4.8 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section of the Wheatland General Plan Update EIR describes existing drainage pattern and water resources for the project site and the region, and evaluates potential impacts of the project with respect to drainage and water quality concerns. The hydrology and water quality impact assessment is primarily based on the *Yuba County General Plan*[1], *City of Wheatland General Plan Update Background Report, Public Review Draft*[2], *City of Wheatland General Plan Policy Document*[3], *Draft Drainage Report for Internal Drainage*[4] prepared by Civil Engineering Solutions, *External Source Flood Protection Plan*[5] prepared by Mead & Hunt, the *Yuba County Water Agency Ground Water Management Plan*,[6] and the *State Water Resources Control Board*[7].

ENVIRONMENTAL SETTING

Location

The City of Wheatland is located in Yuba County, California, and is approximately 13 miles southeast of Marysville, the County seat of Yuba County. The City is bisected by State Route (SR) 65 and lies between Bear River and Dry Creek (See Figure 3-2: General Plan study area in the Project Description Chapter).

Climate

The climate of Wheatland is characterized by hot dry summers and cold wet winters. Seasonal rainfall occurs from November through March. Rainfall originates from moisture collected over the Pacific Ocean then delivered by frontal storms that move to the east. Cloudburst storms may also occur any time from late fall to early spring, and may occur as an extremely severe sequence within a general winter rainstorm. Cloudbursts are high-intensity storms that can produce peak flows equal to or greater than those of the general rainstorm. High peak flows, short duration flood flows, and a small volume of runoff characterize flooding from these cloudbursts. Mean annual precipitation is approximately 20 inches. Summer afternoon temperatures can exceed 100 degrees Fahrenheit. Winter temperatures can fall below freezing but normally vary from the mid 30s to 50s.

Topography

The study area generally drains from the northeast to the southwest. A ridge of high ground separates the historic floodplains of Bear River and Dry Creek in the upper portion of the study area. The ridge disappears as the Bear River and Dry Creek draw closer together towards the confluence. Ground elevations in the plan area range from approximately 60 feet NGVD at the downstream end to 100 feet NGVD on the ridge at the upstream end of the Study area.

The section below describes the existing hydrological features of the Wheatland General Plan Update study area and the surrounding region, and the water quality of the existing resources within the study area.

Drainage

Two types of drainage systems affect the City of Wheatland: flood control systems and local drainage systems. The systems, jurisdictions, and current status are described below. Areas proposed for development located within a floodplain and a flood control area must first be removed from the floodplain with construction of appropriate flood control structures. Once removed from the floodplain, then the local drainage system can be designed.

Flood Control Systems

Flood control systems are typically designed to provide protection against 25-year to 200-year flood events. Examples of these facilities are dams, levees, drainage channels, and pump stations. Flood control for the City of Wheatland General Plan area is provided by a series of levees. These levees are intended to protect the City of Wheatland and adjacent areas (this is the study area as defined in the General Plan) from the following sources of flooding:

- North Bear River Levee – Located south of the study area with flows from east to west.
- South Dry Creek Levee – Located north of the study area with flows from east to west.
- West San Joaquin Drainage Canal Levee – Located east of the study area with flows from south to north and into Dry Creek northeast of study area.

The existing levee system does not provide an adequate level of flood protection for development around the City of Wheatland and adjacent areas including development in the General Plan Land Use Diagram. As such, much of the area around the study area is located in a Federal Emergency Management Agency (FEMA) flood zone. Improvements to the levee system are necessary for future development.

Jurisdiction

The Reclamation District 2103 is responsible for maintenance and operation of the Dry Creek levees, Bear River levee, and the San Joaquin drainage canal. These three channels are outside of the existing city limits, but are within the area of interest. In addition to Yuba County, portions of the Bear River levee system east of SR 65 are located in Placer County, and west of SR 65, the levees are partially located in Sutter County. Other Reclamation Districts within which these levee systems are located include: Reclamation District 817.

From 1998 to 2002, Reclamation District 2103 prepared plans for and improved the Bear River levee from east of SR 65 near the San Joaquin canal to approximately 13,000 feet west of SR 65. Because of these changes, Reclamation District 2103 sponsored a study to certify the rehabilitated Bear River north levee and improve the definition of the floodplains under existing conditions. Based on better topographic information and hydrologic and hydraulic analyses, an application was prepared requesting a Letter of Map Revision (LOMR) for the City of Wheatland and adjacent areas. FEMA requires the floodplain mapping to reflect existing 100- year flooding conditions.

A LOMR is a document issued by FEMA that officially removes a structure or an area from the FEMA Special Flood Hazard Area (SFHA). A LOMR request has been made to FEMA and is currently under review. If the LOMR were approved, portions of the study area designated as Zone A would be re-designated as Zone AE. Zone AE designates areas within the 100-year flood zone with the base flood elevations determined by detail hydraulic analyses. Some land in the study area will be removed from the current flood hazard Zone A, while other areas currently identified as flood hazard areas may no longer be in a flood hazard zone.

In accordance with FEMA levee policy, most of the flood zones were delineated based on the assumption of a failure of the Bear River and Dry Creek levees. The assessments in this report are based on the assumption that all the levees protecting the General Plan area will be repaired and certified in accordance with FEMA standards.

FEMA 100-Year Floodplain Zoning

The FEMA 100-year floodplains provide the elevations to establish whether an area should be included in a floodplain and determines the applicable insurance rates. Based on the proposed floodplain Letter of Map Revision (LOMR) submitted to FEMA for the City of Wheatland and adjacent area, a substantial portion of the northern area of the existing study area is within a FEMA floodplain as well as areas west and east of the city limits.

Developers, utility providers, or municipalities can submit an application for a Conditional Letter of Map Revision (CLOMR) or a LOMR. For a CLOMR, FEMA will provide a “letter from FEMA commenting on whether a proposed project, if built as proposed, would meet minimum National Flood Insurance Program Standards.” For a

LOMR, FEMA will provide "a letter from FEMA officially revising the current National Flood Insurance Program map to show changes to floodplains, floodways on flood elevations."

Areas outside of the FEMA "effective" 100-year floodplain can be developed following the normal City of Wheatland or County standards. In order to develop within the "effective" floodplain, the area to be developed must be protected by flood control facilities to safely handle a 100-year event. Prior to start of construction, the developer can submit an application for a CLOMR. The CLOMR can be prepared and submitted during the planning and design period. This provides FEMA a chance to uncover problem areas that need to be addressed before FEMA will approve the start of construction. Because most of the required information is submitted prior to construction, the follow-up application for a LOMR only needs to describe significant changes to the proposed plan and submit as-built drawings to complete the process and receive approval.

Current Status

The current FEMA floodplain map is Community Panel No. 060460A, adopted on September 29, 1986. The map is an outdated map that provides only an approximation of the flooding – not based on hydrologic and hydraulic studies. As such, the map does not include floodplain elevation information and is in need of substantial revision.

Under existing conditions, most the runoff generated in the Wheatland area collects behind the levees at the confluence of Dry Creek and Bear River. The existing conditions 100-year 24-hour runoff volume is approximately 1,400 acre-feet. The peak flow in Lower Grasshopper Slough at the downstream boundary of the study area is approximately 330 cfs. The proposed drainage for the study area will reduce the peak flow down to 140 cfs as a result of diverting flows from Grasshopper Slough North Tributaries 1 and 2 to Dry Creek. The General Plan conditions 100-year 24-hour runoff volume is expected to be 900 acre-feet.

From 1998 to 2002, Reclamation District 2103 prepared plans for and improved the Bear River levee from east of SR 65 near the San Joaquin canal to approximately 13,000 feet west of SR 65. Because of these changes, Reclamation District 2103 sponsored a study to certify the rehabilitated Bear River north levee and improve the definition of the floodplains under existing conditions. Based on better topographic information and hydrologic and hydraulic analyses, an application was prepared requesting a LOMR for the City of Wheatland and adjacent areas. FEMA requires the floodplain mapping to reflect existing 100-year flooding conditions. At the time that this report was prepared the LOMR was pending. It should be noted that Kleinfelder has conducted recent testing of the North Bear River levee. These tests have concluded that under-seepage issues exist. The solution to this issue will be identified by the appropriate Reclamation District.

Only the upper reach of the Bear River north levee has been submitted to FEMA for certification. The lower portion of the Bear River north levee from approximately 13,000

feet west of SR 65 to the confluence with Dry Creek, the Dry Creek south levee, and the San Joaquin Drainage Ditch levees are not currently FEMA certified. As such, these reaches of levee bounding the City of Wheatland and General Plan area must be considered to fail in a 100-year flood event as defined by FEMA.

Local Drainage Systems

Local drainage systems are typically provided to prevent flooding of streets and structures from 10-year to 100-year storm events. Examples of these facilities are culverts, drain lines, drain inlets, detention ponds, local open channels, detention basins, and pumping plants. These systems are located in areas that are protected by flood control systems or are not in an area subject to a flood control system.

Local flooding occurs because of inadequate sized facilities or deteriorated facilities such as drainage inlets, pipes, drainage ditches and related facilities that transport water to Bear River, Dry Creek, or the San Joaquin Drainage canal. The Wheatland Public Works Department operates and maintains the local drainage system within the City, as well as two facilities outside the city limits consisting of:

1. The northwest detention pond and discharge pumps located west of SR 65 and south of Dry Creek; and

2. Partial maintenance of the east side ditch that connects the Wheatland Ranch Subdivision detention basin to Dry Creek.

The system and related facilities are shown in Figure 4.8-1. Outside the city limits, except as noted above, the Yuba County Public Works Department operates the county local drainage systems which consist primarily of county roadway drain lines and side ditches. Local property owners maintain all other drainage facilities.

The existing City is separated into four general drainage areas; northeast, northwest, southeast, and southwest. The areas are separated by a higher east-west area through the approximate middle of town and the UPRR/SR 65 north-south line/road.

