

***REPORT OF***  
***FLOOD FIGHT POTENTIAL SITES***  
***in***  
***UMATIILA COUNTY, OREGON***

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## Flood Fight Planning - Umatilla County

I. General. This report documents findings regarding potential flood fight locations in the portion of Umatilla County that is within the Portland District, Corps of Engineers boundary. The northeast corner of the county is within the boundary of the Walla Walla District. Primarily, that area is the watershed of the Walla Walla River and its two forks. Primary responsibility for flood fighting lies with the affected city and/or county. The Corps can assist in flood fight efforts if the city, county, and state are fully involved with flood response and require additional assistance. Advance planning is required to mount an effective flood fight. For example, a conceptual plan of action must be determined, easements obtained over potential work areas, material sources need to be identified, construction equipment needs to be located and identified, and elevation bench marks must be identified and/or established.

### II. Methodology.

A. The COE does not flood fight agricultural areas and we usually cannot demonstrate economic justification for most rural areas because of the extensive measures that would need to be taken over a large area to protect scattered infrastructure. Therefore, I limited my evaluations to "urban infrastructure" such as hospitals, potable water treatment plants, sanitary sewage treatment plants, schools, access points to those facilities, and residential areas of more than one or two homes.

B. The methodology I used was to first collect the FEMA flood plain mapping for the county and any included communities. I inspected the flood plain maps to see if flood plains existed within the communities and in the unincorporated part of the county. In unincorporated areas of the county, I looked for road crossings that could possibly stop access to a town. I attempted to establish landmarks and mileages to specific areas I wanted to visit in the field. I then spent 2-1/2 days driving to the sites identified on the flood plain mapping to see if it was possible to mount a flood fight or if there was a need to make such a flood fight.

C. To determine if flood damage was preventable at each site, I assumed that some sort of pre-flood action must be taken, like: a permanent levee/dike could have been built without "extreme" measures taken i.e. no structures moved. The assumption was that "advance measures" were not taken, because it is not likely that enough time would be available to construct such measures.

### III. Inspection Findings.

#### A. Adams.

1. **Community Description:** Adams, Oregon is a small farming/ranching community located approximately 10 miles northeast from Pendleton, the

Umatilla County seat. The town is situated immediately west of State Highway 11, on the way to Walla Walla, WA.

2. **Flood Plain Description:** Adams is affected by two flood plains. One is a short piece of Sand Hollow Creek that empties into Wildhorse Creek. Sand Hollow Creek is an ephemeral creek, that is, one that runs part of the year, depending upon weather conditions. Wildhorse Creek is a permanent flowing stream that starts in the Blue Mountains east of Adams and south of Weston, Oregon. The town of Adams is quite flat, therefore, flooding from either stream can affect approximately half of the town. The majority of flood flows can be attributed to Wildhorse Creek. The flood plain for the 100 year flood extends approximately 400 - 600 feet from the stream in the north portion of town and 100 - 200 feet from the stream in the south portion of town. The main development of Adams has historically taken place west of the stream, but more homes have been built east of Wildhorse Creek. In addition, construction of a new subdivision has begun at the east end of William Street, in the abbreviated flood plain of Sand Hollow Creek.

3. **Type of Flooding:** Due to the flood plain of approximately 600 feet wide, flooding in Adams can be characterized as *widespread*. For a large area in town, the west edge of the creek could be bermed to stop further flooding, if started early enough. However, that would likely cause increased flooding on the east side of the creek, exacerbating the problems for the people living on that side of the creek. Access to the town from Highway 11 is by a spur road crossing a bridge at the north and south end of town. There is little that could be done to protect these bridges, except to patrol them for debris clogging the opening. It is likely that back roads into and out of Adams could be used in case both spur roads to Highway 11 are blocked. Flooding at Adams is not preventable without pre-flood measures and those measures do include moving of some houses in the southern part of town along Wildhorse Creek. A levee built along Wildhorse Creek would probably prevent flooding along this channel. The bridges should be replaced at a higher elevation appropriate to the 100-year flood elevation. A levee along Sand Hollow Creek to its confluence with Wildhorse Creek would probably prevent flooding along this channel.

B. Athena.

1. **Community Description:** Athena, Oregon is a small farming/ranching community located approximately 16 miles northeast from Pendleton, the Umatilla County seat. The town is situated immediately west of State Highway 11, on the way to Walla Walla, WA.

2. **Flood Plain Description:** Athena is affected by two flood plains. One is by Waterman Creek/Gulch that subsequently empties into Wildhorse Creek. Waterman Creek is a permanent flowing stream that starts northwest of town. Wildhorse Creek is a permanent flowing stream that starts in the Blue Mountains east of Adams and south of Weston, Oregon. The town of Athena is somewhat "flume" shaped in cross section, from north to south. Waterman Creek formed this "channel". Waterman Creek empties into Wildhorse Creek. The majority of flood flows can be attributed to Waterman Creek. The flood plain for the 100 year flood extends approximately 400 - 600 feet from the stream in the north portion of town and 100 - 200 feet from the stream in the south portion of town. The main development of Athena has historically taken place east of the stream. However, with the abandonment of the railroad track into town paralleling Waterman Creek, the "industrial" section of town has been depleted. Wildhorse Creek is an integral part of the city park adjacent to the school complex. The remainder of Wildhorse Creek flows in farm fields.

3. **Type of Flooding:** Due to the flood plain of approximately 600 feet wide, flooding in Athena can be characterized as *widespread*. However, the flood plain is mostly empty, ex-industrial property. The creek has a berm/dike along most of the east bank protecting some newer homes. The west edge of the creek could be bermed to stop further flooding westward, if started early enough. However, that would likely cause increased flooding on the east side of the creek, exacerbating the problems for the people living on that side of the creek. Access to the town from Highway 11 is by several roads, only one of which crosses a bridge (at the south end of town). There is little that could be done to protect this bridge, except to patrol it for debris clogging the opening. It is likely that back roads into and out of Athena could be used in case the spur roads to Highway 11 are blocked. A dike/levee built along the east side of Waterman Creek could prevent flooding at Athena. This might require new, higher bridges to clear the 100-year flood. A dike/levee built along Wildhorse Creek would prevent flooding along this channel, but construction might require some structures to be moved.

C. Cayuse.

1. **Community Description:** Cayuse, Oregon is a small community located on the CTUIR approximately 14 miles east from Pendleton, the Umatilla County seat. The community consists of 2 - 4 homes, only. The community is located on a low bench above the Umatilla River on an "S" curve of the river.

2. **Flood Plain Description:** Cayuse is affected by one flood plain from the Umatilla River. The Umatilla River is a permanent flowing stream

that starts east of town in the Blue Mountains. Being located close to the river in elevation and along the outside of an "S" bend of the river, the community experiences a lot of flooding during high water events. In 1997, the CTUIR contracted with the COE, Portland District to update FEMA flood mitigation designs done after the 1996 floods and to act as inspector on the subsequent construction. A low spot in the riverbank immediately upstream of the houses was plugged, the bank downstream from that point was revetted with riprap, and a new channel was excavated through an adjacent gravel bar that was forcing water to flow against the now-protected bankline. In updating the FEMA designs, the CTUIR representatives were briefed on the designs and were apprised of the short term nature of the gravel bar work. Basically, the channel would last until the next high water event. For the next 2 - 3 years there was relatively low flows in the Umatilla River so the "channel" stayed where it was excavated in 1997. No FEMA flood mapping has been done for the CTUIR.

**3. Type of Flooding:** Flooding in Cayuse can be characterized as *widespread*. If the low spot plugged in 1997 is breached, then flooding will again threaten the house downstream from the county road. During 100 year high water events, the bench where the houses are located, will probably flood again. Given enough time, flood fighting can be accomplished at this location, by berming along the upstream side of the bench, including the are of the "plug". Constructing a full size levee around the residential area could prevent flooding at Cayuse. For full protection to access the area, a new, higher bridge would probably need to be built.

#### D. Echo.

**1. Community Description:** Echo, Oregon is a small farming/ranching community located approximately 23 miles west from Pendleton, the Umatilla County seat. The town is situated 1 mile south of Interstate Highway 84, south of Stanfield, Oregon.

**2. Flood Plain Description:** Echo is affected by one flood plain from the Umatilla River. However, there are two areas from the flood plain that affect town. One area is from the south and the other is from the west. The Umatilla River is a permanent flowing stream that starts east of town in the Blue Mountains. A majority of Echo is not threatened directly by flooding. On the south end, the town sits approximately 6 - 8 feet above farm fields that are directly exposed to the river flood flows. Bank erosion during flood times, however, can cause trouble to the town. An arm of the southern flooding extends along the Union Pacific Railroad tracks into town, but there are few homes in this area. There is a small area affected by 100 - 500 year flows adjacent to the County Road Bridge to Lexington.

Currently, this area is the city park commemorating Fort Henrietta of Oregon Trail fame. A new bridge was built in late 1999 and early 2000 and presumably was built to the correct elevation. It is about 7 - 8 feet higher than the old bridge, which was being removed on 7/11/00. Historically, there has been a flood caused by breaching of the irrigation canal along the hillside north of town. The canal flow quickly flooded the residential area downhill of the canal. This flooded area is a bowl, so flood water could not escape, except by pumping or evaporation.

**3. Type of Flooding:** Due to the lack of a flood plain in town, flooding in Echo can be characterized as *limited*. However, the flood plain south of town could be flood fought if erosion is considered a problem. The irrigation canal flood problem was a unique problem that probably won't be repeated, as the canal is no longer used, with the advent of the Bureau of Reclamation Umatilla Basin Project. Access to Echo off I-84 would not be affected by flooding. A levee/dike built along the south and west edges of Echo (from the UPRR tracks on the east to the new bridge on the west) and armoring the riverward slope with riprap, could prevent flooding.

#### E. Gibbon.

**1. Community Description:** Gibbon, Oregon is a small community located on the CTUIR approximately 23 miles east from Pendleton, the Umatilla County seat. The town is situated on the Umatilla River flood plain near the mouth of Meacham Creek, adjacent to the UPRR. At least some of the residents work for the UPRR.

**2. Flood Plain Description:** Gibbon is affected by the flood plain from the Umatilla River. However, Meacham Creek being adjacent, adds flow to the flood plain that affect town. Both the Umatilla River and Meacham Creek are permanent flowing streams that start east and south of the community in the Blue Mountains. The community mostly sits between the UPRR tracks and the river, so the floodwater has nothing to stop it from flooding the community until it reaches the UPRR tracks.

**3. Type of Flooding.** Flooding in Gibbon can be characterized as *widespread*. Flood fighting can be effective if there is time to mobilize forces. Access to the community is by the UPRR and a county road that is frequently blocked by floodwater at the Squaw Creek bridge. Construction of a levee around the residential area could prevent flooding at Gibbon.

#### F. Helix.

1. **Community Description:** Helix, Oregon is a small farming/ranching community located approximately 12 miles north from Pendleton, the Umatilla County seat. The town is situated approximately 10 miles west of State Highway 11, at Athena.

2. **Flood Plain Description:** Helix is affected by two flood plains. One is from Greasewood Creek in the approximate center of town. Greasewood Creek is an ephemeral stream that starts east of town. The water table is quite high, so water exists in the creek channel, but not always on the surface. Most of Helix is affected by Greasewood Creek flooding. The other flood plain is from "Southwest Drainage" a channel that carries runoff along the county road to Holdman, Oregon. Berming along Greasewood Creek could be done if known early enough. Sandbagging could also be effective in parts of town. A recent flood was caused by frozen ground covered by snow, then a warm rain melted the snow. At that time, the town received about 3 - 4 inches of flood water and mud in most of the town. The city hall/library were flooded. An advance measure could be to deepen the Greasewood Creek channel. Sediment from adjacent farm fields has run off the fields and deposited in the creek channel, thereby decreasing its carrying capacity.

3. **Type of Flooding:** Due to the lack of a flood plain in town, flooding in Echo can be characterized as *widespread*. If known about early enough an effective flood fight could be done here along Greasewood Creek by berming or by sandbagging some parts of town. Townsfolk are experienced at this type of work due to the recent flood. Dredging the Greasewood Creek channel to increase the channel capacity and building a levee/dike along the east side of the creek to help direct the floodwater away from downtown Helix, could prevent flooding at Helix. Enlarging the channel to its confluence with Greasewood Creek could prevent flooding from the adjacent Southwest Drainage along the county road to Holdman.

#### G. Hermiston.

1. **Community Description:** Hermiston, Oregon is a moderately-sized farming/ranching community located approximately 30 miles northeast from Pendleton, the Umatilla County seat. The town is situated approximately 6 miles north I-84 and approximately 4 miles east of I-82.

2. **Flood Plain Description:** Hermiston itself is not affected by any flood plains. However, the surrounding area does have some places where the Umatilla River flood plain may affect local residents and/or access to the city of Hermiston. Between Umatilla and Hermiston, there is one place

where floodwater from the Umatilla River would block River Road. South of town there are several places where county roads would be blocked by Umatilla River floodwater. There is one large area along the Umatilla River and the Stanfield Meadows Road that is completely within the Umatilla River flood plain. There are scattered homes in the area and in one place I-84 is affected.

**2. Type of Flooding:** Due to the lack of a flood plain in town, flooding in Hermiston can be characterized as *nonexistent*. However, flooding in adjacent areas can be characterized as both *limited* in the case of scattered road blockages and *widespread* in the Stanfield Meadows Road area. Berming or sandbagging could be effective along River Road to keep it open or to protect local residents. South of Hermiston, there is little that can be done. Perhaps local sandbagging or berming would help protect the individual homes. Definitely, berming along I-84 would help to keep that important road open for travel.

#### H. Holdman.

**1. Community Description:** Holdman, Oregon is a remnant of a small farming/ranching community located approximately 15 miles northeast from Pendleton, the Umatilla County seat. The town is situated on Cold Springs Creek in a narrow canyon along State Highway 37 and approximately 11 miles south of the Columbia River. The community consists of probably 1 - 2 families located around the old school building plus associated farm buildings on both sides of the creek.

**2. Flood Plain Description:** Holdman does not have FEMA flood plain mapping either for the community or for a larger area. However, there is evidence of erosion damage by high water in the creek both upstream and downstream of the community.

**3. Type of Flooding.** Flooding in Holdman can be characterized as *widespread*, but because it is such a small community, it can also be characterized as *limited*. Access along Highway 37 can be affected by high water from Cold Springs Creek and its forks, plus other waterways that the highway follows. It is likely that flooding events are short term and rapidly forming and dissipating, although the flooding caused by frozen ground and rapid snowmelt probably also affects the flood flows. It is probably not a good candidate for COE flood fighting assistance. Building a levee/dike around the buildings could prevent flooding in Holdman.

## I. Milton-Freewater.

1. **Community Description:** Milton-Freewater, Oregon is a small farming/ranching community located approximately 30 miles northeast from Pendleton, the Umatilla County seat. The town is located within the Walla Walla District.
2. **Flood Plain Description:** Milton-Freewater is located along Mill Creek and has experienced flooding in the recent past.
3. **Type of Flooding.** Because it is located within the Walla Walla District it will not be discussed further.

## J. Mission.

1. **Community Description:** Mission, Oregon is a small community located on the CTUIR approximately 8 miles east from Pendleton, the Umatilla County seat. The community consists of residences and the tribal governmental compound. It is located approximately 2 miles south of I-84, on two county roads, and the UPRR tracks.
2. **Flood Plain Description:** Mission is affected by one flood plain from the Umatilla River. The Umatilla River is a permanent flowing stream that starts east of town in the Blue Mountains. There are several locations where residences are located close to the Umatilla River or in old river channels, not normally flowing anymore, except in flood times. In 1997, the CTUIR contracted with the COE, Portland District to update FEMA flood mitigation designs done after the 1996 floods and to act as inspector on the subsequent construction. A low spot in the riverbank upstream of some houses was plugged by construction of a dike with riprap revetment bank protection. This site is located immediately north from the tribal governmental headquarters area and the UPRR tracks. There are other areas considered to be with the "Mission" area where the riverbank is low and high water events cause short term flooding. No FEMA flood mapping has been done for the CTUIR.
3. **Type of Flooding:** Flooding in Mission in the recent past can be characterized as *limited*. If high water events with significantly more water happen, as in 1964, the flooding would be *widespread*. If time allows, flood fighting can be effective here in the Mission area and other areas within the confines of the CTUIR. Levees built along the Umatilla River or around the most flood-prone areas could prevent flooding in the Mission area.

## K. Pendleton.

1. **Community Description:** Pendleton, Oregon is a moderately sized farming/ranching/commercial center community located approximately 212 miles east from Portland and is the Umatilla County seat. The town is situated on I-84/US Highway 30, US Highway 395, State Highways 11 and 37, numerous Umatilla County roads, the UPRR, and has scheduled commercial air service provided by Horizon Airlines.

