Biological Assessment
for the Re-issuance of the NPDES Discharge Permit For Washington Beef, LLC.

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101
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I. Background/History

A. Project History

EPA Region 10 is proposing to reissue the NPDES permit for Washington Beef, LLC. Washington Beef, LLC (hereafter referred to as Washington Beef) owns, operates, and has maintenance responsibility for a complex slaughterhouse facility located on the Reservation of the Confederated Tribes and Bands of the Yakama Nation, in Toppenish, Washington. The facility includes a live animal holding area, beef cattle slaughter house with associated facilities for rendering, meat processing, hide brining, blood drying, and boxed meat warehouse and shipping. Effluent discharge from the facility will be to Wanity Slough or Spencer Lateral. Additionally, this facility is capable of land applying its effluent, and has approximately 40 acres available for effluent land application. EPA does not have legal authority to regulate land application of effluent from the facility, and is not permitting the facility's land application practices therefore, land application will not be discussed in this document.

The facility has applied for authorization to discharge its processing and sanitary wastewater effluent to either Wanity Slough and/or Spencer Lateral through Outfalls 002 and/or 008 as specified below in Table 1 below.

TABLE 1: Effluent Discharge Locations

Outfall	Latitude/ Longitude	Description	Discharge Location	Current Average Flow	Projected Average Flow within 5 years
002	N 46° 22' 11.58" E 120° 19' 14.04"	process and sanitary wastewater	Wanity Slough	0.92 mgd	1.6 mgd
008	N 46° 22' 14.84" E 120° 19' 29.98"	process and sanitary wastewater	Spencer Lateral	0.92 mgd	1.6 mgd

The 2008 NPDES application states that the facility will gradually increase its processing capability, over the next five years, from the current 1,816,875 pounds per day live weight killed (LWK) to 2,080,000 pounds per day LWK. This increase in production will result in

an increase in effluent flow (i.e., flow will increase from 0.92 mgd to 1.6 mgd).

Under the consultation process in Section 7 of the Endangered Species Act (ESA), EPA is required to conduct a biological assessment to identify any potential impacts on endangered or threatened species resulting from major federal permitting activities and to consult with the U.S. Fish and Wildlife Service (FWS) and NOAA Fisheries if potential impacts are identified. This biological assessment identifies and characterizes the endangered or threatened species in the project area and assesses potential impacts to these species that may result from the discharges covered by the NPDES permits.

Section 2 of this document provides a general project description of the proposed permit for the facility. Section 3 of this document of this report describes the listed species and species of concern their ranges, habitats, and life histories. It also describes the reasons for declines of the species and identifies any existing recovery plans. Section 4 of this document describes the environmental baseline including baseline species-specific habitat parameters. Section 5 of this document discusses possible effects of the action on the listed species. Section 6 of this document provides conclusions regarding the effect of the project on the species. Section 7 of this document contains a list of references cited in the document.

EPA has determined that the permitted discharges will have **No Effect** on the Mid Columbia bull trout, and Utes' Ladies Tresses, and are **Not Likely to Adversely Affect the Mid Columbia steelhead**. The permit may be modified during its 5-year term if new information on the effects of the discharges on listed species becomes available.

II. Description of Action and Action Area

A. Discussion of Federal Action and Legal Authority

Section 301(a) of the Clean Water Act (CWA) prohibits the discharge of pollutants except in compliance with CWA Section 402, among other sections. Section 402 authorizes the issuance of NPDES permits for direct dischargers (e.g., publicly owned treatment works or existing or new industrial facilities that discharge process wastewaters from any point source into waters of the United States). The NPDES permit is developed to control the discharge using technology-based limits (referred to as "effluent limitation guidelines" or ELGs) and/or water quality-based effluent limits (WQBELs).

EPA establishes ELGs to require a minimum level of process control and treatment for some categories of industrial point sources. They are based on the demonstrated performance of model process and treatment technologies that are within the economic means of an industrial category. Although ELGs are based on the performance of model process and treatment technologies, EPA does not mandate the use of specific technologies; therefore, dischargers are free to use any available control technique to meet the limitations.

In general, water bodies have water quality standards that are established by the states or EPA to maintain and protect designated uses of the water (e.g., aquatic life, public water supply, primary contact recreation). The application of the ELGs may result in pollutant discharges that cause exceedances of the water quality standards of the receiving waters. In such cases, the CWA and federal guidelines require the development of more stringent WQBELs for the pollutant to ensure that the water quality standards are met in the water body. Additionally, even if a pollutant parameter is not limited in the ELGs, pollutant discharges may still be subject to WQBELs if it is found they are necessary to protect water quality standards. EPA develops WQBELs in accordance with EPA guidance (EPA, 1991).

In cases where the receiving water body does not meet a water quality standard, States and Tribes can use the total maximum daily load (TMDL) process as one way of quantifying the allowable pollutant loadings in receiving waters, based on the relationship between pollutant sources and in-stream water quality standards. A TMDL will provide a wasteload allocation for each point source discharge and load allocations for nonpoint discharges. A WQBEL would be developed for a point source discharge consistent with the wasteload allocation in an EPA approved TMDL.

B. Description of the Project Purpose and Objectives

NPDES permits can include both technology-based and water quality-based permit limits. Washington Beef is a complex slaughterhouse for which national effluent limitations guidelines (ELGs) have been promulgated[1]. Federal regulations at 40 CFR 432.22 and 432.23 (Subpart B - Complex Slaughterhouse Subcategory) are applicable to discharges resulting from the production of red meat carcasses, in whole or part, by complex slaughterhouses and specify standards of performance for 5-day Biochemical Oxygen Demand (BOD_5), total suspended solids (TSS), oil and grease, ammonia (as N), total nitrogen, and fecal coliform bacteria. Daily and monthly average limits are specified for BOD_5, TSS and oil and grease based on pounds per 1000 pounds live weight killed[2] (LWK).

EPA may find that by analyzing the effect of a discharge on the receiving water, that ELGs are not sufficiently stringent to meet water quality standards. Additionally, ELGs do not exist for all pollutants that may be discharged by a facility. In such cases, the Clean Water Act at 301(b)(1)(C) and EPA regulations at 40 CFR 122.44(d)(1) require the development of WQBELs to ensure that water quality standards are met.

C. Project Description

EPA Region 10 is proposing to reissue the NPDES permits for Washington Beef. Discharges from this facility contain the following pollutants: total suspended solids, 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), oil and grease (O & G), bacteria, total ammonia, turbidity, total nitrogen, temperature.

1 ELGs for this industrial category were promulgated on September 8, 2004 (see 69 FR 54476).
2 Live weight kill is defined in 40 CFR 432.2 and means the total weight of animals slaughtered.

A brief description of the facility and the effluent limitations contained in the permit is provided below:

Washington Beef owns, operates, and has maintenance responsibility for a complex slaughterhouse facility located on the Reservation of the Confederated Tribes and Bands of the Yakama Nation, in Toppenish, Washington. The facility includes a live animal holding area, beef cattle slaughter house with associated facilities for rendering, meat processing, hide brining, blood drying, and boxed meat warehouse and shipping. Effluent discharge from the facility will go to either Wanity Slough or Spencer Lateral. Additionally, this facility is capable of land applying its effluent, and has approximately 40 acres available for effluent land application.