The northeast City drainage area drains through the Wheatland Ranch Subdivision into a detention basin constructed in 2002. The detention basin discharges into an existing ditch, outside the City limits to the northwest into Dry Creek. The flap valve closes when the water level is higher in Dry Creek than in the local discharge canal. The flap valve prevents the Dry Creek water from backflowing into areas south of the Dry Creek levee. When the flap valve is closed, local stormwater cannot be discharged into Dry Creek and can puddle on the land side of the levee. In addition, the northeast area has an east to west ditch that discharges stormwater to the west under a UPRR trestle and SR 65 bridge. The westerly discharge capacity is restricted because the downstream channel is confined and has limited capacity for carrying runoff west of SR 65. Possible solutions to allow discharge to Dry Creek when flows in Dry Creek are high are to install a detention basin/pump station or enlarge the east-west channel.

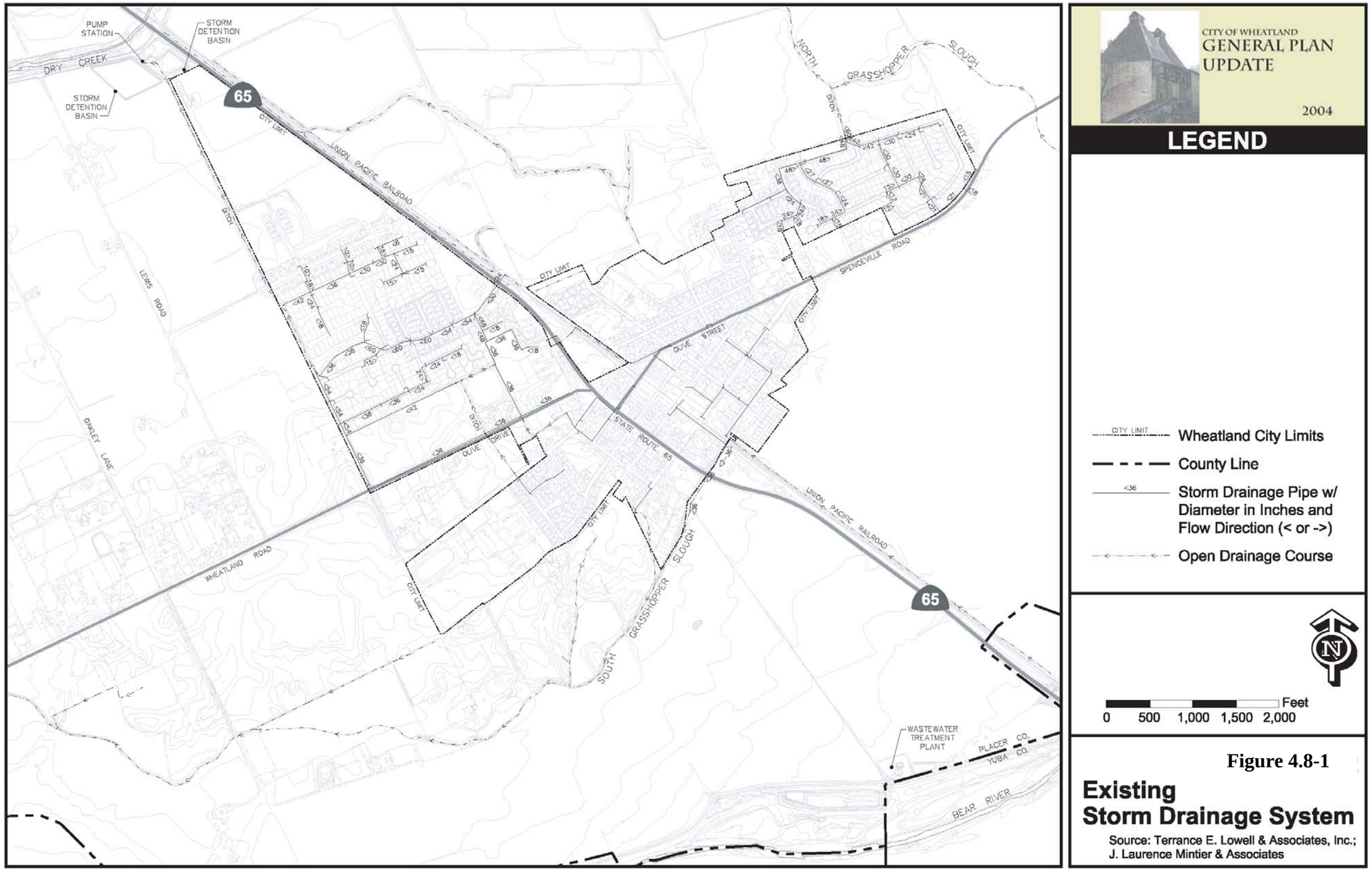

Figure 4.8-1

Existing Storm Drainage System

Source: Terrance E. Lowell & Associates, Inc.; J. Laurence Mintier & Associates

The northwest City drainage area drains through a system of pipes, open ditches, and a major north draining channel that discharges into the detention basin. The major north draining channel and detention basin are in the process of being improved and enlarged in conjunction with the Park Place Subdivision. When the northwest side of the City is removed from the FEMA 100-year floodplain, a berm around the detention basin must be raised 1-3 feet to maintain adequate freeboard. The detention basin berm cannot be raised at this time because the berm would restrict the flow of the existing "flood control system (FEMA)". This detention basin also receives stormwater from under SR 65 from the bridge area described in the northeast drainage.

The southeast City drainage area drains through a system of pipes and open ditches to a small 24-inch diameter concrete culvert that crosses to the west under the UPRR into the south fork of Grasshopper Slough. This pipe also drains a large area outside the City limits. Periodically flows are restricted at this point, resulting in water ponding on the east side of the UPRR and north of the Bear River. The natural ground slope outside the City limits in this area is generally downhill from the land side of the Bear River levee north toward the City. Possible solutions to allow this area to drain are installation of a detention basin/pump station on the east side of SR 65 with a discharge to Bear River, or enlarging the east-west culvert under the UPRR and SR 65 and enlarging the channel west of SR 65.

The southwest City drainage area drains through a system of pipes and open ditches and discharges into the south fork of Grasshopper Slough. This slough also receives stormwater runoff from the east as noted in the southeast drainage area description. The natural ground slope outside the City limits in this area is generally downhill from the land side of the Bear River levee north toward the City. The City's wastewater treatment is uphill from the south fork of Grasshopper Slough. The south fork Grasshopper Slough drains toward the west. This slough has been the subject of a preliminary drainage study by the proposed Heritage Oaks Estates and Jones Ranch projects. This slough crosses Wheatland Road west of the existing City limits and becomes a small ditch with limited capacity. Solutions to local drainage problems have been partially addressed by the Jones Ranch and Heritage Oaks Estates projects, which propose a series of detention basins and pumps to discharge storm water to the Bear River.

The City funds the operation and maintenance of the storm drainage system through general fund revenue except for the Wheatland Ranch Subdivision detention basin and the Park Place drainage canal, which is funded through a Lighting and Landscape District. New developments are required to provide for drainage facilities including pump systems and pipes to meet their demands and/or pay an impact fee based on their demand and use of existing system facilities. New development is required to construct all internal drainage system improvements associated with their projects.

The City requires engineering drainage studies to be provided with all new development plans. The studies are to identify existing onsite and offsite conditions, storm water flows, capacity of existing onsite and offsite inlets, culverts, ditches, canals, detention basins, pump systems, and determine if the proposed development would result in increased

stormwater runoff from the site and/or result in restricting flow from existing upstream uses under existing conditions. Any individual developing or improving land is required to mitigate all potential drainage impacts to upstream or downstream users, which could result from the development. Such corrective or design measures could include enlarging existing culverts and ditches, building detention basins and pumps to discharge to a flood control facility, and/or obtaining of flowage easements. Existing drainage system deficiencies include undersized or deteriorated drain lines and ditches, inadequate inlets or capacity, some broken and offset gutters and valley gutters. In addition to these physical needs, the City's Public Works Improvement Standards relative to water systems was last updated in 1992 and is in need of revision to make the standards consistent with current industry practice.

Existing Drainage Facilities

The existing drainage facilities in the City of Wheatland consist of drainage culverts, detention basins and pumping plant, and floodplains. Below is a description of the above existing facilities.

Drainage Culverts

Table 4.8-1 shows the locations of major drainage culverts in the study area. Most of these existing drainage culverts do not have adequate capacity to pass the 100-year flow, which could result in ponding behind the culverts during flood events.

Table 4.8-1
Existing Culverts

Stream	HEC-RAS Cross Section	Culvert Size (Feet)
Grasshopper Slough North Tributary 1	8940	6 [1]
	6550	2.5
	3570	2.5
Grasshopper Slough North Tributary 2	4850	3
Grasshopper Slough South	1035.5	4 (2 barrels)
	1034.5	3.5 (2 barrels)
	1032.5	6 x 5 [2]
	1030.5	11 x 6
	1021.5	2 (2 barrels)
	1015.5	4.5 (2 barrels)

*Source: Civil Engineering Solutions, Inc., 2005
[1]*Circular Culvert diameter- in feet.*
[2]*Box culvert spam x rise.*

Detention Basin and Pumping Plant

A detention basin and pump station exist west of SR 65 along Dry Creek. The pumping plant at the existing detention basin has a total pumping capacity of 41 cubic feet per second (cfs) at the elevation of 68.2. The estimated storage volume of the detention under existing conditions is approximately 109 acre-feet.

Existing Floodplains

Floodplains help to dissipate flow energy during flood conditions. The Wheatland area consists of floodplains associated with Grasshopper Slough North Tributary 1, Grasshopper Slough North Tributary 2, Sohrakoff Drainage Channel, Grasshopper Slough South, and Lower Grasshopper Slough. The 100-year flood surface water levels are not shown on the effective Flood Insurance Rate Map. Therefore, the water surface elevations in the *Draft Drainage Report for Internal Drainage*, dated November 2005, were computed using HEC-RAS unsteady flow modeling. The analysis performed by Civil Engineering Solutions, Inc. in the *Draft Drainage Report for Internal Drainage* indicates that large areas of the General Plan area would be inundated in the 100-year event (Figure 4.8-2).