2. **Flood Plain Description:** Pendleton is affected by four flood plains. The major one is from the Umatilla River. However, most of the city is protected by a levee along the south bank of the river. The levee starts near the eastern city limit at a rock bluff and proceeds downstream to US Highway 30 and the UPRR mainline tracks, and switches to the western bank of the river until it reaches the I-84 bridge over the Umatilla River. Two further levee segments along both banks downstream, protect the city's sewage treatment plant from both the Umatilla River and McKay Creek and an industrial site dominated by Pendleton Grain Growers (PGG) McKennon Station grain elevator, a travel trailer plant, and a plastic pipe plant. The second flood plain is from the previously mentioned McKay Creek, from the BOR reservoir south of town to the mouth on the Umatilla River by the sewage treatment plant. A residential area called the Montee Addition is situated along both banks of McKay Creek and has been subjected to flooding in the past, even though the dam regulates the stream flow. The last two times cloud bursts caused the flooding. One time it was upstream of the reservoir, which was full at the time, and it caused the dam operators to release more water than the stream banks could contain. The second time the cloud burst happened between the dam and the residential area, also increasing the flow beyond the carrying capacity of the banks. The third area is Tutuilla Creek, which is a small drainage north of McKay Creek. There is a small residential area in town that is subject to flooding when Tutuilla Creek experiences high water events. The houses are built very close to the creek, leaving no room for protective devices. The last flood plain is from a small ravine on the northwest edge of town, called Nelson Creek. This valley follows State Highway 37. This small creek is essentially an ephemeral stream handling only runoff, but probably any frozen ground/rapid snow melt floods like the Helix event, also. This creek exits into the Umatilla River by the US Highway 30 bridge.

3. **Type of Flooding:** Umatilla River flooding can be characterized as *widespread*, if the downtown levee overtops an/or breaches. Otherwise there is no flood threat. McKay Creek flooding can also be characterized as *widespread* flooding along McKay Creek in the residential area, including one school and a new assisted living center for senior citizens. Tutuilla Creek and Nelson Creek flooding can both be characterized as

*limited* flooding, due to its small flood plain area. However, this shouldn't minimize the disruption to those families affected by the flooding. Floods fighting can be effective if the downtown levee overtops and/or breaches, given a enough time to mobilize the COE. Flood fighting can be effective along parts of McKay Creek, given enough time to mobilize. It is possible to flood fight the Tutuilla Creek and Nelson Creek flooding, also, given enough time to mobilize. Flash flooding in any drainage would make flood fighting by the COE unlikely. The existing downtown levee will control flooding in Pendleton, as long as it remains in place and operable. Clearing the channel and/or building a dike/levee along the sides of Tutuilla Creek with homes could prevent flooding along this channel. Building levees along the creek upstream and downstream from Quinney Avenue could prevent flooding along McKay Creek. This will be difficult due to the houses built close to the creek. There is a flash flood potential along the hillside in the southwest part of the Montee Addition. Deepening existing ditches or constructing new ditches along the roads, providing a bigger catchment areas for runoff, and possibly by increasing the size of the culvert under the road into the existing drainage channel could prevent flooding in this part of Montee Addition. Building a levee along the Umatilla River to protect the entire area could prevent flooding in the Riverside area. The existing levees around the sewage treatment plant and the industrial area by McKennon Station will control flooding in those locations as long as they are maintained and are operable.

#### L. Pilot Rock.

1. **Community Description:** Pilot Rock, Oregon is a small farming/ranching community located approximately 14 miles south from Pendleton, the Umatilla County seat. The town is situated on US Highway 395, State Highway 74, numerous Umatilla County roads, and a little used UPRR spur.

2. **Flood Plain Description:** Pilot Rock is affected by three flood plains. One is from the West Fork of Birch Creek. The second flood plain is from the East Fork of Birch Creek. The third flood plain is from Birch Creek downstream from the confluence of the two forks. The main stem of Birch Creek has a concrete bridge at the US Highway 395 crossing and passes by a trailer park on the east bank, which experiences flooding. There is a relatively new (3 years old) fish ladder adjacent to the trailer park. The West Fork has a bridge that Main Street crosses. Buildings were constructed right on the creek banks, eliminating any possible flood fighting construction along the banks. The East Fork has a bridge near the junction of Cedar Street and US Highway 395. Houses were built very close to the creek banks, also eliminating any flood fighting construction along this fork of Birch Creek.

3. **Type of Flooding:** Flooding from the two forks of Birch Creek can be characterized as *limited*, until they merge to form Birch Creek, where it becomes *widespread* flooding. Some limited sandbagging may be possible along streets to stop the spread of localized flooding. No infrastructure is threatened by flooding. Both schools are located high above the creeks. Flash flooding in any drainage would make flood fighting by the COE unlikely. Without major moving of buildings and the bridges, flooding in Pilot Rock probably can't be prevented.

M. Stanfield.

1. **Community Description:** Stanfield, Oregon is a small farming/ranching community located approximately 24 miles west from Pendleton, the Umatilla County seat. The town is situated on US Highway 395, several Umatilla County roads, and the UPRR.

2. **Flood Plain Description:** Stanfield is affected by two flood plains. One is from Stage Gulch. The second flood plain is from the Umatilla River backing up into Stage Gulch. The majority of flooding has come from Stage Gulch. Generally, this stream is an overflow channel for irrigation canals, but with the advent of the BOR's Umatilla Basin Project, it has become a small stream in its own right. The city of Stanfield has been working on flood protection activities for several years. They have moved some mobile homes situated on the creek banks and widened the stream channel downstream of the US Highway 395. The creek slopes have been cut back to a very flat grade and grassed. The area has become a park and athletic fields. Some houses that were built very close to the creek banks, are still there. There is generally room to build a berm or do sandbagging along the creek banks or on some of the streets, if need be.

3. **Type of Flooding:** Flooding in Stanfield can be characterized as *widespread* flooding. Some limited sandbagging may be possible along streets to stop the spread of localized flooding. No infrastructure is threatened by flooding. Both schools are located high above the main part of town in the "valley" of Stage Gulch. Berm construction is possible if enough time is given to mobilize. Flash flooding in any drainage would make flood fighting by the COE unlikely. Building a levee along both sides of Stage Gulch throughout Stanfield could prevent flooding here.

N. Ukiah.

1. **Community Description:** Ukiah Oregon is a small logging/ranching community located approximately 50 miles south from Pendleton, the Umatilla County seat. The town is situated on US Highway 395, a USFS highway, and State Highway 244.

2. **Flood Plain Description:** Ukiah is affected by one flood plain, from Camas Creek. Although the FEMA flood mapping shows only two small areas affected by flooding, historical flooding experience indicates that more of the adjoining area is affected. Flooding comes from typical high water events and from ice dams formed on the gravel bars formed upstream of the Soap Hill Road bridge on the south edge of town. There is a low height levee along the creek in town that was maintained by Umatilla County for several years. They stopped sponsoring the levee in favor of the local community forming a special levee district however, the local residents failed to reach an agreement to form such a district. As a result, no maintenance has been performed on the levee. The area affected by flooding is residential only.

3. **Type of Flooding:** Flooding in Ukiah can be characterized as *limited* flooding. Some limited sandbagging or berming may be possible along streets (or on the existing levee) to stop the spread of localized flooding. No infrastructure is threatened by flooding. Both schools are located high above the main part of town. Berm construction is possible if enough time is given to mobilize. Flash flooding in any drainage would make flood fighting by the COE unlikely. Maintaining the existing levee and dredging the existing gravel bar along the levee in town could prevent flooding in Ukiah.

O. Umapine.

1. **Community Description:** Umapine, Oregon is a small community located approximately 37 miles north from Pendleton, the Umatilla County seat and 6 miles west of Milton-Freewater. The town is located within the Walla Walla District.

2. **Flood Plain Description:** Umapine is located along Dry Creek and it is not known if it has experienced flooding in the recent past.

3. **Type of Flooding.** Because it is located within the Walla Walla District it will not be discussed further.

P. Umatilla.

1. **Community Description:** Umatilla, Oregon is a farming community located approximately 40 miles north from Pendleton, the Umatilla County seat. The town is situated on US Highway 730, Interstate I-82, a state highway, and a UPRR spur.

2. **Flood Plain Description:** Umatilla is affected by two flood plains. One is from the Umatilla River and the other is from the Columbia River. Umatilla River flooding affects only a small area, currently containing

athletic fields and part of the city park. Columbia River flooding affects an area along the north edge of town, currently not developed, probably due to the FEMA flood mapping. River Road between Umatilla and Hermiston has several places where Umatilla River high water could possibly block the road. However, I-82 is higher than that area and could provide a bypass in case of flood water blocking River Road. There are several residential sites that would be affected by flooding or flooding blocked access.

3. **Type of Flooding:** Flooding in Umatilla can be characterized as *limited* flooding. Sandbagging or berming may be possible along River Road to stop the spread of localized flooding. No infrastructure is threatened by flooding. Schools are located high above the rivers and the sewage treatment plant is built higher than the 100 year flood. Flooding from the Columbia River would affect only the COE park/marina. Raising the flood-prone segments of River Road above the flood elevation could prevent flooding here. A levee and/or floodwalls built along the Columbia River could protect the threatened north part of Umatilla from flooding.

Q. Weston.

1. **Community Description:** Weston, Oregon is a small farming/ranching community located approximately 20 miles northeast from Pendleton, the Umatilla County seat. The town is situated immediately east of State Highway 11, on the way to Walla Walla, WA. It is also located on State Highway 244 and has limited rail service by a UPRR spur, primarily servicing the Smith Frozen Foods cannery.

2. **Flood Plain Description:** Weston is affected by one flood plain, from Pine Creek. Pine Creek is a permanent flowing stream that starts in the Blue Mountains southeast of Weston. The town of Weston is shaped like a "flume" caused no doubt by Pine Creek, therefore, flooding from the stream can affect approximately three-fourths of the town. The flood plain for the 100 year flood extends approximately 300 feet from the stream in the middle portion of town and 100 - 200 feet from the stream in the north and south portions of town. The main development of Weston has historically taken place along the stream. Houses were built along and in one case on top of the creek, preventing flood fighting construction in those areas. It is possible that some limited sandbagging could be effective in stopping some localized flooding.

3. **Type of Flooding:** Due to the flood plain being in the middle of town, flooding in Weston can be characterized as *widespread*. Limited sandbagging or berm construction could be effective in small areas, but in general, flood fighting in Weston is probably not a priority. Without

major moving of buildings, construction of levees, and raising bridges, flooding in Weston probably can't be prevented.

#### R. Unincorporated Areas.

1. **Community Description:** The unincorporated areas visited were road crossings. The crossing structures varied from corrugated metal culverts (CMP) to concrete box culverts, to bridges of various kinds.

2. **Flood Plain Description:** Flood plains varied depending upon the waterway crossing the road. In most cases, the crossing structure probably wouldn't be directly damaged, but perhaps the abutments or the road immediately before and after the bridge would be. One specific site that I visited was the Wildhorse Creek bridge south of Helix. It currently has a fence across the creek below the bridge that presents a debris clogging problem and would be a problem during high water events. Birch Creek has many bridges across the creek that appear to be within the flood plain. In addition, some of the county roads that provide access into and across the Birch Creek valley have several places, especially in the lower valley, closer to the Umatilla River. These places appear to be in danger of having flood water blocking them. The area of the Stanfield and Echo Meadows Roads appear to be entirely within the Umatilla River 100-year flood plain with little potential for flood fighting because the area is very flat. Access though or into these areas will be severely restricted during a flood.

3. **Type of Flooding:** Due to the small area for each of the crossings, flooding would be characterized as *limited*. Flooding cannot be prevented over the entire area of unincorporated part of Umatilla County due to the extensive area to protect. Most of the flood prone areas are also too big to protect in their entirety. Bridges could be raised, obstructions removed, trash racks built, and levees built to protect abutments to prevent blocking of the roads at the crossings.

#### IV. Conclusions and Recommendations.

##### A. Conclusions.

1. There are 9 areas that I considered as having *widespread* flooding threat: Adams, Athena, Cayuse, Gibbon, Helix, Holdman, Mission, Stanfield, and Weston. Of these 9 sites, 6 have a good potential for flood fighting, if time permits. Those communities are: Athena, Cayuse, Gibbon, Helix, Mission, and Stanfield. The other 3 sites with widespread flooding have limited potential for flood fighting due to the community's location in relation to the waterway and development along the waterway (Adams, Holdman, and Weston).

2. Because at least some of the flooding problems are caused by rapidly developing storms and because the Portland District lies about 200 miles away from the area, the likelihood of flood fighting by the COE is severely limited.
3. The only site in the unincorporated area that presented a potential for stopping access to a community is the Wildhorse Creek bridge, south of Helix.
4. The areas between I-84 and the Umatilla River south of Hermiston and Hinkle and between I-84 and the road from Echo to Lexington are almost entirely covered by a 100-year flood.
5. Birch Creek has numerous bridges for county roads that will probably be damaged or covered in the event of a flood. In this event, access from one side of the valley to the other will be severely restricted.
6. The county has a flood plan written that covers many of these sites and items discussed above.

B. Recommendations.

1. Provide Umatilla County with this report and solicit their input and comments.
2. Determine if the county is interested in developing site specific flood response plans for the 7 - 9 sites identified (and for the Umatilla River Water Control District 1, Zone 2 and the Riverside-Mission Water Control District).

***Appendix A - Summary Spreadsheet***

**Umatilla County Flood Fight Preparation**  
(Summary of Findings)

Name of Community	Flooding Character				Remarks
	Widespread	Limited	None	Preventable (Y/N)	
Adams	X			Y	Limited flood fight potential. To be truly preventable, houses will probably need to be moved.
Athena	X			Y	Good flood fight potential.
Cayuse	X			Y	Small community on CTUIR, located at S-curve of Umatilla River that is flood-prone to 3 - 4 families. Good flood fight potential.
Echo		X		Y	Good flood fight potential.
Gibbon	X			Y	Small community on CTUIR in Umatilla River canyon u/s of Pendleton. Located at confluence of Umatilla River and Meacham Creek. Good flood fight potential.
Helix	X			Y	Good flood fight potential.
Hermiston			X	N/A	
Holdman	X			Y	Location of old community. Now only 1 - 2 families live there. Located in canyon 13 miles east of Umatilla on Cold Springs Creek. Limited flood fight potential.
Milton-Freewater	N/A	N/A	N/A	N/A	Located in Walla Walla District. Not visited.
Mission	X			Y	Small community related to CTUIR headquarters. Several flood-prone areas for up to 5 - 6 families along Umatilla River. Good flood fight potential.
Pendleton		X		Y	Good flood fight potential. Floods along most of McKay Creek will be preventable only with movement of some houses.
Pilot Rock		X		N	Limited flood fight potential. Flooding not preventable without moving buildings.
Stanfield	X			Y	Good flood fight potential.
Ukiah		X		Y	Good flood fight potential.
Umapine	N/A	N/A	N/A	N/A	Located in Walla Walla District. Not visited.
Umatilla		X		Y	Area with flood potential doesn't need flood fighting. To prevent flooding on River Road, need to raise the road.
Weston	X			N	Limited flood fight potential due to development along creek. Need to move a lot of buildings to make flooding preventable.
Unincorporated Areas		X		N	Visited several road crossings. Bridge on road from SH11 to Helix could be a problem due to a fence across Wildhorse Creek. Stanfield Meadows and Echo Meadows Roads will be covered by 100-year floods of Umatilla River. Prevents access into or through the areas. Flood fight potential is very limited due to the large area to be protected and little opportunity to do so.

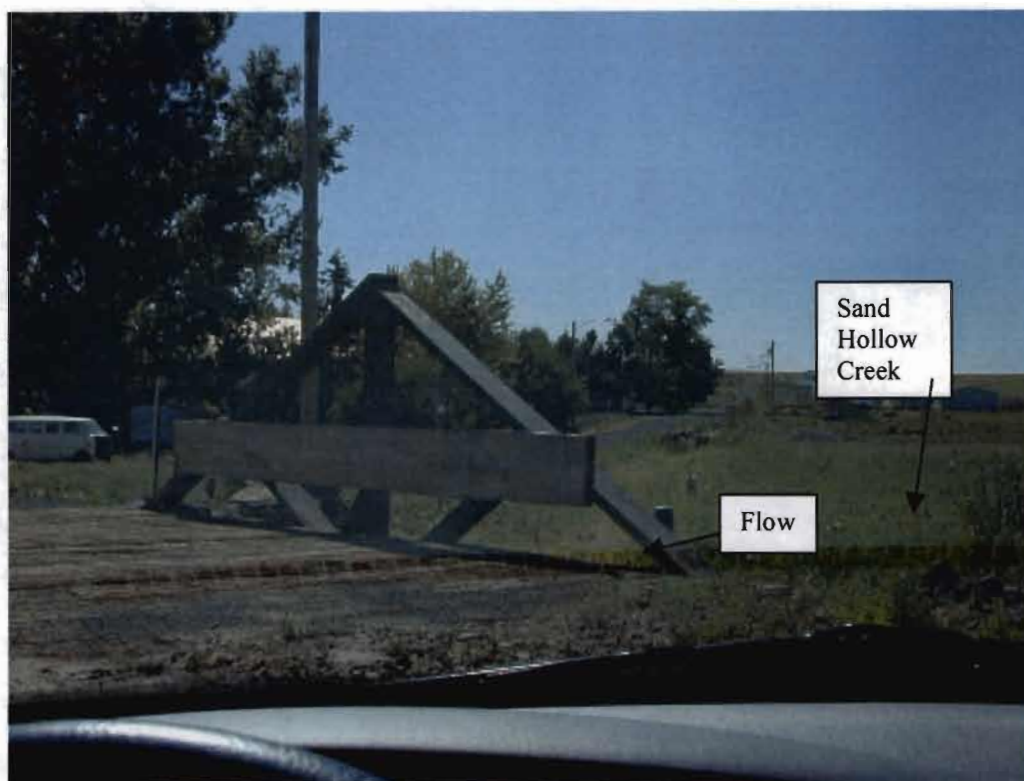


Photo No. 1: View looks southwest (upstream) at bridge on William St. over Sand Hollow Creek on north edge of town.