The facility currently provides the following treatment for its processing wastes: rotary drum, dissolved air floatation, anaerobic lagoon, barrier basin, sequential batch reactor, surge basin. From the surge basin the effluent may be routed to a dissolved air floatation unit, then to an ultraviolet disinfection system, and finally to Outfall 002 which discharges to Wanity Slough (Outfall 002 has a diffuser to facilitate effluent mixing in Wanity Slough); alternatively, the effluent from the surge basin may be routed to a series of 3 artificial wetlands and it is then either land applied or discharged through Outfall 008 which discharges to Spencer Lateral (Outfall 008 does not have a diffuser). The facility also treats 0.04 mgd of sanitary wastewater. The treatment train for this waste stream is identical to the treatment described above for process water except this waste stream is not sent through the rotary drum and the dissolved air floatation treatment steps.

The table below presents the limits for the discharge to Wanity Slough contained in the proposed permit.

Effluent Limitations for Discharge to Wanity Slough

Parameter	Units	Average Monthly Limit	Maximum Daily Limit	Minimum Daily Limit	Range
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	--	--
	lbs/day	400.3	600.5	--	--
Total Suspended Solids (TSS)	mg/L	39	78	--	--
	lbs/day	520	1040	--	--
Oil and Grease	mg/L	10	15	--	--
	lbs/day	133.4	200.2	--	--
E. Coli Bacteria	# / 100 ml	100	see note 1	--	--
pH	s.u.	---	---	--	6.5 - 8.5
Dissolved Oxygen	mg/L	---	---	6.8	---
Turbidity	NTU	12.4	50.3	--	--
Total Nitrogen	mg/L	134	194	--	--
	lbs/day	1788	2587.5	--	--
Total Ammonia as N	mg/L	2.9	11.2	--	--
	lbs/day	38.7	149.5	--	--

1. No more than 10% of all samples collected for the month shall exceed 200 colonies/100 ml.

The table below presents the limits for the discharge to Spencer Lateral contained in the proposed permit.

Effluent Limitations for discharge to Spencer Lateral

Parameter	Units	Average Monthly Limit	Maximum Daily Limit	Minimum Daily Limit	Range
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	--	--
	lbs/day	400.3	600.5	--	--
Total Suspended Solids (TSS)	mg/L	39	78	--	--
	lbs/day	520	1040	--	--
Oil and Grease	mg/L	10	15	--	--
	lbs/day	133.4	200.2	--	--
E. Coli Bacteria	# / 100 ml	100	see note 1	--	--
pH	s.u.	---	---	--	6.5 - 8.5
Dissolved Oxygen	mg/L	---	---	6.8	---
Turbidity	NTU	12.4	44.2	--	--
Total Nitrogen	mg/L	134	194	--	--
	lbs/day	1788	2587.5	--	--
Total Ammonia as N	mg/L	2.3	9.1	--	--
	lbs/day	30.7	121.4	--	--

1. No more than 10% of all samples collected for the month shall exceed 200 colonies/100 ml.

D. Known Ongoing and Previous Projects in the Action Area

The Yakima River basin is located in south central Washington, draining approximately 15,900 square kilometers (6,155 square miles) into the Columbia River. The basin occupies most of Yakima and Kittitas counties, about half of Benton County and a small portion of Klickitat County. It is bounded on the west by the Cascade Range, on the north by the Wenatchee Mountains, on the east by the Rattlesnake Hills, and on the south by the Horse Heaven Hills. The entire basin lies within areas either ceded to the United States by the Yakama Nation or areas reserved for their use. The Yakima River basin lands are some of the most intensively irrigated in the United States. Other major land use activities include livestock operations (grazing, feedlots, dairies) and timber production/harvest.

The Yakima River flows southeasterly for about 344 kilometers (214 miles) from its headwaters in the Cascade Range to its confluence with the Columbia River near Richland, Washington. Altitudes in the basin range from 2,496 meters (8,184 feet) above mean sea level in the Cascades to 104 meters (340 feet) at the confluence. The Naches River is the largest tributary of the Yakima River, flowing 72 kilometers (45 miles) to its confluence at the City of Yakima. The Naches River forms at the confluence of the Bumping, American, and the Little Naches rivers. Its' major tributaries are Rattlesnake Creek and the Tieton River. Major tributaries of the upper

Yakima River (above the Naches confluence) include the Kachess, Cle Elum, and Teanaway rivers. The major tributaries of the lower Yakima River include Toppenish and Satus Creeks; both originate on the Yakama Indian Reservation, and Ahtanum Creek. Numerous small streams contribute seasonal flows to rivers within the basin.

There are several small municipal water treatment facilities near the Washington Beef facility. Additionally, there are five major storage reservoirs in the Yakima River basin: Keechelus, Kachess, and Cle Elum reservoirs which are located in the upper Yakima Basin, and Bumping and Rimrock Reservoirs which are located in the upper Naches River. These reservoirs have a total storage capacity of about 1 million acre-feet. In addition, there are numerous irrigation diversion dams. These features have severely altered the natural hydrographs of the rivers in the Yakima River basin. These altered hydrographs are now characterized by much lower than normal winter flows, as water is stored for the next years' use, and much higher than normal summer flows, as water is delivered in-channel to various diversion points for irrigation. During the run-off period in the spring, high flows still occur during most years but the magnitude of these flows is greatly reduced relative to what would have occurred naturally. During the winter and early spring, high flows may also occur when water is released from the reservoirs during flood control operations. The annual estimated unregulated runoff of the Yakima River at the Parker Gauging Station (in the lower river) averages 3.5 million acre-feet. The average annual irrigation diversion requirements are approximately 2.2 million acre-feet. Approximately 375,000 acre-feet returns as irrigation return flow in a normal water year.

E. Description of Action Area

The Washington Beef facility is located in central Washington on the Yakama Indian Reservation, southwest of the Toppenish, WA city limits. The facility can discharge either to Wanity Slough, or Spencer Lateral.

Wanity Slough is a natural water body, near Parker, Washington (Parker is approximately 10 miles north of Toppenish, Washington). Wanity Slough flows south, entering the Marion Drain which then flows into the Yakima River just south of Granger, Washington. Wanity Slough has municipal discharges as well as numerous agricultural discharges along its length.

Spencer Lateral is part of the Wapato Irrigation Project (WIP). A gate in Spencer Lateral may be opened by WIP employees. When the gate is open, flow from Spencer Lateral goes to Spencer Drain which then flows to Wanity Slough, a water of the U.S. Additionally, at the end of Spencer Lateral the water drains to Harris Drain which then flows to the Yakima River, a water of the U.S.