Grasshopper Slough North Tributary 1

The City is protected from flooding from the Bear River and Dry Creek by levees. The study area between the Bear River and Dry Creek is drained by Grasshopper Slough. The Grasshopper Slough North watershed is located north of the existing developed area of the City of Wheatland. The watershed consists of two main branches: a north branch and a south branch. The northern branch of Grasshopper Slough is referred to in this study as "Grasshopper Slough North Tributary 1." The southern branch of Grasshopper Slough North is referred to in this study as "Grasshopper Slough North Tributary 2."

The Grasshopper Slough North Tributary 1 conveys runoff from areas northeast of the City, in a northwesterly direction reaching Dry Creek east of SR 65.

A ridge of high ground separates the historic floodplains of Bear River and Dry Creek in the upper portion of the General Plan area. Some of the runoff from areas south of the ridge drains into Grasshopper Slough North Tributary 1. A gap in the ridge allows the flow to travel north towards Dry Creek. As the channel emerges from the gap the water would spread out and cover a large portion of the area along the stream. The channel joins Dry Creek through a 36-inch culvert under the Dry Creek levee. This culvert is gated such that flows from Dry Creek would not be able to back up into the Grasshopper Slough system. The small size of the culvert relative to the large size of the upstream watershed results in flows overtopping the south bank of Grasshopper Slough North Tributary 1, upstream of the culvert location and draining to Grasshopper Slough North Tributary 2 in events less than the 100-year.

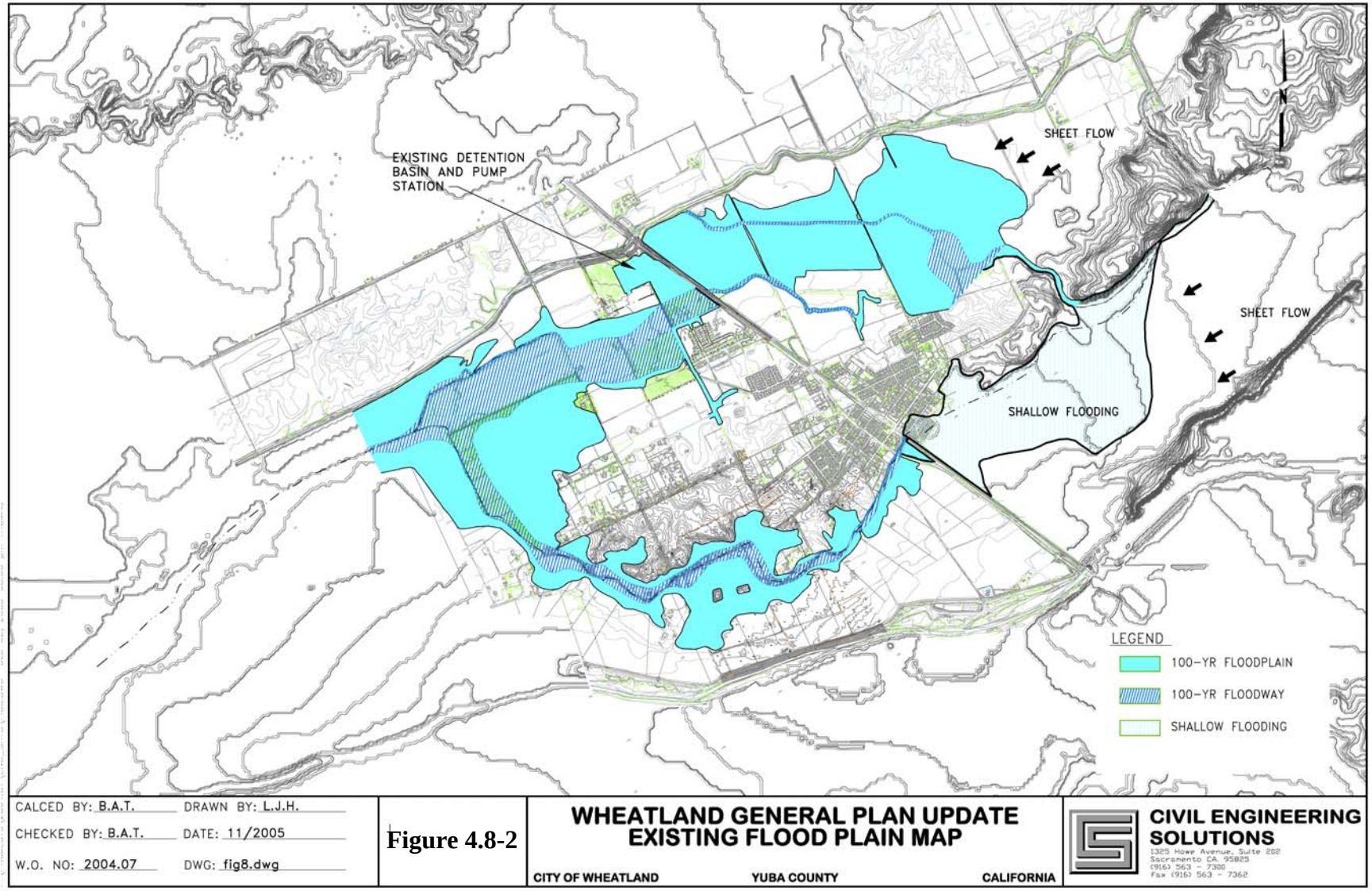
EXISTING DETENTION BASIN AND PUMP STATION
SHEET FLOW
SHEET FLOW
SHALLOW FLOODING
N
LEGEND
100-YR FLOODPLAIN
100-YR FLOODWAY
SHALLOW FLOODING
CALCED BY: B.A.T.
DRAWN BY: L.J.H.
CHECKED BY: B.A.T.
DATE: 11/2005
W.O. NO: 2004.07
DWG: fig8.dwg
WHEATLAND GENERAL PLAN UPDATE
EXISTING FLOOD PLAIN MAP
CITY OF WHEATLAND
YUBA COUNTY
CALIFORNIA
CIVIL ENGINEERING SOLUTIONS
1325 Howe Avenue, Suite 202
Sacramento CA 95825
(916) 563 - 7300
Fax (916) 563 - 7362

Figure 4.8-2

Grasshopper Slough North Tributary 2

Grasshopper Slough North Tributary 2 drains some City areas but mostly agricultural and rural areas north of the City through an open channel system east of Union Pacific railroad (UPRR) and SR 65. The system crosses SR 65 and UPRR at existing bridge structures. The historical channel has been filled in between SR 65 and Oakley Lane. The runoff sheetflows westerly to the Sohrakoff Drainage Channel located approximately 1,300 feet west of SR 65.

Sohrakoff Drainage Channel

The Sohrakoff Drainage Channel collects runoff from the northwest areas of the existing developed area of the City and conveys the flows north. Flows from Grasshopper Slough North Tributary 2 are intercepted by the Drain as well. The western bank of the Sohrakoff Channel passes through some low ground areas where overtopping can occur and flows would exit the drainage channel, sheet flowing west, in large events. The Sohrakoff Drainage Channel ends at the existing detention basin near Dry Creek. A dual pump system at the detention basin lifts flows from the basin into Dry Creek west of SR 65.

The historical drainage channel has been filled in between the Sohrakoff Drainage Channel and Oakley Lane. Runoff generated in the area between the Sohrakoff Channel and Oakley Lane sheetflows west into the remaining portion of Grasshopper Slough North Tributary 2.

Grasshopper Slough South

Grasshopper Slough South drains the area south and west of the City of Wheatland. The sheetflow generated on the agricultural lands along the Bear River upstream of UPRR drains into the channel at UPRR. The channel travels along the south side of Wheatland and then turns north at a location west of Oakley Lane to join the remaining portion of Grasshopper Slough North Tributary 2.

Lower Grasshopper Slough

The combined Grasshopper Slough North Tributary 2 and Grasshopper Slough South are referred to in this chapter as "Lower Grasshopper Slough." Lower Grasshopper Slough drains in a southwesterly direction to join with Dry Creek through a 60-inch culvert upstream of the confluence of Dry Creek and Bear River.

Water Quality Considerations

Regional Surface Water

The study area is located in the Bear River watershed. The Bear River is one of the primary drainages in Yuba County, with headwaters based near Emigrant Gap and Lake Spaulding in the Sierra Nevada. The river flows southwest to a point north of Auburn, where it turns toward the west and its eventual confluence with the Feather River. The Bear River forms the southern boundary of the study area and is located immediately south of the Yuba/Sutter County line.

Other watercourses in the immediate vicinity of the City of Wheatland include: Dry Creek, which flows westerly approximately one mile north of the City; Grasshopper Slough, which is between Dry Creek and the City, and roughly parallels Dry Creek until the two merge approximately four miles west of the City; and Grasshopper Slough South, which originates in the southern part of the City of Wheatland, and flows west to merge with Grasshopper Slough. Surface waters in the City generally drain into Grasshopper Slough or Grasshopper Slough South. Major surface water drainages identified in the study area are described in the drainage section.

During the Gold Rush era, siltation caused by hydraulic mining in the Sierra Nevada foothills extensively altered the original hydrological characteristics of the Sacramento Valley, resulting in significant damage. Streambeds rose by as much as 70 feet in the Wheatland vicinity, causing widespread flooding. The area's drainage patterns were altered further by the construction of levees and agricultural canals, as well as land leveling for farming operations. Some channels, including Grasshopper Slough, have been blocked.

Study Area Surface Water Quality

Water quality in the Study area is primarily characterized by surrounding land uses. In the Study area, the water quality of Grasshopper Slough, Dry Creek, and the Bear River could be influenced by both adjacent and upstream rural/agricultural land uses. Possible constituents associated with rural/agricultural land uses include fertilizers and pesticides, sediments, and to a lesser extent, heavy metals, petroleum hydrocarbons, and other pollutants attributed to the use of vehicles and agricultural equipment, as well as historic mining operations.