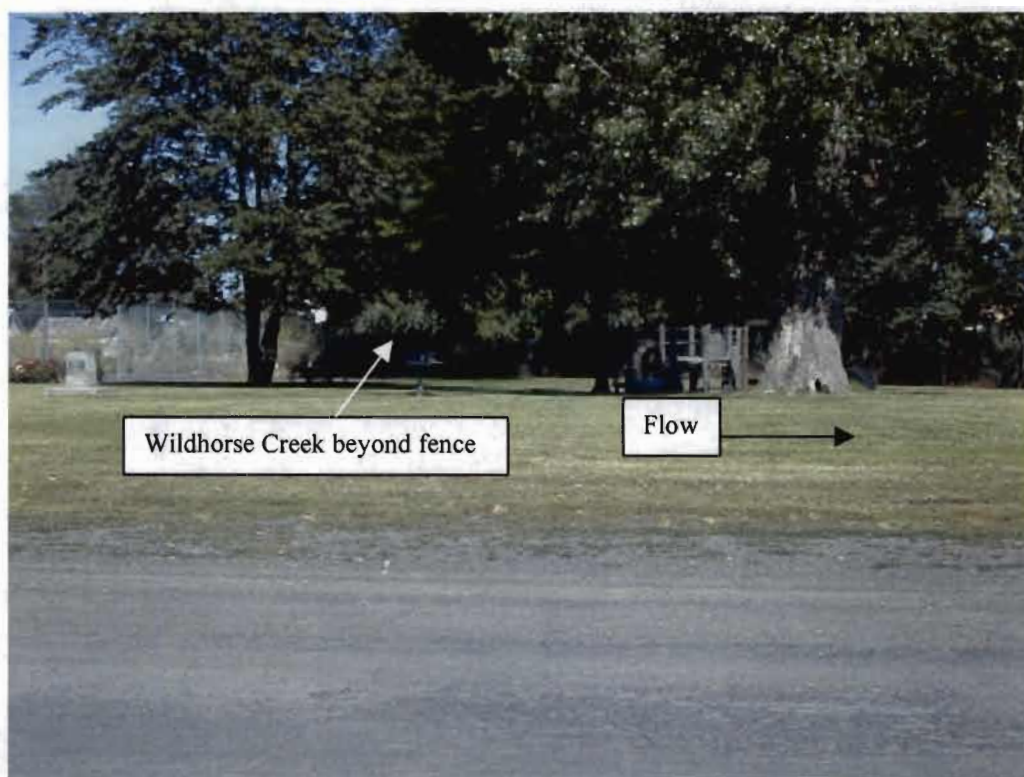


Photo No. 2: View looks east at City Park along Wildhorse Creek taken from Center and Morrison Sts.

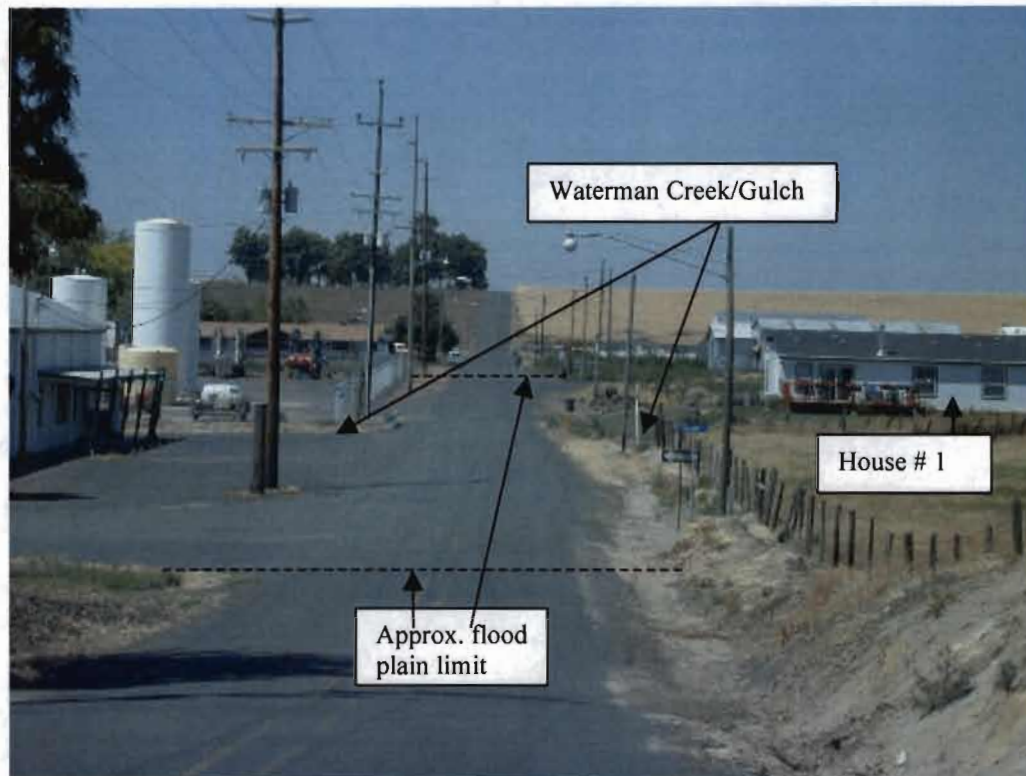


Photo No. 3: View looks west at crossing and flood plain of Waterman Creek/Gulch.

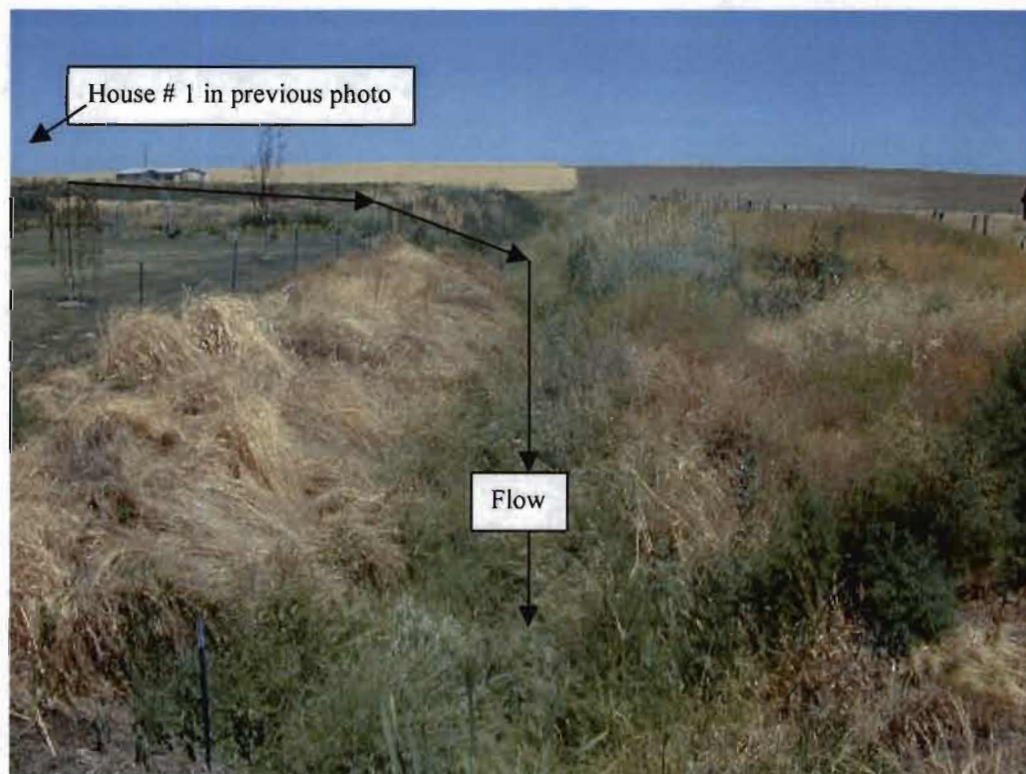


Photo No. 4: View looks upstream at Waterman Creek/Gulch from bridge on Sherman St. along north edge of town.



Photo No. 5: View looks downstream (south) at Waterman Creek from bridge on Sherman St. on north edge of town.



Photo No. 6: View looks downstream at the upstream face of the Sherman St. bridge.

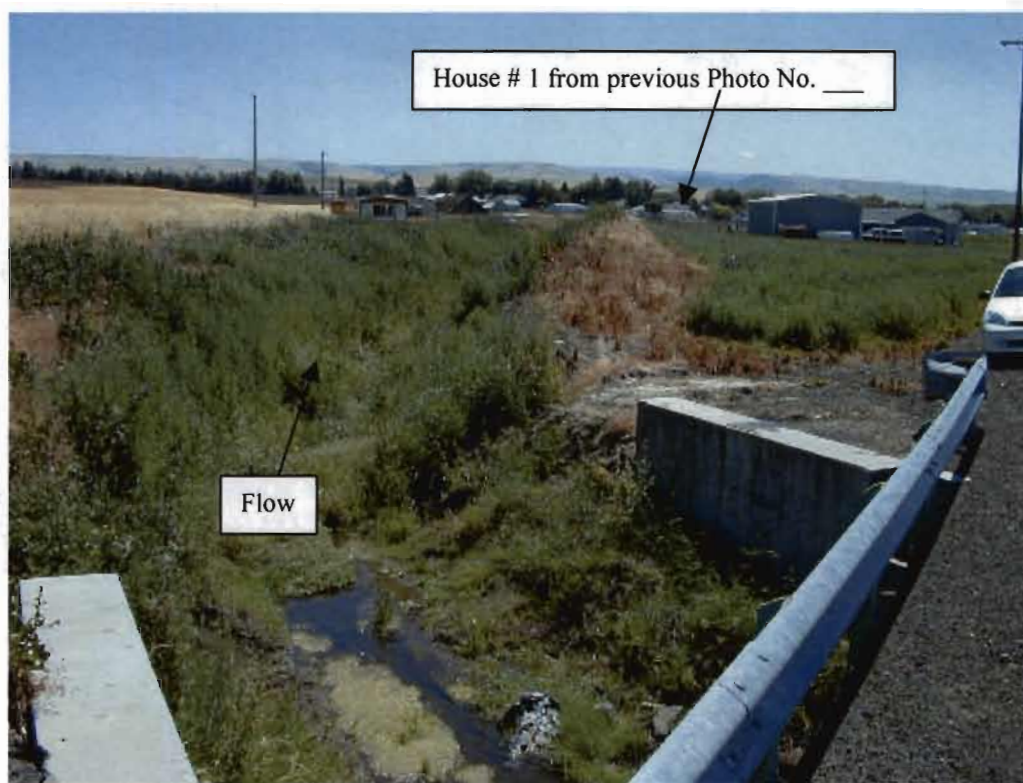


Photo No. 7: View looks downstream at Waterman Creek/Gulch bridge north of town.



Photo No. 8: View looks upstream (north) at Waterman Creek/Gulch from bridge north of town.

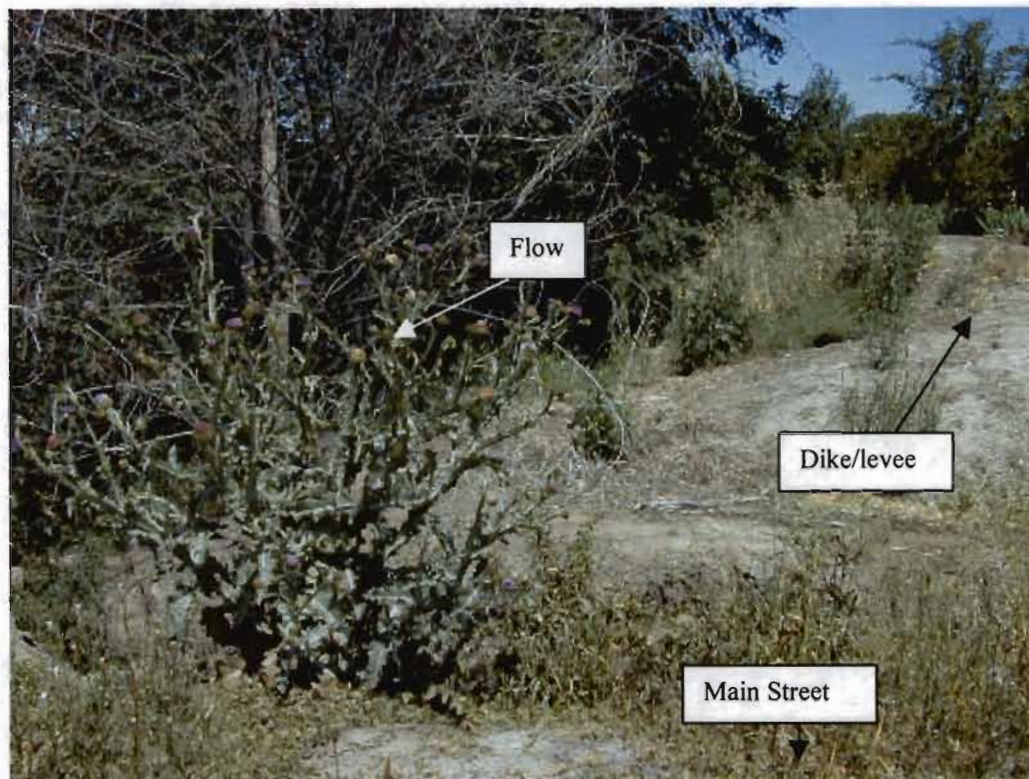


Photo No. 11: View looks upstream at Waterman Creek/Gulch from Main St., showing a dike/levee behind homes along east bank of the creek.



Photo No. 12: View looks southeast at homes along east bank of Waterman Creek/Gulch, taken from bridge in middle of town.

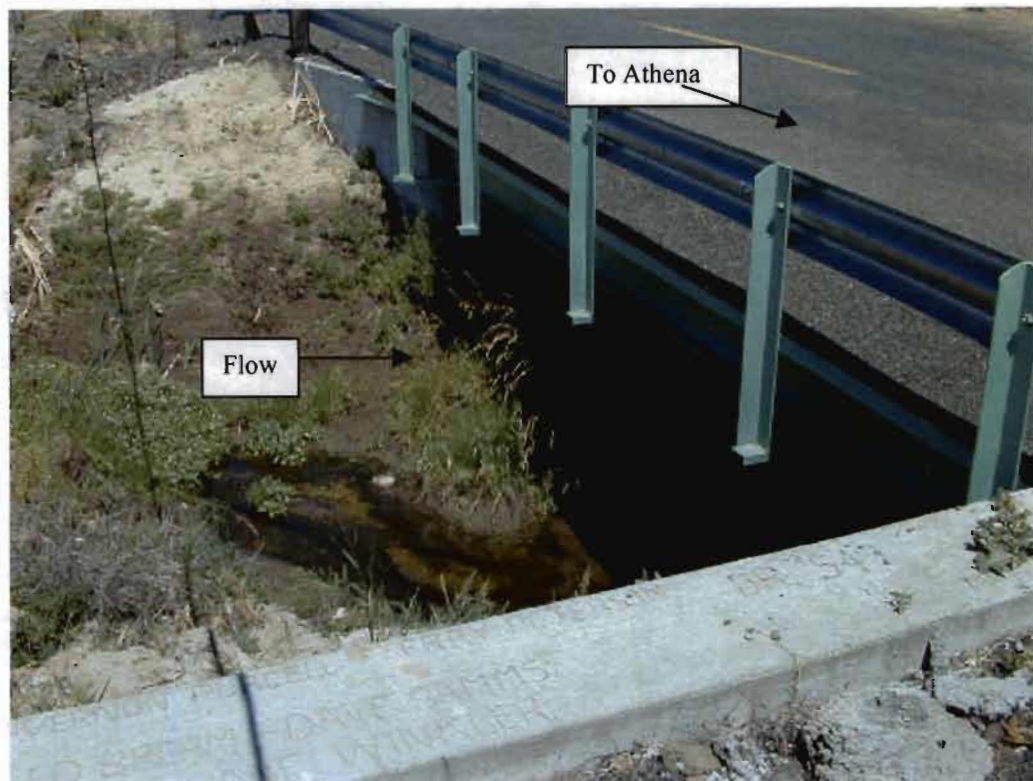


Photo No. 9: View looks at upstream face of bridge over Waterman Creek/Gulch north of town.



Photo No. 10: View looks downstream (south) at Waterman Creek/Gulch from Main St. bridge.