Typically, water in the upper portions of the Yakima basin is high quality water, but the quality degrades downstream. In several reaches of the main stem Yakima River and its tributaries, water quality does not comply with one or more Washington State water quality criteria, either seasonally or on a year-round basis. When a waterbody fails to meet State water standards it is placed on the State 303(d) list and targeted for a Total Maximum Daily Load (TMDL). The

303(d) list is prepared every 4 years by the State of Washington and submitted to U.S. Environmental Protection Agency (EPA) in compliance with the Federal Clean Water Act. The list identifies waterbodies that are known to exceed State water quality standards. A TMDL must be completed for all water bodies on the 303(d) list unless it can be determined that the original decision was incorrect, the problem no longer exists, or "natural conditions" are being met. TMDLs (or Water Cleanup Plans) are designed to address a variety of pollution problems and provide remedies to bring the water back into compliance with standards and meet its highest targeted use.

Many river and stream reaches within the Yakima basin are included on Washington's 303(d) list. Pollutants include turbidity, pesticides, low dissolved oxygen, elevated temperatures, metals, fecal coliform bacteria, and pH. Because Washington does not have authority on rivers and streams on the Yakama Reservation there are no streams, within the reservation, listed on the 303(d) list. However, the water from Wanity Slough and Spencer Later comes directly from the Lower Yakima River, and is subject to agricultural runoff, so these streams likely have the same issues as Washington State waters.

III. Status of Species and Critical Habitat

A. Species Lists

The following federally-listed endangered and threatened species may be located in the vicinity of the discharges. This list was developed from the *Species List* found on the U.S. Fish and Wildlife Services – Species Report at: http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=WA&status=listed.

Endangered Species: None

Threatened Species: Middle Columbia River steelhead (*O. mykiss*)
Bull Trout (*Salvelinus confluentus*)
Ute Ladies'-tresses (*Spiranthes diluvialis*)

B. Description of Species

1. Salmonids

*a. Middle Columbia River steelhead (*O. mykiss*) - Threatened*

Steelhead, General Information

The steelhead is the anadromous form of the rainbow trout (*O. mykiss*), which occurs in two subspecies, *O. mykiss irideus* and *O. mykiss gaidneri*. Whereas stream-resident rainbow

trout may complete their life cycle in a limited area of a small stream and attain a length of only 8 inches or so, steelhead may spend half their lives at sea, roaming for thousands of miles in the North Pacific Ocean. Steelhead return to spawn at sizes ranging from about 24 inches and 5 pounds to about 36 to 40 inches or more and 20 pounds or more (Behnke 2002).

Biologically, steelhead can be divided into two reproductive ecotypes, based on their state of sexual maturity at the time of river entry. These two ecotypes are termed "stream-maturing" and "ocean-maturing". Stream-maturing steelhead enter fresh water in a sexually immature condition and require from several months to a year to mature and spawn. These fish are often referred to as "summer run" steelhead. Ocean-maturing steelhead enter fresh water with well-developed gonads and spawn shortly after river entry. These fish are commonly referred to as "winter-run" steelhead. In the Columbia River basin, essentially all steelhead that return to streams east of the Cascade Mountains are stream maturing. Ocean-maturing fish are the predominate ecotype in coastal streams and lower Columbia River tributaries (ACOE 2000b).

All but one of the *O. m. gairdneri* steelhead populations migrating east of the Cascade Range are characterized as summer-run steelhead (entering the Columbia River from May into the early fall in October); the one exception is a winter-run steelhead spawning in Fifteenmile Creek, which drains the eastern side of the Cascades in Oregon. The genetic traits of Fifteenmile Creel steelhead make it intermediate between the subspecies *irideus* and *gairdneri*. Steelhead of the subspecies *irideus* are mainly winter-run fish, but *irideus* also has summer runs. Considering the entire range of *irideus* from California to Alaska, steelhead can be found entering one river or another in every month of the year (Behnke 2002).

Native steelhead in California generally spawn earlier than those to the north with spawning beginning in December. Washington populations begin spawning in February or March. Native steelhead spawning in Oregon and Idaho is not well documented. In the Clackamas River in Oregon, winter-run steelhead spawning begins in April and continues into June. In the Washougal River, Washington, summer-run steelhead spawn from March into June whereas summer run fish in the Kalama River, Washington spawn from January through April. Among inland steelhead, Columbia River populations from tributaries upstream of the Yakima River spawn later than most downstream populations.

Depending on water temperature, fertilized steelhead eggs may incubate in redds for 1.5 to 4 months before hatching as "alevins". Following yolk sac absorption, young juveniles or "fry" emerge from the gravel and begin active feeding. Juveniles rear in fresh water for 1 to 4 years, then migrate to the ocean as smolts. Downstream migration of wild steelhead smolts in the lower Columbia River begins in April, peaks in mid-May and is essentially complete by the end of June (ACOE 2000b). Previous studies of the timing and duration of steelhead downstream migration indicate that they typically move quickly through the lower Columbia River estuary with an average daily movement of about 21 kilometers (ACOE 2000).

Juvenile steelhead generally spend two years in freshwater before smolting and migrating to the ocean at lengths of about 6 to 8 inches. Most steelhead return to their natal rivers to spawn after spending 15 to 30 months in the ocean. Unlike Pacific salmon, steelhead do not all die soon after spawning, but the rate of survival to repeat spawning is generally low - about 10 percent (Behnke 2002).

Middle Columbia River Steelhead ESU

The Middle Columbia River (MCR) steelhead ESU was listed as threatened on March 25, 1999 (64FR14517).

Geographic Boundaries and Spatial Distribution

The following summary is taken from NMFS (2000). The MCR ESU occupies the Columbia River basin from above the Wind River in Washington and the Hood River in Oregon and continues upstream to include the Yakima River, Washington. The region includes some of the driest areas of the Pacific Northwest, generally receiving less than 40 cm of precipitation annually (Jackson 1993). Summer steelhead are widespread throughout the ESU; winter steelhead occur in Mosier, Chenowith, Mill, and Fifteenmile Creeks, Oregon, and in the Klickitat and White Salmon rivers, Washington. The John Day River probably represents the largest native, natural spawning stock of steelhead in the region.

Critical Habitat

The critical habitat for MCR steelhead was initially designated on February 16, 2000 (65FR7764). The initial designated habitat consisted of all river reaches accessible to listed steelhead in Columbia River tributaries except the Snake River between Mosier Creek in Oregon and the Yakima River in Washington (inclusive). Also included were river reaches and estuarine areas in the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to the confluence with the Snake River. Excluded were areas above the Condit and Pelton Dams and areas above longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). The final critical habitat was designated 09/02/05 (70 FR 52630).

Historical Information

The following summary is taken from NMFS (2000). Estimates of historical (pre-1960s) abundance specific to this ESU are available for the Yakima River, which has an estimated run size of 100,000 (WDF et al. 1993). Assuming comparable run sizes for other drainage areas in this ESU, the total historical run size may have exceeded 300,000 steelhead.

Life History

Life history information for this ESU has been summarized by NMFS (2000). Most fish in this ESU smolt at 2 years and spend 1 to 2 years in salt water before reentering

freshwater, where they may remain up to a year before spawning (Howell et al. 1985, BPA 1992). All steelhead upstream of The Dalles Dam are summer-run (Schreck et al. 1986, Reisenbichler et al. 1992, Chapman et al. 1994). The Klickitat River, however, produces both summer and winter steelhead, and age-2-ocean steelhead dominate the summer steelhead, whereas most other rivers in the region produce about equal numbers of both age-1- and 2-ocean fish. A non-anadromous form co-occurs with the anadromous form in this ESU; information suggests that the two forms may not be isolated reproductively, except where barriers are involved.