Agricultural Uses in the Study Area

The study area currently consists of agricultural, residential, commercial, and industrial land uses. The agricultural crops are usually treated with pesticides and/or herbicides. Although most chemicals used for agricultural purposes in the last ten years tend to have short residual life in the soil, chemicals could have potentially leached into detained water on the site.

According to the California Department of Pesticide Regulation (DPR), the top five agricultural pesticides used in Yuba County in 2002 (the most recent year for which data is available) were petroleum oil, mineral oil, sulfur, copper sulfate (pentahydrate), and propanil. Petroleum oil, mineral oil, and sulfur are used predominantly on orchards, while copper sulfate is used on rice, walnuts and for landscape maintenance and propanil is used on rice.

The *Yuba County General Plan* states that major importation of water to the Bear River watershed occurs near the headwaters. Some irrigation spill and ditch seepage enters from the ridge between the South Yuba and Bear Rivers. Exports from the Bear River watershed are made through conveyance facilities owned by Pacific Gas and Electric (PG&E) and the Nevada Irrigation District (NID). The diversions include nearly all of the imported water and some of the natural flow. The diverted water is used for irrigation, power generation, and domestic uses in the Auburn area. The net effect of the upstream uses, exports, and imports in the Yuba and Bear River basins has been to deplete the stream flow at the base of the foothills. However, the average depletion of the Bear River above Wheatland is relatively minor due to the imports of water from the Yuba Basin, located farther upstream. The Camp Far West Reservoir, located approximately 12 miles east of the study area, is fed by the Bear River, Rock Creek, and other minor tributaries. The reservoir has a capacity of 103,000 acre-feet and is owned by the South Sutter Water District.

A major tributary to the Bear River is Dry Creek, which runs parallel to the Bear River and is located near the northern Study area boundary. Dry Creek conveys approximately 11,200 acre-feet of water per year, imported via irrigation spill and flows from the Wolf Creek drainage north of Auburn.

Groundwater

The City of Wheatland is located above the Sacramento Valley Groundwater Basin, a 5,000 square mile basin, which encompasses Butte, Colusa, Glenn, Placer, Sacramento, Solano, Sutter, Tehama, Yolo, and Yuba Counties. Specifically, the City lies atop the South Yuba Subbasin, a 138 square mile aquifer system bounded on the north by the Yuba River, on the west by the Feather River, on the south by the Bear River, and on the east by the Sierra Nevada. Elevations range from about 150 feet in the northwest corner of the subbasin to about 30 feet in the southwest corner near the confluence of the Feather and Bear Rivers.

The South Yuba Subbasin is comprised of water-bearing continental deposits of Quaternary (Recent) to Late Tertiary (Miocene) age. The cumulative thickness of these deposits increases from a few hundred feet near the Sierra Nevada foothills to over 1,400 feet along the western margin of the basin. The base of the aquifer system overlies Pre-Tertiary metamorphosed igneous and sedimentary rock of the Sierra Nevada block. The deposits include historic dredger tailings as well as alluvium, stream channel deposits, and floodplain deposits.

The Bear River channel has been identified as a significant groundwater recharge area for Yuba County. Groundwater recharge areas identified in the Study area are illustrated in Figure 4.8-3.

Groundwater Quality

Water quality is generally excellent in most portions of the South Yuba Sub-basin, particularly at depths below 100 feet from the ground surface. The high quality of the groundwater is indicated by its low salinity. In general, total dissolved solids (TDS) concentrations are below 500 milligrams per liter (mg/L) throughout the Sub-basin. State-monitored water quality wells in the Sub-basin indicate a median TDS concentration of 224 mg/L. The groundwater chemistry is primarily calcium magnesium bicarbonate or magnesium calcium bicarbonate. The City of Wheatland currently (June 2004) draws its entire water supply from six (6) municipal well sites.

Groundwater quantity within the South Yuba Sub-basin varies by location, but overall reliance upon groundwater for domestic and agricultural use in the Sacramento Valley has increased steadily over the past few decades. The number of domestic and irrigation wells in the region increased from 9,109 in 1970 to 37,046 in 2002. The reasons for this increase include more demand, the need for reliable water supplies, the high costs of new surface water storage, and environmental concerns leading to the reduced diversion of surface water.

The California Department of Water Resources has estimated natural and applied inflows and outflows for the South Yuba Subbasin. Basin inflows include natural recharge of 53,700 acre-feet per year (afy) and applied recharge of 26,000 afy. Basin outflows include urban extraction of 6,000 afy, agricultural extraction of 93,400 afy, and subsurface outflow of 24,900 afy. The figures indicate a net deficit of 44,600 afy. Estimated total groundwater storage capacity in the South Yuba Subbasin is approximately 1,090,000 acre-feet.

Between 1950 and 1982, the Subbasin became increasingly overdrafted. Groundwater storage declined by 280,000 acre-feet, and a well-developed cone of depression formed. Within the cone of depression, groundwater levels dropped below adjacent river levels on the Bear, Feather, and Yuba Rivers, and fell below sea level as well. Beginning in 1982, an increase in surface water irrigation supplies, and corresponding reduction in groundwater pumping, allowed groundwater levels to return to an elevation above sea level. The depth to ground water in the Wheatland area as of June 2004 is approximately 80 to 100 feet. The City of Wheatland's wells draw water from depths ranging from 200 feet to 400 feet below grade. Currently, groundwater quantity problems in the City's wells do not exist. Water supply issues are discussed in more detail in section 4.16.

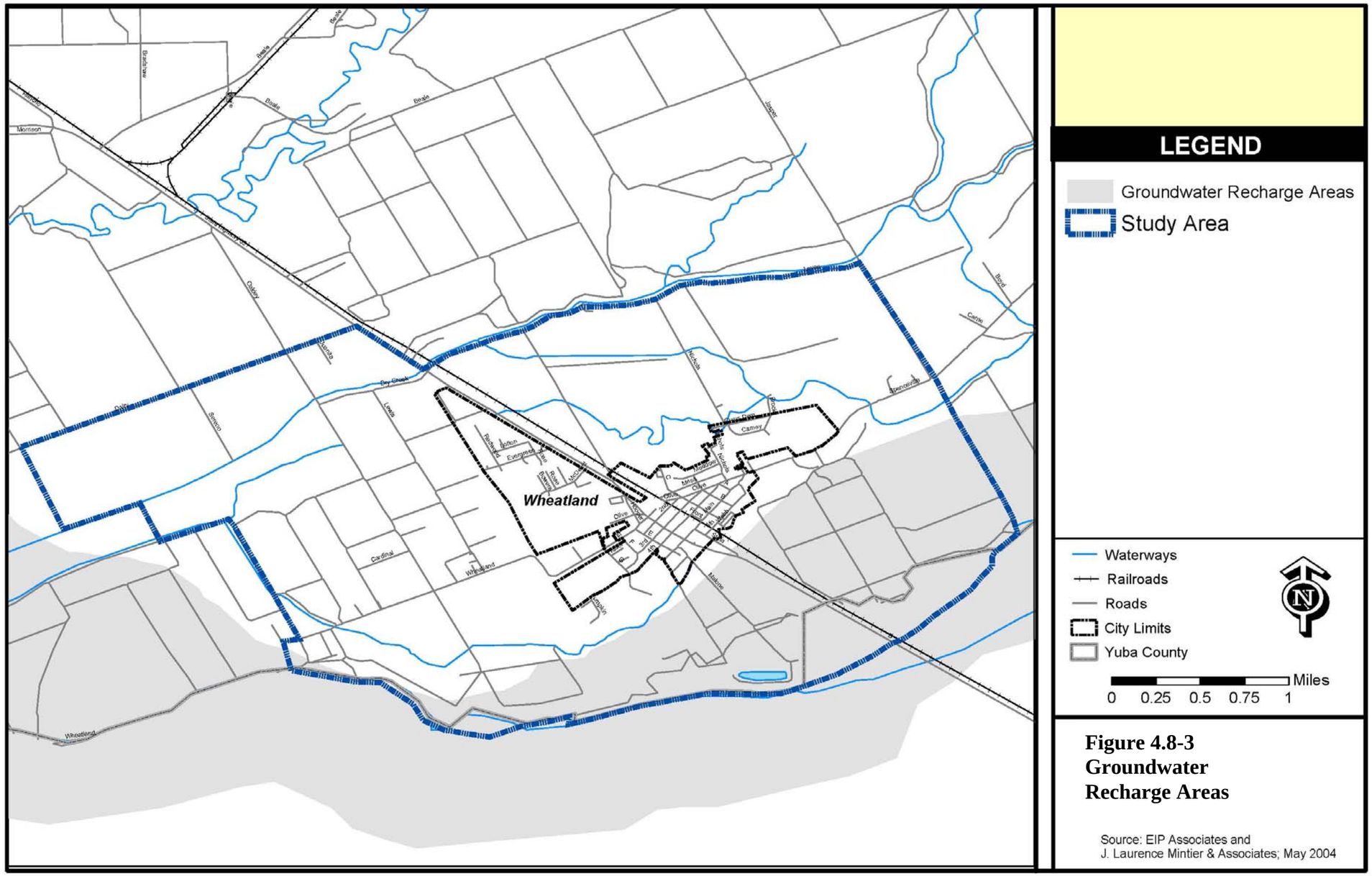

Figure 4.8-3
Groundwater Recharge Areas

Source: EIP Associates and J. Laurence Mintier & Associates; May 2004

The *Yuba County General Plan* recognizes that surface water supply cannot be divorced from consideration of groundwater recharge. The Plan states that some surface water must be reserved for groundwater recharge, as well as for protection of the aquatic environment.

REGULATORY CONTEXT

The following is a description of federal, State, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

Federal

Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers studies. FEMA is also responsible for distributing the Flood Insurance Rate Maps (FIRMS), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas, including the 100-years floodplains.

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within the flood hazard areas depending upon the potential for flooding within each area. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations (CFR). These standards are implemented at the State level through construction codes and local ordinances; however, these regulations only apply to residential and non-residential structure improvements. Roadway construction or modification is not explicitly addressed in the FEMA regulations. However, the California Department of Transportation (Caltrans) has also adopted criteria and standards for roadway drainage systems and projects situated within designated floodplains. Standards that apply to floodplain issues are based on federal regulations (Title 23, Part 650 of the CFR). At the State level, roadway design must comply with drainage standards included in Chapters 800-890 of the Caltrans Highway Design Manual.