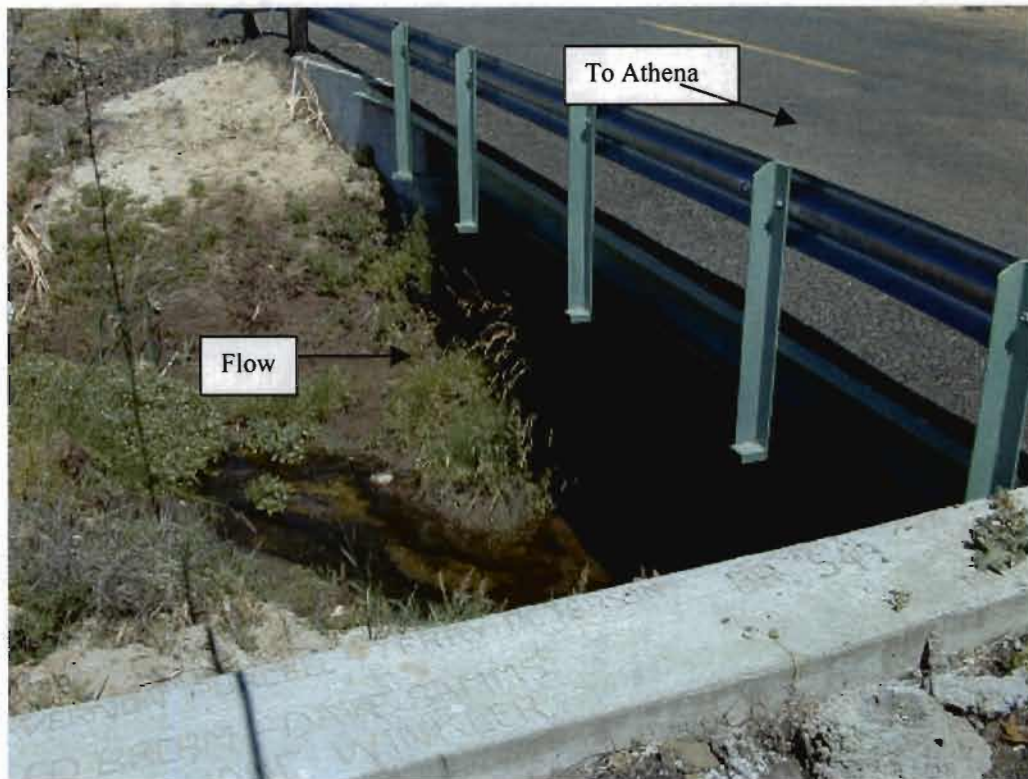


Photo No. 13: View looks at upstream face of bridge over Waterman Creek/Gulch north of town.



Photo No. 14: View looks downstream (south) at Waterman Creek/Gulch from Main St. bridge/concrete box culvert.

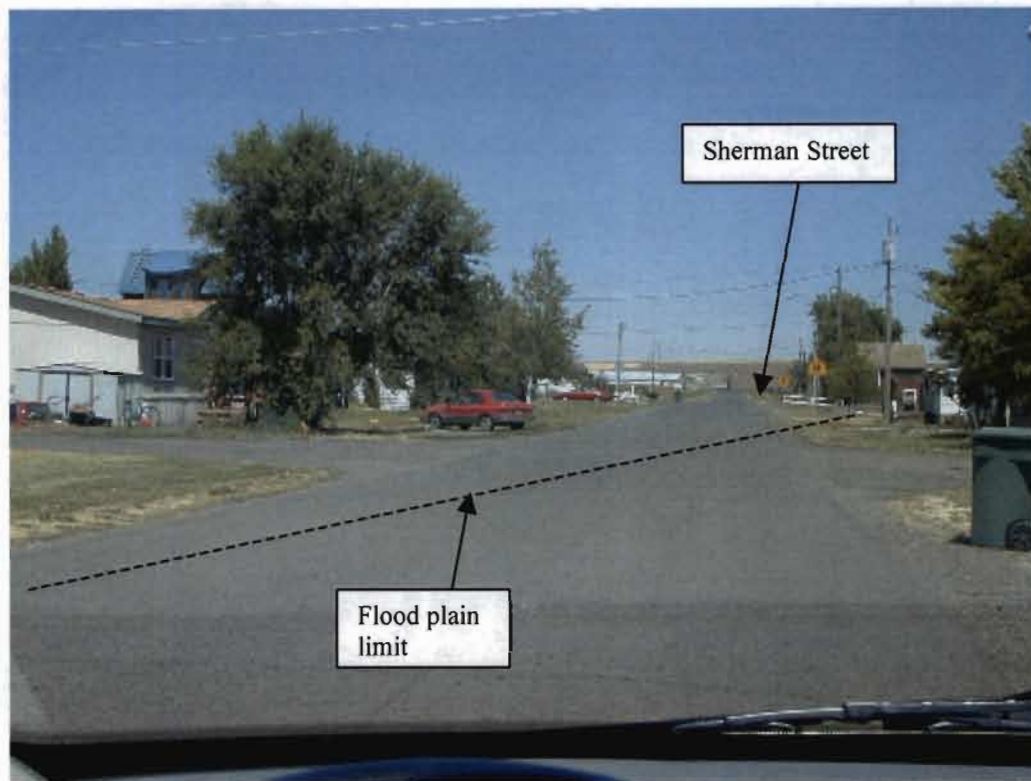


Photo No. 15: View looks upstream (north) at Waterman Creek/Gulch flood plain at College Street and 2nd Street.



Photo No. 16: View looks upstream (north) at combined Waterman Creek/Wildhorse Creek south of town.



Photo No. 17: View looks at upstream face of bridge.

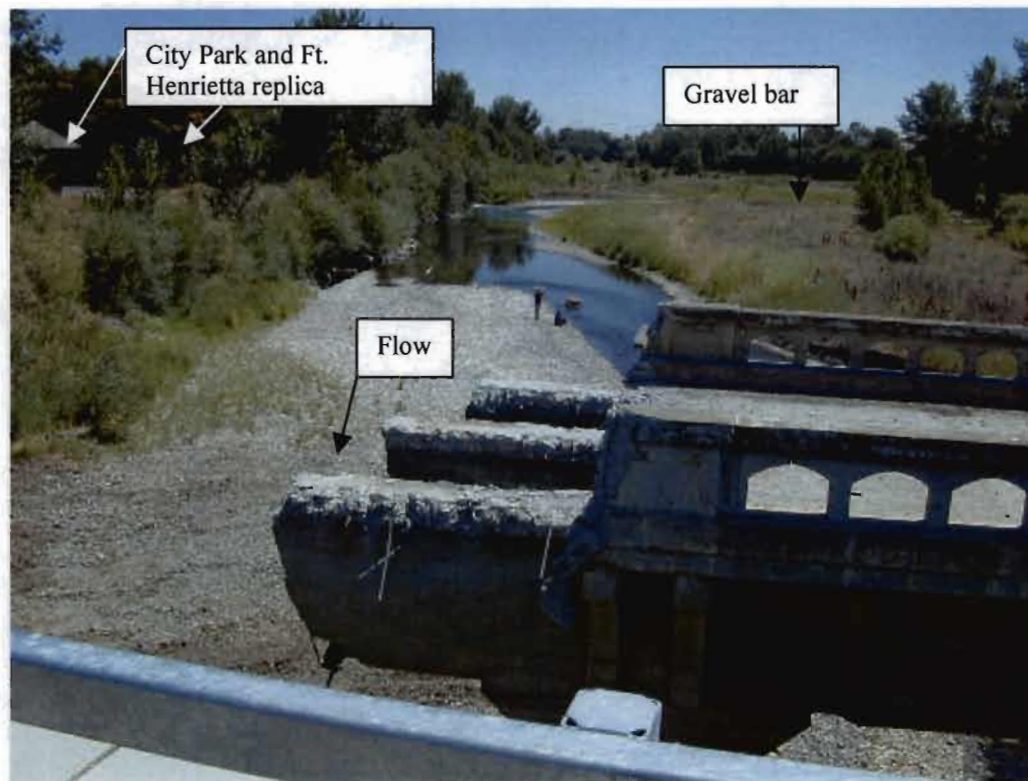


Photo No. 18: View looks upstream (south) at old county road bridge being destroyed and gravel bar buildup west of town. Taken from new bridge.



Photo No. 19: View looks downstream (north) at gravel bar downstream from bridge site.



Photo No. 20: View looks north at equipment removing old bridge and downtown area (not in flood plain except lower right corner).

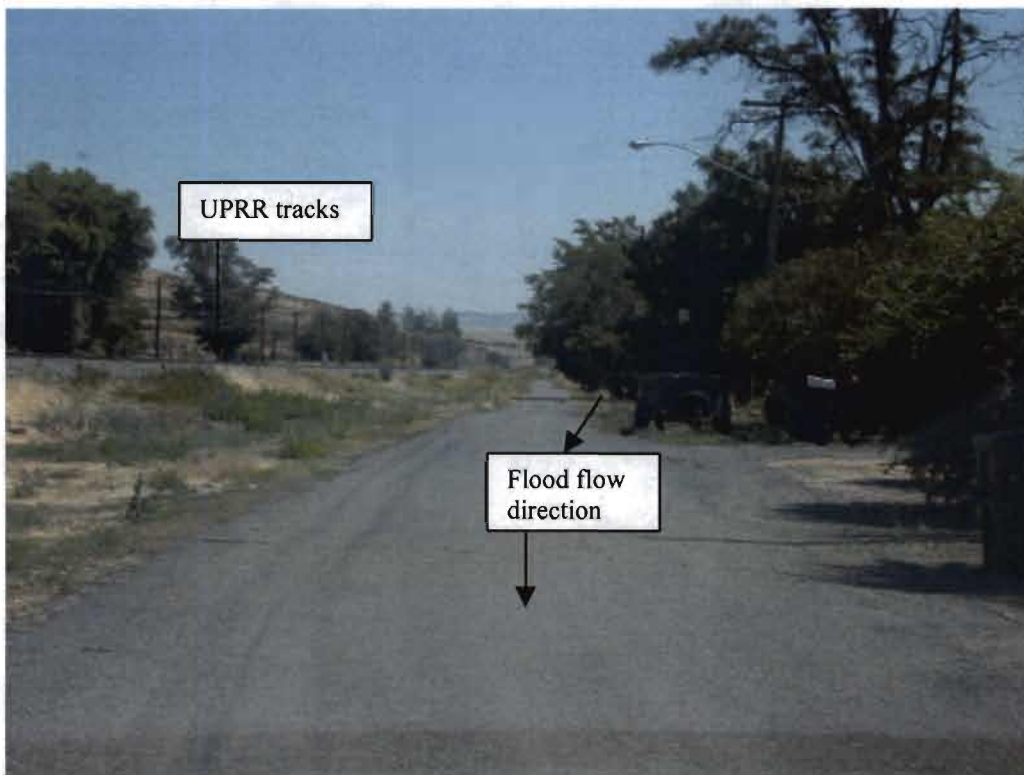


Photo No. 21: View looks southeast at flood plain area in southeast part of town showing UPRR tracks on left. Taken from Kennedy and Railroad Sts. Photo point is in flood plain.

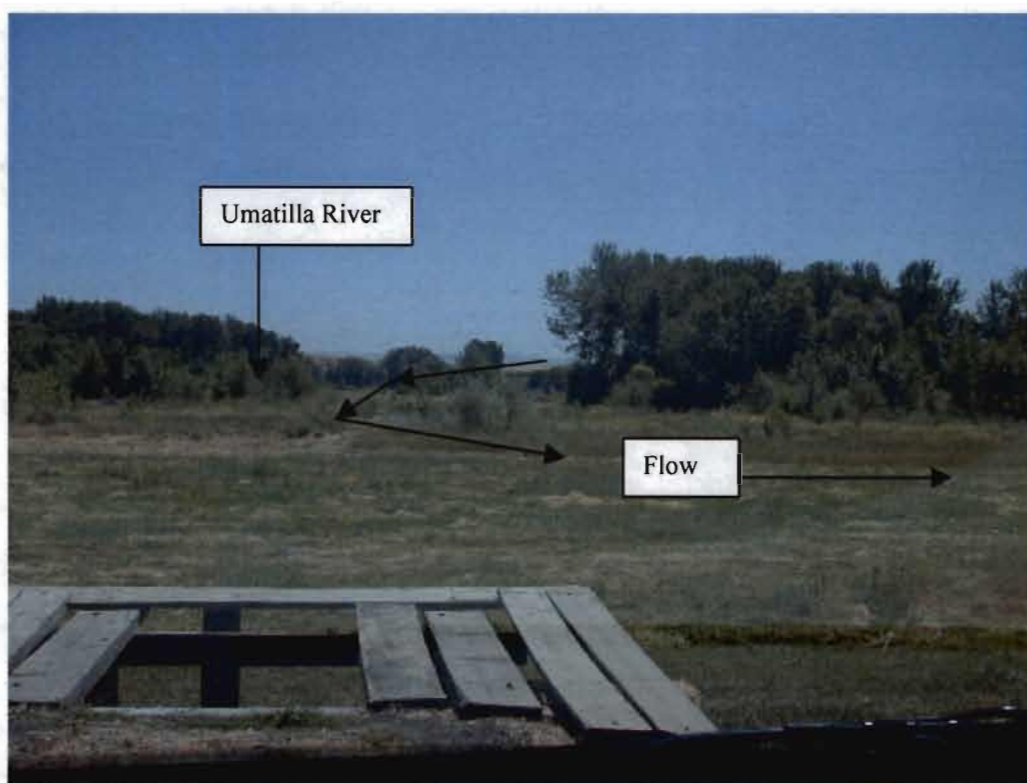


Photo No. 22: View looks south are area directly affected by flooding from bank on south edge of town. Taken from Dale and Halstead Sts.

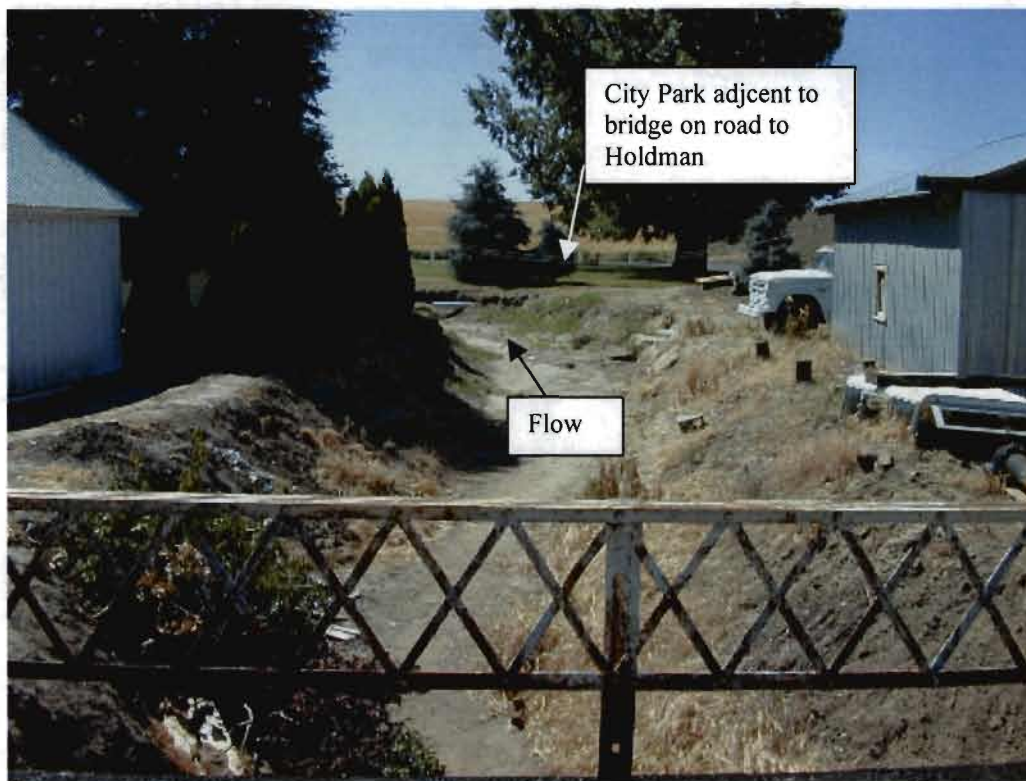


Photo No. 23: View looks downstream from bridge across Greasewood Creek at middle part of creek in town.



Photo No. 24: View looks downstream from "middle" bridge at upstream face of bridge.



Photo No. 25: View looks northeast (downstream) at Greasewood Creek, south of Helix.