Habitat and Hydrology

Habitat degradation due to water diversions and impacts form live stock grazing are issues throughout this ESU.

Hatchery Influence

Total steelhead abundance in the ESU appears to have been increasing recently, but the majority of natural stocks for which we have data within this ESU have been declining, including those in the John Day River, which is the largest producer of wild, natural steelhead. There is concern about the pervasive opportunity for genetic introgression from hatchery stocks within the ESU. There is widespread production of hatchery steelhead within this ESU, but it is largely based on within-basin stocks (NMFS 1996). (NMFS 2000) has summarized the influence of hatchery operations on the MCR steelhead ESU. Recent and continued increases in the proportion of stray hatchery steelhead in the Deschutes River basin is a major concern. The ODFW and the Confederated Tribes of the Warm Springs Reservation of Oregon estimate that 60 percent to 80 percent of the naturally spawning population consists of strays. Although the reproductive success of stray hatchery fish has not been evaluated, their numbers are so high that major genetic and ecological effects on natural populations are possible (Busby et al. 1999). The negative effects of any interbreeding between stray and native steelhead will be exacerbated if the stray steelhead originated in geographically distant river basins, especially if the river basins are in different ESUs.

Population Trends and Risks

Current population sizes are substantially lower than historic levels, especially in the rivers with the largest steelhead runs in the ESU, the John Day, Deschutes, and Yakima Rivers. At least two extinctions of native steelhead runs in the ESU have occurred (the Crooked and Metolius Rivers, both in the Deschutes River Basin). For the MCR steelhead ESU as a whole, NMFS estimates that the median population growth rate (lambda) over the base period (1990-1998) ranges from 0.88 to 0.75, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin. In 2002, the count of Bonneville Dam steelhead totaled 481,036 and exceeded all counts recorded at Bonneville Dam since 1938, except the 2001 total which was 633,464. Of the total return in 2002, 143,032 were considered wild steelhead (FPC 2003).

*b. Bull Trout (*Salvelinus confluentus*) - Threatened*

The bull trout (Salvelinus confluentus)is a member of the char family (*Salvelinus*) and is represented by different life history forms, including river-resident populations, lacustrine populations, and sea-run populations. The latter appear to be relatively rare (Behnke 2002).

The stream-resident form is subdivided into two basic types: one lives its entire life in small headwater streams, often isolated above waterfalls; the other typically spawns in smaller tributary streams but spends most of its time foraging in larger rivers. This second form, often called "fluvial," occurs only in relatively larger river basins that contain a network of headwater spawning tributaries connected to larger riverine habitat, allowing bull trout to undertake movements of more than 100 miles (Behnke 2002).

The northernmost distribution of bull trout occurs in the headwaters of the Yukon and Mackenzie River basins of Alaska and Canada. In Pacific Coast drainages, they occur in rivers of British Columbia southward to around Puget Sound. Bull trout are not native to Vancouver Island or other islands off the Pacific Coast of and Canada and southern Alaska. Native distribution includes the upper parts of the North and South Saskatchewan River drainages of Alberta, Canada (Behnke 2002).

To the south, a few bull trout populations persist in cold headwater tributary streams in the Upper Klamath Lake basin of Oregon. The southernmost population of bull trout once occurred in the McCloud River of California. However, those bull trout declined rapidly in the 1940s after construction of Shasta Dam (Behnke 2002).

Typically, species are listed throughout their entire range or, coterminously (i.e. in the lower 48 states). To allow more flexibility, especially for a wide-ranging species such as the bull trout, the Service has a policy which allows listing of a distinct population segment of that species' range, rather than its entire range. A distinct population segment is a discrete population that is identified as significant based on one or more of three criteria. The bull trout was initially listed as three separate Distinct Population Units (DPSs) (63 FR 31647, 64 FR 17110). Eventually, the FWS identified five distinct population segments: Coastal-Puget Sound; St. Mary-Belly River; Columbia River; Klamath River; and Jarbidge River. The listing of the St. Mary-Belly and Coastal-Puget Sound populations completes the listing of all five populations of bull trout in the United States, resulting in a coterminous listing. Now that all five population segments are listed, the FWS decided to list the species conterminously to avoid any possible confusion about which of these populations is listed. The final listing rule for the United States coterminous population of the bull trout discusses the consolidation of these DPSs, plus two other population segments, into one listed taxon and the application of the jeopardy standard under section 7 of the ESA relative to this species (64 FR 58930). However, they retain recognition of the population segments as interim recovery units to more effectively manage and recover this species. Because each population faces different challenges, the FWS will manage each separately based on the conservation needs of the

individual population. The terminology of DPS has been retained for this discussion.

Bull Trout - Columbia Basin ESU

The Columbia River (CR) bull trout DPSs were listed as threatened on June 10, 1998. The following information on bull trout was taken from 63 FR 31647-31674.

Geographic Boundaries and Spatial Distribution

The Columbia River population segment is from the northwestern United States and British Columbia, Canada. This population segment is comprised of 386 bull trout populations in Idaho, Montana, Oregon, and Washington with additional populations in British Columbia. The Columbia River population segment includes the entire Columbia River basin and all its tributaries, excluding the isolated bull trout populations found in the Jarbridge River in Nevada. Bull trout populations within the Columbia River population segment have declined from historic levels and are generally considered to be isolated and remnant.

Critical Habitat

Critical habitat has been designated for Columbia River Basin Population of bull trout effective 10/26/05 (70 FR56212).

Bull trout are seldom found in waters where temperatures are warmer than 15°C to 17.8°C. Besides very cold water, bull trout require stable stream channels, clean spawning gravel, complex and diverse cover, and unblocked migration routes. Because bull trout life history patterns include migratory and resident forms, both adults and juveniles are present in the streams throughout the year. Bull trout adults may begin to migrate from feeding to spawning grounds in the spring and migrate slowly throughout the summer (Pratt 1992). Spawning usually begins in the fall. Bull trout eggs incubate from 100 to 145 days, after which the alevins require 65 to 90 days to absorb their yolk sacs (Pratt 1992). They remain within the interstices of the streambed as fry for up to three weeks before filling their air bladder, reaching lengths of 25-28 mm, and emerging from the streambed in late April (McPhail and Murray 1979, Pratt 1992).

2. Plants

*a. Utes ladies'-tresses (*Spiranthes diluvialis*) - Threatened*

Ute ladies'- tresses is a perennial terrestrial orchid (family Orchidaceae). This species generally inhabits riverbanks where inundation occurs infrequently. Ute ladies' tresses is endemic to moist soils in mesic or wet meadows near springs, lakes, and perennial streams. The elevation range of known occurrences is 4,000 to 7,000 feet. Generally, this species occurs in areas where the vegetation is relatively open (e.g. grass dominated sites), but some populations are found in riparian woodlands. This orchid is found in several areas of the interior western United States. This species has only recently been recorded on a few sites in central Washington, where it can occur at relatively low elevations (down to roughly 700 feet in Chelan County). The primary threats to the

species are urban development and watershed alterations in riparian and wetland habitats and invasions of exotic plants species such as purple loosestrife, whitetop and reed canary grass. The reissuance of the NPDES permit will affect instream water quality, but it will not have any affect on areas where this species is likely to occur.

