the Laramie River, and the Hawk Springs Dam on Horse Creek are basically closed in the non-irrigation season.

If there is a system spill routed over or through Guernsey Dam or Kingsley Dam, Wyoming reserves the right to present evidence to the Governance Committee that depletions from Wyoming's new water related activities did not adversely affect the program purposes identified in subsection I.A.4 of the Program Document and that mitigation is not required or could be reduced. A finding by the Governance Committee that mitigation of new depletions is not necessary or could be reduced will have precedence over any mitigation described in this depletions plan.

Mitigation for depletions from new water related activities will be provided in the following manner:

II.D.1. Wyoming Water Bank

The State of Wyoming will administer a Wyoming Water Bank (WWB). Project proponents, including federal agencies, may be allowed to participate in the WWB if it is determined that the WWB has sufficient assets to accept the responsibility for mitigating the depletions for the term of the PRRIP and potential future increments of the PRRIP. Federal agencies' participation in the WMDP will be limited to a total of 350 acre feet per year, unless increased participation is approved by the State Coordinator, in consultation with the Director of the Wyoming Water Development Office (Director). WWB assets may include the following:

II.D.1.a. The State Coordinator will maintain a tabulation of abandoned, obsolete or reduced depletions that were considered under existing water related activities baselines. Reduced depletions may result from water right abandonment actions or the simple retirement of an existing water use. Examples of activities that may result in decreased depletions include a reduction in irrigated acreage due to revised operations, the down-sizing of an industrial facility or the conversion of irrigated lands for subdivisions or other less depletive activities. If the tabulation of obsolete or reduced depletions indicates there have been sufficient reductions under the existing water related baselines to offset the depletions from the new projects, the new projects may be covered by the WWB. If the State Administrator concludes

that there are not sufficient reductions under the existing water related baselines to offset the depletions from new projects, the Director will be consulted to determine if there is sufficient replacement water available to offset the depletions as per subsection II.D.1.b.

II.D.1.b. The Wyoming Water Development Office (WWDO) will maintain an inventory of replacement water supplies. Storage water available through an existing water related activity, such as existing reservoirs in Wyoming, or the delivery of new water to the system, such as imported water or non-hydrologically connected groundwater, could be used as a replacement supply. Water available from the Wyoming Account in the Pathfinder Modification Project and Wyoming's allocation of Glendo storage water will not be considered a replacement water option for new water related activities as it is needed for other purposes.

Prior to the beginning of each water year, the State Coordinator and the Director will make a determination of the obligations the WWB could accept for the following water year. Initially, the WWB may only be able to serve projects with very small depletions like domestic wells or stock watering reservoirs. If the WWDO is successful in securing replacement water or there are considerable reductions in depletions covered by the existing water related baselines, the WWB may be capable of serving projects with larger depletions in the future.

II.D.2. Activities outside the WWB

Wyoming will require proponents of projects not covered by the WWB to provide project specific mitigation. A mitigation plan identifying the proposed replacement supply must be provided for review and approval. The following describes the alternate means in which mitigation may be provided by a project proponent:

II.D.2.a. An existing water related activity covered under the existing water related activity baseline in the same river reach as the new depletion could be transferred or retired. For example, if a project proponent wants to implement a new project, the proponent could retire an existing water use that depletes water in the same quantity as the new project if the timing of the retired depletions at the state line would have occurred in the same irrigation or non-irrigation season as the depletions from the new project. As previously noted in II.C.3, project proponents will be encouraged to pursue this alternate if possible.

II.D.2.b. An activity covered under the existing water related activity baseline but within a different river reach as the new depletion could be retired. Both the effects of the new depletion and the benefits of the retired water related activity would be translated to the WY/NE state-line to ensure the depletion is effectively replaced. Replacement water achieved from simply retiring an existing use cannot be protected under state water law, so the depletions and benefits will be translated to the state line using the tables in Attachment I.

(Note: Under II.D.2.a.or II.D.2.b above, project proponents cannot seek involuntary abandonments of water rights and propose that, if successful, the resulting reductions in depletions can be used as mitigation for their projects.)

II.D.2.c. The project proponent could elect to provide replacement water by acquiring storage water available under the existing water related baseline, such as existing reservoirs in Wyoming, or the delivery of new water to the system, such as imported water or non-hydrologically connected groundwater. The project proponent would have the following options:

II.D.2.c.i Simply release and measure the water entering a stream or river under the assumption that it will not be protected under Wyoming water administration. Under this option, the effects of the new depletions and the benefits of the replacement supply must balance at the WY/NE state line using the tables in Attachment I.

II.D.2.c.ii. Seek protection of the delivery of the replacement water to the WY/NE state line. Under this option, the effects of the new depletion at the state line would be calculated using the tables in Attachment I. However, the replacement supply would be assessed losses (conveyance and other) imposed by the Wyoming State Engineer's Office from the point of delivery to the stream or river to the WY/NE state line.

II.D.2.c.iii. Seek protection of the delivery of the replacement water from the state line to the Lewellen gage upstream of Lake McConaughy in Nebraska from the State of Nebraska.

II.D.3. Groundwater Wells

The definition of non-hydrologically connected groundwater wells is provided in Chapter 1, subsection II.I. Attachment No. II to this depletions plan includes maps of areas in which wells are classified as not hydrologically connected and provides a description of the methodology used to develop them. Groundwater wells within these areas are categorically excluded as new water related activities and are exempt under this plan due to lack of hydrological connection. If wells fall outside the areas depicted on the map, the project proponents or State Coordinator may complete analyses of hydrological connection to determine if the wells meet the criteria for non-hydrologically connected wells. Proponents of new groundwater projects, in which the wells are determined to be hydrologically connected, may elect to assume the water pumped has the same effects as a surface water diversion or may complete groundwater modeling to determine actual effects on surface water. The annual report to the Governance Committee will include a map depicting those new wells with a permitted capacity of 500 gpm, or greater, that are considered non-hydrologically connected during the reporting period.

II.D.4. Reporting

Wyoming will annually report to the Governance Committee the new water related activities and the manner in which the depletions were addressed. The report will address the new depletions in each sub-basin and water use category. The Governance Committee may review the annual report and seek clarifications and modifications if it is deemed that Wyoming is not complying with sub-section III.E.3 of the Program Document.

CHAPTER 3-SOUTH PLATTE RIVER BASIN, WYOMING

I. Existing Water Related Activities

I.A. Description

The major streams in Wyoming's South Platte River Basin (SPRB) are Crow Creek, which flows into Colorado, and Lodgepole Creek, which flows into Nebraska. Both of these streams are dry at the respective state lines, except during periods of peak flows, which occur during the spring runoff or flash floods.

The City of Cheyenne receives a portion of its water supply from direct flow diversions and storage reservoirs in the upper Crow Creek drainage. When surface water could no longer meet its demands, the city turned to groundwater and, ultimately, developed the Cheyenne Stage I and Stage II projects.

The Cheyenne Stage I and Stage II Projects consist of a collection and transmission system in the Little Snake River Drainage within the Upper Colorado River Basin. The system collects stream flows in the Little Snake River Drainage and delivers them to a tunnel that transports the water under the continental divide to Hog Park Reservoir in the North Platte River Basin. Storage in Hog Park Reservoir is released to replace water stored in Rob Roy Reservoir or diverted by other supply components of the Stage I and Stage II projects located in the Douglas Creek Drainage in the NPRB. The water released from the Rob Roy supply system is delivered by gravity to Cheyenne's reservoirs in the Upper Crow Creek drainage in the SPRB.

From 1970 to 1997, Cheyenne's use of the Stage I and Stage II projects supplemented the flows of Crow Creek through return flows from the use of trans-basin water by an average of approximately 3,000 acre feet per year. None of this return flow arrives at the Colorado state line due to intervening agricultural water use. As Cheyenne continues to grow, there will be more demands placed on the Stage I and Stage II projects, which will result in increased return flows to Crow Creek. Whether this increased return flow will arrive at the state line is irrelevant. If the return flow arrived at the state line, it would be considered an accretion rather than a depletion. It would take extraordinary efforts to protect any such accretions to serve the PRRIP.

In Wyoming, importers of water, such as the City of Cheyenne, have the right to fully deplete their imported water subject to the development of a monitoring plan approved by the WSEO. Therefore, the City may find a use for the water that returns to Crow Creek. However, this future activity will not affect the existing water related baseline, because none of the return flow left Wyoming prior to July 1, 1997.

I.B. Existing Water Related Activities Baseline

Under Wyoming's Depletion Plan, the existing water related activities Baseline for water leaving the SPRB in Wyoming for most of the water use categories is zero. For several years prior to July 1, 1997, water passed the state lines only during some spring runoffs or large

rainfall events. The only water use category that could impact these events would be the construction or enlargement of reservoirs to store what little natural flow is passing the state lines. Therefore, the Benchmark for the SPRB will be the existing reservoir capacity as of July 1, 1997, as evidenced by water rights and field inspections.

II. New Water Related Activities

Due to the limited availability of storable natural flow and cost of construction of storage facilities, it is unlikely that reservoirs proposing to store natural flow in the SPRB will be constructed in Wyoming. If reservoirs were proposed, they would likely fall under the federal nexus and a consultation with the FWS would be required. In the unlikely event that a reservoir is proposed that falls outside the federal nexus, Wyoming will complete a state evaluation in the manner described in subsection II.C of Chapter 2 of this depletions plan. If the project undergoes a separate state evaluation, the standard for mitigation is described in subsection I.A.4 of the Program Document. The mitigation must occur in the manner and to the extent described in subsection III.E.3 of the Program Document and this depletions plan.

Attachment No. I
Wyoming's Depletions Plan
Tracking of Depletions and Accretions

Wyoming is committed to comply with Section III.E.3 of the Program Document through the implementation of Wyoming's Depletions Plan. However, Wyoming has long contended that new depletions in Wyoming will have very little effect on the occurrence or magnitude of FWS target flows at the critical habitat or the effectiveness of the Program in reducing shortages to those target flows. Further, Wyoming has consistently requested that the Governance Committee prepare an "analytical tool" that could be used to track the impacts of depletions on the program purposes identified in Section I.A.4 of the Program Document.

The following presentation is offered as an "interim tool" with the understanding that time constraints will not allow the development of the "analytical tool" before the Program must be approved for implementation and the understanding that the Governance Committee will develop and approve such an "analytical tool" as soon as possible during the first increment of the Program.

The interim tool would be used in the Wyoming Depletions Plan for the following purposes:

1. Calculating the effects of overruns and the benefits of under-runs relating to the various Benchmarks under Existing Water Related Baseline No. 2 at the Wyoming/Nebraska state line.

2. Determining the amount of retired water use that would be necessary to offset new water related activities to allow those new water related activities to be covered by an existing water related baseline.

3. Calculating the amount of unprotected replacement water that would be necessary to offset new water related activities that cannot be covered by an existing water related baseline.

This "interim tool" is based on the assumption that balancing the effects of depletions and the benefits of accretions at the Wyoming/Nebraska state line mitigates the impacts of excess depletions and new water related activities in Wyoming on FWS target flows and maintains the effectiveness of the Program in reducing shortages to those target flows. Balancing the effects and benefits at the Wyoming/Nebraska state line suggests that, in Nebraska, if the depletions had not occurred, flows would have incurred the same losses from the state line to the habitat as unprotected replacement water supplies and, therefore, the program purposes are met. However, if there is a system spill routed over or through Guernsey Dam or Kingsley Dam, Wyoming reserves the right to present evidence to the Governance Committee that any excess depletions or new water related activities in Wyoming did not adversely affect the program purposes that mitigation is not required or could be reduced in the year the spill occurred.

In order to balance the effects and benefits at the Wyoming/Nebraska state line, it must be recognized that the storage water delivered to the Guernsey-State Line reach from the federal reservoirs approximates 75% to Nebraska and 25% to Wyoming. In addition, the Modified North Platte Decree (Decree) apportions the natural flow in the irrigation season (May 1 through

September 30) in the reach 75% to Nebraska and 25% to Wyoming. Nebraska's share of water is diverted at the Whalen Diversion Dam into the Interstate or Gering-Fort Laramie Canals; at a diversion just upstream of the state line into the Mitchell Canal; or at the Tri-State Diversion Dam, just downstream of the state line. The system is operated to ensure that no water passes the Tri-State Diversion Dam with the exceptions of system spills and some minor storage deliveries. Therefore, the only way to balance the effects or benefits at the Wyoming/Nebraska state line of the three activities described above is to make the balance point the Guernsey-State Line reach as flows arriving in this reach will automatically divided 75% to Nebraska and 25% to Wyoming.

Tables I and II serve to track the effects of depletions and the benefits of accretions in the sub-basins within the North Platte River Basin (NPRB) in Wyoming to the Guernsey- State Line reach during the irrigation season (May 1 through September 30) and the non-irrigation season (October 1 through April 30), respectively.

The tables were developed to estimate the amount of water that would arrive at the Guernsey to State Line reach if the depletions had not occurred and the amount of water that would arrive at the reach if there were under-runs to baselines, retirement of existing water uses, or replacement water was provided but not specifically protected by Wyoming water administration.

The tables recognize that Guernsey Dam on the North Platte River, the Wheatland Irrigation District's dams on the Laramie River, and the Hawk Springs Dam on Horse Creek are basically closed in the non-irrigation season. Therefore, the tables assume that depletions that occur in the non-irrigation season above these dams do not show up at the Guernsey-State Line reach until the dams begin releasing water in the irrigation season.

A. Overruns/Under-runs to Existing Water Related Baseline No. 2

Wyoming will annually monitor and report water uses covered by Existing Water Related Baseline No. 2 in the manner described in Section I.C of Chapter 2 of the depletions plan.

The depletions from annual water use will be compared against the Benchmarks included under this baseline. Overruns and under-runs to these Benchmarks will be quantified. The effects of overruns and under-runs will be translated to the state line using the tracking factors in Tables I and II for irrigation season and non-irrigation season. If the overruns are not offset by under-runs, Wyoming will provide a mitigation plan for the review and approval of the Governance Committee. The mitigation plan will:

1. Identify the net overruns at the state line that occurred in the irrigation season and offer a means to replace those overruns in the irrigation season of the year following the year the overruns occurred.

2. Identify the net overruns at the state line that occurred in the non-irrigation season and offer a means to replace those overruns in the non-irrigation season of the year following the year the overruns occurred.

The mitigation plans will be specific to each occurrence of excess depletions to Existing Water Related Baseline No. 2. If the mitigation plan proposes to mitigate the excess depletions with natural flow, Tables I and II may be an appropriate tool to quantify the benefits in the Guernsey-State Line reach. If the mitigation plan proposes to mitigate the excess depletions with storage water, it may be protected by Wyoming water administration and administered to arrive at the Wyoming/Nebraska state line rather than just the Guernsey-State Line reach and Tables I and II would not be applicable. In either event, the mitigation plans would be subject to review and approval by the Governance Committee.

B. Retirement of Existing Water Uses to Offset New Water Related Activities

Section II.D of Chapter 2 of Wyoming's Depletions Plan explains that new water related activities can be mitigated by retiring an existing water related activity covered by a baseline. The following examples are offered to explain how the tables could be applied to alternative retirement plans for the development of a hypothetical new subdivision in the Upper Laramie River sub-basin that will deplete 100 acre feet of water per year (60 acre feet in the irrigation season and 40 acre feet in the non-irrigation season).

1. The developer could acquire and permanently retire irrigated lands in the Upper Laramie River sub-basin that are included under the existing water related baseline. However, the benefits of retiring irrigated land occur in the irrigation season. Review of Tables I.E and II.C indicate that the effect of depletions in the non-irrigation season have twice the effect at the Guernsey-State Line reach as depletions in the irrigation season.

The following calculations quantify the amount of water needed at the Guernsey-State Line reach to offset the effects of the new subdivision in the Upper Laramie River sub-basin.

Irrigation season effects = 60 acre feet x 0.25 (Table I.E)	=	15.0 acre feet
Non-irrigation season effects = 40 acre feet x 0.50 (Table II.C)	=	20.0 acre feet
Effects at the Guernsey-State Line reach		35.0 acre feet

Due to the intervening reservoirs, the effects of the depletions resulting from the subdivision in the Upper Laramie River basin in both the irrigation and non-irrigation seasons arrive at the Guernsey-State Line reach during the irrigation season. Therefore, retiring irrigated lands, an irrigation season depletion, serves to mitigate the total effects of the subdivision at the reach in terms of quantity and timing under this particular example. The following calculation quantifies the amount of water needed in the Upper Laramie River basin to provide 35 acre feet at the Guernsey-State Line reach in the irrigation season.

Replacement needed = 35 acre feet/0.25 (Table I.E) = 140.00 acre feet

Therefore, the developer could acquire and permanently retire irrigated lands that consumed 140 acre feet of water per year. At a consumptive use rate of 0.79 acre feet/acre, 177 acres would have to be retired in the Upper Laramie River sub-basin.

2. The developer will be encouraged to mitigate new water related activities in the river reach in which the resulting depletions will occur. However, if there are no implications to intervening water rights or those implications are mitigated, the developer may propose to retire water use in another river reach. For example, assume the developer proposes to acquire and permanently retire irrigated land in the Guernsey to State Line sub-basin that is included under the existing water related baseline.

The following calculations quantify the amount of water needed at the Guernsey-State Line reach to offset the effects of the new subdivision in the Upper Laramie River sub-basin.