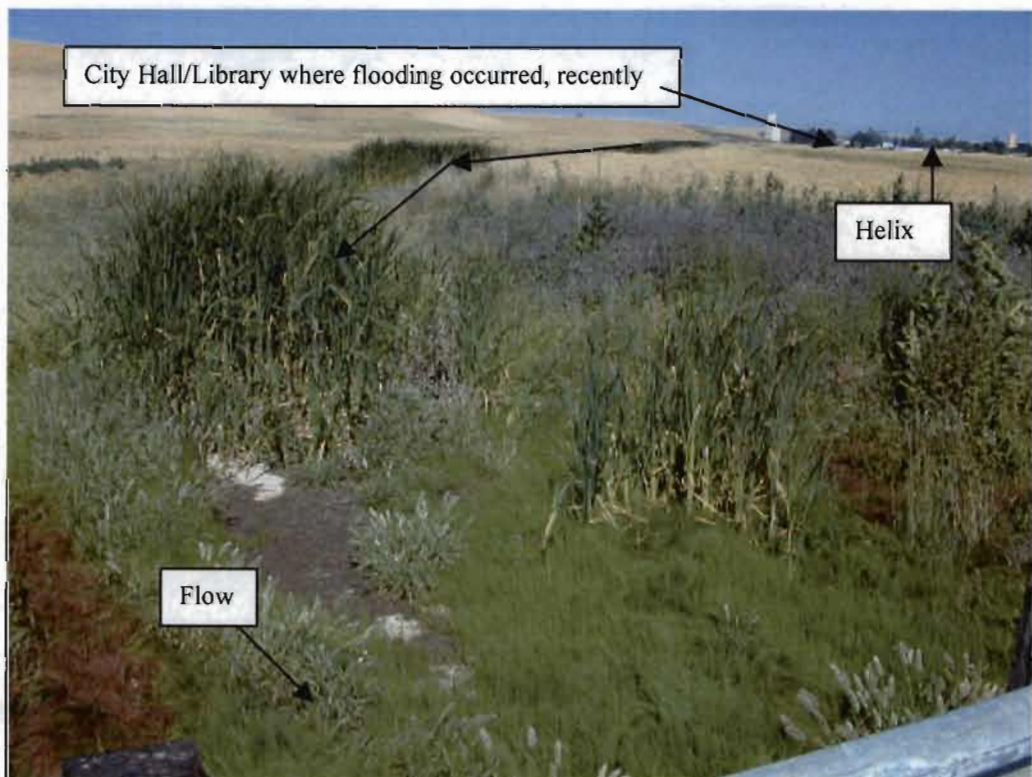


Photo No. 26: View looks northwest at Greasewood Creek crossing from south of Helix.

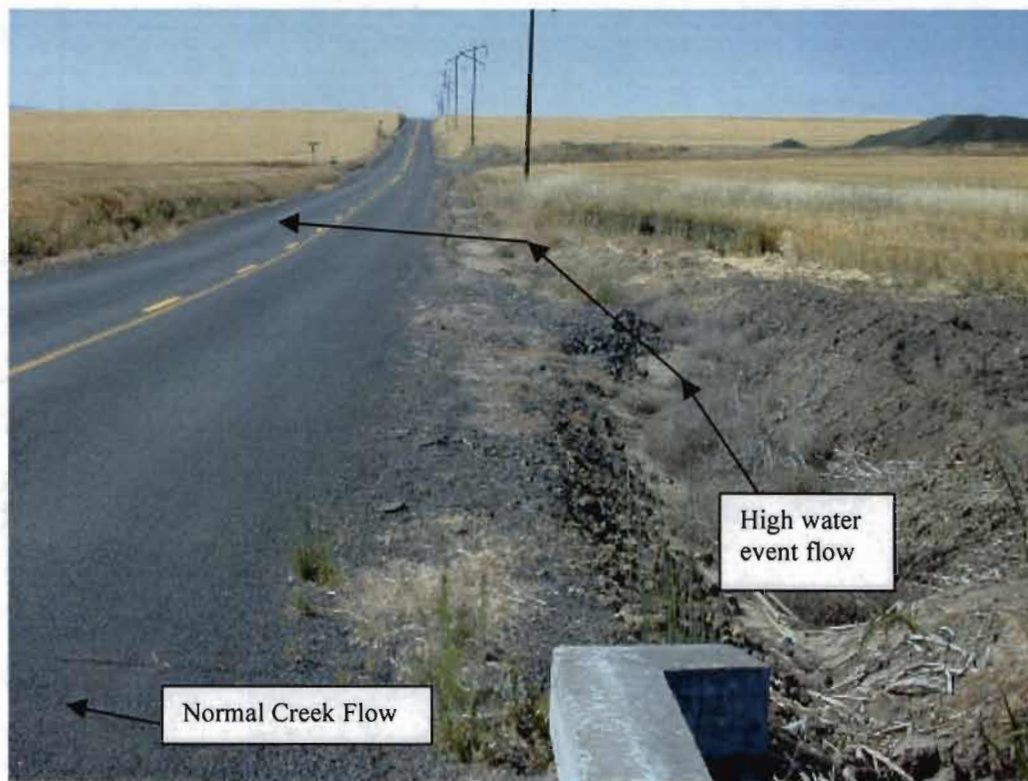


Photo No. 27: View looks south from Greasewood Creek crossing south of Helix.  
During high water events, water flows across road here.



Photo No. 29: View looks south from north side of town.

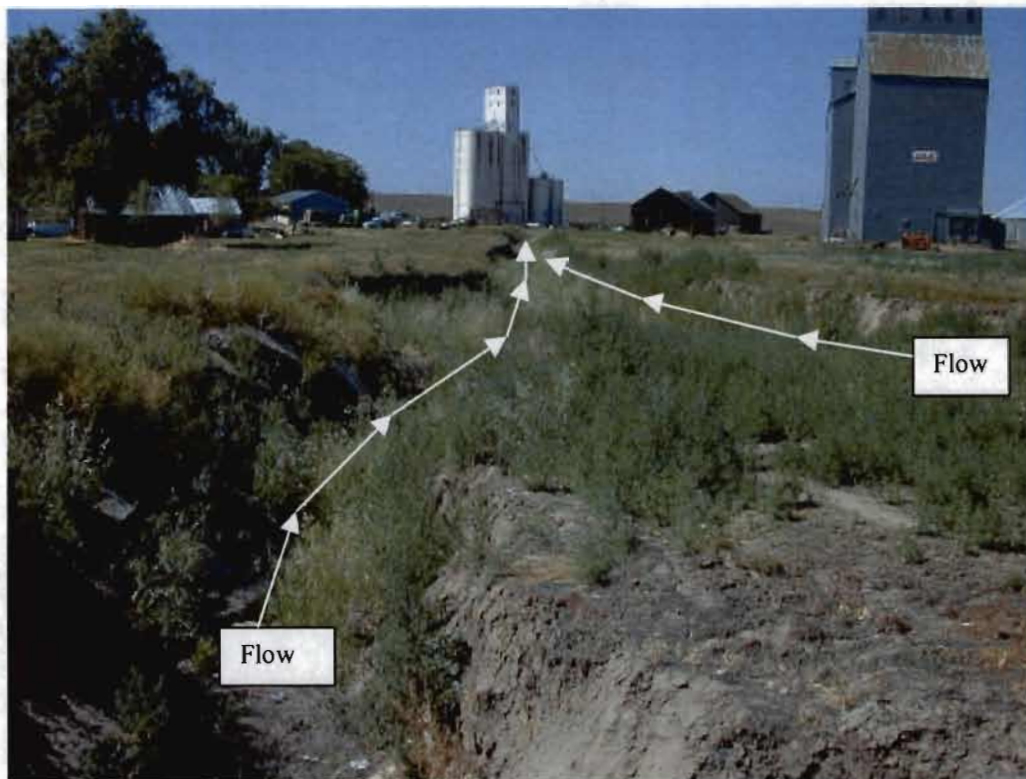


Photo No. 29: View looks south at confluence of two branches of Greasewood Creek at north edge of town.

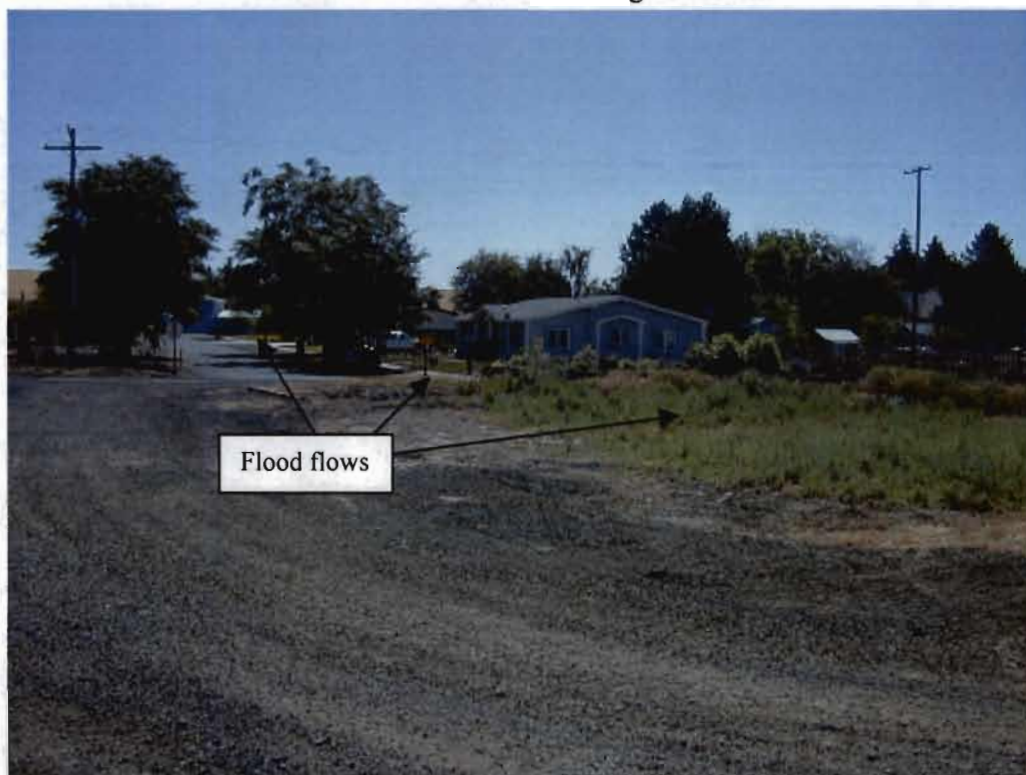


Photo No. 30: View looks southeast at area flooded on north edge of town.

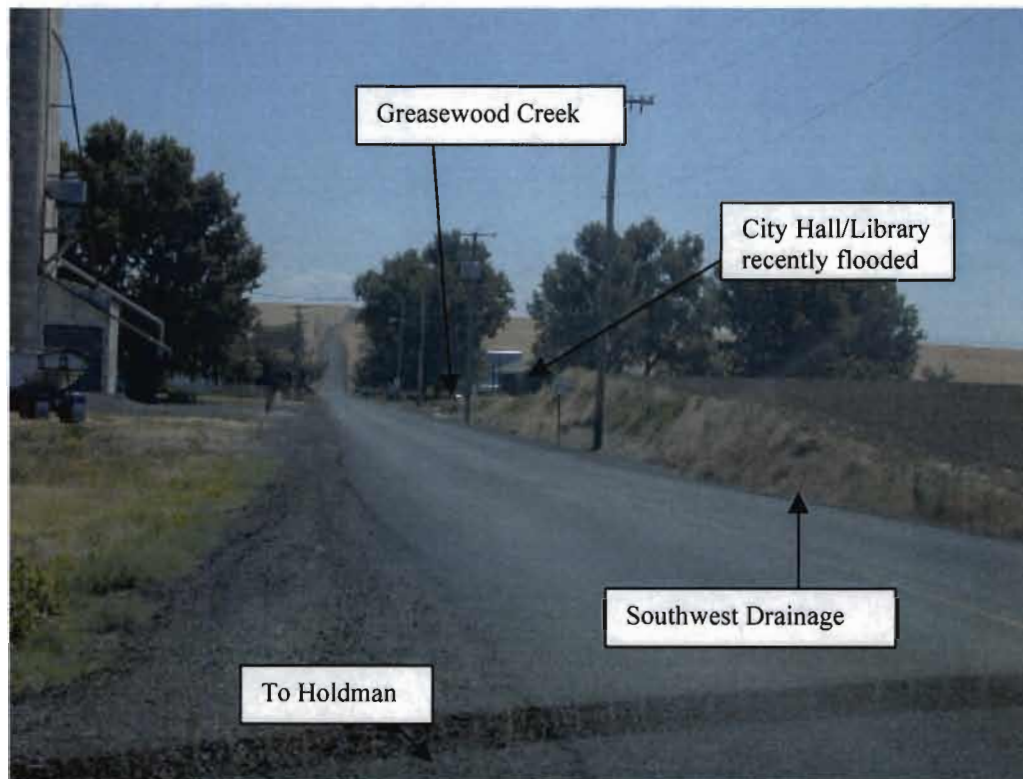


Photo No. 31: View looks southeast at Southwest Drainage and Greasewood Creek on west edge of town.

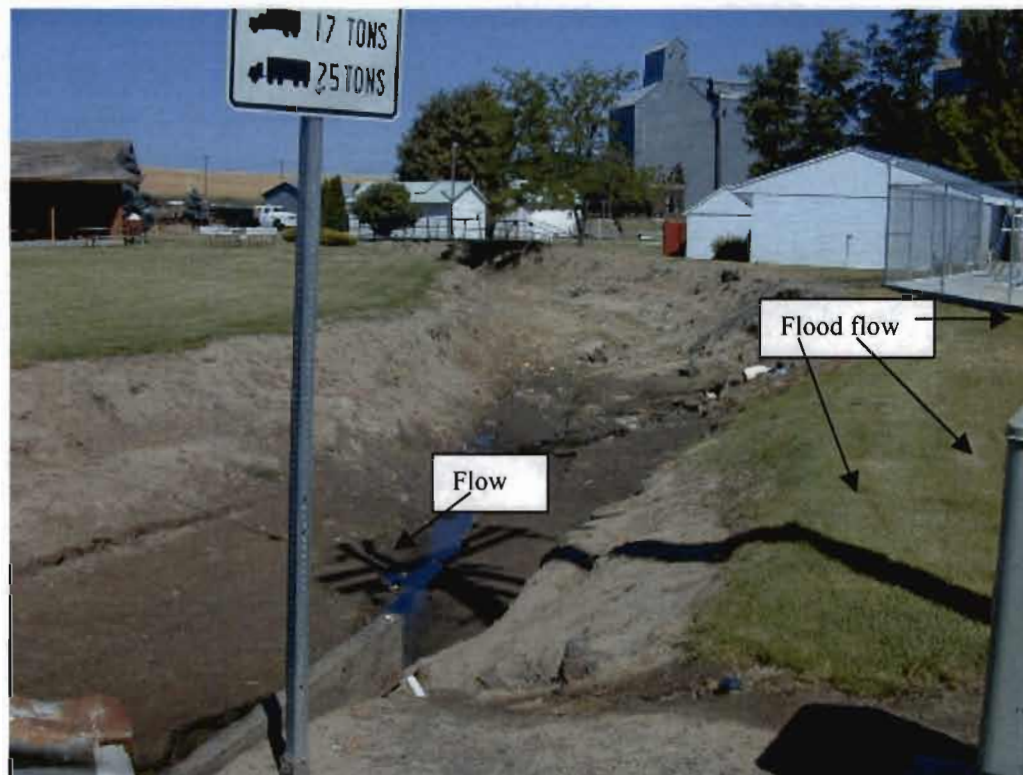


Photo No. 32: View looks northwest at Greasewood Creek upstream from bridge on road to Holdman



Photo No. 33: View looks south at upstream side of Greasewood Creek bridge at west edge of town.



Photo No. 34: View looks southeast at Greasewood Creek, looking downstream.

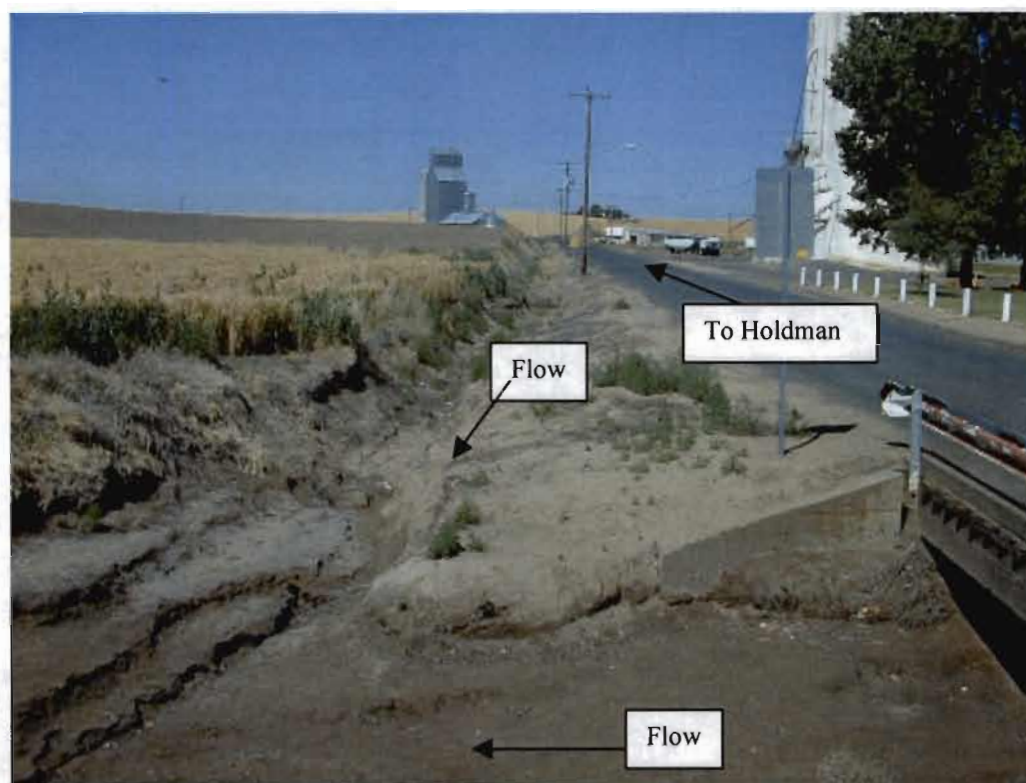


Photo No. 35: View looks west at Southwest Drainage at confluence with Greasewood Creek.