IV. Environmental Baseline

A. Description of Action Area

The facility is located in southcentral Washington southwest of Toppenish, in the Lower Yakima Basin. The facility can discharge to either Wanity Slough or Spencer Lateral.

B. Description of Environmental Baseline

The following description of the baseline is taken from *Interim Comprehensive Operating Plan for the Yakima Project, Washington* (U.S. Department of Interior, U.S. Bureau of Reclamation, November 2002). Typically, water quality in the upper portions of the Yakima basin is very good, but degrades downstream. In several reaches of the main stem Yakima River and its tributaries, water quality does not comply with one or more Washington State water quality criteria[3], either seasonally or on a year-round basis. When a waterbody fails to meet State water quality standards it is placed on the State 303(d) list and targeted for a Total Maximum Daily Load (TMDL). A TMDL must be completed for all water bodies on the 303(d) list unless it can be determined that the original decision was incorrect, the problem no longer exists, or "natural conditions" are being met. TMDLs (or Water Cleanup Plans) are designed to address a variety of pollution problems and provide remedies to bring the water back into compliance with water quality standards and meet its highest targeted use. Currently, the Yakama Nation does not have Clean Water Act authority and therefore does not develop 303(d) lists or TMDLs for waters on its reservation.

Many river and stream reaches within the Yakima basin that are under the State of Washington's jurisdiction are included on Washington's 303(d) list. Pollutants include turbidity, pesticides, low dissolved oxygen, elevated temperatures, metals, fecal coliform bacteria, and pH. Spencer Lateral and Wanity Slough, on the Yakama Reservation, are likely to be similar to the Washington State waters described below because they are subject to the same circumstances that result in the Washington impairments (e.g., agriculture, agricultural return flows, dams, municipal wastewater treatment plants). A brief description of each of these pollutants of concern is discussed below.

Sediment

Significant suspended sediment loads have been associated with the discharge of agricultural return flows to the river during the irrigation season. The prevalence of suspended sediment from eroded farm soils has long been recognized as a problem in the

3 The effluent limitations in the NPDES Permit were based on the Yakama Nation's water quality standards. These standards are similar to the State of Washington's.

tributaries and main stem of the Yakima River where furrow and flood irrigation are employed. In the lower basin, high sediment levels have been correlated with high levels of turbidity and high levels of bacteria, which exceed water quality standards during the irrigation season. This is particularly apparent in the reaches below the City of Yakima. Suspended sediment has been directly correlated with the presence of the banned pesticide DDT in some of the drains and in the main stem Yakima. DDT and its breakdown products have been found in fish tissue well in excess of recommended human health criteria. It is suspected that the agricultural drain systems also may be associated with the transport of other pesticides, fecal coliform bacteria, and nutrients such as phosphorus and nitrites to the Yakima River. The *Lower Yakima River Suspended Sediment and DDT TMDL* is designed to reduce suspended sediments, improve water clarity, and reduce pesticides (most notably DDT) in the river. Turbidity standards, which are being used as a surrogate for sediment loads, have been set for the irrigation returns and tributaries discharging to the lower Yakima River under Washington's jurisdiction. These enforceable limits, set in 5-year increments over the next 15 years, will improve water clarity and reduce the amount of sediment and pesticides entering the river. The primary implementation activities of this TMDL will be to improve irrigation water management practices and reduce tailwater runoff. To accomplish these goals, growers are being encouraged to convert furrow and flood irrigated fields to sprinkler and drip irrigation or to install facilities to remove sediment from return water. Conversion to sprinkler and drip systems will essentially eliminate surface water runoff, its associated erosion, and suspended sediment. Water delivered to crops in this manner can be much more precisely and efficiently applied. The Roza-Sunnyside Board of Joint Control developed and is implementing policy that will require grower observance of the TMDL targets. The policies are enforced by the potential reduction or denial of service by the districts to growers who refuse to come into water quality compliance.

Temperature
Exceeding temperature criteria is the most prevalent pollutant parameter on the1998 State 303(d) list for the Yakima basin. Of the 180 listings in the Yakima basin on the 1998 list, 73 are for failure to meet temperature criteria. The highest temperatures have occurred in the lower portion of the basin, although there are numerous 303(d) listings in the upper basin tributaries. Water is usually cooler in the upper basin, but warms as it flows to the lower basin. Human activities have dramatically altered the Yakima River system in ways that may influence water temperature, such as changes to channel morphology; removal of riparian cover; and disruption of floodplain function, hyporheic flow, and flow regimes.

Fecal Coliform Bacteria
There are 18 303(d) listings for FC in the Yakima basin. Fecal coliform (FC) contamination is found periodically in several reaches of the Yakima River and regularly in several tributaries. These pollution problems are often noted downstream of areas where livestock operations are prevalent or failing septic systems are suspected. Activities that will reduce FC include a State of Washington sediment TMDL that targets the reduction of surface water runoff from agricultural lands; recent dairy legislation including periodic compliance inspections; local irrigation district policies requiring the exclusion of livestock from drain and watercourses; and increased monitoring to identify failing septic systems. A Granger Drain FC TMDL was developed and is being implemented to specifically reduce bacterial loadings to the Granger Drain, a tributary of the lower Yakima River through best management practices directed at seducing the runoff of suspended sediment from irrigated agricultural lands.

Pesticides and Other Organic Compounds
There are 46 listings for pesticides and organic compounds on the 1998 State 303(d) list in the Yakima basin. Pesticides and other organic compounds continue to have a significant presence in the Yakima River system. During a 1987-91 study, USGS scientists detected more than 110 different organic compounds in Yakima River basin streams. These findings included pesticides applied to agricultural fields during that period, persistent pesticides used historically (such as DDT), and organic compounds associated with industrial and urban activities. Sampling and analysis by USGS in 1999 and 2000, for a large suite of pesticides and chemicals will yield more information on the prevalence of these pollutants.

Metals
There are 16 listings for metals in the Yakima basin on the 1998 303(d) list, including arsenic, silver, mercury, cadmium, and copper. The findings of 1999 sampling and analysis by Washington Department of Ecology personnel will likely result in the removal of several of these listings in the upper Yakima basin.

Nutrients
Nutrients include nitrate/nitrite nitrogen, ammonia nitrogen, and phosphorus. Giffin Lake, which receives return flows from agriculture, is 303(d) listed for phosphorus. Two

waterbody segments, Selah Ditch and Granger Drain, are listed for ammonia nitrogen.