National Pollutant Discharge Elimination System (NPDES)

As authorized by the California Clean Water Act, and implemented by the California Regulatory Water Quality Control Board, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

State

Inland Surface Water Plan

In March 2000, the State Water Resources Control Board (SWRCB) adopted Inland Surface Water Plan / Enclosed Bays and Estuaries Program (ISWP/EBEP) Phase I water quality objectives for inland surface waters. Included among the provisions of these objectives are: (a) that all point and nonpoint discharges must comply with identified water quality objectives; and (b) that effluent limits are to be imposed, either through National Pollutant Discharge Elimination System (NPDES) permits or Waste Discharge Requirements (WDRs), such that water quality objectives shall not be exceeded in the receiving water outside a designated mixing zone. The Central Valley Regional Water Quality Control Board (CVRWQCB) is responsible for ensuring that stormwater discharges meet the adopted numerical objectives within the Wheatland General Plan Update Study area.

California General Construction Activity Stormwater Permit

The U.S. Environmental Protection Agency (U.S. EPA) and the SWRCB regulate point sources of pollution, such as construction sites, that have the potential to discharge pollutants into the waters of the United States. This is accomplished through the issuance of NPDES stormwater discharge permits. NPDES Phase II regulations took effect in March 2003, requiring that applicants proposing construction activities involving disturbance of from one to five acres, and associated stormwater discharge, must obtain a NPDES permit from the State. Construction activities larger than five acres were already regulated, under NPDES Phase I (1990). (Phase II also required that small [population < 100,000] municipal separate storm sewer system [MS4] operators obtain a NPDES permit.) Landowners are responsible for applying for coverage under the permit and complying with permit requirements, but may delegate specific duties to developers and contractors by mutual consent.

Permit applicants are required to prepare, and retain at the construction site, a Storm Water Pollution Prevention Plan (SWPPP), which describes the site, erosion and sediment controls, means of waste disposal, implementation of local plans, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-stormwater management control. Dischargers are also required to inspect construction sites before and after storms to identify stormwater discharge from construction activity, and to identify and implement controls where necessary.

According to the California Department of Water Resources (DWR), basic information for many of the State's groundwater basins is lacking. To this end, the California Legislature mandated in the Budget Act of 1999 that the Department of Water Resources prepare:

> "... the statewide update of the inventory of groundwater basins contained in Bulletin 118-80, which includes, but is not limited to, the following: the

> review and summary of boundaries and hydrographic features, hydrogeologic units, yield data, water budgets, well production characteristics, and water quality and active monitoring data; development of a water budget for each groundwater basin; development of a format and procedures for publication of water budgets on the Internet; development of the model groundwater management ordinance; and development of guidelines for evaluating local groundwater management plans."

Groundwater use in the Sacramento Valley Groundwater Basin is largely unregulated, although some local agencies in the Sacramento Valley have chosen to write groundwater management plans based on AB 3030, the Groundwater Management Act of 1992 (*California Water Code Sections 10750-10756)*. The Groundwater Management Act provides a systematic procedure for an existing local agency to develop a groundwater management plan.

The Yuba County Water Agency (YCWA) has prepared a Groundwater Management Plan for Yuba County. The purpose of the YCWA's Groundwater Management Plan is to build on and formalize the historically successful management of the County's groundwater resource and develop a framework for implementation of future activities.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

A hydrology/water quality impact would be considered significant if any of the following conditions, or potential thereof, would result with the proposed project implementation:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- Result in adverse impacts from the construction of new (or expanded) drainage facilities;
- Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff;
- Substantial reduction in the flood carrying capacity in an existing waterway (100-year flood event);
- Substantial flooding, erosion or siltation; or
- Substantially degraded water quality (i.e., through sedimentation or pollutant loading).

Method of Analysis

The hydrology and water quality impact analysis for the General Plan Update study area is based on a *Draft Drainage Report for Internal Drainage* prepared for the study area by

Civil Engineering Solutions, November 2005, along with an *External Source Flood Protection Plan* by *Mead & Hunt, October 2005*.

The External Source Flood Protection Plan presents three (3) flood control alternatives and one (1) flood protection option for protecting the General Plan area. Each flood control alternative mitigates for the external flooding potential from the Bear River, Dry Creek, and the San Joaquin Drainage Ditch.

The Drainage Report for Internal Drainage presents four (4) alternative drainage plan concepts for the City of Wheatland to consider as measures to mitigate for internal drainage impacts from the General Plan implementation.

Project-Specific Impacts and Mitigation Measures

4.8-1 New development in the study area associated with the General Plan Update would result in increased runoff, therefore leading to potential flooding. The General Plan Land Use Plan, and circulation proposals could also result in the location of projects in flood zones, or alter the course of floodwaters.

Buildout of land uses and circulation improvements allowed by the General Plan Update would result in an increase in impermeable surfaces, such as roadways, sidewalks, and rooftops. The increase in impermeable surfaces would increase stormwater runoff. Increased runoff because of development in the study area would require new drainage facilities and/or modifications to existing/planned facilities before General Plan Update development.

Additional roadways, along with additional development proposed for the study area would also alter the course of floodwaters by creating new barriers. The Drainage Report prepared by Civil Engineering Solutions, Inc. for the General Plan study area includes a proposed drainage system, which would reduce future flows.

Proposed Roadways

The Wheatland General Plan study area extends in all directions from the existing City boundaries. Because the proposed roadways would cross over existing streams at a number of locations, culvert crossings would be required. The SR 65 bypass is proposed along the east boundary of the study area, which would represent a divide between undeveloped offsite areas to the east and the proposed developed area. Table 4.8-2 shows the culverts proposed at locations where the proposed roadways cross the existing and proposed drainage channels.

Table 4.8-2
Proposed Culverts

Stream	HEC-RAS Cross Section ID Number	Proposed Culvert Size (Feet)	Culvert Length (Feet)
Grasshopper Slough North Tributary 1	13060	42-inch CMP (1 barrel)	Existing – No Change
	12320	8 x 3 (3 barrels) [1]	76
	8940	5 (3 barrels) [2]	60
	8500	8 x 5 (3 barrels)	100
	6550	10 x 4 (2 barrels)	55
	3570	10 x 4 (2 barrels)	55
Grasshopper Slough North Tributary 2	7314	10 x 4 (2 barrels)	50
	4850	10 x 4 (2 barrels)	60
	4155	10 x 3 (2 barrels)	60
	1310	6 (2 barrels)	60
Grasshopper Slough South	1037.95	6 x 5 (4 barrels)	60
	1037.05	10 x 6 (2 barrels)	60
	1034.5	6 x 6 (4 barrels)	60
	1032.5	9 x 6 (3 barrels)	90
	1030.5	11 x 6 (2 barrels)	Existing – No Change
	1024.05	7 x 6 (3 barrels)	60
	1021.5	6 x 5 (5 barrels)	60
	1015.5	6 x 6 (4 barrels)	60
Sohrakoff	3740	6 (2 barrels)	60
	2035	4 (2 barrels)	70

[1] *Box culvert spam x rise*
[2] *Circular Culvert diameter- in feet.*
Source: Civil Engineering Solutions Inc., 2005

Proposed Drainage

The General Plan study area does not have adequate capacity within the channels to convey the existing flows. Without mitigation, development would result in increased flows, which would result in widening the existing floodplains. The computed future conditions flows are shown in Table 4.8-3. In order for development to occur, future flows will have to be reduced, channels will have to be constructed, and the floodplains will have to be encroached. The General Plan Policy Document includes measures that encourage the reduction of flows. Limiting post-development flows to be below, or consistent with existing conditions would be consistent with the policies included in the General Plan Update. Flows would also be reduced by the proposed regional detention basins.

Table 4.8-3
Post-Project Peak Flow Rates

Stream	Location	HEC-RAS Cross Section ID Number	100-Year Flow (Cubic Feet per second)
Grasshopper Slough North Tributary 1	Proposed Boulevard	12320	67
	Proposed Boulevard	8499.99	409
	Nichols road	6550	391
Grasshopper Slough North Tributary 2	B Street	7349	53
	C Street	4850	144
	Proposed Boulevard	1310	154
Sohrakoff Channel	Dry Creek Lee Road	3740	126
	Proposed Boulevard	2035	156
Lower Grasshopper Slough	Proposed Road No. 1	1037.95	410
	Proposed Road No. 2	1037.05	108
	UPRR	1035.5	327
	State Street	1034.5	323
	Hwy 65	1032.5	307
	Main Street Extension	1024.05	506
	Oakley Lane	1021.5	500
	Wheatland Road	1015.5	521
Lower Grasshopper Slough	Below Grasshopper South confluence	1008	539

Source: Civil Engineering Solutions Inc., 2005

Interior Drainage Alternatives

As stated above, the Drainage Report for Internal Drainage presents four (4) alternative drainage plan concepts for the City of Wheatland to consider as measures to mitigate for internal drainage impacts from the General Plan implementation.

Alternative 1

In Alternative 1, each development would be responsible to mitigate the associated post-project peak release flows reducing the flow to pre-project conditions. Alternative 1, offers the maximum flexibility for phasing of the developments, but requires redundant mitigation, as each project would be required to provide measures independently.

Grasshopper Slough North Tributary 1

The floodplain along Grasshopper Slough North Tributary 1 covers a large portion of the area along the stream. The sheet flow generated upstream of the General Plan study area along Dry Creek would be reduced in a detention basin (Pond R2) to be located upstream of the proposed SR 65 Bypass. The out flow from the detention based is proposed to be drained through a storm drain to

Grasshopper Slough North Tributary 1. A drainage easement would be required for the storm drain because streets are not proposed in the area. The flow along the stream would be contained in the channel upstream of Nichols Road.