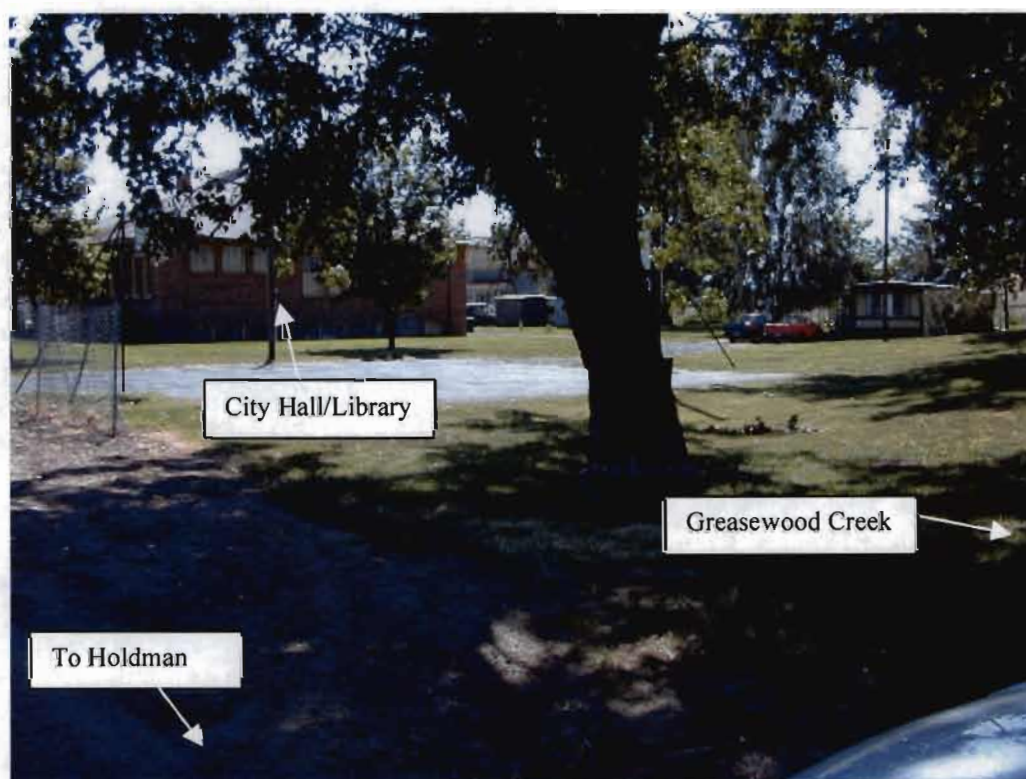


Photo No. 36: View looks east at City Hall/Library recently flooded, immediately downstream from Greasewood Creek.

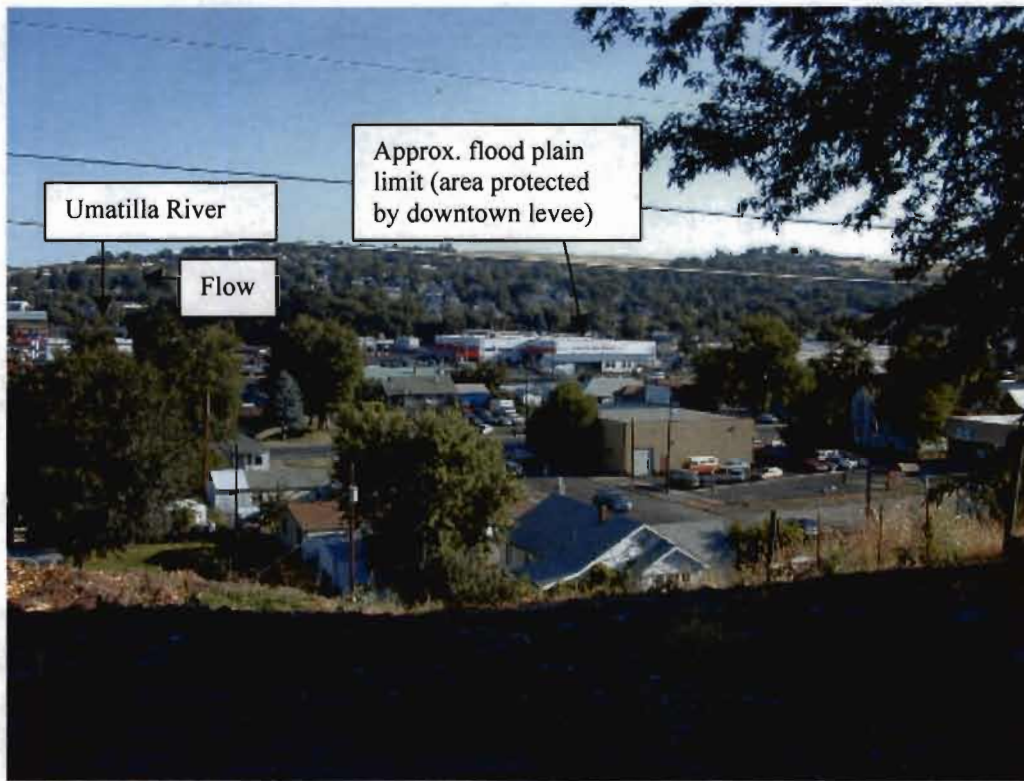


Photo No. 37: View looks north at downtown Pendleton, taken from hill on south side of town. Flood plain limit is approx. at white and red building in background.

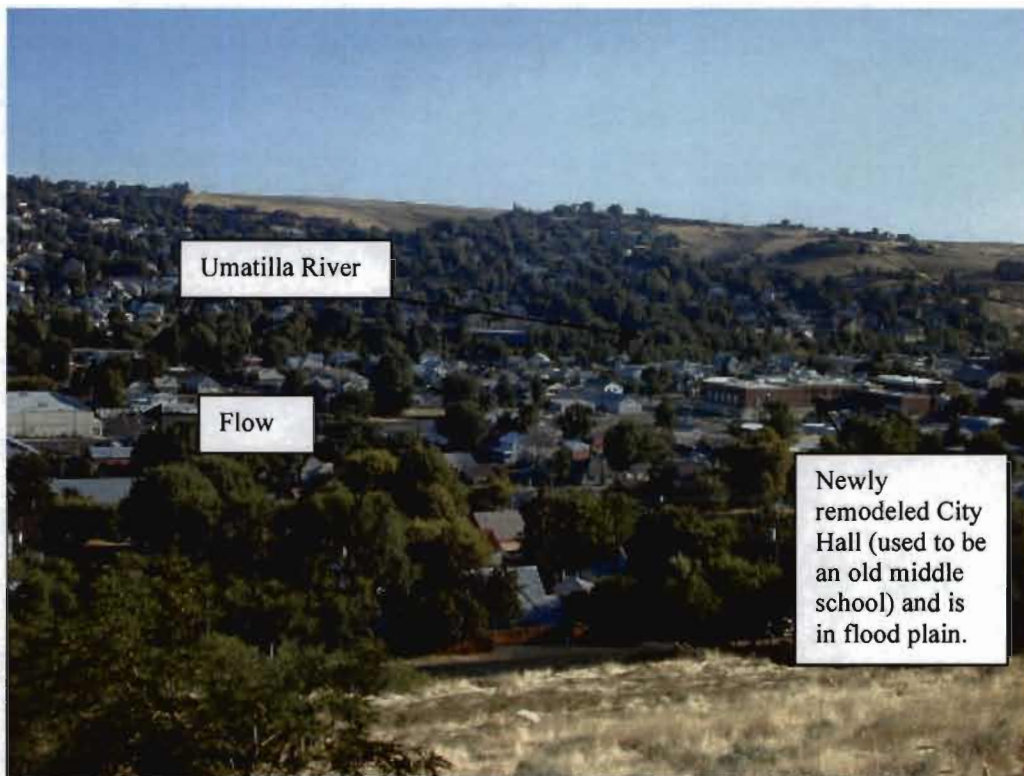


Photo No. 38: View looks northeast at downtown Pendleton. Brick building (new City Hall) in right center of photo is in flood plain. Protected by downtown levee.



Photo No. 39: View looks southwest at Montee Addition, along McKay Creek mostly in Pendleton. Area has been flooded in recent past.

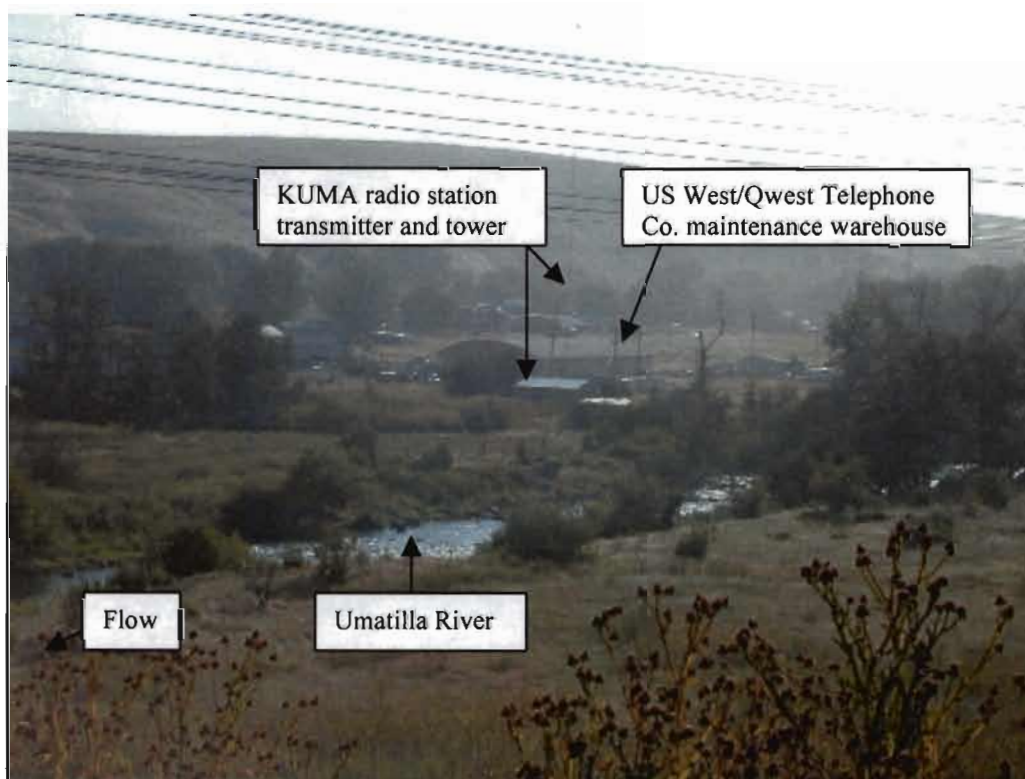


Photo No. 40: View looks northeast at Riverside area. Area has been flooded in recent past.

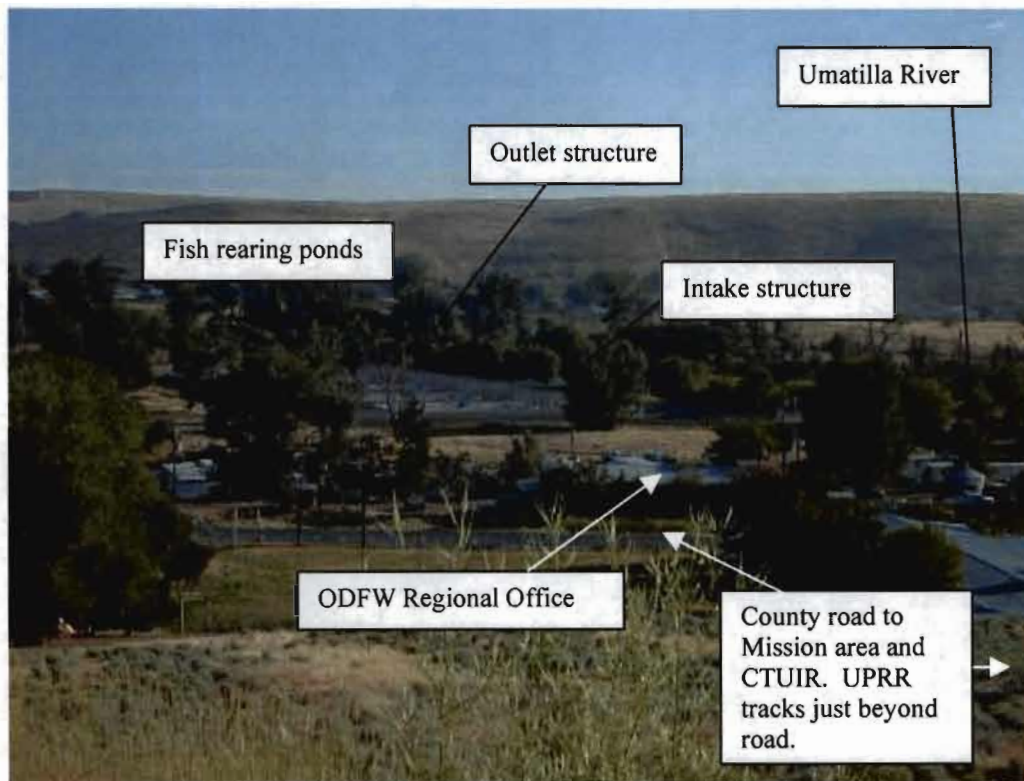


Photo No. 41: View looks north at new CTUIR/ODFW fish rearing pond facility. Intake and outlet structure could act as groins, directing flood flows toward north bank and the Riverside area.



Photo No. 42: View looks north at Nelson Creek crossing under State Highway 37 in northwest part of Pendleton.



Photo No. 43: View looks east at Nelson Creek ditch to Umatilla River.

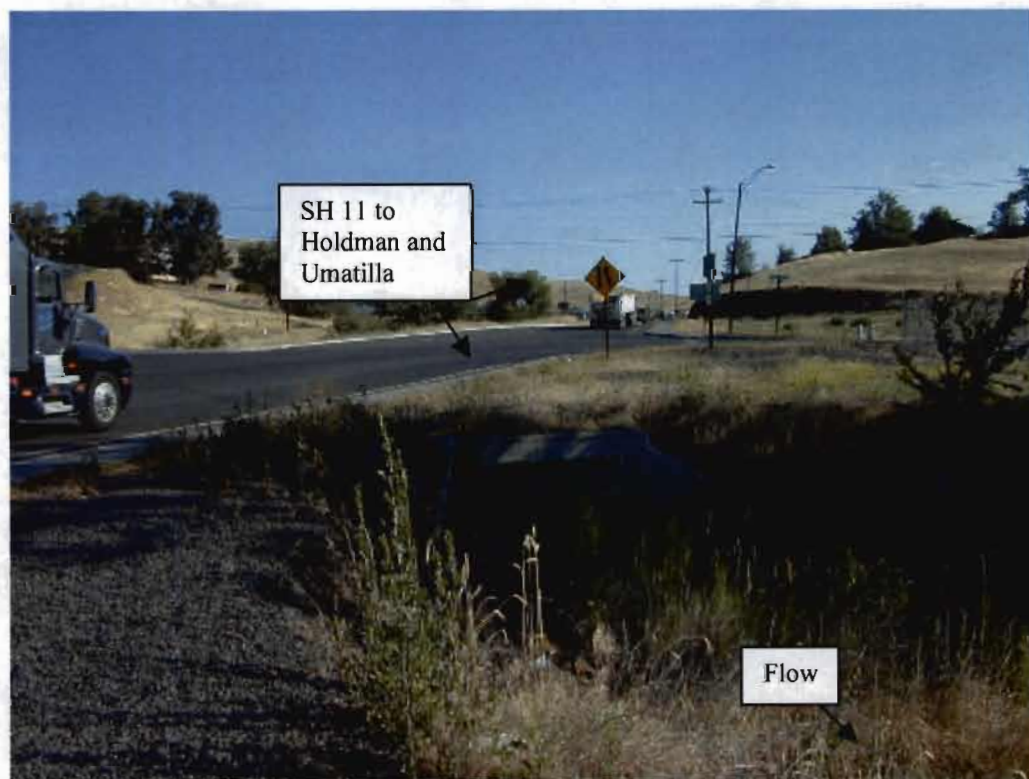


Photo No. 44: View looks north at Nelson Creek concrete box culvert under SH 37.



Photo No. 45: View looks upstream (east) at Tutuilla Creek from bridge on Hailey Ave.