Irrigation season effects = 60 acre feet x 0.25 (Table I.E)	=	15.0 acre feet
Non-irrigation season effects = 40 acre feet x 0.50 (Table II.C)	=	20.0 acre feet
Effects at the Guernsey-State Line reach		35.0 acre feet

Due to the intervening reservoirs, the effects of the depletions resulting from the subdivision in the Upper Laramie River basin in both the irrigation and non-irrigation seasons arrive at the Guernsey-State Line reach during the irrigation season. Therefore, retiring irrigated lands, an irrigation-season depletion, serves to mitigate the total effects of the subdivision at the reach in terms of quantity and timing under this particular example. The following calculation quantifies the amount of water needed in the Guernsey to State Line sub-basin to provide 35 acre feet in the irrigation season.

Replacement needed = 35.0 acre feet/1.00 (Table I.D)	=	35.0 acre feet

Therefore, the developer could acquire and permanently retire irrigated lands in the Guernsey to State Line sub-basin that consumed 35 acre feet of water per year. At a consumptive use rate of 1.31 acre feet/acre, 27 acres would have to be retired.

C. Unprotected Replacement Water to Offset New Water Related Activities

The developer, discussed in the examples in B. above, could purchase 100 acre feet of storage water per year from a reservoir in the Upper Laramie River sub-basin that is an existing water related activity and release 60 acre feet of the water in the irrigation season and 40 acre feet of water in the non-irrigation season into the river system without the benefit of protection under water administration. As the released replacement water is in the same sub-basin as the new water related activity, the effects of the depletions and the benefits of the replacement will be the same at the Guernsey-State Line reach and the loss factors in the tables do not have to be considered.

The developer will be encouraged to mitigate new water related activities in the river reach in which the resulting depletions will occur. However, if there are no implications to intervening water rights or those implications are mitigated, the developer may propose to provide unprotected replacement water in a different water reach. The tables would be used as part of the evaluation of such proposals. The term “unprotected” is used to suggest that the water would not be protected under Wyoming water administration but would be considered natural flow that could be used by intervening appropriators. Unprotected replacement water could be achieved by

simply releasing and measuring water into a stream or river under the assumption that it will not be protected under Wyoming water administration.

If replacement water is protected by Wyoming water administration, the tables are not applicable, as losses assessed by the Wyoming State Engineer's Office for each specific project would prevail. For the replacement water to be protected, it will need to be storage water. If the replacement/storage water is to be protected, it may be administered to arrive at the Wyoming/Nebraska state line rather than just the Guernsey-State Line reach.

Table I-Tracking One (1) Acre Foot of Depletion or Accretion Irrigation Season

A. Above Pathfinder Reservoir (Main Stem)-Irrigation season

Reach	Use/Reach	Remaining Flow	Comments
Above Pathfinder	5%	0.95	Conveyance loss (12% for total reach)
Pathfinder to Guernsey	5%	0.90	Conveyance loss
Effects @ Guernsey-State Line		**0.9**	Irrigation season

B. Pathfinder to Guernsey Reservoir (Main Stem)-Irrigation season

Pathfinder to Guernsey	2.5%	0.975	Conveyance loss (5% for total reach)
Effects @ Guernsey-State Line		**0.975**	Irrigation season

C. Above Guernsey Reservoir (Tributaries)-Irrigation Season

Above Guernsey	50%	0.50	Use and conveyance loss within reach
Effects @ Guernsey-State Line		**0.50**	Irrigation season

D. Guernsey Reservoir to State Line-Irrigation season

Effects @ Guernsey-State Line		**1.00**	Irrigation season

E. Upper Laramie-Irrigation season

Above Wheatland Res.	50%	0.50	Use and conveyance loss within reach
Wheatland ID (WID)	50%	0.25	Use and conveyance loss within reach
Grayrocks Reservoir	0%	0.25	Assumes direct bypasses
Effects @ Guernsey-State Line		**0.25**	Irrigation season

F. Lower Laramie-Irrigation season

Above Grayrocks	50%	0.50	Use and conveyance loss within reach
Grayrocks Reservoir	0%	0.50	Assumes direct bypasses
Effects @ Guernsey-State Line		**0.50**	Irrigation season

G. Horse Creek-Irrigation season

Horse Creek	100%	0.00	There is no flow from HC during the irrig. season.
Effects @ Guernsey-State Line		**0.00**	Irrigation season

Table II-Tracking One (1) Acre Foot of Depletion or Accretion
Non-Irrigation Season

A. Above Pathfinder Reservoir-Non-irrigation season

Reach	Use/Reach	Remaining Flow	Comments
1. Pathfinder in priority			
Above Pathfinder	2.5%	0.975	Conveyance loss (5% for total reach)
Pathfinder-Guernsey	5%	0.93	Conveyance loss-Water released in irrigation season
Effects @ Guernsey-State Line		**0.93**	Irrigation season*
2. Seminoe in priority			
CAID/Casper Canal	50%	0.50	Water released/used in irrigation season
Effects @ Guernsey-State Line		**0.50**	Irrigation season*
B. Pathfinder to Guernsey Reservoir-Non-irrigation season			
Stored in Guernsey		1.00	
Effects @ Guernsey-State Line		**1.00**	Irrigation season*
C. Upper Laramie-Non-irrigation season			
Stored in Whtld. Res.		1.00	
Wheatland I.D. (WID)	50%	0.50	Water released/used in irrigation season
Grayrocks Reservoir	0%	0.50	Assumes direct bypasses
Effects @ Guernsey-State Line		**0.50**	Irrigation season*
D. Lower Laramie-Above Grayrocks			
Stored in Grayrocks		1.00	
Grayrocks Reservoir	0%	1.00	Assumes direct bypasses
Effects @ Guernsey-State Line		**1.00**	Non-irrigation season
E. Horse Creek-Above Hawk Springs Reservoir-Non-irrigation season			
Stored in Hawk Springs		1.00	
Below Hawk Springs Res.	100%	0.00	Water released/used in irrigation season
Effects @ Guernsey-State Line		**0.00**	Irrigation season*
F. Below Guernsey, Grayrocks, and Hawk Springs Reservoirs-Non-irrigation season			
Effects @ Guernsey-State Line		**1.00**	Non-irrigation season

* Depletions and accretion in the non-irrigation season translate to effects at the Guernsey-State Line during the irrigation season due to the intervening reservoirs.

Attachment II
Wyoming's Depletions Plan
Groundwater Areas Not Considered to be Hydrologically Connected

Introduction

Attachment 5, Section 7 to the Platte River Recovery Implementation Program is the "Depletions Plan, Platte River Basin, Wyoming", known as "Wyoming's Depletion Plan". Chapter 1, Sec.II.I. provides criteria for the designation, "hydrologically connected", and exempts groundwater development that does not meet these criteria from the provisions of the Depletion Plan:

> Hydrologically connected groundwater well - A well so located and constructed that if water were withdrawn by the well continuously for 40 years, the cumulative stream depletion would be greater than or equal to 28% of the total volume of groundwater withdrawn from that well. Use from groundwater wells in Wyoming that are not hydrologically connected does not effect the purposes of the PRRIP, is not a new water related activity, and requires no mitigation.

Chapter 2, Sec. II.D.3. of Wyoming's Depletion Plan references maps of areas determined to be not "hydrologically connected" with respect to groundwater development, and explains the use of those maps in the categorization and accounting of groundwater wells:

> The definition of non-hydrologically connected groundwater wells is provided in Chapter 1, subsection II.I. Attachment No. II to this depletions plan includes maps of areas in which wells are classified as not hydrologically connected and provides a description of the methodology used to develop them. Groundwater wells within these areas are categorically excluded as new water related activities and are exempt under this plan due to lack of hydrological connection. If wells fall outside the areas depicted on the map, the project proponents or State Coordinator may complete analyses of hydrological connection to determine if the wells meet the criteria for non-hydrologically connected wells. Proponents of new groundwater projects, in which the wells are determined to be hydrologically connected, may elect to assume the water pumped has the same effects as a surface water diversion or may complete groundwater modeling to determine actual effects on surface water. The annual report to the Governance Committee will include a map depicting those new wells with a permitted capacity of 500 gpm, or greater, that are considered non-hydrologically connected during the reporting period.

The definition of "hydrological connection" in Wyoming's Depletion Plan was adopted from criteria included in the Modified North Platte Decree to govern the accounting of irrigated acreage. Acreage irrigated from wells determined to be not hydrologically connected was excluded from the Decree limitations on irrigation in the lower-Laramie River Basin and in the North Platte River Basin above Guernsey Dam. As a screening tool to assist the Wyoming State Engineer's Office in the consideration of future irrigation well applications, the North Platte Decree Committee (NPDC) agreed to the preparation of maps of those areas for which additional analysis of hydrological connection would not be necessary. In these areas – called "exclusion

area", "area determined to not be hydrologically connected", and, informally, "green area" – any future wells are presumed to not be hydrologically connected under the "28/40" criteria. Outside of the mapped areas, wells may or may not be hydrologically connected, but more detailed, site-specific investigations are required to adequately assess this issue.

The development of maps of exclusion areas in those portions of the North Platte River Basin subject to Modified North Platte Decree limitations is detailed in a series of technical memoranda developed by Wyoming in cooperation with the NPDC Groundwater Wells Subcommittee and subsequently approved by the NPDC for use in Modified Decree compliance reporting. Those memoranda are included with the minutes of the relevant NPDC meetings. They are cited below, in reference to their specific sub-basins, but are not repeated here. The following general discussion of the methodology, however, is drawn from those memoranda. The methodology, data sources, calculations, etc. approved by the NPDC have been extended to the rest of the North Platte Basin in Wyoming to complete Wyoming's Depletion Plan.

Figure 1 provides a general location map for the North Platte River Basin and the individual sub-basins discussed below. Figures 2 through 5 present calculation details for those sub-basins (and portions of sub-basins) not previously examined by the NPDC. An appendix to this memo compiles the six individual sub-basin maps produced from the NPDC work and the present discussion.

Procedure

The basic approach to the definition of areas in which groundwater wells are presumed not to meet the Depletion Plan criteria for hydrological connection comes from the evaluation of stream depletion by the U.S. Geological Survey (USGS) as laid out in papers by Jenkins (1968). This technique uses a term called "stream depletion factor" (sdf):

$$sdf = d^2S/T$$

where (all parameters expressed in consistent units):

d = distance from well to stream
S = aquifer storativity (dimensionless)
T = aquifer transmissivity

The "sdf" parameter has units of days. It's functional relationship with stream depletion is defined in equation and graphical form by Jenkins (1968).

The conceptual model behind this formulation is that of a linear stream with a well at the specified perpendicular distance from the stream, in an infinite, homogeneous, and isotropic aquifer, with both the well and the stream fully penetrating the aquifer. Drawdown in the system is assumed to be insignificant in relation to aquifer thickness, and the stream is assumed to have an unlimited water supply and no streambed resistance to groundwater flow.

Generally, to define exclusion areas, aquifer parameters are entered into the above equation and the distance parameter is calculated to define the "setback distance" where an sdf value corresponding with 28% depletion in 40 years is achieved. Areas beyond the setback distance are exclusion areas. Where area-wide groundwater modeling has been developed (e.g the lower-Laramie River Basin), and provides an integration of spatial variations in aquifer and stream parameters, such modeling is used in preference over the above, simplified approach. However, such models are rare in the North Platte Basin of Wyoming.

Obviously, this is a highly-generalized, screening-level approach to hydrogeologic conditions that can be quite complex in detail. The objective is to define areas for which additional analysis is not necessary to reasonably conclude that the depletive impact of a groundwater well would fall below the threshold of 28% in 40 years. Areas not so defined may or may not meet the "28/40" criteria, but more detailed study is deemed necessary to make that determination.

The conceptual model behind this method is inherently conservative, in the sense of over-predicting rather than under-predicting stream depletion (i.e. smaller rather than larger exclusion zones), and has generally been applied so as to enhance rather than compromise that conservatism. For example, where streams are accompanied by a high-permeability alluvial aquifer, setbacks have generally been calculated from the edge of the alluvial aquifer rather than from the stream channel, with the effect of increasing the setback distance by the width of the alluvial aquifer (i.e. as though the alluvial aquifer were infinitely permeable). Where pump test data provide a range of transmissivity or permeability values for a formation, the larger values generally have been used for setback calculation. Similarly, in the absence of specific data, a value of 0.1 is used as the default for the storage parameter, increasing setback distances over what would be calculated using the higher values typical of site-specific studies (e.g. 0.15, 0.23, 0.25). As a final step in the delineation of exclusion areas, setback distances are manually smoothed (either increasing the distance or leaving it unchanged in all cases) to provide qualitative compensation for multiple-stream effects.

In some cases, the boundaries of exclusion areas are defined stratigraphically rather than by setback distance calculations. For example, the large setback distances associated with high-permeability formations may be truncated where the lower contact of the formation outcrops if the underlying formation is of significantly lower permeability (i.e. rather than the large setback being extended on into the area of known low-permeability material). Such boundaries are indicated as "stratigraphic boundary" on the attached figures.

Portions of some sub-basins have not been evaluated for hydrological connection due to the character of the hydrogeology and stream system. This generally applies to areas in which aquifer materials have little primary permeability, so groundwater movement is dominated by fracture-producing structural features that may be ill-suited to the simplified analysis as homogeneous porous media. The primary example is the mountainous areas underlain by granites and other crystalline rocks. There, the perennial stream network is commonly sufficiently dense that the fracture systems necessary to provide useful groundwater production may also provide ready connection to nearby surface water. Areas for which evaluations have not been made are subject to the same qualification as cited above for all other locations not identified as in exclusion areas, i.e. groundwater wells in these areas may or may not meet the

hydrologically-connected criteria, but more detailed, site-specific investigations are required to adequately assess this issue.

Following the procedures developed for the NPDC, the standard, USGS 1:100,000-scale map coverage is used to identify "perennial" streams. With exceptions as noted in the sub-basin by sub-basin discussions, setback distances are only considered for perennial streams that flow into the North Platte River or one of its tributaries. Streams in topographically closed basins or streams which lose their flow to evaporation/infiltration well before reaching the North Platte system are not considered avenues for North Platte River depletion. (The flow in intermittent streams is commonly a function of storm events rather than a connection with groundwater. The logic of generally excluding intermittent streams from consideration here is that if the groundwater table is significantly below the stream, stream losses are a function of streambed permeability, and are insensitive to changes in groundwater levels as would be caused by well development.)

Unless otherwise noted, all geologic contacts come from the statewide geologic mapping of Love and Christiansen (1985).

North Platte River Basin above Alcova Dam

This area falls within that portion of the North Platte River Basin subject to the irrigated acreage restrictions of the Modified North Platte Decree. Areas presumed not to meet the "28/40" hydrological connection criteria have been developed and approved by the NPDC for purposes of irrigated acreage accounting under the Decree. The details of that development are provided in the October 12, 2006 memo attached to the minutes of the October 17, 2006 NPDC meeting. The exclusion areas approved by the NPDC are adopted without modification for the PRRIP Wyoming Depletion Plan. These areas are presented on the attached map entitled, "Above Alcova Dam - North Platte River Basin Areas Not Hydrologically Connected" dated October 17, 2006.

North Platte River Basin between Alcova and Guernsey Dams

This area falls within that portion of the North Platte River Basin subject to the irrigated acreage restrictions of the Modified North Platte Decree. Areas presumed not to meet the "28/40" hydrological connection criteria have been developed and approved by the NPDC for purposes of irrigated acreage accounting under the Decree. The details of that development are provided in the April 13, 2004 memo attached to the minutes of the April 13, 2004 NPDC meeting. The exclusion areas approved by the NPDC are adopted without modification for the PRRIP Wyoming Depletion Plan. These areas are presented on the attached map entitled, "Alcova Dam to Guernsey Dam - North Platte River Basin Areas Not Hydrologically Connected" dated April 13, 2004.

Laramie River Basin above Wheatland Irrigation District Tunnel

This area falls outside that portion of the North Platte River Basin subject to the irrigated acreage restrictions of the Modified North Platte Decree. Thus, the methodology developed for the

NPDC for the areas outlined above has been applied to this area specifically for Wyoming's Depletion Plan. Setback distances, stratigraphic boundaries, and the assignment of exclusion areas so defined are presented on Figure 2. The exclusion areas are also presented on the attached map entitled, "Upper Laramie Basin Areas Not Hydrologically Connected" dated July 10, 2006. The following discussion provides the details of development.

Those portions of the upper Laramie River basin underlain by crystalline rocks (all rocks of Precambrian age) are excluded from the present analysis due to the high density of perennial streams, the fracture-dominated character of the permeability, and the unlikelihood of substantial groundwater development, as discussed in the "Procedure" section. (See "no analysis" designation on Figure 2.)

In areas adjacent to perennial streams, e.g. the downstream end of this basin, this same "no analysis" approach is taken to the Casper Fm. and underlying strata. (Due to the potential similarities in fracture conditions within the Forelle Limestone and the underlying Casper Fm., and to provide an additional margin of conservatism, the "top" of the Casper aquifer is here considered as the Forelle / Chugwater Fm. contact. This approach leaves the 250 ft. of strata in the Forelle and Satanka Shale (between the Forelle Lms. and the Casper Fm.) as a buffer against Casper Fm. depletions being transmitted to overlying strata.)

Upstream of the crystalline rocks of the Laramie Range (T22, R73), where the river runs across younger, sedimentary rocks, generalized transmissivities, storage coefficients, and the resultant sdf-calculated exclusion-zone setback distances are adopted for groups of hydrologically similar formations as developed by the NPDC analysis of adjacent North Platte sub-basins. Figure 2 presents the setback values (in ft.). (No applicable large-area groundwater modeling has been identified for the upper-Laramie basin.)