Dissolved Oxygen and pH

There are nine dissolved oxygen (DO) listings in the Yakima basin; all occur in areas heavily influenced by agricultural return flows. There are also four listings for pH. Both DO and pH have a tendency to react to other changes in the water quality. DO may fall out of compliance with standards as water temperature increases, and as decomposing compounds that require oxygen (biological oxygen demand) are added to the waterbody. pH may rise above criteria levels as water levels drop and aquatic plants thrive, changing the chemistry of the waterbody.

Instream Flow

Eight stream segments are listed for insufficient instream flow in the Yakima basin. Of these, two are in the main stem of the Yakima River itself. While there are no State water quality standards for low instream flows, insufficient flow can interfere with many of the characteristic uses and influence other pollutant criteria in a waterbody.

C. Status of ESA Species in the Action Area

a. Middle Columbia River Bull trout in the Action Area

A review of the *Bull Trout (Salvelinius confluentus) Draft Recovery Plan* (USFWS 2002) found that the Ahtanum local population is the only population near the action area.

The Ahtanum Creek is 15-20 miles north of the action area. This population originated from native fluvial or resident life history forms that occurred throughout the Yakima River. Currently, they are seasonally isolate (from July through October) from fish in the Yakima River due to thermal barriers and total dewatering of the lower Ahtanum Creek below (river mile 19.7) by irrigation withdrawals. Bull trout have been encountered below this diversion during mid April when water is available.

Although bull trout are present in the mainstem Ahtanum Creek they are probably more abundant in the upper portion of the drainage, particularly in the North, Middle, and South forks where habitat conditions are more favorable. The Ahtanum Creek local population most likely consists of both resident and fluvial forms. Removal of low water migration barriers within the system would allow for a full expression of the fluvial life history form.

b. Middle Columbia River Steelhead in Action Area

In correspondence dated October 24, 2002, NOAA-Fisheries indicated that Wanity Slough and Marion Drain both support small numbers of the Middle Columbia River

steelhead (*Onchorynchus mykiss*).

c. *Ute Ladies'-Tresses in Action Area*

As stated previously, Ute ladies'-tresses is endemic to moist soils in mesic or wet meadows near springs, lakes, and perennial streams. This action addresses the effluent discharge to Wanity Slough and Spencer Lateral. The action will affect in-stream water quality, but will not impact those areas where the orchid is likely to be found.

V. Effects of the Permits on Listed Species

The primary actions that are evaluated in this BE are the effluent limitations that, if applied, have the potential to influence BOD, ammonia, turbidity, pH, TSS, dissolve oxygen and bacteria levels in Wanity Slough and Spencer Lateral.

The description of effects of the discharge permit is limited to the effects on the Middle Columbia steelhead. EPA has determined that bull trout are not in the area of the discharge, therefore this species is assigned a **NO EFFECT** determination and will not be addressed further in this BE. Additionally, EPA has determined that Ute ladies'-tresses will not be affect by this action as the issuance of the permit will only impact the stream itself, and this species is not found within streams. Additionally, the proposed effluent limitations are intended to restore water quality to protect sensitive native salmonids. If these limitations are protective of salmonid populations, other listed species will likely not be limited by this action. This plant species is assigned a **NO EFFECT** determination and will not be addressed further in this BE.

A. Direct Effects of Pollutants on Middle Columbia Steelhead

EPA has evaluated the discharges likely to result from compliance with the permit limits for this permit. Based on this evaluation, EPA has determined that issuance of this permit is **NOT LIKELY TO ADVERSELY AFFECT** Middle Columbia Steelhead. The discussion below outlines this evaluation for each pollutant.

1. Total suspended solids/turbidity

Total suspended solids (TSS) includes settleable and suspended sediment and organic solids in a wastewater discharge. As such, TSS provides a surrogate for sediment in the discharge that may have the potential to impact the listed aquatic species. Sediment can impact spawning habitat by physically covering habitat, adding to the nutrient loading in the system, and by creating hypoxic or anoxic conditions.

As stated previously, significant suspended sediment loads have been associated with the discharge of agricultural return flows to the river during the irrigation season. The prevalence of suspended sediment from eroded farm soils has long been recognized as a problem in the tributaries and main stem of the Yakima River where furrow and flood

irrigation are employed. In the lower basin, high sediment levels have been correlated with high levels of turbidity and high levels of bacteria, which exceed water quality standards during the irrigation season.

The allowable TSS limit in the draft permit is dependent on the production level at the facility. However, the average monthly allowable discharge for is 39 mg/L (530 lbs/day). This limit is based on the ELGs because there are no water quality criteria for TSS. However, water quality criteria are available for turbidity for the protection of aquatic life. The allowable turbidity concentration is 12.4 NTU as an average monthly limit, which is 5 NTU above background, as required by the Tribes water quality standards. This level is intended to be protective of aquatic life.

The primary source of sediment loading is from non-point agricultural sources, and the loading attributed to this facility is comparatively small. EPA has determined that the permit limits for TSS/turbidity are **not likely to adversely affect** Mid Columbia steelhead.

2. Oil and Grease

Nonpetroleum oils may occur at four levels in the aquatic environment: (a) floating on the surface, (b) emulsified in the water column, (c) solubilized, and (d) settled on the bottom as a sludge. Oils of any kind can cause (a) drowning of water fowl because of loss of buoyancy, exposure because of loss of insulating capacity of feathers, and starvation and vulnerability to predators because of lack of mobility; (b) lethal effects on fish by coating the epithelial surfaces of gills, thus preventing respiration; (c) potential fish kills resulting from biochemical oxygen demand; (d) asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom; and (e) adverse aesthetic effects of fouled shorelines and beaches. Oils of animals or vegetables are generally chemically non-toxic to humans and aquatic life, however, floating sheens of such oils can result in deleterious environmental effects as described above Thus EPA recommended that surface waters be virtually free from floating nonpetroleum oils of vegetable or animal origin (*Quality Criteria for Water, 1986*, USEPA, May 1, 1986).

The proposed permit contains a narrative conditions which states: "There shall be no discharge of floating solids, visible foam, or oily wastes which produce a sheen on the surface of the receiving water." EPA believes that this narrative requirement will be sufficient to ensure that the water is not negatively impacted from oil and grease, therefore, EPA has determined that the permit limit for oil and grease will have **no effect** Mid Columbia steelhead.

3. Dissolved Oxygen (D.O.)/Biochemical Oxygen Demand

Oxygen depletion is caused by decomposition of organic matter, and nitrification of ammonia, both measured as biochemical oxygen demand (BOD), and by algal respiration. Data from Wanity Slough indicates that the water quality criteria for dissolved oxygen are not met, making habitat unsuitable for the listed species.

On July 23, 1993 a stream survey of Wanity Slough was conducted to characterize the receiving water characteristics. In-stream vertically averaged concentrations of dissolved oxygen were between 9.09 mg/L and 11.2 mg/L throughout the stream study area. These values are between 102.2% saturation and 119.1% saturation. It was postulated that the supersaturated D.O. values were likely due to large populations of rooted aquatic plants, which were observed throughout the stream (see 1994 fact sheet for Washington Beef). While supersaturation (i.e., greater than 100% saturation) sounds good it can indicate problems such as excessive plant growth. Aquatic plants produce oxygen by photosynthesis during daylight hours but they also use oxygen for respiration. During the night or on heavily overcast days, respiration removes oxygen from the water while photosynthesis stops or drastically slows down. Oxygen depletion in the water can occur, during the night or heavily overcast days, because of heavy plant growth. These wide daily fluctuations of D.O. can be stressful to aquatic organisms.