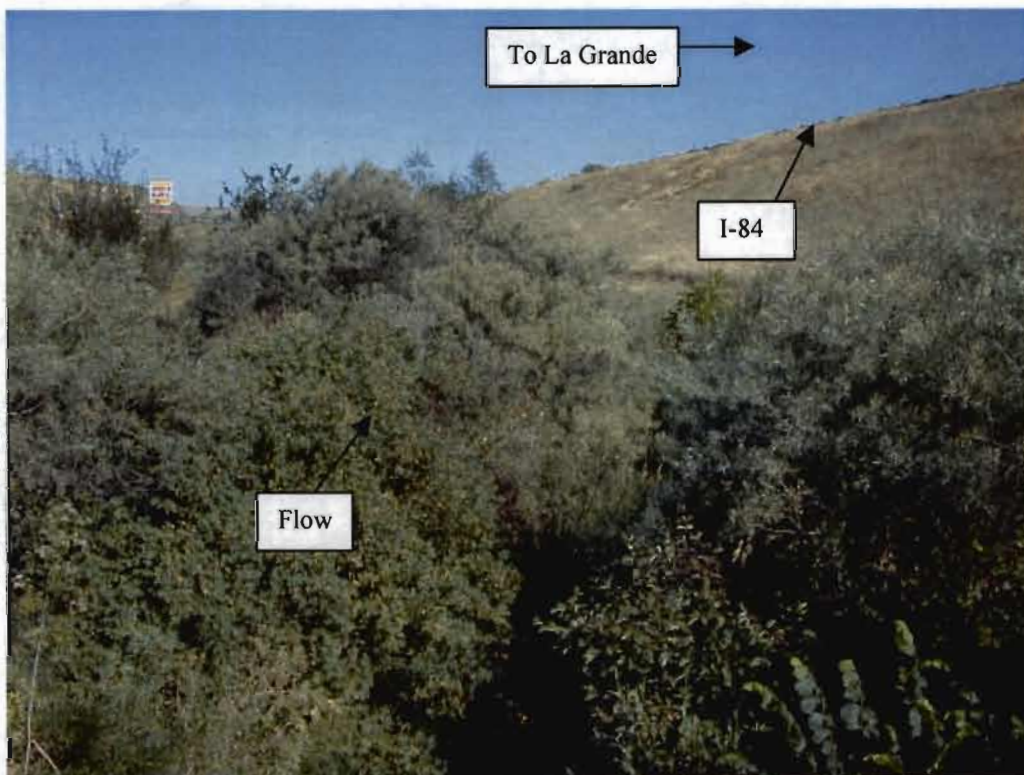


Photo No. 46: View looks downstream (west) at Tutuilla Creek from bridge on Hailey Ave. Shows typical brush along Tutuilla Creek.

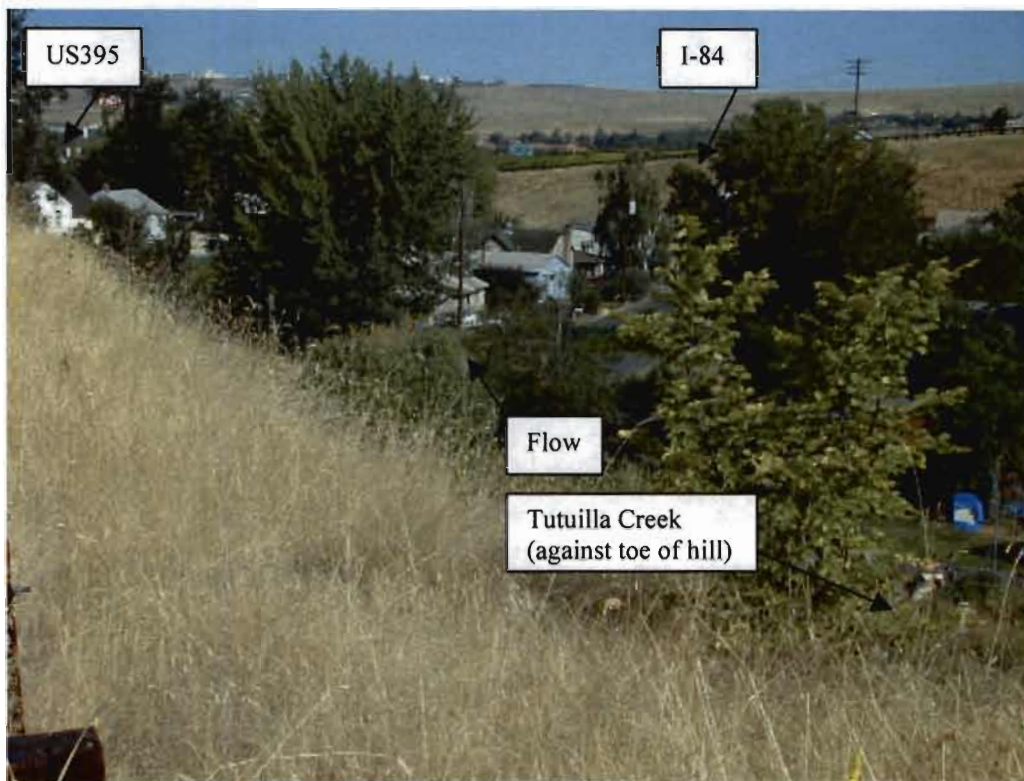


Photo No. 47: View looks northwest at Tutuilla Creek area near US395/I-84 junction. Shows houses and brush along Tutuilla Creek.

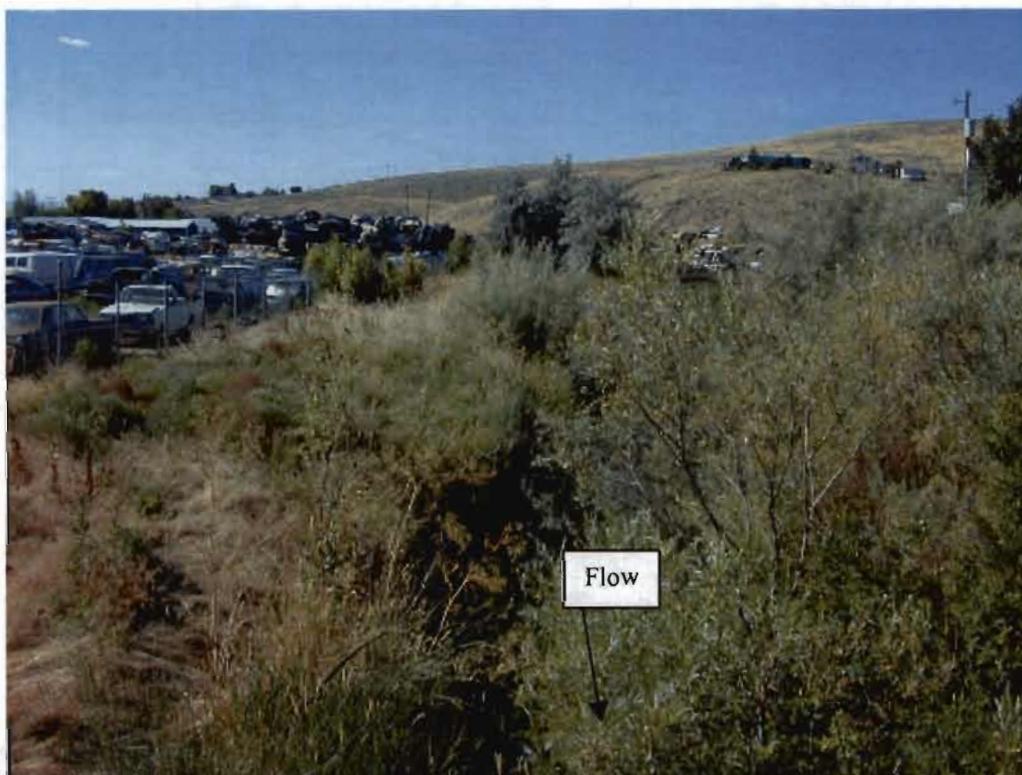


Photo No. 48: View looks upstream (southeast) at Tutuilla Creek from bridge on Tutuilla Creek Road. Shows typical brush along upper creek.



Photo No. 49: View looks downstream from bridge on Tutuilla Creek Road.

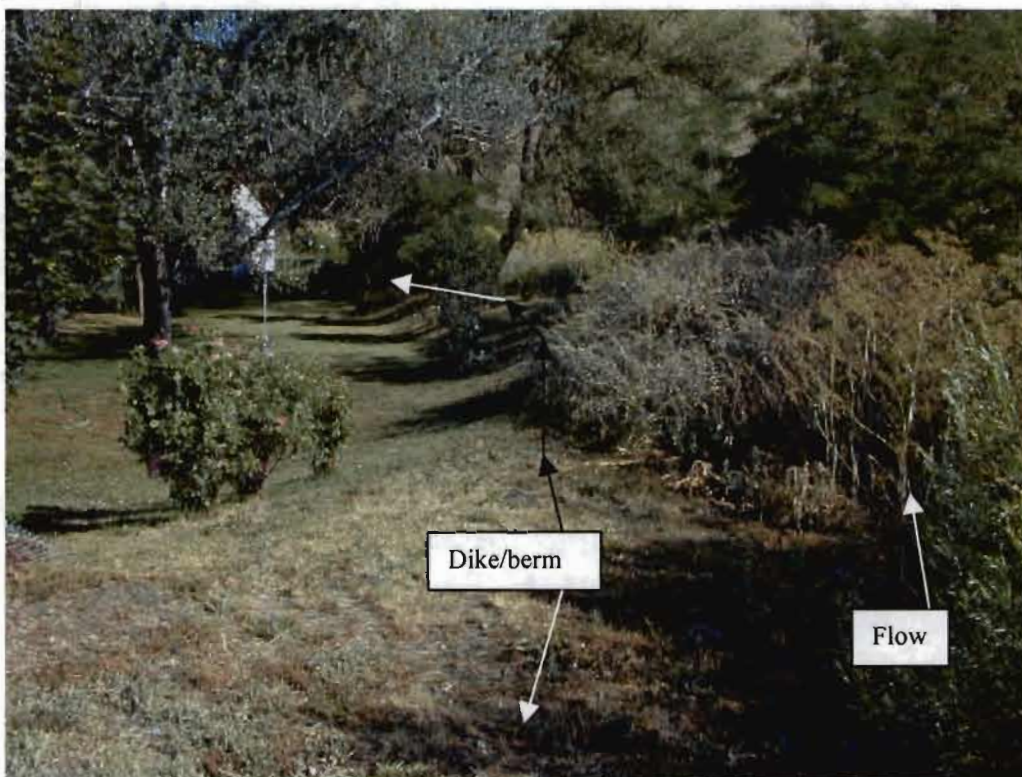


Photo No. 50: View looks downstream from bridge on Tutuilla Creek Road. Shows rudimentary dike/berm along left bank.

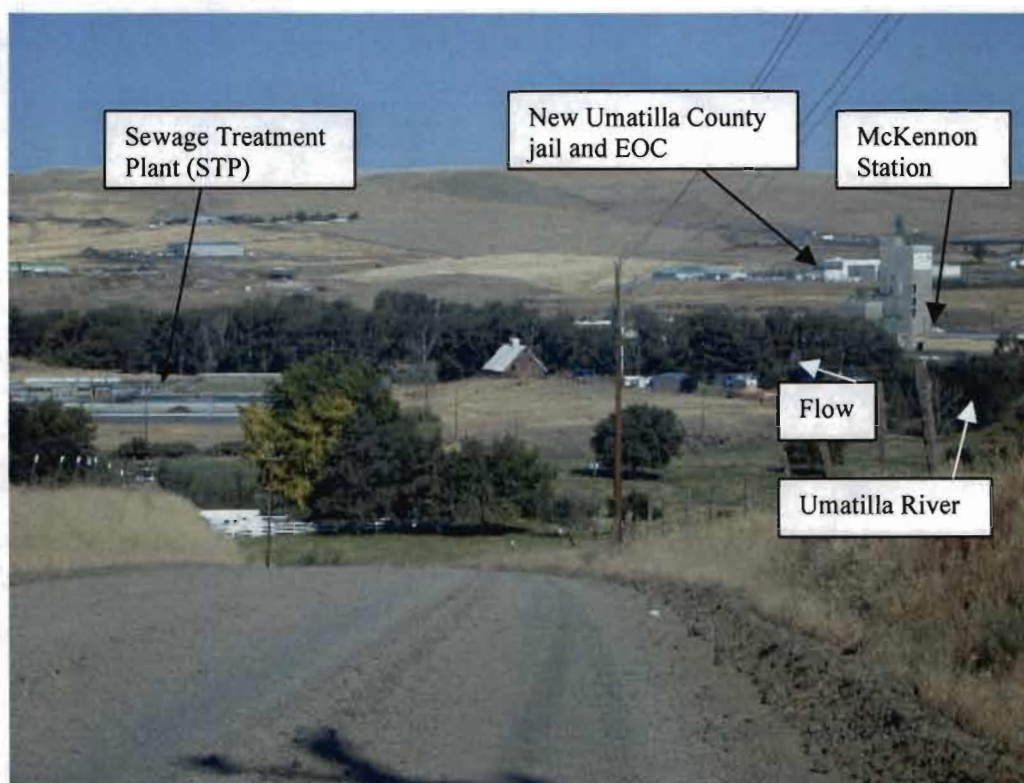


Photo No. 51: View looks west at STP area and McKennon Station in background.



Photo No. 52: View looks west at STP area and McKennon Station in background.



Photo No. 53: View looks southwest at Montee Addition where flooding has occurred in the recent past.

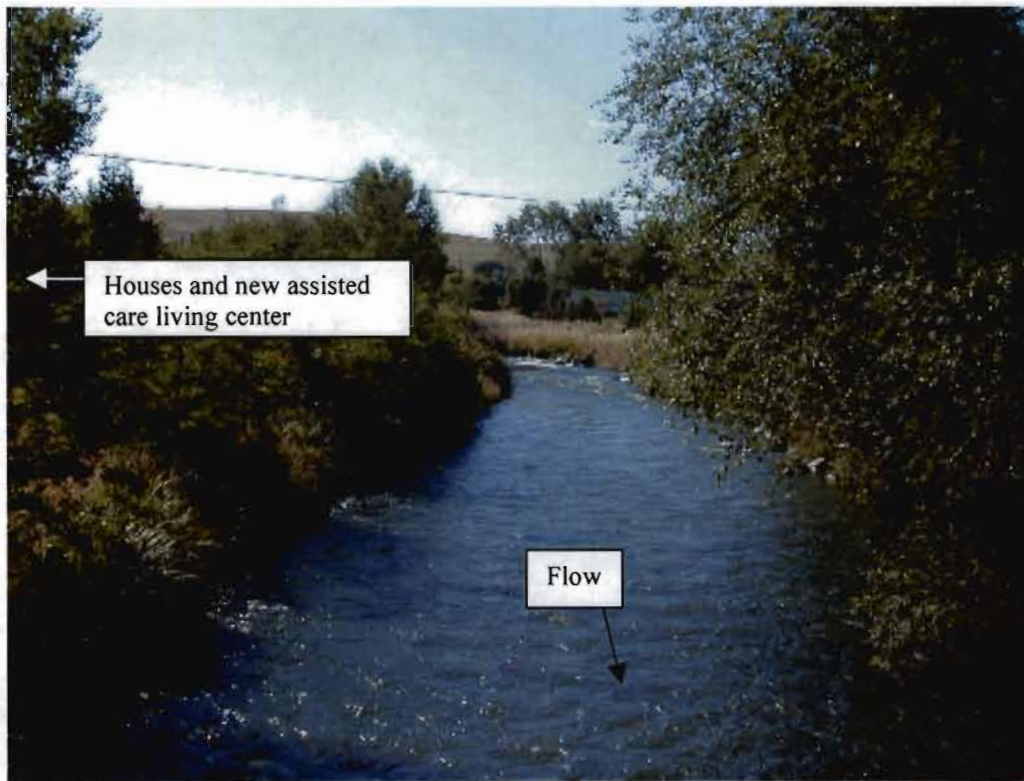


Photo No. 54: View looks upstream (south) at McKay Creek, taken from bridge on Quinney Ave.



Photo No. 55: View looks downstream (north) at McKay Creek, taken from bridge on Quinney Ave.

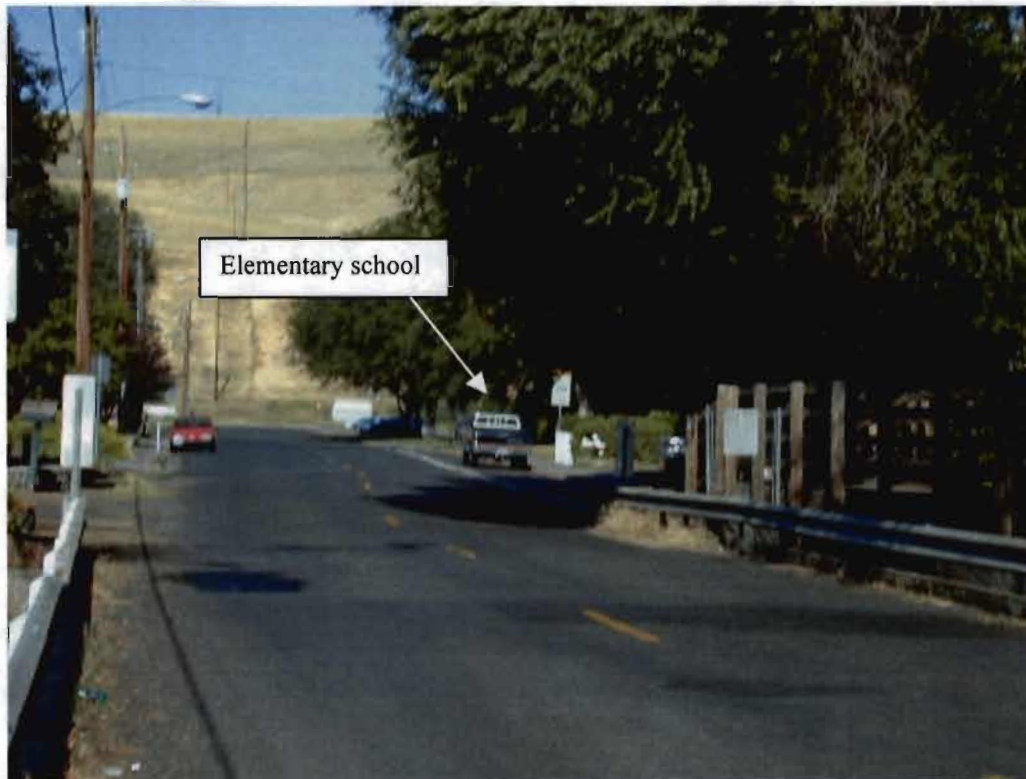


Photo No. 56: View looks west at Quinney Ave. from McKay Creek bridge.