The following list presents the generalized setback values adopted from NPDC (2004) and NPDC (in preparation) for the various formations through which the Laramie River and its tributaries flow in this basin:

Formation(s)	Setback distance
Chugwater Fm.	2800 ft.
Sundance, Thermopolis, Mowry, Frontier	8300 ft.
Niobrara and Steele Shales	2800 ft.
Mesaverde	8300 ft.
Lewis Shale	2800 ft.
Hanna Fm.	13700 ft

Quaternary deposits in this basin vary from extremely-low permeability glacial moraine to well-sorted stream alluvium. However, the occurrence of thick deposits of high-permeability alluvium in the upper Laramie basin is relatively rare. Most of the extensive mapped Quaternary deposits (e.g. Love and Christiansen, 1985; 1:500,000-scale) form a relatively thin veneer over the bedrock which controls groundwater flow. Lowry et al. (1973) describe the Quaternary aquifer: "most of the deposits are thin and often occur in elevated positions, there is little or no saturation of most deposits shown on the map. Deposits near stream level generally contain

some water ...". (Their map is quite similar to that of Love and Christiansen with respect to these deposits.) The sporadic geologic mapping available for the upper Laramie River basin at 1:25,000 scale (e.g. McAndrews, 1966) commonly shows the situation of bedrock units exposed in scattered outcrops where the thin Quaternary veneer has been stripped away.

To further investigate this issue, Statements of Completion filed with the Wyoming State Engineer's Office were reviewed for 41 individual wells located in the areas of Quaternary deposits mapped by Love and Christiansen (1985). These wells were selected to investigate the thickness of Quaternary deposits in areas for which there are no nearby bedrock outcrops, i.e. in those areas most likely to provide relatively thick unconsolidated deposits. This examination provided site-specific confirmation of the generalizations presented above. There is rarely more than 20 ft. of material above bedrock, and unless the well is beside a stream, that material is most commonly unsaturated. Many of the wells completed in the shallow sand and gravel deposits alongside the Laramie or Little Laramie River, however, are reported to be quite productive.

In addition, records for all water wells permitted for yields of 100 gpm or more that are not at locations obviously meeting the "hydrologic connection" criteria were individually examined. (The generally poor groundwater conditions in the upper Laramie Basin are indicated by there only being 12 wells with reported yields of 100 gpm or more that fall in the exclusion areas defined herein.) In all areas except one (discussed below), these wells are completed in locally productive bedrock strata rather than in unconsolidated surficial materials. For example, wells P295G and P371C, located in T15, R73W, Sec. 17 are on an exclusion area boundary line[1]. The lithologic log for the former describes "earth and clay" for the first 10 ft., then "rock" to the total depth of 85 ft. The latter well is 1629 ft. deep. In both cases, it is clear that the mapped surface deposit of Quaternary alluvium is not controlling groundwater production or hydrologic connections.

The exception cited in the previous paragraph is a group of "wells" (some are simply open pits) along the Pioneer Canal and the associated string of lakes in topographic depressions between T14, R76, Sec. 15 and T14, R75, Sec. 1. It is concluded that these wells are largely pumping irrigation seepage and return flows which would not otherwise return to the Laramie River.

Thus, to delineate areas of potentially hydrologically connected alluvial material in the upper Laramie River basin, larger-scale mapping (1:100,000) by the Wyoming Geological Survey has been consulted. From Hallberg and Case (2005) and VerPloeg and Boyd (2000) the "Alluvium" and "Alluvial deposits", respectively, have been extracted for identification of exclusion area setbacks. Mapped setbacks are the greater (further from the stream) of 1) the extent of the mapped deposits of alluvium; or 2) the setback calculated based on the underlying bedrock as listed above.

Checking this approach against individual well data indicated that well P394G (T16, R75, Sec. 8) had been inappropriately classified. The lithologic log for this well reports 30 ft. of gravel,

[1]Well locations are based on Wyoming State Engineer's Office Statements of Completion. These documents list only the permitee-supplied 1/4, 1/4 Section, the center of which is assumed as the well location for the present analysis.

from which a yield of 300 gpm is obtained. Thus, in the area west of the Steele Shale ridge in the northwest portion of the Township, the "Qal"/"Qt" contact of Love and Christiansen (1985) is used to define a somewhat smaller exclusion area than provided by the above approach. (East of this ridge, well permits report small yields, and well depths up to 100 ft.. Even close to the river (e.g. T17, R74. Sec. 19), lithologic logs report "shale"and "clay" at around 10 ft.

In T19, R74, the Laramie River skirts an area of Wind River Formation outcrop (west of the river), mostly located in the topographically closed Dutton Creek Basin. This formation has been found to be locally quite permeable in the Shirley Basin, further west ("above Alcova" sub-basin). In recognition of the possibility of high-permeability Wind River Fm. strata being in contact with the river through this reach, the setback distance of 21,000 ft. from the Shirley Basin area is adopted for the west side of the river here. This approach reaches beyond the topographic boundary of the Laramie River Basin, into the topographically closed basin of Dutton Creek. It is assumed that the groundwater divide is, or could be modified through groundwater extraction to be, west of the topographic divide in this case. Because the Wind River Fm. lies on top of the adjacent formations exposed upstream and downstream (as opposed to extending its influence beyond its surface outcrop as an underlying formation), its associated setback distance is applied only to the area of Wind River Fm. outcrop. This creates a truncation of the 21,000-ft setback at the lower contact of the formation.

On the east side of the Laramie River through this reach, groundwater communication with the river is controlled by the Lewis Shale and a 2800-ft. setback is applied. In recognition of the small area in which the Wind River Fm. extends to the east side of the river (T19, R74), the Lewis-Shale setback is applied from the edge of the Wind River Fm. rather than from the river channel[2].

The only perennial tributary of the Laramie River from the downstream end of the upper-Laramie sub-basin to where the river flows out of the mountains southwest of Laramie city, is the Little Laramie River. The drainage of the Little Laramie River is addressed as above, i.e. setbacks applied as a function of underlying formations. Upstream of the junction of Mill Creek and the Little Laramie River (T16, R76, Sec.3) setbacks are larger than the inter-stream distances, so the exclusion area boundary is defined by the relatively large, Hanna-Fm.-based setback north from the North Fork of Mill Creek and the Mesaverde-based setback south from the Little Laramie River. Thus, the areas of more complex structural conditions along the mountain face (e.g. T17, R77, Sec. 31) are not indicated for exclusion and the analysis need not consider separate setbacks for individual formations.

Detailed studies of the Casper Fm. associated with the City of Laramie municipal supply wells (e.g. Western Water, 1993) have identified a regional permeability of 20 ft/day for the active portion of this formation around the Laramie wells (i.e. the largely saturated portion of the aquifer adjacent to its contact with the overlying Satanka Shale). Applied to the formation thickness of 700 ft., a transmissivity of 14,000 ft^2/day (105,000 gpd/ft) is indicated. Entry of this value into the sdf calculation produces a "28/40" setback distance of 8.6 miles (45,000 ft.). This

[2]The setback from this contact instead of from the river channel is indicated by a short red line marking the contact on Figure 2.

distance is applied to the Casper Formation north and south of the natural springs feeding Spring Creek, a tributary of the Laramie River[3]. It is this radius of potential influence centered on the head of Spring Creek, and truncated at the Forelle / Chugwater contact, that creates the semicircle, "windshield wiper", shape in the lower right portion of Figure 2.

Laramie River Basin below Wheatland Irrigation District Tunnel

With the exception of the Wheatland Irrigation District, this area falls within that portion of the North Platte River Basin subject to the irrigated acreage restrictions of the Modified North Platte Decree. Areas presumed not to meet the "28/40" hydrological connection criteria have been developed and approved by the NPDC for purposes of irrigated acreage accounting under the Decree. The details of that development are provided in the March 27, 2003 memo attached to the minutes of the April 3, 2003 NPDC meeting (for the main part of the basin) and the April 11, 2006 memo attached to the minutes of the April 11, 2006 NPDC meeting (for the southern basin and other peripheral areas). The exclusion areas approved by the NPDC are adopted without modification for the PRRIP Wyoming Depletion Plan.

Because the area within the Wheatland Irrigation District (WID) is outside the irrigated acreage restrictions of the Decree, exclusion areas are developed here. Aquifer transmissivities and storage characteristics for WID are taken from groundwater modeling prepared by Nebraska experts for the Nebraska v. Wyoming lawsuit (Hydroscience Associates, 2000a) – the same modeling that was used in the NPDC analysis for the surrounding areas subject to Decree restrictions. Similarly, exclusion area setbacks are calculated using the same simplified, "sdf", method. Setback distances, stratigraphic boundaries, and the assignment of exclusion areas so defined for the Wheatland Irrigation District area are presented on Figure 3. These exclusion areas are combined with those adopted by the NPDC and presented on the attached map entitled, "Lower Laramie Basin Areas Not Hydrologically Connected" dated July 10, 2006.

A setback of 13,514[4] ft. is applied to the reach of Wheatland Creek downstream of the town of Wheatland, where the groundwater model produced a transmissivity of 1500 ft^2/day and a storage coefficient of 0.12. Given the proximity of these setbacks (in some cases overlapping) to those along Sybille Creek (west) and Chugwater Creek (east) and the presence of a second, shallower and more permeable aquifer layer across much of this area, no exclusion zone is proposed west of Wheatland.

Upstream of Wheatland, to a point on the eastern of the two perennial forks of Wheatland Creek (also known as Ayers Draw) the groundwater model transmissivity of 1000 ft^2/day generates a setback of 11,034 ft. for the lower aquifer layer (the Arikaree Fm.). Along both this and the west

[3]Although this stream is not identified as perennial on the 1:100,000-scale USGS mapping, it is known to carry Casper-Formation water westward to the Laramie River, and thus provides a stream-depletion connection to the river as long as it is flowing. Groundwater production beyond the point of complete depletion of this small stream no longer has a ready mechanism for transmission of depletion to the Laramie River / North Platte system and may qualify as "not hydrologically connected".

[4]Although the five significant digits listed here are well beyond the accuracy of the input and analysis, they are retained for conformity with the NPDC-approved values in the surrounding lower-Laramie River basin.

fork (also known as Rock Creek), the shallow aquifer layer (Quaternary terrace deposits) is present and appears to be sufficiently permeable that wells penetrating significant saturated thickness cannot be categorically excluded under the "hydrological connection" criteria. Thus, no extensions of the previously-defined exclusion zones into the area of terrace deposits ("Qt" or "Qs" on Love and Christiansen, 1985) are indicated. (This contact defines the "stratigraphic boundary" on Figure 3 at the south end of WID.)

In the headwaters of the east fork of upper Wheatland Creek, the groundwater model transmissivity of 70 ft^2/day generates a setback of 2,919 ft., although this setback is mostly subsumed by the larger setback from downstream segments.

The exclusion area established previously for the area south of Wheatland Irrigation District is extended northward based on the above setbacks and boundaries and the same process of manual smoothing as was applied in the surrounding NPDC-approved areas.

North Platte River Basin below Guernsey Dam (excluding Laramie River and Horse Creek drainages)

This area falls outside that portion of the North Platte River Basin subject to the irrigated acreage restrictions of the Modified North Platte Decree. Thus, the methodology developed with the NPDC for the areas outlined above has been applied to this area specifically for Wyoming's Depletion Plan. Setback distances, stratigraphic boundaries, and the assignment of exclusion areas so defined are presented on Figure 4. The exclusion areas are also presented on the attached map entitled, "Guernsey to State Line Basin Areas Not Hydrologically Connected" dated July 10, 2006. The following discussion provides the details of development.

This sub-basin provides the most widespread, productive aquifer of the North Platte River basin in Wyoming. The alluvial sands and gravels along the river create what has been termed the "valley-fill aquifer" (Crist, 1975), which has been extensively developed for irrigation. It is basically coincident with the "alluvium" mapped by Love and Christiansen (1985), with the addition of areas mapped as "dune sand" northeast of Torrington.

Due to its well-demonstrated production potential and location within the "pivotal reach" of the North Platte River with respect to the North Platte Decree, the alluvial aquifer along the North Platte River below Guernsey Dam has been the subject of several modeling studies (e.g. Crist, 1975, Hydroscience, 2000b). This aquifer extends from approximately the Interstate Canal on the north, to the geologic contact with Brule and Chadron Formation outcrops approximately 2 miles south of the river. Transmissivities in the 100s of thousands of gpd/ft provide groundwater connections well within the 40-year time frame of the "hydrological connection" criteria. No exclusion zones are proposed for this aquifer. Furthermore, to maintain a conservative approach for the underlying deposits, setbacks are applied from the edge of the valley-fill aquifer as though it were the stream.

Beneath the valley-fill aquifer, groundwater modeling in this area has consistently considered materials to be essentially impermeable. These are largely the siltstone and mudstone-dominated

strata of the White River Fm. (Brule and Chadron Fms.) that appear at the surface to the north and south of the valley-fill aquifer.

At the upstream end of this reach of the North Platte River, and beyond the valley-fill aquifer, hydrological connection with the river is controlled by the Arikaree Fm. Along the south side of the North Platte in this reach, exclusion zones have been developed previously, for the lower-Laramie River Basin and for the Alcova-to-Guernsey Basin. In the former, an effective transmissivity of 400 ft^2/day and a calculated setback distance of 7,000 ft. (6,979 ft.; NPDC, 2003) were developed from groundwater modeling work centered in the Wheatland area. In the latter, an effective transmissivity of 250 ft^2/day and a calculated setback distance of 5,500 ft. (NPDC, 2004) were developed from groundwater modeling work along Horseshoe Creek. The larger of the two setback values – 7,000 ft. – is adopted here, and is applied to the north side of the North Platte River as well. (West of the "valley-fill aquifer" modeled by Crist (1975), i.e. in Platte Co., the "Qa" unit of Love and Christiansen (1985) is used for the boundary from which the setback distance is applied.)

Nearly coincident with the hydrologic boundary between the above-Guernsey and below-Guernsey reaches of the North Platte River is the axis of the Hartville Uplift. Outcrops of Paleozoic formations to the west ("North Platte Basin between Alcova and Guernsey Dams" reach) are afforded a large setback (16,000 ft.) to reflect the potential for widespread, fracture-enhanced permeability. East of the lower contacts of these aquifers are granitic rocks and thin, overlying deposits of Arikaree Fm. The Arikaree Fm. thickens eastward to provide a useful aquifer in northern Goshen Co. Thus, at the extreme upstream end of the Guernsey to State Line reach of the North Platte River, a large setback is applied to the area of Paleozoic-rock outcrop on the north side of the North Platte, and the Arikaree Fm. setback (7,000 ft.) is applied eastward from those outcrops.

Downstream of the Arikaree Fm., hydrological connections beyond the valley-fill aquifer are controlled by the lower-permeability strata of the Brule, Chadron, and Lance Fms. The Brule Fm. was evaluated for the NPDC in the adjacent lower-Laramie River Basin (NPDC, 2003; NPDC, 2006), where a transmissivity of 120 ft^2/day and a setback of 4200 ft. were applied. HRS (2000; p. 4-5) evaluated groundwater flow between the Horse Creek and lower North Platte River basins (i.e. the southwest portion of the below-Guernsey reach of the river being considered here, primarily in the Chadron and Lance Fms.), for which they applied an effective transmissivity of 267 ft^2/day. Application of the larger of these values – 267 ft^2/day – generates a setback distance of 6,200 ft., which is applied from the edge of the valley-fill aquifer on the north and south sides of the North Platte River.

Although not recognized as perennial on the USGS 1:100,000-scale stream coverage, agricultural drains in the area south of the North Platte River and north of the Ft. Laramie Canal are known to flow year-round due to irrigation return flows. To reflect the potential for North Platte depletions via groundwater development adjacent to these drain systems, a 6,200-ft buffer is applied to these features (Cherry Creek Drain, Katzer Main Drain) as well.

Rawhide Creek is the only significant tributary to the North Platte River in this reach that is not confined to the area discussed above (excluding the Laramie River, which is considered in other

sections of this report). Rawhide Creek is an intermittent stream for 4.4 miles above the Interstate Canal, but is perennial through a large area in northern Goshen County underlain by the Arikaree Fm.. The aquifer in this area is adequate to support irrigation-well development (see Crist, 1977), but it is separated from the valley-fill aquifer along the North Platte by several miles of intervening Brule Fm. (Crist (1975) and the refined "Crist" model developed by Nebraska for the Nebraska v. Wyoming lawsuit (Hydroscience, 2000b) modeled the Brule as creating an effectively impermeable boundary to the "valley fill" aquifer. Thus, groundwater-development caused depletion of Rawhide Creek is primarily transmitted through to the North Platte River via the narrow alluvial aquifer along the intermittent stretch of Rawhide Creek.

Crist (1975) provides a transmissivity estimate for the alluvium along Rawhide Creek north of the Interstate canal of 4,300 ft^2/day. Calculation of a setback distance based on this transmissivity produces a value of 4.75 miles. Since this setback calculation assumes a widespread aquifer rather than a narrow band of alluvium, it is concluded that the Rawhide connection to the Arikaree aquifer in northern Goshen Co. does not meet the "hydrological connection" criteria of this report.

Horse Creek Basin

This area falls outside that portion of the North Platte River Basin subject to the irrigated acreage restrictions of the Modified North Platte Decree. Thus, the methodology developed with the NPDC for the areas outlined above has been applied to this area specifically for Wyoming's Depletion Plan. Setback distances, stratigraphic boundaries, and the assignment of exclusion areas ("Area Determined to be Not Hydrologically Connected") so defined are presented on Figure 5. The exclusion areas are presented on the attached map entitled, "Horse Creek Basin Areas Not Hydrologically Connected" dated July 10, 2006. The following discussion provides the details of development.