Sheetflow generated upstream of the General Plan study area along the Bear River would be collected into a proposed detention basin (Pond R1) upstream of the proposed SR 65 Bypass. A proposed culvert would meter the flow out of the detention basin into the existing channel draining from the proposed SR 65 Bypass into Grasshopper Slough North Tributary 1. The existing clay mining area along the left bank of the channel downstream of Nichols Road is expected to be filled. The existing levees along the channel would have to be raised to contain the future flows even with mitigation with local and regional detention basins in place. The channel downstream of Nichols Road is proposed to be widened and deepened as shown in Figure 10 of the *Drainage Report* (see Appendix E of this Draft EIR).

The existing 36-inch culvert at the end of Grasshopper Slough North Tributary 1 is anticipated to not drain into Dry Creek under high tailwater conditions and a detention basin and pump station (Pond R4) are proposed at Dry Creek. The same detention basin would also receive flows from Grasshopper Slough North Tributary 2.

Grasshopper Slough North Tributary 2

The Grasshopper Slough North Tributary 2 crosses SR 65 and UPRR at existing bridge structures. The historical channel has been filled in between SR 65 and Oakley Lane. A new channel is proposed to divert the flow north to Dry Creek upstream of UPRR. The proposed channel would not be able to drain into Dry Creek under high tailwater conditions and a detention basin and pump station (Pond R4) are proposed at Dry Creek. The detention basin area and pump station capacity were determined by balancing the cost of land and capital cost of the pump station. The minimum cost was found to be a detention basin area of 17 acres and a pump station of 100 cubic feet per second (cfs), as shown in Figure 11 of the *Drainage Report*, (see Appendix E of this Draft EIR). The land cost was assumed to be $200,000 per acre and the capital cost of the pump station was assumed at $35,000 per cfs.

Sohrakoff Drainage Channel

Under proposed conditions the Sohrakoff Drainage Channel will continue to collect runoff from the northern areas of the existing developed area of the City as well as the General Plan study area north of the existing City limits and east of the channel. Flows from the Grasshopper Slough North Tributary 2 will no longer be intercepted by the Drain because the flows will be diverted north upstream of UPRR.

Grasshopper Slough South

Grasshopper Slough South drains the area south of the City of Wheatland. The sheetflow generated in the areas upstream of UPRR will be collected into a proposed channel as shown on Figure 10 (see Appendix E of this Draft EIR). The existing corrugated metal pipe culverts under UPRR and State Street do not have adequate capacity to convey the projected future upstream flows. The area upstream of UPRR will be inundated during the 100-year event without additional drainage improvements. Under existing conditions, the peak flow reaching the twin 48-inch culverts under UPRR is approximately 400 cfs. The culverts lack adequate capacity to transmit the flows downstream. A regional detention basin (Pond R3) is proposed upstream of UPRR to reduce the downstream flows. The proposed detention basin would reduce the future 100-year flows to approximately 100 cfs. A single 42-inch outlet structure is recommended for the detention basin. As an alternative, pumping flow above the capacity of the culverts to Bear River was considered but was found to be more costly than a detention basin. The capacity of the UPRR culverts was estimated to be approximately 100 cfs.

Local Detention

Each future development shall reduce its post-project flows to or below existing conditions, consistent with General Plan policy numbers 5.E.4, 5.E.6 and 5.E.8. Actual local detention basins were not analyzed in the drainage study because data for future developments are not available. Instead, local detention basins were assumed to reduce future flows to existing conditions and so future conditions subbasins were analyzed as if they were not developed.

According to the *Drainage Report*, the storm drain trunk lines are proposed to convey the 10-year flows along the proposed streets. The proposed storm drain sizes were based on the assumption that each future development would reduce post-development flows to existing conditions. Storm drains would be sized for areas that would not be able to drain into a stream without crossing a major street. Future storm drain sizes and lengths are anticipated to vary due to future development boundaries.

<u>Alternative 2</u>

In Alternative 2, the regional drainage system would collect and provide facilities for development post-project un-mitigated flows. The detention and release of the City's flow would be released into the Bear River and Dry Creek. Alternative 2, would require increased pipe sizes and channel capacities necessitating excavation of the existing drainage corridors and/or new parallel channels around the City to handle the increased post-development flows. New channels would provide sufficient capacity for the ultimate buildout of the General Plan.

Alternative 2, requires a similar scope of improvements as in Alternative 1, but with the following additional improvements (See Figure 12 for Alternative 2 in Appendix E of this Draft EIR).

- Additional regional detention and pumping;
- Increased trunk pipe sizes; and
- Reconstructed and/or parallel regional channel systems.

Alternative 2, would require significant regional improvement installation prior to development, and provide increased conveyance throughout the City. The result is a large amount of flows ending up in the west and south plan areas, which could not be contained in a channel system matching existing channel flow elevations west of the plan area. Thus, significant fill materials or additional plan improvements would be necessary for the west and south areas to be allowed to develop.

Alternative 3

Alternative 3, is similar to Alternative 2, but adds detention throughout the study area to reduce westward flows. In addition, in the south and west areas a deepened channel system would be produced, which would require a pump station to either discharge to the existing channel west of the General Plan area or into Dry Creek. The detention and release of the City's internal flows to Bear River and Dry Creek would also occur at the regional improvements. Increased pipe sizes and channel capacities are required in this alternative to handle the post-development flows from General Plan buildout. Alternative 3, requires a similar scope of improvements as in Alternative 1, but with the following additional improvements (See Figure 13 for Alternative 3 regional improvements in Appendix E of this Draft EIR).

- Additional regional detention and pumping;
- Pumping and deepened detention in the west area;
- Increased trunk pipe sizes;
- Reconstructed and/or parallel regional channel systems; and
- Deeper channels in the west and south areas.

Alternative 3, would require significant regional improvement installation prior to development.

Alternative 4

In Alternative 4, the proposed General Plan area would be divided into five (5) regional watersheds, and a stand-alone watershed plan would be developed specifically for each watershed. The timing of development in each watershed would affect the scope of improvements required. For example, development on one regional watershed would require drainage improvements in the developed

watershed that consider the developmental condition and flows of adjacent watersheds.

Increased pipe sizes and channel capacities are required in this alternative to handle the General Plan buildout post-development flows. Alternative 4, would propose to parallel existing drainage corridors around the City with new channels that provide sufficient capacity for the ultimate buildout condition. Alternative 4, requires a similar scope of improvements as in Alternative 1, but with the following additional improvements:

- Additional regional detention and pumping;
- Increased trunk pipe sizes; and
- Reconstructed and/or parallel regional channel systems.

Each watershed in Alternative 4 would require regional drainage improvements prior to development within the watershed.

The buildout of the General Plan Update would create increased impervious surfaces, channel crossings, and peak-flow timing. For the above reasons implementation of the Land Use Plan could lead to structures within areas that have a potential to flood during a 100-year storm. The buildout of the Land Use Plan or construction of circulation improvements could also alter (redirect) the course of floodwaters, posing flood risks to new areas. The City's storm drainage system consists of collection, conveyance, detention, and pumping facilities. Stormwater is ultimately pumped and discharged directly into the Bear River and Dry Creek. Future development will require the development of a new storm drainage and flood protection system. Implementation of any of the above four Alternatives would provide adequate capacity for future stormwater flows. Policies of this chapter also require the development of new storm drainage, as proposed by the *Drainage Report*, and flood protection system in the safest and most efficient manner.

The General Plan Update includes the following goals and policies applicable to internal flood hazard issues:

Goal 5.E To collect and dispose of stormwater in a manner that protects the City's residents and property from the hazards of flooding, manages stormwater in a manner that is safe and environmentally sensitive, and enhances the environment.

Policy 5.E.1. The City shall prepare a Storm Drainage Master Plan and Flood Protection Master Plan to assure adequate protection for residents and property.

Policy 5.E.2. The City shall encourage project designs that minimize drainage concentrations and impervious coverage.

Policy 5.E.3. The City shall prohibit grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of storm drainage facilities.

Policy 5.E.4. The City shall require projects that have significant impacts on the quantity and quality of surface water runoff to incorporate mitigation measures for impacts related to urban runoff.

Policy 5.E.5. Future drainage system requirements shall comply with applicable state and federal pollutant discharge requirements.

Policy 5.E.6. The City shall allow stormwater detention facilities to mitigate drainage impacts and reduce storm drainage system costs. To the extent practical, stormwater detention facilities should be designed for multiple purposes, including recreational (e.g., parks, ball fields, etc.) and/or stormwater quality improvement.

Policy 5.E.7. The City shall consider using stormwater of adequate quality to replenish local groundwater basins, restore wetlands and riparian habitat, and irrigate agricultural lands.

Policy 5.E.8. The City shall require detention storage with measured release to ensure that the capacity of downstream creeks and sloughs will not be exceeded. To this end:

a) Outflow to creeks and sloughs shall be monitored and controlled to avoid exceeding downstream channel capacities;

b) Storage facilities shall be coordinated and managed to prevent problems caused by timing of storage outflows.

Policy 5.E.9. The City shall require the preparation of watershed drainage plans for proposed developments. These plans shall define needed drainage improvements and estimate construction costs for these improvements.

Implementation of the goals and policies above would reduce the impacts to a ***less-than-significant*** level.

<u>Mitigation Measure(s)</u>
None required.

4.8-2 Development associated with the General Plan Update would be within the 100-Year flood hazard area.

The City of Wheatland is experiencing an unprecedented population growth that is anticipated to continue in the foreseeable future. In order to provide a current basis for evaluating future growth on both public and private lands the Wheatland City Council made the decision to update the 1980 General Plan.

As part of the General Plan Update, an External Source Flood Protection Plan was prepared to evaluate flooding from external sources in the City of Wheatland and surrounding areas, and provide alternative measures to mitigate for the future flooding potential from Bear River south of the City of Wheatland.