Dissolved oxygen data was collected by the Yakama Nation Water Resources Planning Program from March 1990 through April 1991. This data was collected upstream of lateral 4, and just downstream of the Washington Beef facility. Dissolved oxygen levels varied from 6.2 mg/L to 11.4 mg/L but did not exhibit an explicit flow period or seasonal relationship. Based on this data, the stream is not meeting either Washington's or the Yakama Nation's water quality standards.

Dissolved oxygen is a characteristic of a water body that can be affected by several different parameters such as temperature, physical characteristics (stream velocities, percent sediments, etc.), nutrients, sunlight, ammonia, etc. Because any oxygen demanding material or nutrients can negatively affect dissolved oxygen, meeting the criterion without allowing some insignificant decrease in dissolved oxygen would require disallowing any discharge of any pollutant that would affect dissolved oxygen. In this case, EPA believes that this is unnecessarily restrictive and would lead to unnecessary and costly expenditures for the facility. Therefore, EPA is requiring the facility to control BOD and D.O. levels such that the discharge has a non-measureable effect on dissolved oxygen levels in the water. Washington State describes a measureable change in D.O. as a decrease in D.O. of 0.2 mg/L (see WAC 173-201A-320).

Because the discharge will have a non-measureable effect on D.O., EPA has determined that the permit limits for D.O. and biochemical oxygen demand are **not likely to adversely affect** Mid Columbia steelhead.

4. Ammonia

Discharges of ammonia may impact receiving waters in three ways: 1) by causing acute or chronic toxicity, 2) by causing dissolved oxygen depression due to nitrogenous BOD, and 3) by adding nitrogen, which may act as a nutrient, to the receiving water.

To evaluate potential for acute or chronic effects on steelhead, EPA developed the effluent limits using the EPA's most recent acute and chronic ammonia criteria. The

ammonia toxicity is both temperature and pH dependent, and the criteria were developed using the 95th percentile of the pH and temperature data collected from Wanity Slough. The ammonia concentrations in Wanity Slough, upstream of the facility, are less than the ammonia criteria which would result in acute or chronic effects on fish. A mixing zone of 20% of the low flow was used when determining the effluent limits to ensure that there is remaining assimilative capacity in the stream downstream of the facility, and to ensure that there is a zone of passage for aquatic life. No mixing zone was allowed for the discharge to Spencer Lateral, therefore, the discharge must meet the criteria before being discharged.

EPA has determined that the discharge of ammonia, from the facility, is **not likely to adversely affect** the Mid Columbia steelhead.

5. Bacteria

E. coli bacteria are indicators of potential human pathogens. There is no information to suggest that bacteria or the pathogens for which they are indicators pose any threat to the Mid Columbia steelhead, therefore, EPA has determined that the discharges of bacteria will have **no effect** on the Mid Columbia steelhead.

6. Temperature

Water temperature is a critical aspect of the freshwater habitat of Pacific Northwest salmon and trout. These fish, including those listed as threatened or endangered under the Endangered Species Act (ESA), need cold water to survive. Human-caused increases in river water temperatures have been identified as a factor in the decline of ESA-listed fish in the Pacific Northwest. State and Tribal temperature water quality standards can play an important role in helping to maintain and restore water temperatures to protect these salmon and trout and aid in their recovery. The *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards* (EPA-B-03-002) provides temperature recommendations for the protection of salmonids in the northwest. The guidance is a product of a three year collaborative effort involving the Idaho Department of Environmental Quality, Oregon Department of Environmental Quality, Washington Department of Ecology, NOAA Fisheries (formerly the National Marine Fisheries Service), U.S. Fish and Wildlife Service, Nez Perce Tribe, and the Columbia River Inter-Tribal Fish Commission. This guidance provides the following 7-day average summer maximum temperature recommendations for the protection of salmon and trout:

- 12°C (55°F) for Bull Trout Rearing - *generally in the upper portion of river basins*
- 16°C (61°F) for Salmon and Trout "Core" Juvenile Rearing - *generally in the mid to upper part of river basins*
- 18°C (64°) for Salmon and Trout Migration plus Non-Core Juvenile Rearing - *generally in the lower part of river basins*

- 20°C (68°F) plus cold water refugia protection for Salmon and Trout Migration - *generally in the lower part of a few river basins that likely reach this temperature naturally*

The guidance also recommends the following 7-day average temperatures for the protection of spawning and smoltification (generally during the fall-winter-spring period)

- 9°C (48°F) for Bull Trout Spawning
- 13°C (55°F) for Salmon and Trout Spawning, Egg Incubation, and Fry Emergence
- 14°C (57°F) for Steelhead Smoltification

A review of the *Salmon Stock Inventory* (SaSI)[4], which is a database of the spawning run timing periods for all known salmon runs in Washington, indicates that spawning does not occur in Wanity Slough or Spencer Lateral, or in streams downstream of these waterbodies. However, rearing does occur in Wanity Slough. This information indicates that a summer maximum of 18° C temperature criterion as a 7-day average would be protective of rearing. Currently, 7-day average data has not been collected in Wanity Slough. There are some summer temperature data in Wanity Slough however, samples were generally weekly sample. Samples in July and August and September ranged from 15° C to 22.78° C. The temperature data of Wanity Slough in July and August were generally over 18° C but there were temperatures below 18° C, and in late August there was even a recorded temperatures 16.75°. It is possible that Wanity Slough has some assimilative capacity for temperature. The facility's effluent varies from 20 – 24.4°C from July through mid-September. Without temperature effluent and ambient data using the correct metric it is not possible to determine if the effluent is adversely temperature in Wanity Slough.

While the effluent discharged from the Washington Beef facility might result in a slight increase the water temperature downstream, the majority of the temperature impacts within the Yakima basin come from human activities that have dramatically altered the Yakima River system in ways that may influence water temperature, such as changes to channel morphology; removal of riparian cover; and disruption of floodplain function, hyporheic flow, and flow regimes.

As stated previously, there are five major storage reservoirs in the Yakima River basin. Of the five reservoirs, three, Keechelus, Kachess, and Cle Elum reservoirs are located in the upper Yakima Basin. The other two reservoirs are located in the upper Naches River. These reservoirs have a total storage capacity of about 1 million acre-feet. In addition, there are numerous irrigation diversion dams. These features have severely altered the natural hydrographs of the rivers in the Yakima River basin. These altered hydrographs are now characterized by much lower than normal winter flows, as water is stored for the next years' use, and much higher than normal summer flows, as water is delivered in-channel to various diversion points for irrigation. During the run-off period in the spring,

4 The SaSI maps for the lower Yakima basin can be viewed at: http//www.ecy.wa.gov/services/gis/maps/wria/number/wria37.htm

high flows still occur during most years but the magnitude of these flows is greatly reduced relative to what would have occurred naturally. During the winter and early spring, high flows may also occur when water is released from the reservoirs during flood control operations. The annual estimated unregulated runoff of the Yakima River at the Parker Gauging Station (in the lower river) averages 3.5 million acre-feet. The average annual irrigation diversion requirements are approximately 2.2 million acre-feet. Approximately 375,000 acre-feet returns as irrigation return flow in a normal water year.