The lower Horse Creek basin in Wyoming (i.e. downstream of T20, R61, Sec. 4) is underlain by the Lance and Chadron Fms. HRS (2000) evaluated groundwater flow northward through these deposits from the Horse Creek basin south of this area, concluding that such flow was minimal due to the relatively low permeability. The effective transmissivity of 267 ft^2/day from that report generates a setback distance of 6,200 ft., which is applied throughout the areas of Chadron and Lance outcrop. (The same approach was applied above, for the adjacent portions of the Guernsey-to-stateline basin.)

Upstream of this area, and downstream of T19, R63, Sec.4 on Bear Creek and T18, R63, Sec. 3 on Horse Creek, the basin is underlain by the Brule Formation. This formation consists primarily of fine-grained materials (clay, silt, ash), commonly produces springs along its upper contact as downward-moving groundwater encounters its low permeability, and produces lab-sample permeabilities of 0.1 and 0.2 gpd/ft^2 (Rapp et al., 1957). However, the uppermost Brule includes abundant fractures and sand and gravel lenses and stringers in local areas of the Horse Creek basin, which can produce highly favorable local conditions for groundwater production. Examples of such extraordinary areas include the Pine Bluffs lowland (Lowry and Crist, 1967), 25 miles south of Horse Creek, and the LaGrange area in the eastern Horse Creek Basin.

Borchert (1976) presents the results of two Brule Fm. pump tests in T19, R61, Secs. 9 and 11, where transmissivities of 70,000 - 100,000 ft^2/day were found. However, he also reports a pump test of the overlying alluvial aquifer only ½ mile to the north of the first of the Brule wells (T19, R61, Sec. 4) in which a negative boundary was observed corresponding to the alluvium / Brule contact. Borchert explains this: "Because the Brule in this area has a low permeability, it acts as a hydrologic barrier ...", seemingly strongly at odds with the Brule pump tests cited above. Borchert (1985) later developed a groundwater model for a 10–mile X 10-mile are in the central Horse Creek basin around Hawk Springs Reservoir (T20, R61), combining the Brule with the overlying alluvial deposits to define the "LaGrange Aquifer". Model-calibrated hydraulic conductivities ranged from 0.01 to 950 ft/day. (A map of the distribution of hydraulic conductivity used in this model has not been located.)

To address this evidence of localized high Brule-Fm. transmissivities, Statements of Completion filed with the Wyoming State Engineer's Office have been reviewed for 21 Brule Fm. water wells in the Horse Creek Basin to supplement the published research (e.g. Rapp et al., 1957; Borchert, 1976; Borchert, 1985; Libra et al., 1981). Although interpretation of driller-reported production tests (often run by bailer) is somewhat speculative, a picture of highly-variable conditions again emerges. Apparently credible drawdown data from this sample set range from 6 gpm with 134 ft. of drawdown for a well east of Hawk Springs Reservoir (T20, R60, Sec. 18; U.W.154754), to 10 gpm with no measurable drawdown from a well at the southern end of the area of Brule outcrop (T18, R62, Sec. 13; U.W.110562).

Thus, the present level of investigation is insufficient to identify the stream depletion relationships of the Brule Fm. in the Horse Creek basin. No exclusion areas are mapped for the area underlain by this formation, including the overlying Quaternary alluvial and terrace deposits in the east-central Horse Creek Basin. Given the generally low permeabilities of the Brule Fm., however, this area is a likely candidate for additional, site-specific studies demonstrating a relatively low level of hydrological connection. The northwest-southeast trending Brule outcrop in the northeast Horse Creek basin has been evaluated in conformance with the adjacent Guernsey-to-stateline and lower-Laramie River basins, i.e. assumed to be of relatively low permeability. The boundary between these two approaches ("no analysis" vs. low-permeability Brule) is drawn as a straight line defined by the upper Brule contacts in the topographic low spots in T20, R64, Sec. 13 and T21, R63, Sec. 32. Brule outcrops northeast of this line are more than 5 miles from the nearest point on Fox Creek (northern tributary of Bear Creek), a distance through which the persistence of high Brule transmissivity is considered quite unlikely.

Upstream of the "Goshen Hole" area, Horse Creek and its only perennial tributary, Bear Creek, flow across the Arikaree Fm. and , in Laramie County, the Ogallala Fm. Lowry and Crist (1967) present an average specific capacity for the Arikaree of 0.016 gpm/ft/ft of saturated thickness, and map a saturated thickness of approximately 200 ft. for most of the Arikaree reach of Horse Creek. Estimation of an effective transmissivity based on a specific capacity of 3.2 gpm/ft (i.e. 0.016 * 200) suggests a value of approximately 4,800 gpd/ft (640 ft^2/day)[5]. (Borchert (1976) presents Arikaree Formation transmissivities of 1,240 to 3,300 gpd/ft from pump tests near Albin

[5]Transmissivity (in gpd/ft) can be approximated as 1500 * specific capacity (in gpm/ft) based on the empirical equation of Driscoll (1986, p. 1021).

(T17, R62), south of Horse Creek.) Use of the 4,800 gpd/ft value generates an exclusion area setback distance of 9,700 ft. which is applied to Horse Creek and its tributaries through the Arikaree Fm.[6] In consideration of the potentially high permeabilities locally present in the underlying Brule Fm. (discussed above), the effective eastern boundary of the Arikaree-Fm. exclusion zone is mapped by drawing a straight line that connects the Arikaree / Brule contact in each of the stream-valley bottoms rather than following the upland contact of Love and Christiansen, 1985. (This approach treats the areas where relatively thin, upland Arikaree deposits overly the Brule as effectively part of the Brule "outcrop".)

Kellehan Creek is a south-bank tributary of Horse Creek which the USGS 1:100,000-scale mapping identifies as perennial only downstream to (T18, R61, Sec.28), several miles short of its confluence with Horse Creek. Recognizing the possibility that communication between Kellehan and Horse Creeks may be locally enhanced due to Brule permeabilities, setback distances are applied to upper Kellehan Creek (in the Arikaree Fm.) as though it were a through-flowing tributary.

Upstream of the Arikaree, Horse Creek flows across the Ogallala Fm. Lowry and Crist (1967) cite Ogallala transmissivities from 5,000 to 38,000 gpd/ft from the much-studied area of the Cheyenne municipal wells (20 miles south of Horse Creek). Setback calculation using the high end of this range produces a value of 27,000 ft. This setback is not extended into the area of Brule-Fm. outcrop because the Arikaree lies on top of the Brule, i.e. the higher Arikaree-Fm. permeabilities clearly terminate at its contact with the underlying Brule.

Upstream of the Ogallala outcrop, setbacks are adopted from the geologically similar conditions on upper Chugwater Creek, 5 - 10 miles to the north (NPDC, 2006). In both areas a Brule-Fm. based setback of 4200 ft. is applied to that formation and to the underlying, less-permeable strata of the Pierre Shale. Exclusion-area analysis is terminated where uppermost Horse Creek flows across crystalline rocks (and across the short interval of steeply eastward-dipping sedimentary strata on the mountain flank).

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[6]Along Fox Creek, e.g. T20N, R64W, Love and Christiansen (1985) map a deposit of Quaternary sand. As elsewhere, this is largely a veneer over groundwater-controlling bedrock, as evidenced by Rapp et. al (1957) ignoring it entirely in their geologic mapping of the area.

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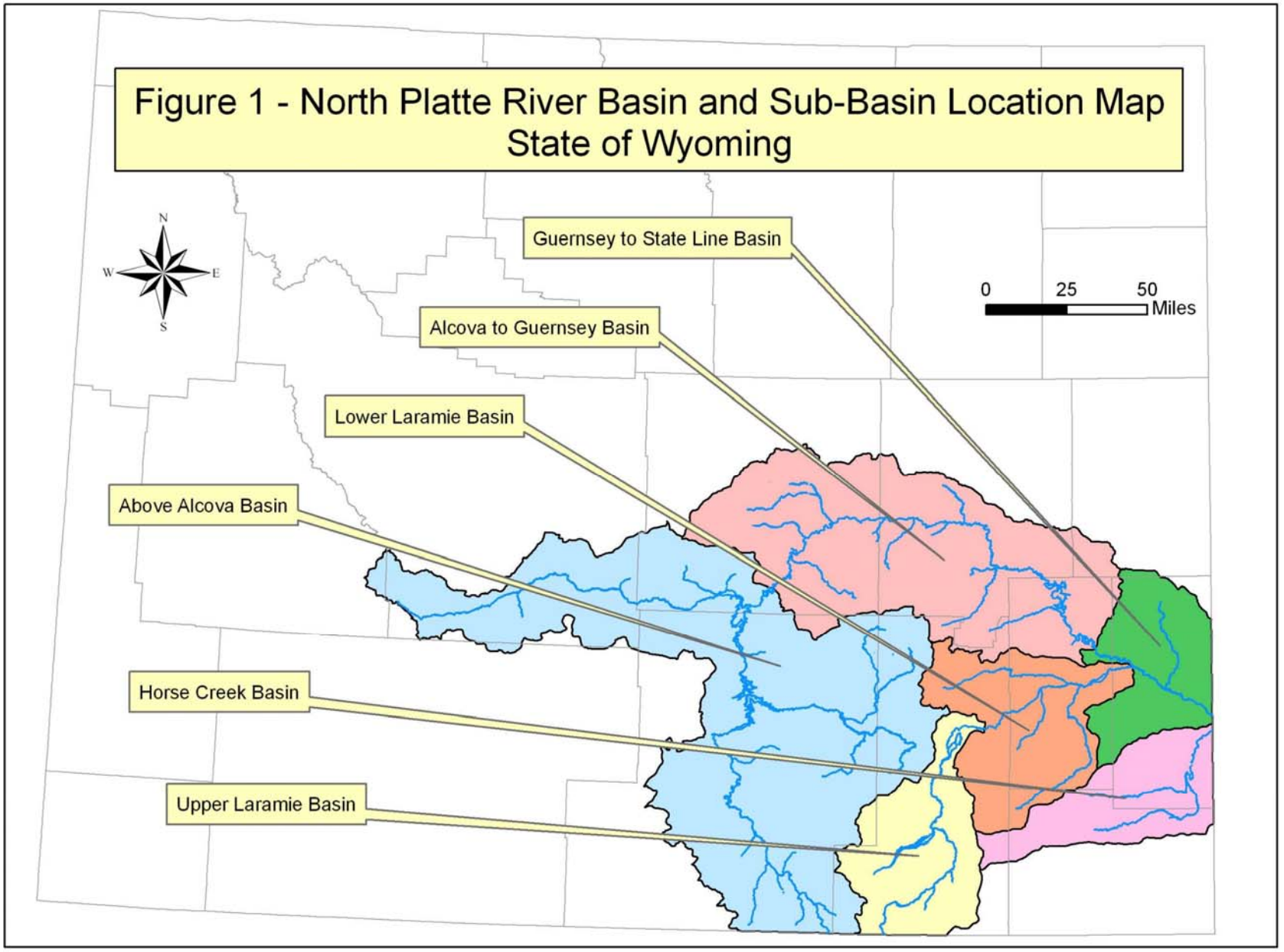


Figure 1 - North Platte River Basin and Sub-Basin Location Map
State of Wyoming
N
W
E
S
Guernsey to State Line Basin
Alcova to Guernsey Basin
Lower Laramie Basin
Above Alcova Basin
Horse Creek Basin
Upper Laramie Basin
0
25
50
Miles

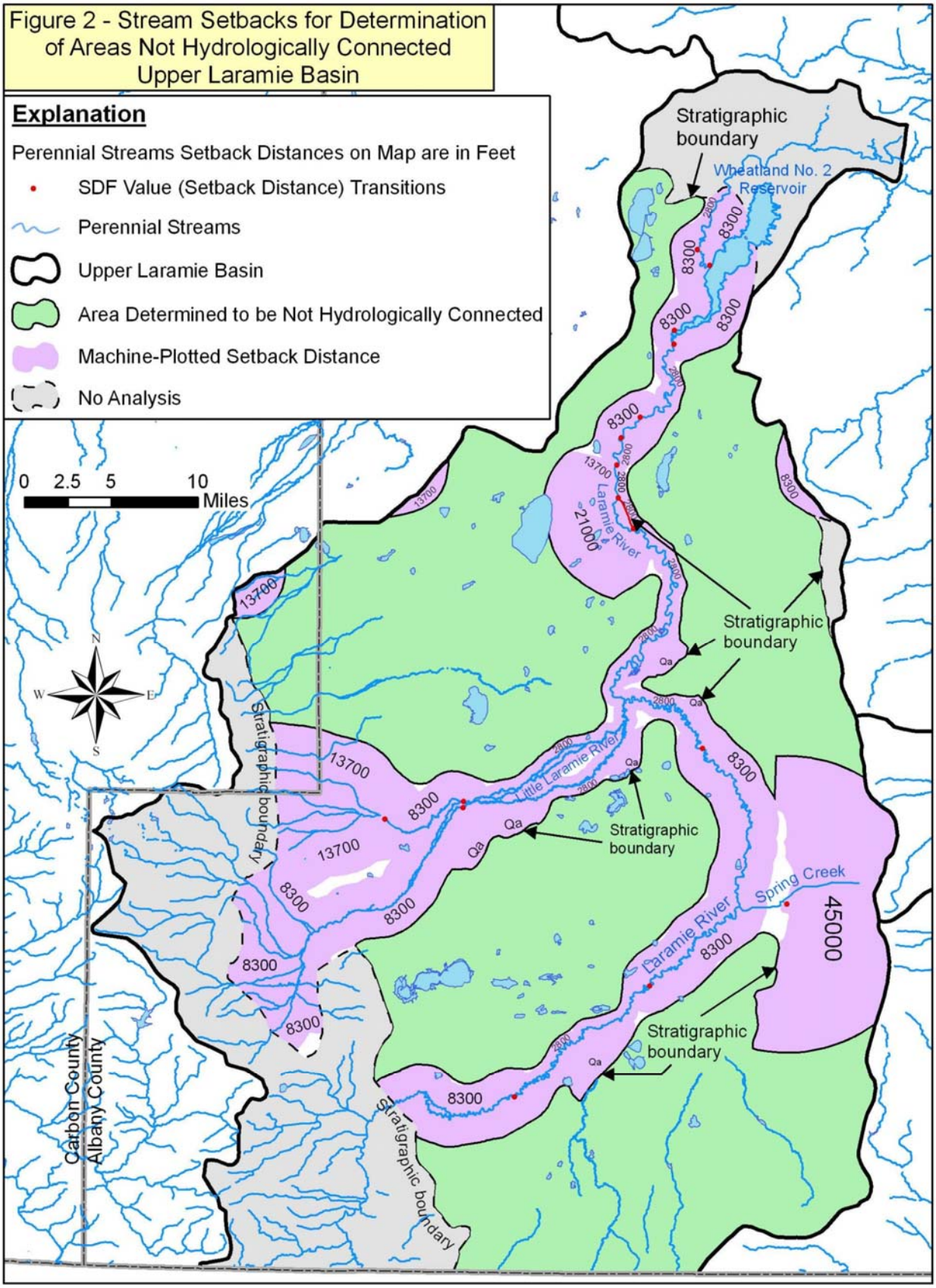


Figure 2 - Stream Setbacks for Determination of Areas Not Hydrologically Connected Upper Laramie Basin
Explanation
Perennial Streams Setback Distances on Map are in Feet
SDF Value (Setback Distance) Transitions
Perennial Streams
Upper Laramie Basin
Area Determined to be Not Hydrologically Connected
Machine-Plotted Setback Distance
No Analysis
0 2.5 5 10 Miles
N
W
E
S
Stratigraphic boundary
Wheatland No. 2 Reservoir
Laramie River
Little Laramie River
Spring Creek
Carbon County
Albany County
8300
13700
2800
21000
45000
Qa