To mitigate for the flooding issues associated with the City of Wheatland and the General Plan Study area, three alternative flood control systems, all consisting of levee improvements, were developed and evaluated. These alternatives were developed with the objective to protect the Preferred Land Use Alternative approved by the General Plan Steering Committee on April 7, 2005, from external sources of flooding described above in accordance with FEMA standards. The alternatives are:

- Alternative 1 – Oakley Lane Cross Levee
- Alternative 2 – Pleasant Grove Road Cross Levee
- Alternative 3 – No Cross Levee

Several common features associated with all three of the alternatives include the fact that the construction of all three of the proposed alternatives will require the submittal of a LOMR request to FEMA for levee certification and appropriate zoning to allow development. In addition, all three of the alternatives include the reconstruction of at least the upstream 4.4 mile section of the south Dry Creek Levee and 1,000 feet of the west San Joaquin Drainage Ditch levee. The specific requirements for the three selected alternatives are discussed below.

<u>Alternative 1 – Oakley Lane Cross Levee</u>

The Oakley Lane Cross Levee Alternative includes construction of a cross levee between the downstream end of the north Bear River levee and the south Dry Creek levee along the shortest route between the two levees plus improvements to the existing Dry Creek south levee and San Joaquin Drainage Ditch west levee. The resulting cross levee would be located approximately 3,000 feet west of and parallel to Oakley Lane, in a generally north-south direction. The location of the south end of the levee was selected based on the pending LOMR, using the full extent of the FEMA certifiable reach of the north Bear River levee.

The crest of the new Oakley Lane Cross Levee would be at a minimum elevation of 73.4. The crest elevation was developed using hydraulic models for the Bear

River and simulating a failure of the lower portion of the north Bear River levee (downstream from the portion of the levee that has a pending LOMR and is FEMA certifiable) during the 100-year flood, in accordance with FEMA guidelines for a non-FEMA-certifiable levee. Results from the hydraulic analysis were used to establish the levee height at three feet above the backwater from the Bear River levee failure for the 100-year flood, in accordance with FEMA guidelines.

The maximum height of the cross levee would be approximately 14.5 feet above existing grade and the south end of the cross levee ties into high ground at contour elevation 73.4. The cross levee would be approximately 6,700 feet long with a 16-foot crest width, a 3 horizontal to 1 vertical upstream (or west) side slope, and a 2 horizontal to 1 vertical downstream (or east) side slope. Approximately 17 acres of right-of-way would be required to build and maintain the levee.

In addition to construction of the Oakley Lane Cross Levee, improvements to existing levees would also be required for this alternative to meet FEMA standards. Approximately 4.4 miles of the south Dry Creek levee from the point of intersection of the cross levee upstream to the San Joaquin Drainage Ditch and approximately 1,000 feet of the west San Joaquin Drainage Ditch levee would need to be reconstructed, raised, and widened to provide the required 100-year freeboard and acceptable stability. Approximately 42 acres of additional right-of-way would be required to build and maintain the reconstructed levee.

Alternative 2 – Pleasant Grove Road Cross Levee

The Pleasant Grove Road Cross Levee Alternative includes construction of a cross levee between the north Bear River levee and the south Dry Creek levee, parallel to and just east of Pleasant Grove/Forty Mile Road and improvements to the existing Dry Creek south levee, San Joaquin Drainage Ditch west levee, and downstream section of the north Bear River levee. The crest of the cross levee would be at elevation 76.0, which is three feet above the Bear River 100-year flood profile. Final design of the levees on the south side of Dry Creek and north side of the Bear River may result in the cross levee being higher than 76.0. The Bear River hydraulic model was used to establish the 100-year flood elevations at the cross levee location. The downstream section of the north Bear River levee that is currently not FEMA certifiable would be reconstructed and certified and, as such, be able to contain the 100-year flood. Openings in the cross levee would be designed to allow flows to pass downstream and to protect against flooding caused by backwater flood stages from the Feather River.

With the crest elevation at 76.0, the maximum height of the cross levee is approximately 16.5 feet above existing grade. The cross levee would be approximately 3,800 feet long, with a crest width of 16 feet, a 3 horizontal to 1 vertical upstream (or west) side slope, a 2 horizontal to 1 vertical downstream (or east) side slope, and a ten foot bench between the cross levee and road

embankment. Approximately ten acres of right-of-way would be required to build and maintain the levee.

In addition to construction of the Pleasant Grove Road Cross Levee, improvements to existing levees are also required for this alternative to meet FEMA standards. Improvements would consist of reconstructing, raising, and widening the levee to provide the required 100-year freeboard and stability. The improvements include the following levees:

- Approximately 2.1 miles of the north Bear River levee, between the cross levee and the downstream end of the FEMA certifiable reach of the north Bear River levee;

- Approximately 6.0 miles of the south Dry Creek levee, from the point of intersection of the Pleasant Grove Road Cross Levee upstream to the San Joaquin Drainage Ditch; and

- Approximately 1,000 feet of the west San Joaquin Drainage Ditch levee.

Approximately 85 acres of additional right-of-way would be required to build and maintain the reconstructed levees.

Alternative 3 – No Cross Levee

The No Cross Levee Alternative would include approximately 10.1 miles of existing perimeter levee improvements with no cross levee. Improvements to the existing levees that are not currently FEMA certifiable are required for this alternative to meet FEMA standards. Improvements would consist of reconstructing, raising, and widening the levee to provide the required 100-year freeboard and stability. The improvements include the following levees:

- The north Bear River levee from the downstream point of the levee that is currently FEMA certifiable and extending to the confluence of Dry Creek;

- The south Dry Creek levee from the confluence of Bear River upstream to the San Joaquin drainage ditch; and

- The west San Joaquin drainage ditch levee.

All of the levee improvements were evaluated with the hydraulic models, using the resulting 100-year flood elevations plus three feet to establish top of levee elevations. Approximately 115 acres of additional right-of-way would be required to build and maintain the reconstructed levees.

The flood control alternatives each provide equivalent flood protection for the General Plan Update Land Use Diagram. However, it is the responsibility of the regional reclamation districts to choose the most appropriate means of flood protection. It should also be noted that prior to implementation of the reclamation district chosen alternative, additional environmental review would be completed.

The General Plan Update includes the following goals and policies applicable to external flood hazard issues:

Goal 9.C To protect the lives and property of the citizens of Wheatland from hazards and manage floodplains for their open space and natural resource values.

Policy 9.C.1. The City shall continue to implement floodplain zoning and undertake other actions required to comply with state floodplain requirements, and to maintain the City's eligibility under the Federal Flood Insurance Program.

Policy 9.C.2. The City shall require evaluation of potential flood hazards prior to approval of development projects. The City shall require proponents of new development to submit accurate topographic and flow characteristics information.

Policy 9.C.3. The City shall not allow development in areas subject to flooding unless adequate mitigation is provided, to include project levees designed for a standard project flood.

Policy 9.C.4. The City shall require flood-proofing of structures and outdoor storage areas for hazardous materials in areas subject to flooding. Hazardous materials and wastes shall be contained within floodproofed structures or storage areas.

Policy 9.C.5. The City shall prohibit the construction of facilities essential for emergencies and large public assembly in the 100-year floodplain, unless the structure and road access are free from flood inundation.

Policy 9.C.6. The City shall continue to work closely with the U.S. Army Corps of Engineers, Reclamation Districts 2103 and 817, the Federal Emergency Management Agency (FEMA), and the State Department of Water Resources in defining existing and potential flood problem areas and solutions.

Policy 9.C.7. The City shall preserve floodways and floodplains for non-urban uses, except that development may be allowed in a floodplain with mitigation measures that are in conformance with the City’s Flood Protection Master Plan.

Policy 9.C.8. The City shall formulate emergency management plans for the safe evacuation of people from areas subject to inundation from dam failure. Plans shall be reviewed and periodically updated.

Policy 9.C.9. The City shall participate in the National Flood Insurance Program.

Policy 9.C.10. The City shall require that roadway systems for areas protected from flooding by levees be designed to provide multiple escape routes for residents in the event of a levee failure.

Policy 9.C.11. The City shall develop evacuation routes and a disaster plan in the remote event of a failure to Camp Far West Dam.

Implementation of the goals and policies above would reduce the impacts to a ***less-than-significant*** level.

Mitigation Measure(s)
None required.

4.8-3 Development in the study area could result in erosion, sedimentation, and subsequent degradation of the surface water quality.

Development of the proposed land uses and circulation improvements within the study area would have the potential to degrade water quality. Short-term water quality impacts would occur during individual site construction, and long-term impacts would be experienced during the lifetime of development.

Short-term grading and construction activities may cause an increase in erosion leading to sedimentation of streams in the affected watershed. Pollutants may also be transported from construction areas to downstream locations due to improper handling practices. Solvents, fuels, lubricants, and chemical wastes may be spilled, dumped or discarded on construction sites. These contaminants may be picked up in site runoff and ultimately enter downstream waterways.

The degree to which construction activities affect water quality is partly determined by the time of year during which construction occurs. Construction during winter rainy season would result in an increased potential for erosion, sedimentation, and contaminant transport in surface runoff. Decreased water quality during individual project construction would be a potentially significant impact.

Long-term occupation of the proposed land uses would introduce non-point sources of pollution such as fertilizers, pesticides, household chemicals, and automobile products (including fuels, and lubricants spilled, leaked, or dumped) within the study area.

Runoff water quality is at its worst during the first storm following a prolonged dry period due to the "first flush" effect: the storm tends to remove pollutants that have accumulated over the preceding dry period. These pollutants include sediments, hydrocarbons, heavy metals, and bacterial contaminants that originate from urban sources like those identified above. Subsequent stormwater runoff is of generally better quality because exposed surfaces are typically less contaminated with pollutants.

Stormwater pollution control is implemented through the use of NPDES permits, which are applied to industry, municipalities, and construction activities. The Municipal Storm Water Permitting Program regulates storm water discharges from municipal separate storm sewer systems (MS4s). Phase II of the program adopts a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes. The City of Wheatland currently and at buildout would qualify as a Small MS4 (population < 100,000).

The MS4 permits require the discharger to develop and implement a Storm Water Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The management programs specify what best management practices (BMPs) will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection and elimination; construction and post-construction; and good housekeeping for municipal operations. In general, medium and large municipalities are required to conduct chemical monitoring, though small municipalities are not.