Among other things the irrigation storage dams can alter water temperature. The elevated temperatures of water released from reservoirs in the basin may impact bull trout and other species. Elevated water temperatures in some years have delayed the onset of spring chinook spawning in the upper Yakima River. The historic thermal regimes below the natural lakes in the basin are unknown, but altered temperature regimes below dams are common. Limnological studies conducted by the U.S. Bureau of Reclamation have shown temperature stratification to some degree in all of the storage reservoirs in the basin. With the exception of Tieton Dam, the outlet works for each dam is located above the coldest waters available in the reservoir pool.

Additionally, the operation of the dams in the Yakima Core Area has had a profound effect on the flow regimes of the rivers in the basin and has reduced habitat quality within the basin and can result in salmonid mortality. Below storage reservoirs, habitat degradation associated with non-normative flows have likely impacted bull trout. The magnitude of high flows resulting from rain-on-snow events and during the snowmelt runoff period has been reduced significantly; the hydrograph for the upper Yakima River is extremely unnatural in the opposite direction during July and August.

Finally, with over 500,000 acres of irrigated land, the Yakima River basin ranks fifth nationally in total agricultural production. Habitat within the Yakima basin has been adversely affected by irrigation diversions and water withdrawals. Water withdrawals from streams by 64 irrigation diversions within the basin contribute to low flow conditions in some streams, and seasonal dewatering of others. Seven mainstem irrigation diversion dams (Wapato, Easton, Town Ditch, Sunnyside, Prosser, and Horn Rapids) have contributed to altered flow regime within the basin (*Proposed Designation of Critical Habitat for the Klamath River Columbia River DPU Segments of Bull Trout* (67 FR 71235, 11/29/02)).

The types of activities described above have significantly contributed to elevated temperatures in rivers and streams in the Yakima basin which can affect steelhead. While the Washington Beef facility can contribute heat, based on the existing available data, EPA has determined that that temperate may, but is **not likely to adversely affect** the Mid Columbia River Steelhead.

B. Indirect Effects on Aquatic Species

There are no indirect effects to listed aquatic species as a result of EPA's proposed re-issuance of this permit.

C. Description of how the Environmental Baseline Would be Affected

The environmental baseline for receiving waters would be affected by the direct effects listed in the previous section. The facility discharges total suspended solids/turbidity, thereby very slightly affecting the total suspended solids and turbidity in the receiving streams. However, the load from the facility is far outweighed by sediment load and turbidity from other non-point sources (e.g., agricultural return flows) in the basin. Additionally, the turbidity limit has been established to ensure that the water quality for aquatic life is protected. Therefore, EPA has determined that with respect to total suspended solids and turbidity the facility will not significantly affect the environmental baseline in receiving streams.

The facility also discharges oil and grease in their effluent, thereby increasing the amount of oil and grease in the streams. However, the permit limits the amount of oil and grease that is discharged such that there is no oily sheen visible on the receiving water. As stated in Part V.A, this requirement should ensure that aquatic life is protected. EPA has determined that the discharge of oil and grease will not significantly affect the environmental baseline in the receiving streams.

Biological Oxygen Demand and D.O. was also limited in the discharge from the facility. However, as discussed previously, the dissolved oxygen and BOD_5 at the points of discharge from the facility will not affect the environmental baseline of the receiving water.

The ammonia level in the discharge is low and will not affect the environmental baseline of receiving streams. EPA has determined that the permit is not likely to adversely affect the environmental baseline with respect to ammonia.

The temperature levels in the discharge may slightly increase the temperature near the outfalls. Given the information available, EPA has determined that the permit is not likely to adversely impact the environmental baseline.

D. Effects on Essential Elements of the Critical Habitat of the Mid Columbia Steelhead

1. Mid Columbia Steelhead

NMFS has designated the Yakima River as critical habitat for designated critical habitat for the Mid Columbia Steelhead (*National Oceanic and Atmospheric Administration, Designated Critical Habitat for 19 Evolutionary Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho and California*, February 16, 2000), however the Agency excluded all Indian lands from their critical habitat designation. The effects of

the pollutants of concern, in the discharge, on water quality have been discussed in section V above.

E. Use of Best Scientific and Commercially Available Data

In order to determine effects of the facility discharges, the best scientific and commercially available data was used to evaluate these effects.

F. Effects Determinations for Listed Aquatic and Terrestrial Species and Designated Critical Habitat

1. Salmonids

The Mid Columbia River Bull trout are not in the vicinity of the discharge, therefore there is **no effect** on the listed Bull trout. However, the Mid Columbia River Steelhead are found in Wanity Slough, therefore it is important to make sure the direct and cumulative effects of the facility do not further endanger the steelhead. Limits for TSS and turbidity for the permit are discussed in the previous section, and analysis of effects have determined that TSS and turbidity is **not likely to adversely affect** the listed steelhead. The effects of BOD_5 and associate depressed levels of dissolved oxygen were analyzed, and it was determined that the BOD and dissolved oxygen at the discharge points will have no measureable affect water quality, therefore BOD_5 and dissolved oxygen are **not likely to adversely affect** the listed steelhead. The effects of ammonia on listed species were analyzed in the previous section and it was determined that the levels are **not likely to adversely affect** the listed steelhead. The effects of temperature was analyzed in the previous section and it was determined that the levels are **not likely to adversely affect** the listed steelhead. It was determined that bacteria levels would have **no effect** on the listed steelhead. The effects of oil and grease on steelhead was analyzed in the previous section and it was determined that this parameter would have **no effect** on the listed steelhead

The permit may be modified during the life of the permit if new information regarding the discharge effects on listed species becomes available.

2. Plants

The primary threats to the Utes' Ladies Tresses are urban development and watershed alterations in riparian and wetland habitats and invasions of exotic plants species such as purple loosestrife, whitetop and reed canary grass. The reissuance of the NPDES permit will affect in-stream water quality, but it will not have any affect on areas where this plant species is likely to occur, therefore it was determined that the re-issuance of this permit will have **no effect** on the Utes' Ladies Tresses.

G. Summary of Effects Analysis

The table below summarizes the determinations of effects on the threatened species.

Effects Determination of Washington Beef, LLC on Threatened Species

Species:	Mid Columbia River Bull Trout	Mid Columbia River Steelhead	Utes' ladies tresses
Determination:	No Effect	Not Likely to Adversely Affect	No Effect

VI. Conclusions

A. Aquatic Life

EPA has determined that the re-issuance of this NPDES permit will have **No Effect** on the Mid Columbia River Bull Trout, and is **Not Likely to Adversely Affect** the Mid Columbia River Steelhead.

B. Plants

EPA has determined that the re-issuance of this NPDES permit will have **no effect** on the Utes' ladies tresses.

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