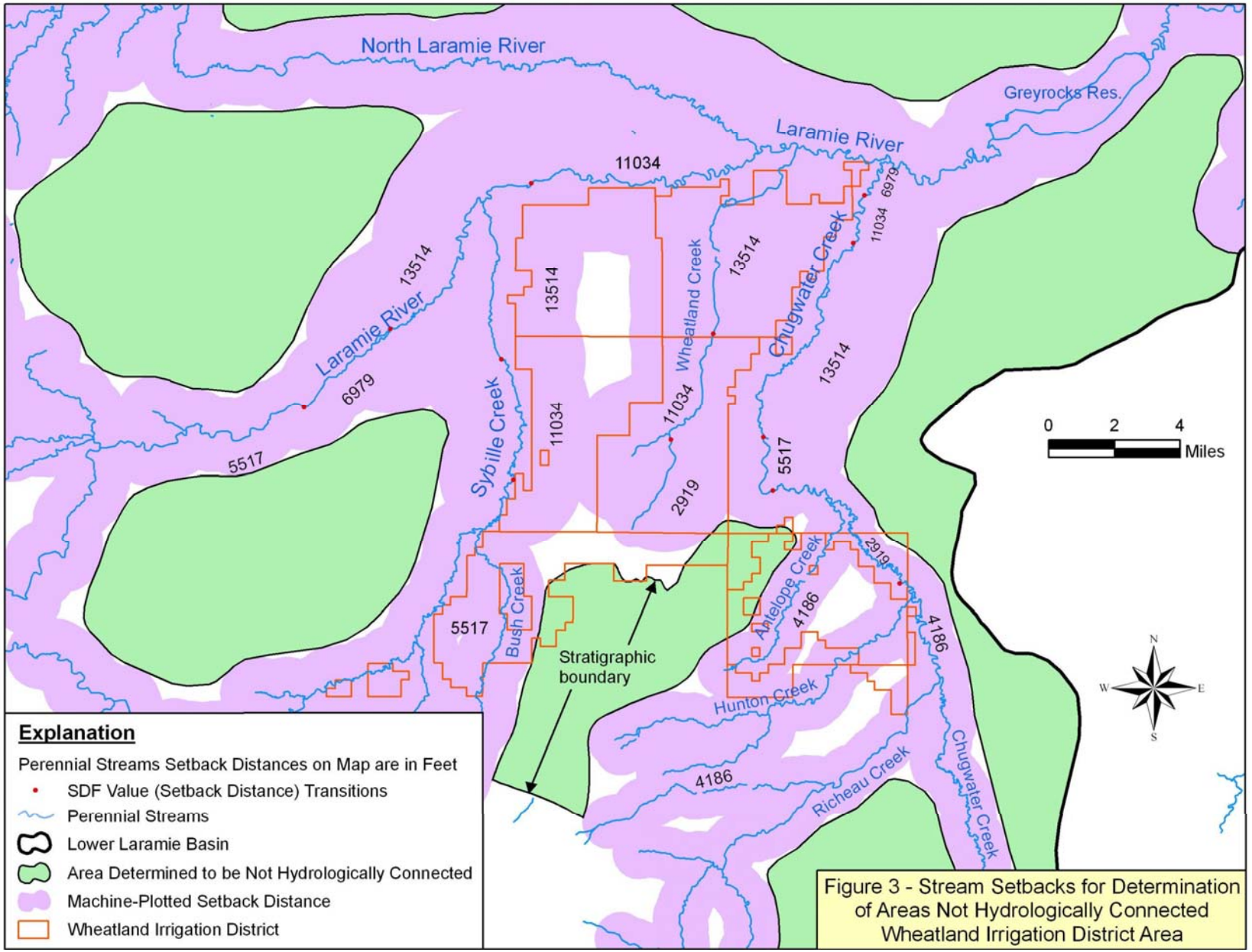


Figure 3 - Stream Setbacks for Determination of Areas Not Hydrologically Connected Wheatland Irrigation District Area

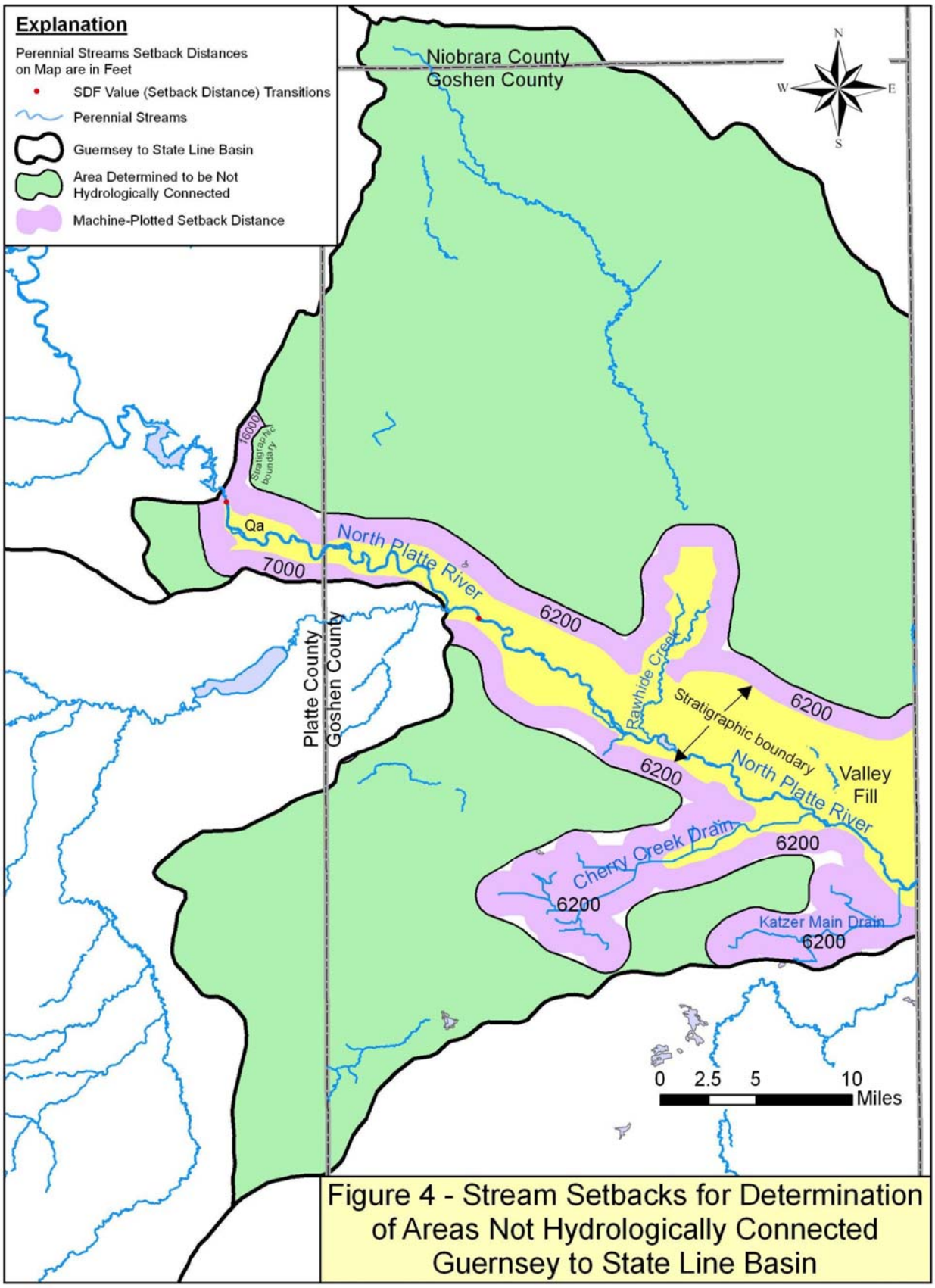


Figure 4 - Stream Setbacks for Determination of Areas Not Hydrologically Connected Guernsey to State Line Basin

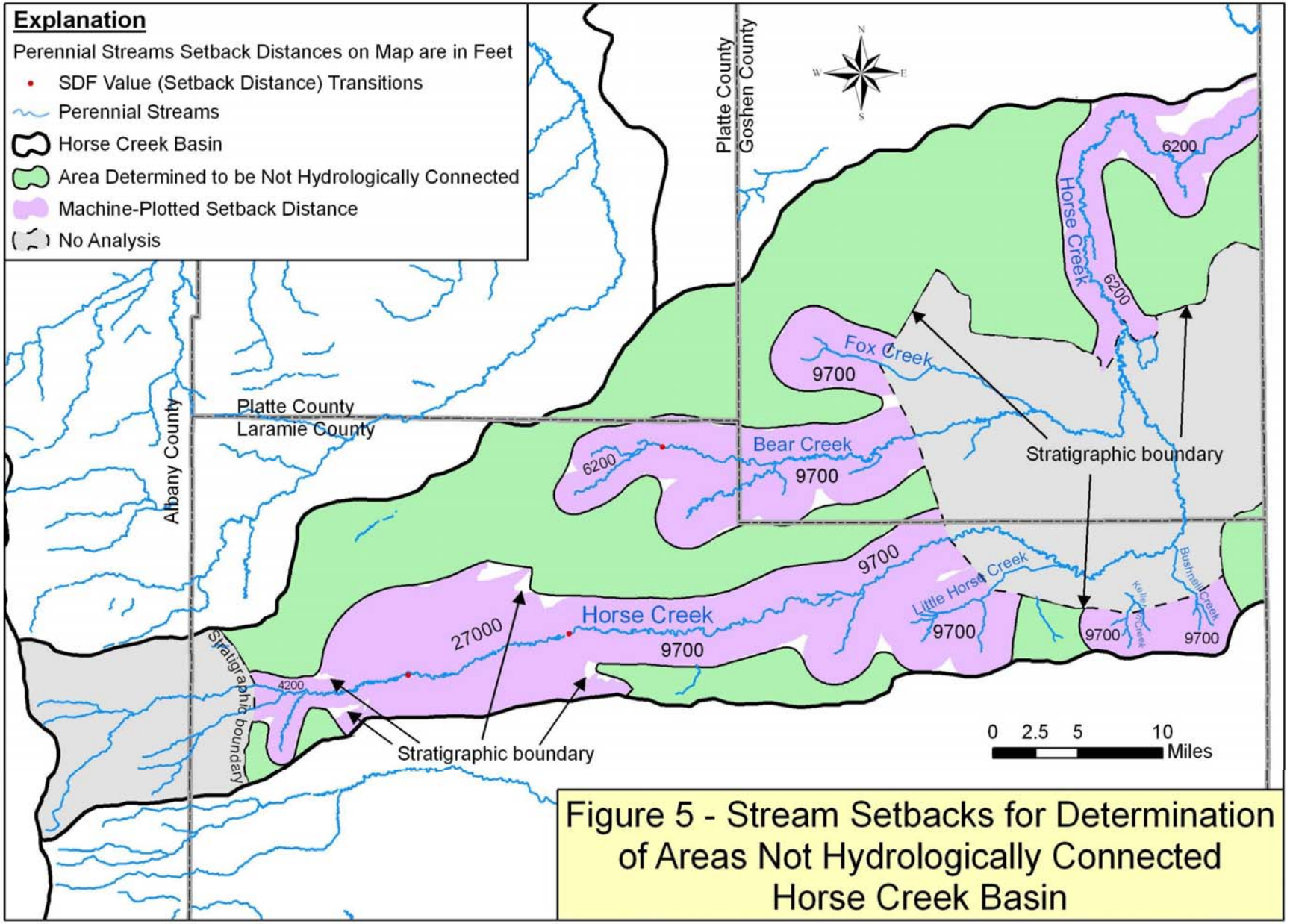
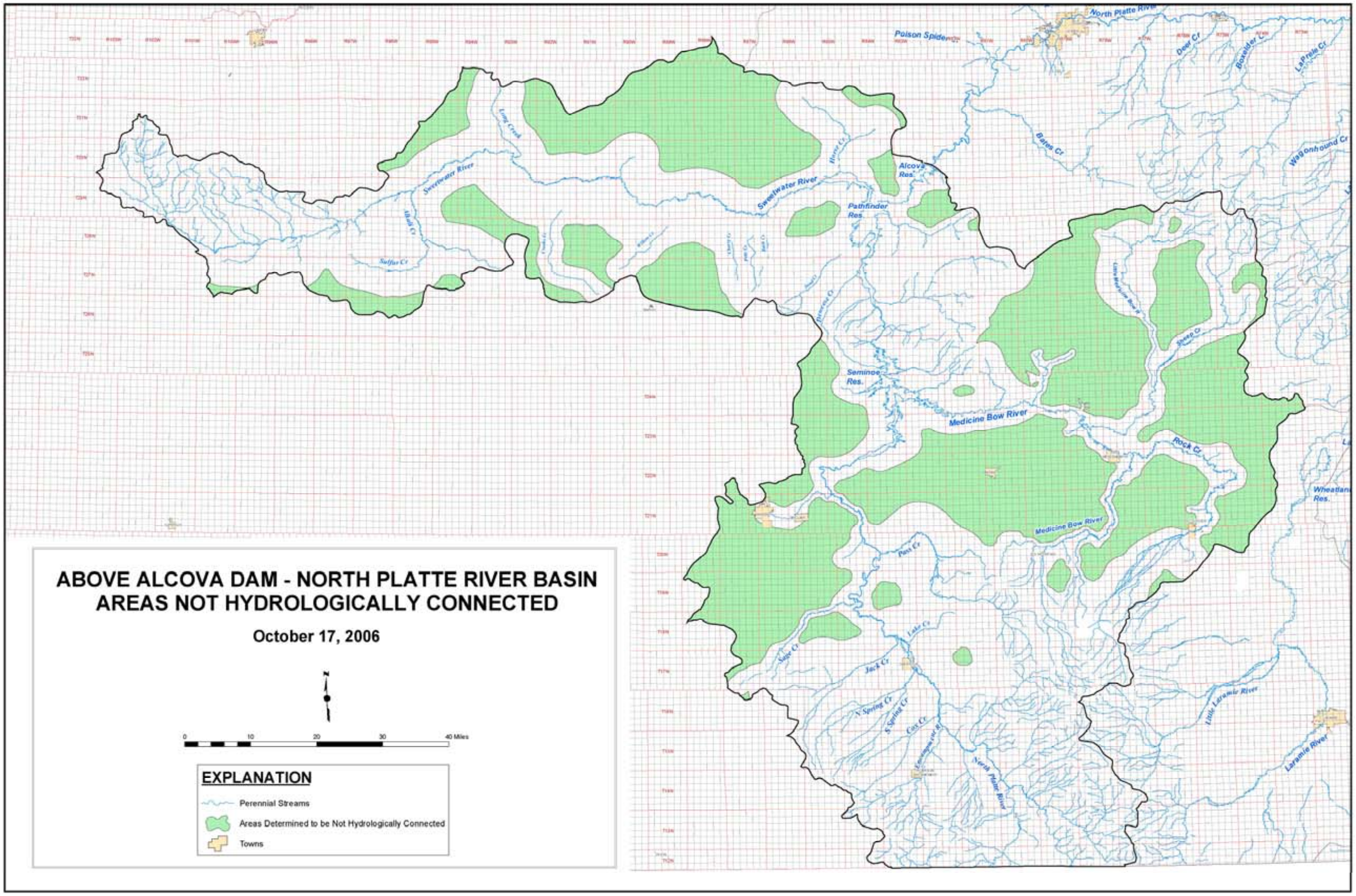
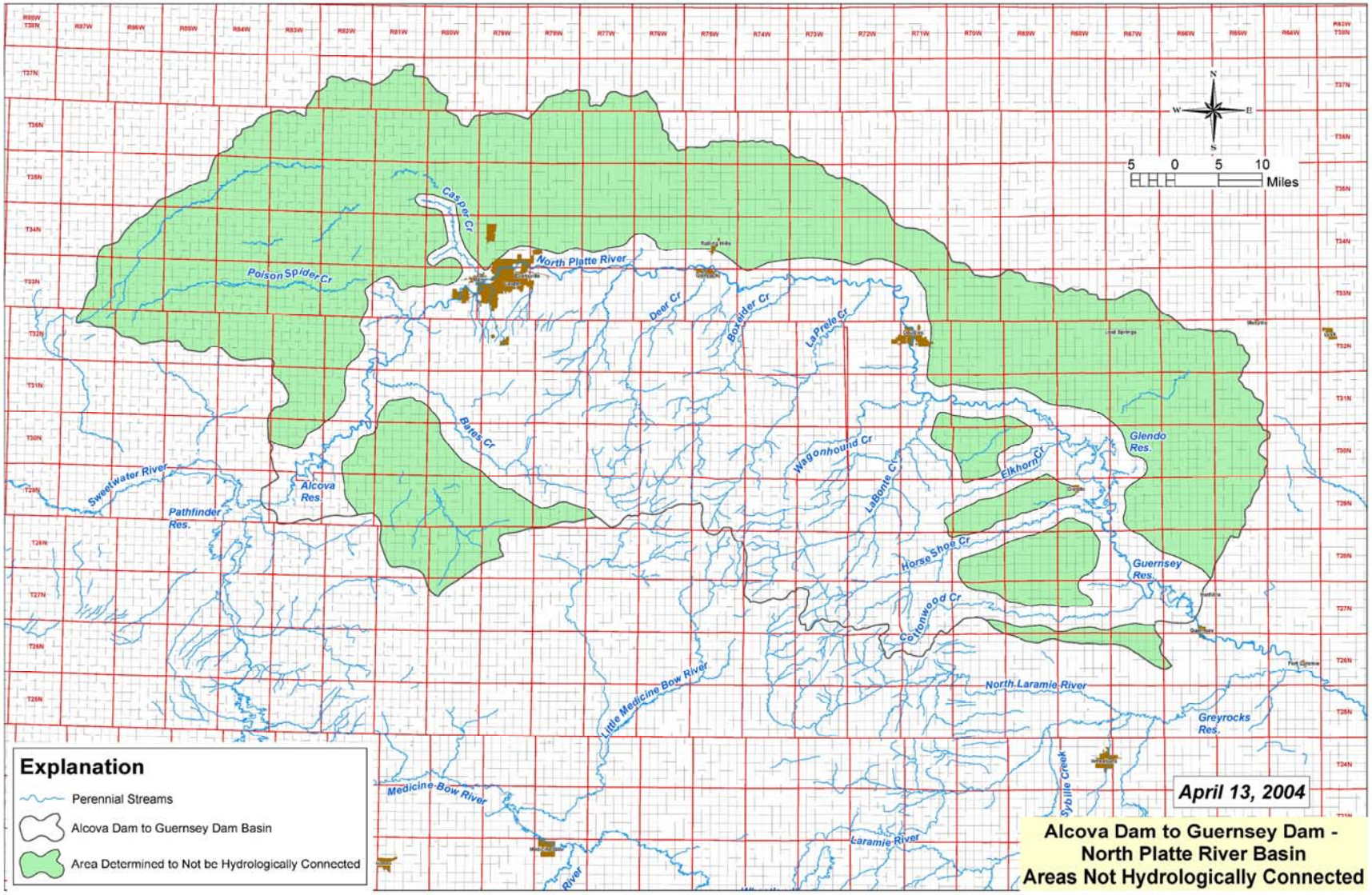
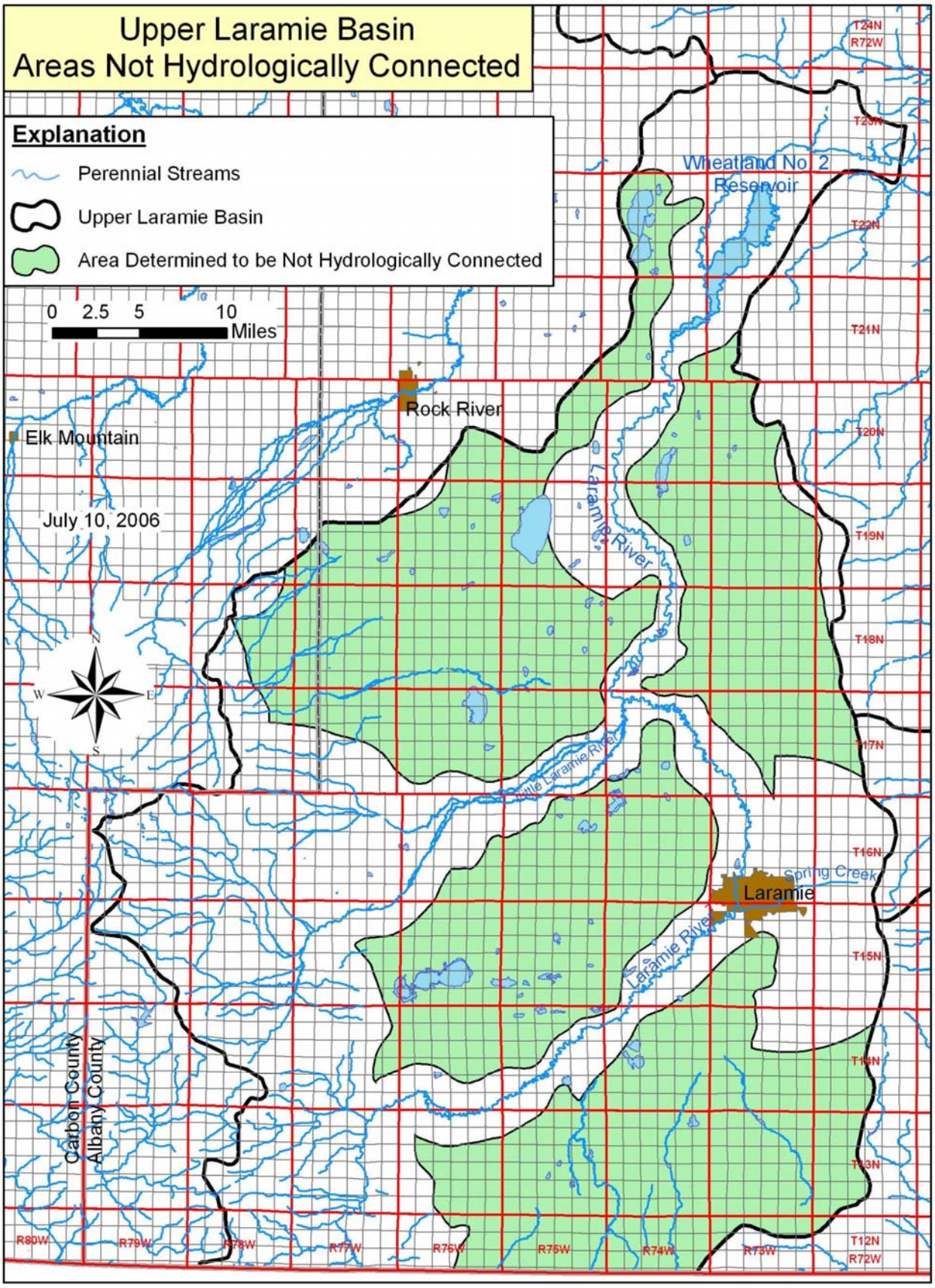