In addition, subsequent developments greater than one acre in area would be required to obtain construction NPDES permits. Landowners are responsible for applying for coverage under the permit and complying permit requirements, but may delegate specific duties to developers and contractors by mutual consent. Violation of downstream receiving water quality standards or non-compliance with the NPDES program would be considered a substantial impact.

Construction General Permit applicants are required to prepare, and retain at the construction site, a Storm Water Pollution Prevention Plan (SWPPP), which describes the site, erosion and sediment controls, means of waste disposal, implementation of local plans, control of post-construction sediment and erosion control measures and maintenance responsibilities, and non-stormwater management control. Dischargers are also required to inspect construction sites before and after storms to identify stormwater discharge from construction activity, and to identify and implement controls where necessary.

The General Plan Update includes the following goals and policies applicable to water quality issues:

Goal 5.E To collect and dispose of stormwater in a manner that protects the City's residents and property from the hazards of flooding, manages stormwater in a manner that is safe and environmentally sensitive, and enhances the environment.

Policy 5.E.1. The City shall prepare a Storm Drainage Master Plan and Flood Protection Master Plan to assure adequate protection for residents and property.

Policy 5.E.2. The City shall encourage project designs that minimize drainage concentrations and impervious coverage.

Policy 5.E.3. The City shall prohibit grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of storm drainage facilities.

Policy 5.E.4. The City shall require projects that have significant impacts on the quantity and quality of surface water runoff to incorporate mitigation measures for impacts related to urban runoff.

Policy 5.E.5. Future drainage system requirements shall comply with applicable state and federal pollutant discharge requirements.

Policy 5.E.6. The City shall allow stormwater detention facilities to mitigate drainage impacts and reduce storm drainage system costs. To the extent practical, stormwater detention facilities should be designed for multiple purposes, including recreational (e.g., parks, ball fields, etc.) and/or stormwater quality improvement.

Policy 5.E.7. The City shall consider using stormwater of adequate quality to replenish local groundwater basins, restore wetlands and riparian habitat, and irrigate agricultural lands.

Policy 5.E.8. The City shall require detention storage with measured release to ensure that the capacity of downstream creeks and sloughs will not be exceeded. To this end:

a. Outflow to creeks and sloughs shall be monitored and controlled to avoid exceeding downstream channel capacities;

b. Storage facilities shall be coordinated and managed to prevent problems caused by timing of storage outflows.

Policy 5.E.9. The City shall require the preparation of watershed drainage plans for proposed developments. These plans shall define needed drainage improvements and estimate construction costs for these improvements.

Goal 8.A To protect and enhance the natural quantity and qualities of the Wheatland area's rivers, creeks, sloughs, and groundwater.

Policy 8.A.1. The City shall cooperate with Yuba County in the conservation of Bear River and Dry Creek for the protection of water resources and open space qualities.

Policy 8.A.5. The City shall require proposed developments to comply with streambed alteration and watershed protection regulations as administered by the California Department of Fish and Game and regulations adopted by the Environmental Health Department.

Policy 8.A.8. The City shall endeavor to protect, preserve, and improve riparian corridors.

Implementation of the goals and policies above would minimize impacts to water quality; however not to a *less-than-significant* level. The resultant impact would therefore remain ***potentially significant***.

Mitigation Measure(s)
Implementation of the following mitigation measure would reduce the potential impacts to a *less-than-significant* level.

4.8-3 *For future development projects, applicants shall obtain NPDES Construction General Permit, which requires the submittal of a Notice of Intent (NOI) with applicable fee to the State Water Resources Control Board (SWRCB) and the preparation of a Stormwater Pollution Prevention Plan (SWPPP) to be submitted to the City Engineer for review.*

4.8-4 Development in the study area could result in loss of groundwater supplies or interfere substantially with groundwater recharge.

The availability, quantity, and quality of water are vital to natural processes and human activities. Water is essential to the development of housing, commerce, industry, agriculture, and recreation. A groundwater aquifer underlies the City of Wheatland and serves as the City's municipal water supply. Wheatland currently (June 2004) draws its entire water supply from six (6) municipal well sites.

The overall reliance upon groundwater for domestic and agricultural use in the Sacramento Valley has increased steadily over the past few decades. The number of domestic and irrigation wells in the region increased from 9,109 in 1970 to 37,046 in 2002. The reasons for this increase include more demand, the need for reliable water supplies, the high costs of new surface water storage, and environmental concerns leading to the reduced diversion of surface water.

Development proposed within the General Plan study area encompasses approximately 10,420 acres. The General Plan Update (GPU) would result in a substantial increase in the total population in the Wheatland study area at buildout. The GPU would induce direct population growth through the construction of new housing units and the attraction of additional commercial enterprises. The GPU also incorporates construction of additional infrastructure, including roads, utilities, and government services that would indirectly contribute to growth, and impact groundwater levels.

The population growth associated with the General Plan Update would be substantial, at 10 times greater than existing population. This expansion would trigger a commensurate demand for groundwater supplies. As the physical dimensions of Wheatland expand, and impervious surfaces increase, additional runoff could potentially exceed the capacity of stormwater drainage systems, as the groundwater level decreases.

The *Yuba County General Plan* states that some surface water must be reserved for groundwater recharge, as well as for protection of the aquatic environment. However, surface water would simultaneously incur additional demands due to growth. Groundwater resources are regional in nature and require a cooperative effort to ensure protection of water quality and quantity. Policies in this section seek to protect groundwater and maintain the highest quality for human and natural use. The General Plan also seeks to ensure a safe and adequate water supply for existing and future development, and promote water conservation and reuse. See Chapter 4.16 for a more detailed discussion regarding General Plan Update water demands.

The General Plan Update includes the following goals and policies applicable to groundwater issues:

Goal 5.C To ensure a safe and reliable water supply sufficient to meet the future needs of the City.

Policy 5.C.1. The City shall protect the groundwater basin from overdraft from City use of groundwater. To this end, the City shall study, working closely with other public and private entities as deemed appropriate, the safe yield of the groundwater basin. Water management programs such as conjunctive use and recharge programs will also be considered. The City shall use this

information to determine the most appropriate long-term water supply to serve Wheatland.

Policy 5.C.2. If the results of studies undertaken pursuant to Policy 5.C.1 indicate an imbalance between safe groundwater yield and projected water requirements, the City shall develop a response plan to address the imbalance. This response plan will include an appropriate mix of water conservation measures, reuse, surface water supplements, and other water management techniques.

Policy 5.C.3. The City shall promote efficient water use and reduced water demand by:

a) Requiring water-conserving building design and equipment in new construction;
b) Encouraging water-conserving landscaping and other conservation measures; and
c) Encouraging retrofitting of existing development with water-conserving devices.

Policy 5.C.4. The City shall work with other agencies to promote water conservation measures countywide for both urban and agricultural uses.

Policy 5.C.5. The City shall only approve new development that relies on an adequate City water supply and delivery system**.**

Policy 5.C.6. The City shall plan, secure funding for, and procure sufficient water treatment capacity and infrastructure to meet projected water demands.

Policy 5.C.7. The City shall investigate processes for monitoring water demand growth trends to anticipate water supply needs.

Policy 5.C.8. The City shall monitor water quality regularly to ensure that safe drinking water standards are met and maintained in accordance with State and EPA regulations and take necessary measures to prevent contamination.

Policy 5.C.9. The City shall ensure that water supply capacity and infrastructure are in place prior to granting building permits for new development.

Policy 5.C.10. The City shall ensure through the development review process that public facilities and infrastructure are designed to meet ultimate

capacity needs, pursuant to a master plan, to avoid the need for future replacement to achieve upsizing.

Policy 5.C.11. The City shall ensure adequate water pressure throughout the urban area for fire protection purposes.

Goal 8.A To protect and enhance the natural quantity and qualities of the Wheatland area's rivers, creeks, sloughs, and groundwater.

Policy 8.A.1. The City shall cooperate with Yuba County in the conservation of Bear River and Dry Creek for the protection of water resources and open space qualities.

Policy 8.A.2. The City shall monitor any activities that may degrade the aquifers of Bear River or Dry Creek as it impacts City water supply and shall support the maintenance of high water quality in these water bodies.

Policy 8.A.3. The City shall cooperate with other jurisdictions in jointly studying the potential for using surface water sources to balance the groundwater supply so as to protect against aquifer overdrafts and water quality degradation.

Policy 8.A.4. The City shall help protect groundwater resources from overdraft by promoting water conservation and groundwater recharge efforts.

Policy 8.A.5. The City shall require proposed developments to comply with streambed alteration and watershed protection regulations as administered by the California Department of Fish and Game and regulations adopted by the Environmental Health Department.

Policy 8.A.7. The City shall retain to the extent feasible the environmental and ecological features of the creeks, sloughs and rivers in their natural state.

Policy 8.A.8. The City shall endeavor to protect, preserve, and improve riparian corridors.

Policy 8.A.9. The City shall require runoff controls in conjunction with development projects and agriculture production to limit toxics and nutrients from entering waterways.

Implementation of the goals and policies above would reduce the impacts to a ***less-than-significant*** level.

Mitigation Measure(s)
None required.

Endnotes

[1] Yuba County, Yuba County General Plan, May 1994.
[2] City of Wheatland, General Plan Update, Background Report, Public July 2004.
[3] City of Wheatland, Revised Draft General Plan Policy Document, Chapters 1, Land Use and Community Character, Chapter 5, Public Facilities and Services, and Chapter 8, Environmental Resources, July 2005.
[4] City of Wheatland, General Plan Update, Draft Drainage Report for Internal Drainage, Civil Engineering Solutions, Inc., November 2005.
[5] City of Wheatland, General Plan Update, External Source Flood Protection Plan, Mead & Hunt, October 20, 2005.
[6] Yuba County Water Agency, Groundwater Management Plan, March 2005.
[7] State Water Resources Control Board, Stormwater Program, www.swrcb.ca.gov/stormwtr/municipal.html, November 2005.