Figure 5 - Stream Setbacks for Determination of Areas Not Hydrologically Connected Horse Creek Basin


ABOVE ALCOVA DAM - NORTH PLATTE RIVER BASIN
AREAS NOT HYDROLOGICALLY CONNECTED
October 17, 2006
0
10
20
30
40 Miles
EXPLANATION
Perennial Streams
Areas Determined to be Not Hydrologically Connected
Towns
Sweetwater River
Medicine Bow River
Rock Cr
Alcova Res.
Pathfinder Res.
Seminoe Res.
Poison Spider
North Platte River
Bates Cr
Wagonhound Cr
Wheatland Res.
Little Laramie River
Laramie River
North Platte River


Explanation
Perennial Streams
Alcova Dam to Guernsey Dam Basin
Area Determined to Not be Hydrologically Connected
N
W
E
S
5 0 5 10
Miles
Casper Cr
North Platte River
Poison Spider Cr
Deer Cr
Boxelder Cr
LaPrele Cr
Bates Cr
Sweetwater River
Alcova Res.
Pathfinder Res.
Wagonhound Cr
LaBonte Cr
Elkhorn Cr
Glendo Res.
Horse Shoe Cr
Guernsey Res.
Cottonwood Cr
Little Medicine Bow River
North Laramie River
Greyrocks Res.
Sybille Creek
Medicine Bow River
Laramie River
April 13, 2004
Alcova Dam to Guernsey Dam -
North Platte River Basin
Areas Not Hydrologically Connected


Upper Laramie Basin
Areas Not Hydrologically Connected
Explanation
Perennial Streams
Upper Laramie Basin
Area Determined to be Not Hydrologically Connected
0 2.5 5 10
Miles
Elk Mountain
July 10, 2006
Rock River
Wheatland No. 2
Reservoir
Laramie River
Little Laramie River
Spring Creek
Laramie
Carbon County
Albany County
T24N
R72W
T23N
T22N
T21N
T20N
T19N
T18N
T17N
T16N
T15N
T14N
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T12N
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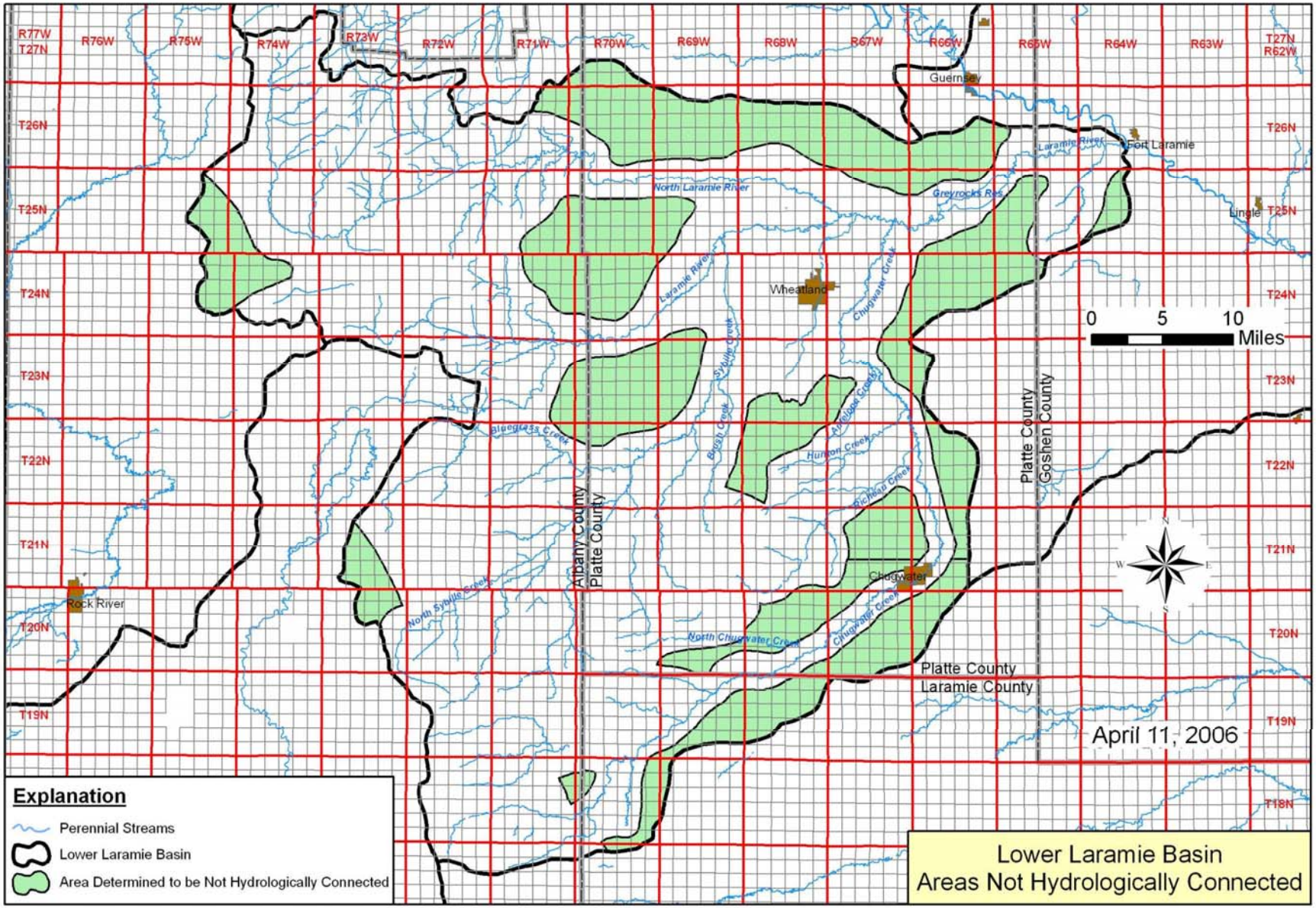
R77W
R76W
R75W
R74W
R73W
R72W


R77W
T27N
R76W
R75W
R74W
R73W
R72W
R71W
R70W
R69W
R68W
R67W
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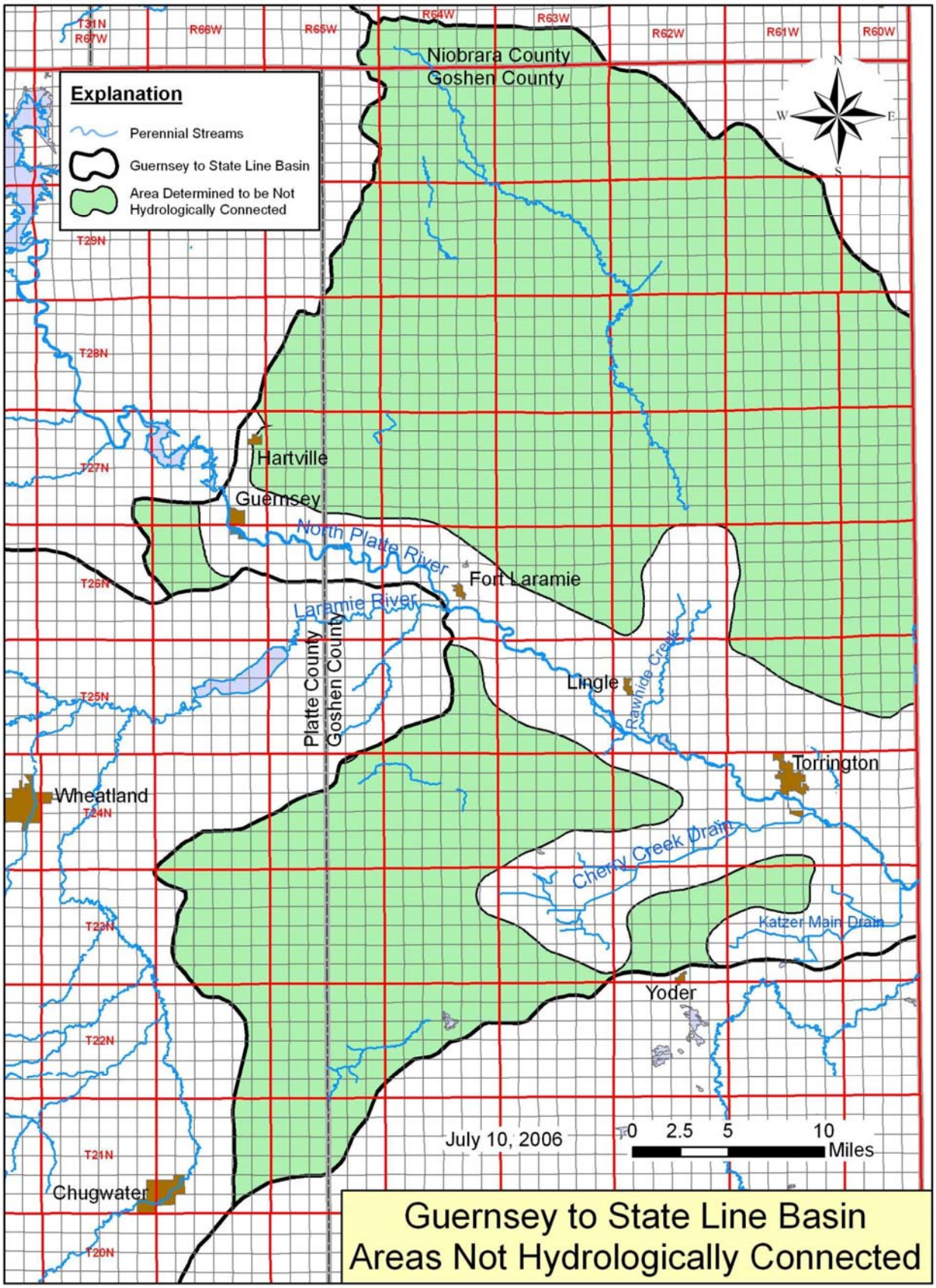
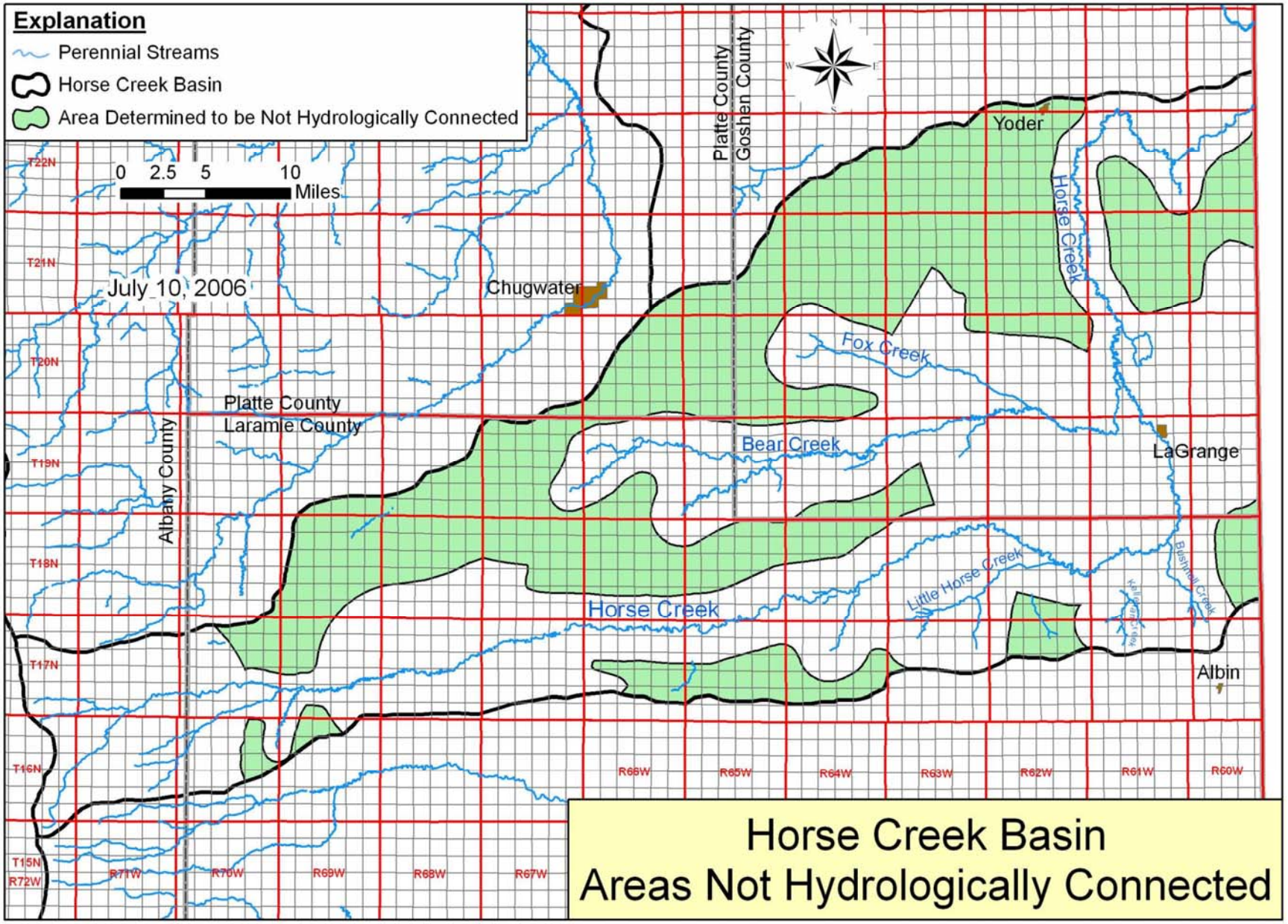
R65W
R64W
R63W
T27N
R62W
T26N
T25N
T24N
T23N
T22N
T21N
T20N
T19N
T18N
Guernsey
Fort Laramie
Laramie River
North Laramie River
Greyrocks Res
Lingle
Wheatland
Chugwater Creek
Laramie River
Sybille Creek
Bluegrass Creek
Bush Creek
Hunton Creek
Richeau Creek
Albany County
Platte County
Platte County
Goshen County
Rock River
North Sybille Creek
Chugwater
North Chugwater Creek
Chugwater Creek
Platte County
Laramie County
0 5 10
Miles
N
W
E
S
April 11, 2006
Explanation
Perennial Streams
Lower Laramie Basin
Area Determined to be Not Hydrologically Connected
Lower Laramie Basin
Areas Not Hydrologically Connected


Explanation
Perennial Streams
Guernsey to State Line Basin
Area Determined to be Not Hydrologically Connected
Niobrara County
Goshen County
Hartville
Guernsey
North Platte River
Fort Laramie
Laramie River
Platte County
Goshen County
Lingle
Rawhide Creek
Torrington
Wheatland
Cherry Creek Drain
Katzer Main Drain
Yoder
Chugwater
July 10, 2006
0 2.5 5 10
Miles
Guernsey to State Line Basin
Areas Not Hydrologically Connected


Explanation
Perennial Streams
Horse Creek Basin
Area Determined to be Not Hydrologically Connected
0 2.5 5 10
Miles
July_10, 2006
Platte County
Goshen County
Yoder
Horse Creek
Chugwater
Fox Creek
Platte County
Laramie County
Albany County
Bear Creek
LaGrange
Little Horse Creek
Bushnell Creek
Horse Creek
Albin
T22N
T21N
T20N
T19N
T18N
T17N
T16N
T15N
R72W
R71W
R70W
R69W
R68W
R67W
R66W
R65W
R64W
R63W
R62W
R61W
R60W
Horse Creek Basin
Areas Not Hydrologically Connected

Attachment No. III
Wyoming's Depletions Plan
Streamlined ESA Consultation Process

On June 16, 2006, the U.S. Fish and Wildlife Service (FWS) issued a programmatic biological opinion (PBO) for the Platte River Recovery Implementation Program. The PBO established a two-tiered consultation process for future federal actions on existing and new water related activities subject to section 7(a)(2) of the ESA. The PBO, dated June 16, 2006, is the Tier 1 BO and it evaluated the effects of the PRRIP, which includes Wyoming's Depletions Plan. The Tier 2 BO will determine if the flow related effects of future federal actions are consistent with the scope and determination of effects addressed in the Tier 1 BO. The federal review will determine if: 1) the proposed activities comply with the definition of existing water related activities and/or 2) proposed new water related activities are covered by Wyoming's Depletions Plan.

The Tier 2 BO will be completed under the streamlined ESA consultation process discussed in this attachment and the template documents provided herein. Please note that this streamlined ESA consultation process will only be necessary for future federal actions on water related activities. Water related activities that are not federal actions will be addressed by the State Coordinator in the manner outlined in Wyoming's Depletions Plan.

The following is a summary addressing the template documents included in this attachment that would be used to develop the Tier 2 BO.

Template No. 1-Wyoming Platte River Recovery Agreement
This agreement between the State of Wyoming and the water user would be used to document any action required of the water user to comply with Wyoming's Depletions Plan. If the water users proposed water related activity complies with the depletions plan without additional actions by the water user, the State Coordinator would simply advise the Federal Action Agency and FWS of this fact through correspondence and this agreement would not be necessary. However, if applicable, this agreement would be drafted by the State Coordinator in consultation with the water user. The draft agreement would be offered to the Federal Action Agency and the FWS for review and comment. Upon concurrence of the federal agencies, the Wyoming Platte River Recovery Agreement will be finalized.

Template No. 2-Platte River Recovery Agreement
This agreement is between the water user and the FWS. The agreement will be drafted by the Federal Action Agency using this template and may include the Wyoming Platte River Recovery Agreement as an attachment. The Platte River Recovery Agreement will be initially executed by the water user. The FWS will execute the agreement upon completion of the Tier 2 Biological Opinion.

Template No. 3-Biological Assessment & Request for Formal Section 7 Consultation
The Federal Action Agency will complete the biological assessment using this template. Please note that the biological assessment will address site specific effects on listed species within

Wyoming not covered by the PRRIP and the PBO. The biological assessment, along with the Platte River Recovery Agreement executed by the water user, will be submitted to the FWS.

Template No. 4-Platte River Tier 2 Biological Opinion

The streamlined consultation process will be completed when the FWS issues the Tier 2 Biological Opinion and executes the Platte River Recovery Agreement.

TEMPLATE NO. 1
WYOMING PLATTE RIVER RECOVERY AGREEMENT

This RECOVERY AGREEMENT is entered into this ____ day of _____, [Year], by and between the Wyoming State Engineer (State Engineer), acting on behalf of the State of Wyoming and name of Water User ("Water User").

WHEREAS, in 2006, the Secretary of the Interior and the Governors of Wyoming, Nebraska and Colorado signed a Cooperative Agreement to implement the Platte River Recovery Implementation Program ("Program"); and

WHEREAS, the Program implements certain aspects of the Service's recovery plans for four species (interior least tern, whooping crane, piping plover and pallid sturgeon) (collectively the "target species") listed as threatened or endangered pursuant to the Endangered Species Act ("ESA"). The Program is intended to provide defined benefits for the target species and their associated habitats while providing for water development in the Platte River Basin to proceed in compliance with state law, interstate compacts and decrees, and the ESA; and

WHEREAS, on June 16, 2006, the Service issued a programmatic biological opinion (PBO) concluding that implementation of the Program, along with existing and a specified amount of new depletions, are not likely to jeopardize the continued existence of the target species or destroy or adversely modify their designated critical habitat in Nebraska. The Service also concluded that implementation is not likely to jeopardize the threatened bald eagle or western prairie fringed orchid in Nebraska; and

WHEREAS, Water User is the choose one: owner/operator/contractor of name of water project or projects (Water Project), which causes or will cause depletions to the Platte River system within Wyoming; and

WHEREAS, the State of Wyoming has prepared and the Governance Committee of the Program has approved the Depletions Plan, Platte River, Wyoming (Wyoming's Depletions Plan), which defines the existing water related activities and certain specific new water related activities that are covered
by the Program and the PBO;

WHEREAS, Water User's Water Project is covered by the PBO; and

WHEREAS, Water User desires certainty that its depletions can occur consistent with Section 7 and Section 9 of the ESA and therefore its Biological Opinion through participation in the Program; and

WHEREAS, the existing water related activity will be operated on behalf of Wyoming water users.

NOW THEREFORE, Water User and the State Engineer agree as follows:

(Example Situations)

If the State Coordinator has determined that the activity will qualify as an existing water related activity without terms and conditions, **this agreement may not be necessary**. For example, if the water user is rehabilitating an existing water supply system that will not increase depletions or the water user is proposing a project that will rely on a change of use approved by the Wyoming Board of Control, then the State Engineer would simply document such findings in a letter to the Federal Action Agency.

OR

If the State Coordinator has determined that the activity will qualify as an existing water related activity subject to certain terms and conditions, this agreement can be used to document those terms and conditions. For example, a water user seeking a replacement well may be required to cement
the old well and/or voluntarily abandon an existing water right. (Note: This could also be documented with conditions on the permit for the replacement well.) Another example, the water user could acquire and retire depletions from an existing water related activities as defined in Wyoming's Depletions Plan and thereby ensure the activity can be completed without exceeding an existing water related activity benchmark or baseline.

OR

If the water user is proposing a new water related activity, the agreement would be used to document the terms and conditions for coverage by Wyoming's Depletions Plan and the Program. For example, the water user could acquire replacement water to offset the new depletions. Another example, the water user could seek and receive replacement water from the Wyoming Water Bank through the Director of the Wyoming Water Development Office. (Any agreements for water from the water bank should be attached to this agreement.)

OR

If the water user is proposing a project that includes both existing and new water related activities, the agreement could be used to document the quantification of the two activities, and perhaps, place conditions on each to ensure there is proper mitigation.

The following general conditions will apply to this agreement:

1. The Wyoming State Engineer, his employees, and the State of Wyoming do not waive their sovereign immunity by entering into this agreement and specifically retain immunity and all defenses available to them as sovereigns pursuant to W.S. 1-39-104(a) and all other laws.

2. The construction, interpretation and enforcement of this agreement shall be governed by the laws of the State of Wyoming. Venue for any court action shall be in the First Judicial District, Laramie County, Wyoming.

3. Water user shall indemnify, defend and hold harmless the State of Wyoming, the State Engineer, and its officers, agents, employees, successors and assignees from any and all claims, lawsuits, losses and liability arising out of the Water User's failure to perform any of Water User's duties and obligations hereunder or in connection with the negligent performance of Water User's duties or obligations or participation in the Program.

_____ _____

Water User Representative Date

_____ _____

Wyoming State Engineer Date

Approved by: _____ _____

Wyoming Attorney General's Office Date

WYOMING

TEMPLATE BIOLOGICAL ASSESSMENT
& REQUEST FOR FORMAL SECTION 7 CONSULTATION

Text shown in blue should be provided by the applicant

[DATE]

[FROM FEDERAL ACTION AGENCY
TO U.S. FISH & WILDLIFE SERVICE]

This letter contains the Biological Assessment addressing potential impacts from operation of the [Project] on federally-listed species and designated critical habitats. With this submission, we are requesting initiation of Formal Consultation under Section 7(a) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)("ESA"), concerning the whooping crane (*Grus americana*), interior least tern (*Sternula antillarum*), northern Great Plains population of the piping plover (*Charadrius melodus*), pallid sturgeon (*Scaphirhynchus albus*) (collectively referred to as the "target species"), and designated critical habitat of the whooping crane. We further request initiation of Formal Consultation for the western prairie fringed orchid (*Platanthera praeclara*), [include other non-target listed species or critical habitats, as needed]. We have determined that the Project is not likely to adversely affect the American burying beetle (*Nicrophorus americanus*) and will have no effect on the Eskimo curlew (*Numenius borealis*).

[Briefly describe: (1) Project; (2) Applicant; (3) Project location; and (4) Federal action (e.g., permit or authorization) associated with the Project.]

For an Existing Water-Related Activity

Based on a determination by the Wyoming State Engineer's Office (SEO), this project is an existing water-related activity which will not increase depletions to the Platte River system and is covered by the Program's Wyoming Depletions Plan. A copy of the determination received from the SEO is attached to this biological assessment.

Description of water use should include:

- Location of Use (e.g., the service district, the county, the irrigation district, the industrial facility)
- Source of Water (e.g., water from X wells located in Y county providing up to Z acre-feet of supply annually; X acre-feet of storage rights from Y reservoir)
- Use of Water (e.g., approximately X domestic water taps, X acres of irrigated cropland, operation of an X-megawatt power-generation plant, up to X miles of pipeline hydrostatic testing, etc.)

Note: Depletions to Platte River flows (if any) associated with existing water-related activities covered by the Wyoming Depletion Plan do not need to be estimated.

For a New Water-Related Activity

Based on a determination by the Wyoming State Engineer's Office (SEO), this project is a new water-related activity which [will not result in new depletions] [*or*] [will result in new depletions to the Platte River Basin requiring mitigation in order to be covered by the Program's Wyoming Depletions Plan]. A copy of the

determination received from the SEO is attached to this biological assessment.

Description of water use should include:

- Location of Use (e.g., the service district, the county, the irrigation district, the industrial facility)
- Source of Water (e.g., water from X wells located in Y county providing up to Z acre-feet of supply annually; X acre-feet of storage rights from Y reservoir)
- Use of Water (e.g., approximately X domestic water taps, X acres of irrigated cropland, operation of an X-megawatt power-generation plant, up to X miles of pipeline hydrostatic testing, etc.)

Description of water replacement (mitigation) should include:

- A description of the mitigation measures agreed upon to comply with Wyoming's Plan (or with the Federal Depletion Plan). A copy of the corresponding Platte River Recovery Agreement between the project proponent and the State of Wyoming may be provided to meet this information need.

The Platte River Recovery Implementation Program (PRRIP or Program), established in 2006, is implementing actions designed to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska through a basin-wide cooperative approach agreed to by the States of Wyoming, Nebraska, and Colorado and the U.S. Department of the Interior [Program, 2006; Section I.A.1.]. The Program addresses the adverse impacts of existing and certain new water related activities on the Platte River target species and associated habitats, and provides ESA compliance[1] for effects to the target species and whooping crane critical habitat from such activities including avoidance of any prohibited take of such species. [Program, 2006; Section I.A.2 & footnote 2.]. The State of Wyoming is in compliance with its obligations under the Program.

For Federal actions and projects participating in the Program, the Platte River Recovery Implementation Program Final Environmental Impact Statement (U.S Department of Interior, 2006) and supplemental Environmental Assessment and Finding of No Significant Impact (2018), as well as the June 16, 2006 programmatic biological opinion (PBO) and the August 27, 2018 Supplemental biological opinion (collectively referred to as the PBOs) serve as the description of the environmental baseline and environmental consequences for the effects of the Federal actions on the listed target species, whooping crane critical habitat, and other listed species in the central and lower Platte River addressed in the PBOs. These documents are hereby incorporated into this Biological Assessment by this reference.

Table II-1 of the Supplemental biological opinion (pages 6-8) contains a list of species and critical habitat in the action area, their status, and the Service's determination of the effects of the Federal action analyzed in the PBOs, including the continued operation of existing and certain new water-related activities. The Service determined in the PBOs that the continued operation of existing and certain new water-related activities may adversely affect but would not likely jeopardize the continued existence of the endangered whooping crane, interior least tern, and pallid sturgeon, or the threatened northern Great Plains population of the piping plover.

[1] "ESA Compliance" means: (1) serving as the reasonable and prudent alternative to offset the effects of water-related activities that FWS found were likely to cause jeopardy to one or more of the target species or to adversely modify critical habitat before the Program was in place; (2) providing offsetting measures to avoid the likelihood of jeopardy to one or more of the target species or adverse modification of critical habitat in the Platte River basin for new or existing water-related activities evaluated under the ESA after the Program was in place; and (3) avoiding any prohibited take of target species in the Platte River basin.

Further, the Service found that the continued operation of existing and certain new water-related activities may adversely affect but would not likely jeopardize the threatened bald eagle and western prairie fringed orchid associated with the central and lower reaches of the Platte River in Nebraska, and was not likely to destroy or adversely modify designated critical habitat for the whooping crane. The bald eagle was subsequently removed from the federal endangered species list on August 8, 2007.

The Service also determined that the PBOs Federal Action, including the continued operation of existing and certain new water-related activities, would have no effect to the endangered Eskimo curlew. There has not been a confirmed sighting since 1926 and this species is believed to be extirpated in Nebraska. Lastly, the Service determined that the PBOs Federal Action, including the continued operation of existing and certain new water-related activities, was not likely to adversely affect the endangered American burying beetle.

[Insert applicable BA text describing potential affects to non-target listed species, their critical habitats, if any, and/or site-specific affects to any listed species/critical habitat]

INSERT APPLICABLE LANGUAGE BELOW:

The above-described Project operations qualify as an "existing water related activity" because they are surface water or hydrologically connected groundwater activities implemented on or before July 1, 1997, within the intent and coverage of the Program. [Program, 2006; Section I.A. footnote 3]. The existing water related activity conforms to the criteria in Section III of Chapters 2 or 3 of the Depletions Plan, Platte River Basin, Wyoming (Wyoming's Depletions Plan [Program, Attachment 5, Section 7]) and:

1. The existing water related activity is operated on behalf of Wyoming water users;

2. The State Coordinator has determined that the activity qualifies as an existing water related activity; and

3. If required by the State Coordinator, the Applicant has signed a Wyoming Recovery Agreement to document any mitigation requirements need to qualify as an existing water activity.

-AND/OR-

The above-described Project operations qualify as a "new water related activity" because such operations constitute new surface water or hydrologically connected groundwater activities which may affect the quantity or timing of water reaching the associated habitats of the target species implemented after July 1, 1997. [Program, 2006; Section I.A. footnote 3]. The new water related activity conforms to the criteria in Section II of Chapters 2 or 3 of Wyoming's Depletions Plan and:

1. The new water related activity is operated on behalf of Wyoming water users;

2. The new water related activity can be completed without exceeding an existing water related baseline or benchmark as described in Wyoming's Depletions Plan or the Applicant has requested, and the State of Wyoming has agreed, that the depletions resulting from the new water related activity will be mitigated with water from the Wyoming Water Bank; and

3. The Applicant has signed a Wyoming Recovery Agreement with the Wyoming State Coordinator to document the requirements to qualify for the status described in 2. above.

[Note: It is understood that a Project may include existing and new water related activities. In these situations, the activities within the Project must be categorized as "existing" or "new" and biological assessment will address both categories.]

Accordingly, the impacts of this activity to the target species, whooping crane critical habitat, and other listed species in the central and lower Platte River addressed in the PBOs are covered and offset by operation of Wyoming's Depletions Plan as part of the PRRIP.

The Applicant intends to rely on the provisions of the Program to provide ESA compliance for potential impacts to the target species and whooping crane critical habitat. Insert the [Federal Agency] intends to require, as a condition of any approval, that the Applicant fulfill the responsibilities required of Program participants in Wyoming. The [Federal Agency] also intends to retain discretionary Federal authority for the Project, consistent with applicable regulations and Program provisions, in case reinitiation of Section 7 consultation is required.

This letter addresses consultation on all listed species and designated critical habitat in Nebraska, including the referenced Platte River target species and whooping crane critical habitat. Potential impacts from construction and operation of the Project to any other federally-listed threatened or endangered species and designated critical habitats will be addressed within the applicable biological opinion prepared by the Service, in accordance with the ESA.

References:

Platte River Recovery Implementation Program Document. 2006.

U.S. Department of the Interior. 2006. Platte River Recovery Implementation Program Final Environmental Impact Statement.

U.S. Fish and Wildlife Service. 2006. Biological Opinion on the Platte River Recovery Implementation Program.

U.S. Department of the Interior. 2018. Platte River Recovery Implementation Program First Increment Extension Final Environmental Assessment.

U.S. Fish and Wildlife Service. 2018. Supplemental Biological Opinion on the Platte River Recovery Implementation Program First Increment Extension.

/FROM FEDERAL ACTION AGENCY/

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
[State] Field Office
[Address]
[City, State, Zip Code]

[Date]

[FWS tracking number]

[Name]
[Agency]
[Address]
[City, State Zip]

RE: [Project Name] Project, [County Location] County, [State]

Dear [Mr./Mrs.] :

This biological opinion is provided in response to your [Date] request to initiate formal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (ESA). Your biological assessment describes the potential effects of the [Project Name] on federally listed species and designated critical habitat.

The Federal Action reviewed in this biological opinion is the [Project Name] Project, located at [location description], [county name] County, [state]. The Project is [project description and purpose].

I. Background

On June 16, 2006, the U.S. Fish and Wildlife Service (Service) issued a programmatic biological opinion (PBO) for the 13-year first increment of the Platte River Recovery Implementation Program (PRRIP) and water-related activities[1] affecting flow volume and timing in the central and lower reaches of the Platte River in Nebraska. On August 27, 2018, the Service issued a supplemental programmatic biological opinion (Supplement) for an extension of the PRRIP through 2032. These two biological opinions are hereinafter referred to collectively as the PBOs. The action area for the PBOs includes the Platte River basin upstream of the confluence with the Loup River in Nebraska, and the mainstem of the

[1] The term "water-related activities" means activities and aspects of activities which (1) occur in the Platte River basin upstream of the confluence of the Loup River with the Platte River; and (2) may affect Platte River flow quantity or timing, including, but not limited to, water diversion, storage and use activities, and land use activities. Changes in temperature and sediment transport will be considered impacts of a "water related activity" to the extent that such changes are caused by activities affecting flow quantity or timing. Impacts of "water related activities" do not include those components of land use activities or discharges of pollutants that do not affect flow quantity or timing.

Platte River downstream of the Loup River confluence.

The Federal Action addressed by the PBOs includes the following:

1) funding and implementation of the PRRIP through 2032, the anticipated first increment of the PRRIP, as extended; and

2) continued operation of existing and certain new water-related activities[2] including, but not limited to, Reclamation and Service projects that are (or may become) dependent on the PRRIP for ESA compliance during the first increment of the PRRIP, as extended, for their effects on the target species[3], whooping crane critical habitat, and other federally listed species[4] that rely on central and lower Platte River habitats.

The PBOs establish a two-tiered consultation process for future federal actions on existing and new water-related activities subject to section 7(a)(2) of the ESA, with issuance of the PBOs being Tier 1 and all subsequent site-specific project analyses constituting Tier 2 consultations covered by the PBOs. Under this tiered consultation process, the Service will produce tiered biological opinions when it is determined that future federal actions are "likely to adversely affect" federally listed species and/or designated critical habitat in the PRRIP action area and the project is covered by the PBOs.

Although the water depletive effects of this Federal Action to central and lower Platte River species have been addressed in the PBOs, when "no effect" or may affect but not likely to adversely affect determinations are made on a site-specific basis, the Service will review these determinations and provide written concurrence where appropriate. Upon receipt of written concurrence, section 7(a)(2) consultation will be considered completed for those federal actions.

Water-related activities requiring federal approval will be reviewed by the Service to determine if: (1) those activities comply with the definition of existing water-related activities; and/or (2) proposed new water-related activities are covered by the applicable states or the federal depletions plan. The Service has determined that the [Project Name] Project meets the above criteria; therefore, this Tier 2 biological opinion regarding the effects of the [Project Name] Project on the target species, whooping crane critical habitat, and western prairie fringed orchid in the central and lower Platte River can tier from the PBOs. This Tier 2 biological opinion does not address potential effects from construction and operation of the Project on any other federally-listed threatened or endangered species and designated critical habitats outside of the PRRIP action area. Those effects will be addressed by the appropriate Field Office of the Service, in accordance with the ESA.

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[2] "Existing water related activities" include surface water or hydrologically connected groundwater activities implemented on or before July 1, 1997. "New water-related activities" include new surface water or hydrologically connected groundwater activities including both new projects and expansion of existing projects, both those subject to and not subject to section 7(a)(2) of the ESA, which may affect the quantity or timing of water reaching the associated habitats and which are implemented after July 1, 1997.

[3] The "target species" are the endangered whooping crane (*Grus americana*), the interior least tern (*Sternula antillarum*), the pallid sturgeon (*Scaphirynchus albus*), and the threatened northern Great Plains population of the piping plover (*Charadrius melodus*).

[4] Other listed species present in the central and lower Platte River include western prairie fringed orchid (*Platanthera praeclara*), American burying beetle (*Nicrophorus americanus*) and Eskimo curlew (*Numenius borealis*).

II. Consultation History

Table II-1 of the Supplement (pages 6-8) contains a list of species and critical habitat in the action area, their status, and the Service's determination of the effects of the Federal Action analyzed in the PBOs.

The Service determined in the Tier 1 PBOs that the Federal Action, including the continued operation of existing and certain new water-related activities, may adversely affect but would not likely jeopardize the continued existence of the federally endangered whooping crane, interior least tern, and pallid sturgeon, or the federally threatened piping plover (herein after referred to as piping plover), and western prairie fringed orchid in the central and lower Platte River. Further, the Service determined that the Federal Action, including the continued operation of existing and certain new water-related activities, was not likely to destroy or adversely modify designated critical habitat for the whooping crane. The bald eagle was subsequently removed from the Federal endangered species list on August 8, 2007. Bald eagles continue to be protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. For more information on bald eagles, see the Service's webpage at: http://www.fws.gov/migratorybirds/BaldEagle.htm

The Service also determined in the Tier 1 PBOs that the Federal Action would have no effect to the endangered Eskimo curlew. There has not been a confirmed sighting since 1926 and this species is believed to be extirpated in Nebraska. Lastly, the Service determined that the Federal Action, including the continued operation of existing and certain new water-related activities, was not likely to adversely affect the endangered American burying beetle.

The effects of the continued operation of existing and certain new water-related activities on the remaining species and critical habitats listed in Table II-1 of the Supplement were beyond the scope of the PBOs and were not considered.

The Service has reviewed the information contained in the biological assessment submitted by your office on [Date]. We concur with your determinations of "may affect, and likely to adversely affect" for the endangered whooping crane, interior least tern, pallid sturgeon, and the threatened piping plover, and the western prairie fringed orchid in the central and lower Platte River. We also concur with your determination of may affect, and likely to adversely affect, for designated whooping crane critical habitat.

We also concur with your determinations of "may affect, but not likely to adversely affect" for [species, and "no adverse modification of critical habitat" for species]. You have also made the determination of no effect for the [species]. We acknowledge those no effect determinations.

III. Scope of the Tier 2 Biological Opinion

The [Project Name] Project is a component of "the continued operation of existing and certain new water-related activities" requiring a federal action to be evaluated in the Tier 1 PBOs, and flow-related effects of the Federal Action are consistent with the scope and the determination of effects in the PBOs. Because [Project Proponent] has elected to participate in the PRRIP, ESA compliance for flow-related effects to federally listed endangered and threatened species and designated critical habitat from [Project Name] Project is provided to the extent described in the Tier 1 PBOs.

This biological opinion applies to the [Project Name] Project effects to listed endangered and threatened species and designated critical habitat as described in the PBOs for the period of the first 26 years of the PRRIP (i.e., the anticipated duration of the PRRIP first increment and extension).

IV. Description of the Federal Action

[Describe the Federal Action and any Interdependent and Interrelated Actions – use text from the Biological Assessment]

V. Status of the Species/Critical Habitat

Species descriptions, life histories, population dynamics, status and distributions are fully described in the PBO on pages 76-156 and on pages 17-53 in the Supplement for the whooping crane, interior least tern, piping plover, pallid sturgeon, and western prairie fringed orchid, and whooping crane critical habitat, and are hereby incorporated by reference.

Climate change was evaluated as a potential threat to the species and whooping crane critical habitat in the Supplement. The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). "Climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8-14, 18-19).

Changes in temperature and/or precipitation patterns will influence the status of the Platte River system. These changes may contribute to threats that have already been identified and discussed for interior least tern, piping plover, pallid sturgeon and western prairie fringed

orchid in the Tier 1 PBOs.

[Discuss changes in status of target species/critical habitat since the Tier 1 PBOs were issued, or include a statement saying "Since issuance of the Service's PBO and the Supplement, there have been no substantial changes in status."]

VI. Environmental Baseline

The Environmental Baseline sections for the Platte River and for the whooping crane, interior least tern, piping plover, pallid sturgeon, and western prairie fringed orchid, and whooping crane critical habitat are described on pages 157 to 219 of the Tier 1 PBO and pages 54 to 81 of the Supplement, and are hereby incorporated by reference.

[Discuss changes in status of target species/critical habitat in the action area since the Tier 1 PBOs were issued, or include a statement saying "Since issuance of the Service's PBO and the Supplement, there have been no substantial changes in status of target species/critical habitat in the action area."]

VII. Effects of the Action

Since issuance of the Tier 1 PBO, our analyses under the ESA include consideration of ongoing and projected changes in climate. The Supplement considered these impacts. In our analyses, we used our best professional judgement to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change. Actions that are undertaken to improve the river ecology and habitats for listed species not only address human activities, but also contribute to listed species and whooping crane critical habitat resiliency to climate change.

Based on our analysis of the information provided in your biological assessment for the [Project Name], the Service concludes that the proposed Federal Action will result in a [a/an existing depletion, new depletion, or a combination of existing and new depletions]. These depletions are associated with [briefly describe here, or by reference, the specific water supply sources, water uses, amount information, etc. (e.g. in Colorado, use the *Supplemental Worksheet for PRRIP BA*)].

[Include as needed:] As an existing water-related activity, we have determined that the flow-related adverse effects of the [Project Name] are consistent with those evaluated in the Tier 1 PBOs for the whooping crane, interior least tern, piping plover, pallid sturgeon, western prairie fringed orchid, and whooping crane critical habitat.

[Include as needed:] As a new water-related activity, we have determined that the flow-related adverse effects of the [Project Name] are consistent with those evaluated in the Tier 1 PBOs for the whooping crane, interior least tern, piping plover, pallid sturgeon, western prairie fringed orchid, and whooping crane critical habitat, and these effects on flows are being addressed in conformance with the [Select the applicable depletion plan: Wyoming

Depletion Plan, Nebraska New Depletion Plan, Colorado Plan for Future Depletions, Federal Depletions Plan] of the PRRIP.

[If the site-specific project/activity may affect listed species/critical habitat addressed in the PBOs, include those site-specific effects here. In that instance, the Incidental Take Statement section below may need additional text.]

VIII. Cumulative Effects

Cumulative effects include the effects of future State, local, or private (non-federal) actions that are reasonably certain to occur in the action area considered in this biological opinion. A non-federal action is "reasonably certain" to occur if the action requires the approval of a State or local resource or land-control agency, such agencies have approved the action, and the project is ready to proceed. Other indicators which may also support such a "reasonably certain to occur" determination include whether: a) the project sponsors provide assurance that the action will proceed; b) contracting has been initiated; c) State or local planning agencies indicate that grant of authority for the action is imminent; or d) where historic data have demonstrated an established trend, that trend may be forecast into the future as reasonably certain to occur. These indicators must show more than the possibility that the non-federal project will occur; they must demonstrate with reasonable certainty that it will occur. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act and would be consulted on at a later time.

Cumulative effects are described on pages 194 to 300 of the Tier 1 PBO and pages 102 to 104 of the Supplement, and are hereby incorporated by reference. [Discuss any changes in cumulative effects, if any, since the Tier 1 PBOs was issued, or include a statement saying "Since issuance of the Service's PBO and the Supplement, there have been no substantial changes in cumulative effects to the species."]

IX. Conclusions

The Service concludes that the proposed [Project Name] Project is consistent with the Tier 1 PBOs for effects to listed species and critical habitat addressed in the Tier 1 PBOs. After reviewing site specific information, including: 1) the scope of the Federal Action; 2) the environmental baseline; 3) the status of the whooping crane, interior least tern, piping plover, pallid sturgeon, and western prairie fringed orchid in the central and lower Platte River and their potential occurrence within the project area, as well as whooping crane critical habitat; 4) the effects of the [Project Name] Project; and 5) any cumulative effects, it is the Service's biological opinion that the [Project Name] Project, as described, is not likely to jeopardize the continued existence of the federally endangered whooping crane, interior least tern, and pallid sturgeon, or the federally threatened piping plover, or western prairie fringed orchid in the central and lower Platte River. The [Project Name] Project is also not likely to destroy or adversely modify designated critical habitat for the whooping crane.

This Tier 2 biological opinion does not address potential effects from construction and operation of

the Project on any other federally-listed threatened or endangered species and designated critical habitats outside of the PRRIP action area. Those effects will be addressed by the appropriate Field Office of the Service, in accordance with the ESA.

X. Incidental Take Statement

Section 9 of ESA and federal regulations pursuant to section 4(d) of ESA prohibit the take of endangered and threatened species without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct, and applies to individual members of a listed species. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Sections 7(b)(4) and 7(o)(2) of ESA do not apply to the incidental take of federally listed plant species (e.g., Ute ladies' tresses orchid, and western prairie fringed orchid). However, limited protection of listed plants from take is provided to the extent that ESA prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage of such plants on non-federal areas in violation of state law or regulation or in the course of any violation of a state criminal trespass law. Such laws vary from state to state.

The Department of the Interior, acting through the Service and Bureau of Reclamation, is implementing all pertinent Reasonable and Prudent Measures and implementing Terms and Conditions stipulated in the Tier 1 PBOs' Incidental Take Statements (pages 309-326 of the PBO and 111-115 of the Supplement) which will minimize the anticipated incidental take of federally listed species. In instances where the amount or extent of incidental take outlined in the Tier 1 PBOs is exceeded, or the amount or extent of incidental take for other listed species is exceeded, the specific PRRIP action(s) causing such take shall be subject to reinitiation expeditiously.

[If the site-specific project/activity may affect listed species/critical habitat addressed in the PBOs, include any site-specific Reasonable and Prudent Measures and Terms and Conditions here. See the format in the PBOs Incidental Take sections]

XI. Closing Statement

Any person or entity undertaking a water-related activity that receives federal funding or a

federal authorization and which relies on the PRRIP as a component of its ESA compliance in section 7 consultation must agree: (1) to the inclusion in its federal funding or authorization documents of reopening authority, including reopening authority to accommodate reinitiation upon the circumstances described in Section IV.E. of the Program document; and (2) to request appropriate amendments from the federal action agency as needed to conform its funding or authorization to any PRRIP adjustments negotiated among the three states and the Department of the Interior, including specifically new requirements, if any, at the end of the first PRRIP increment and any subsequent PRRIP increments. The Service believes that the PRRIP should not provide ESA compliance for any water-related activity for which the funding or authorization document does not conform to any PRRIP adjustments (Program Document, section VI). Reinitiation of consultation over [Project Name] Project will not be required at the end of the first increment including the extension (a period covering the first 26 years of the PRRIP) provided a subsequent Program increment or additional first increment Program extension is adopted pursuant to appropriate ESA and NEPA compliance procedures, and, for a subsequent increment, the effects of the [Project Name] Project are covered under a Tier 1 PBO for that increment addressing continued operation of previously consulted-on water-related activities.

This concludes formal consultation on the actions outlined in the [Date] request from [federal action agency]. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the specific action(s) causing such take shall be subject to reinitiation expeditiously.

Requests for reinitiation, or questions regarding reinitiation should be directed to the appropriate Field Office at the address below.

[For Colorado and Nebraska Projects, select the Nebraska field office; for Wyoming, select Wyoming field office below and delete the other one]

Field Supervisor
Nebraska Ecological Services Field Office
U.S. Fish and Wildlife Service
9325 S Alda Road
Wood River, NE 68883

Field Supervisor
Wyoming Ecological Services Field Office
U.S. Fish and Wildlife Service

334 N Parsley Boulevard
Cheyenne, WY 82007

XII. Conservation Recommendations

Section 7(a)(1) of ESA directs Federal agencies to utilize their authorities to further the purposes of ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of an action on listed species or critical habitat, to help implement recovery plans, or to develop information. Conservation recommendations are provided in the PBO (pages 328-329) and Supplement (page 117) and are hereby incorporated by reference.

XIII. Literature Cited

Platte River Recovery Implementation Program Document. 2006.

U.S. Department of the Interior. 2006. Platte River Recovery Implementation Program Final Environmental Impact Statement.

U.S. Fish and Wildlife Service. 2006. Biological Opinion on the Platte River Recovery Implementation Program.

U.S. Department of the Interior. 2018. Platte River Recovery Implementation Program First Increment Extension Final Environmental Assessment.

U.S. Fish and Wildlife Service. 2018. Supplemental Biological Opinion on the Platte River Recovery Implementation Program First Increment Extension.

We appreciate the opportunity to review and comment on this proposed project. Should you have questions, please contact [FWS lead biologist] within our office at [email address] or [phone number].