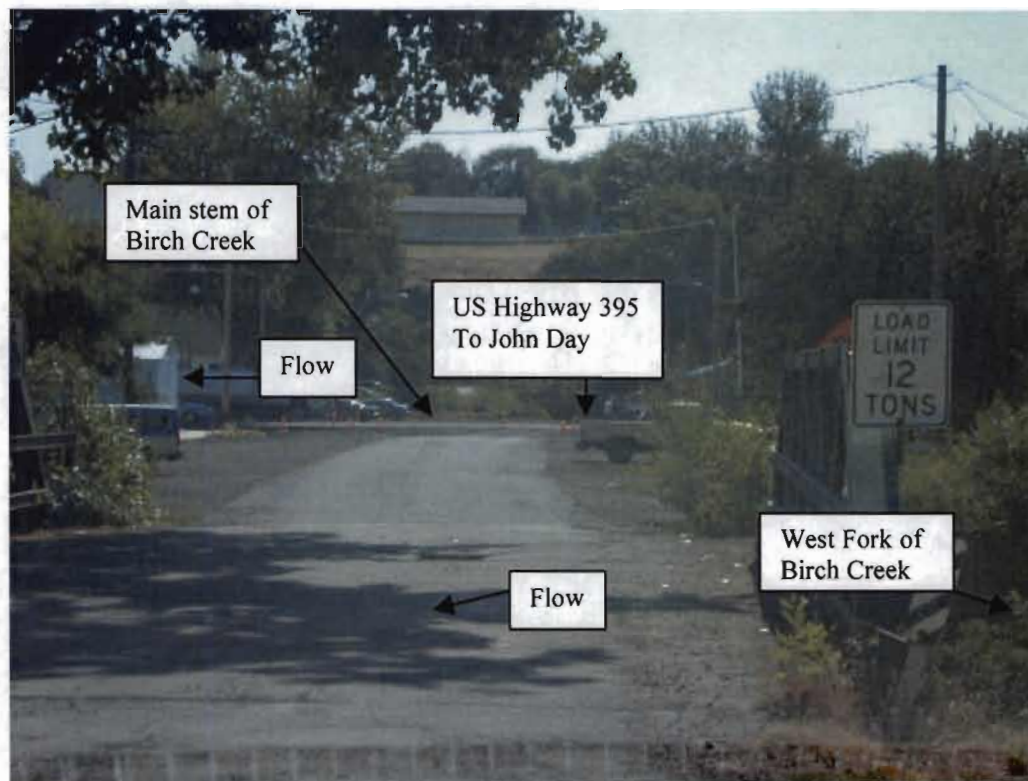


Photo No. 57: View looks east at bridge over West Fork of Birch Creek from 2nd St. and Delwood Ave.



Photo No. 58: View looks downstream (north) at the main stem of Birch Creek from Main St. bridge.



Photo No. 59: View looks upstream (south) at the main stem of Birch Creek from Main St. bridge, showing building encroachment.

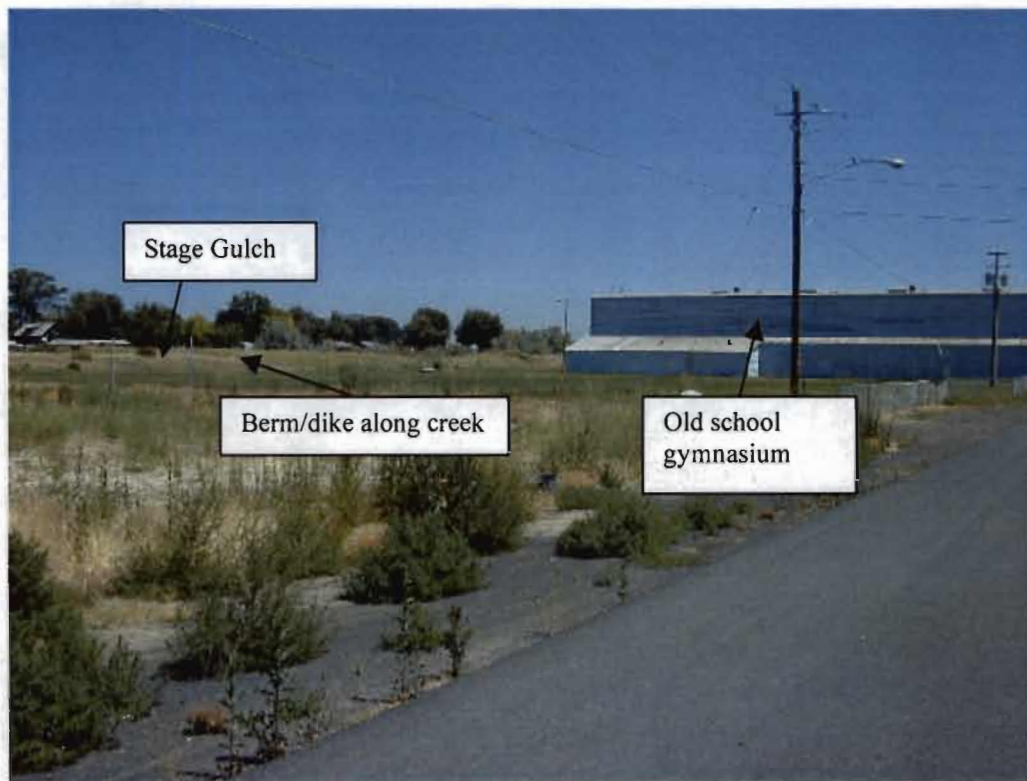


Photo No. 60: View looks northeast (upstream) at old school used as a church, located immediately south of Stage Gulch.

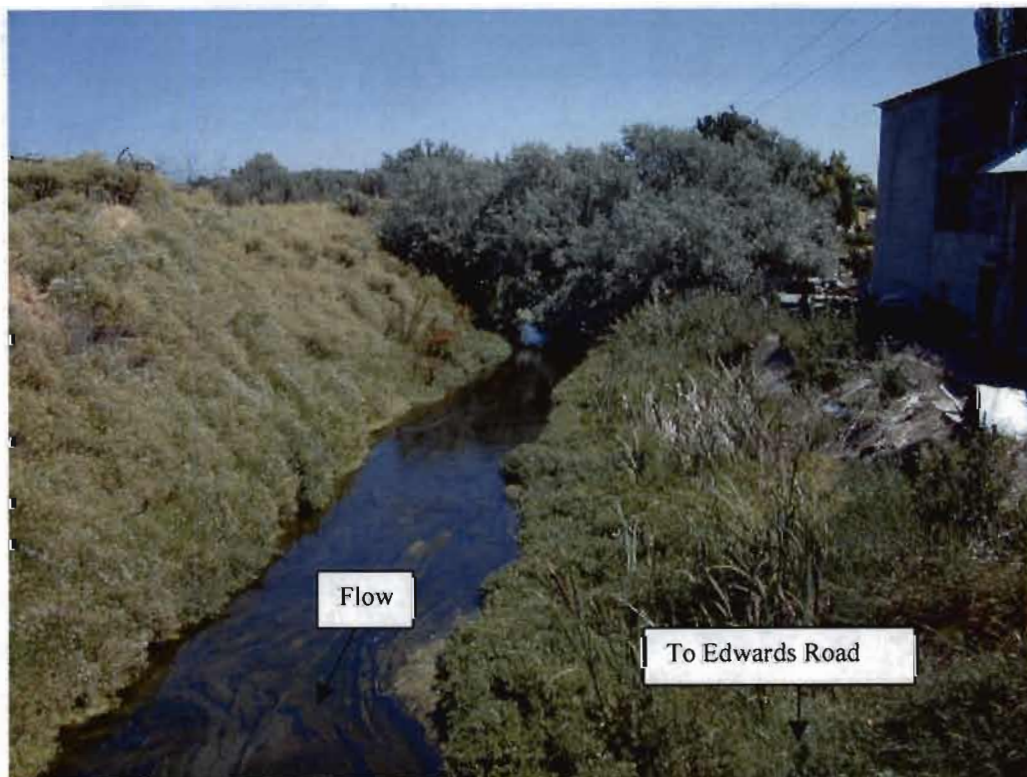


Photo No. 61: View looks upstream at Stage Gulch and encroaching building along Edwards Road on the east edge of town.



Photo No. 62: View looks downstream (west) at Stage Gulch from Edwards Road bridge.

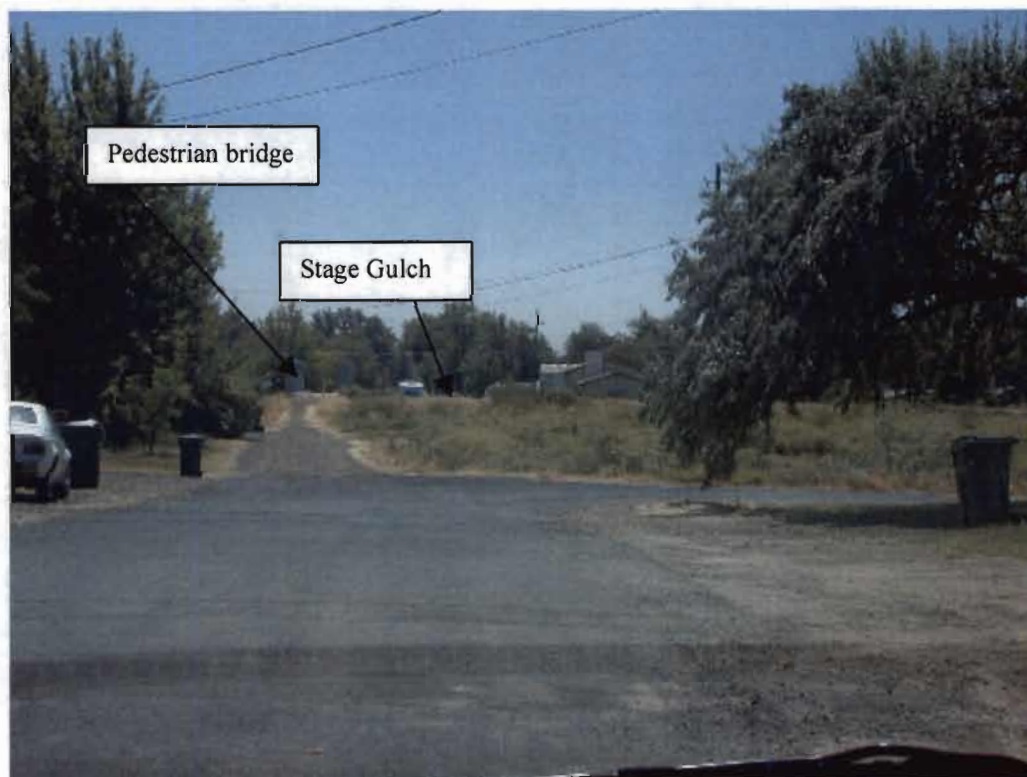


Photo No. 63: View looks south at Stage Gulch flood plain. taken from NE Wayne St. and Harding Ave. on north side of Stage Gulch.



Photo No. 64: View looks upstream (east) from bridge on Dunne St.



Photo No. 65: View looks south from bridge on Dunne St.



Photo No. 66: View looks downstream (west) from Dunne St. bridge.



Photo No. 67: View looks upstream (east) from US Highway 395 bridge.

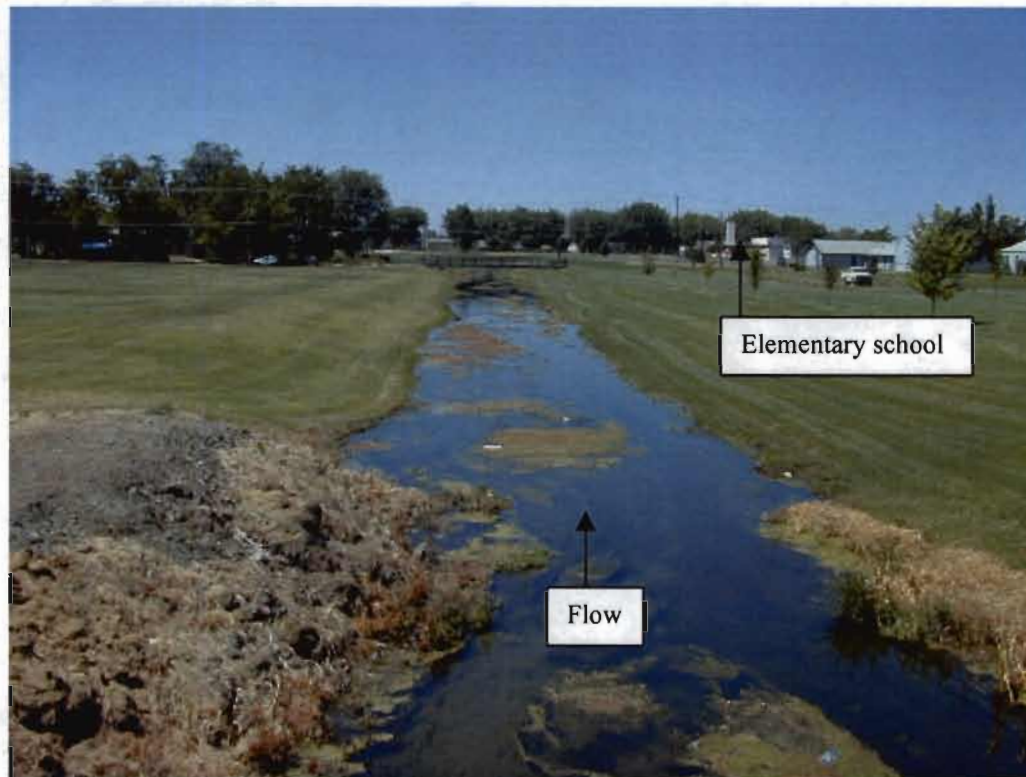


Photo No. 68: View looks downstream from US Highway 395 bridge.

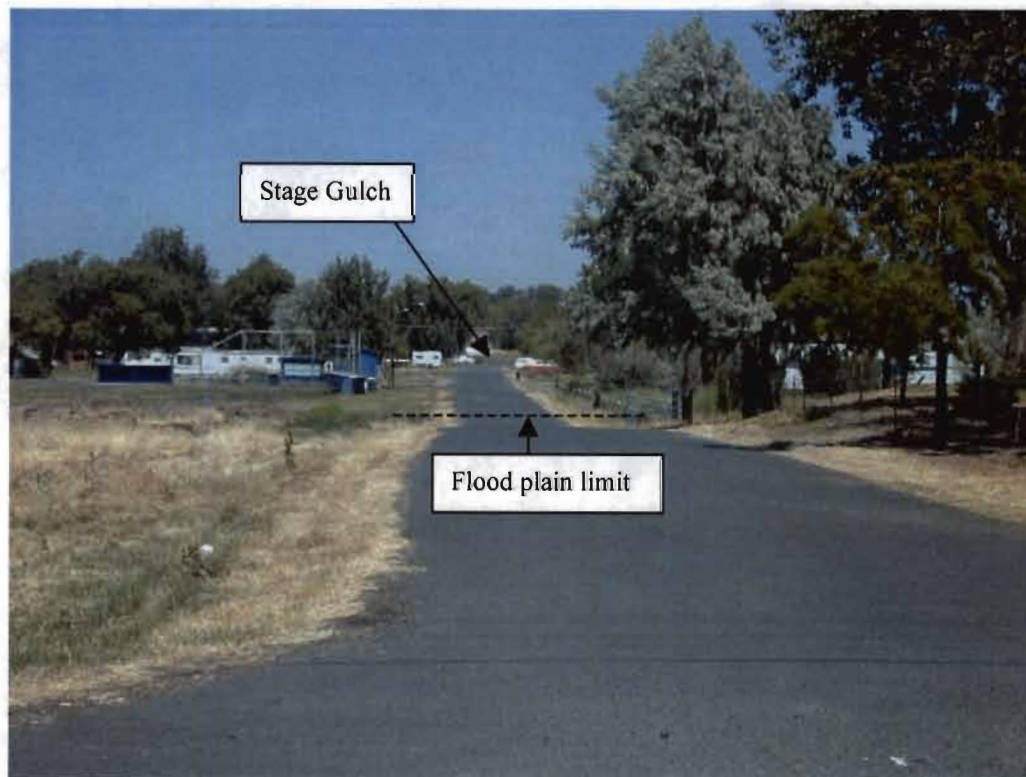


Photo No. 69: View looks north at flood plain from SE Ball Ave. down SE Wayne St.



Photo No. 70: View looks north at flood plain on SE Dunne St. from SE Ball Ave.  
Photo point is approx. flood plain limit.

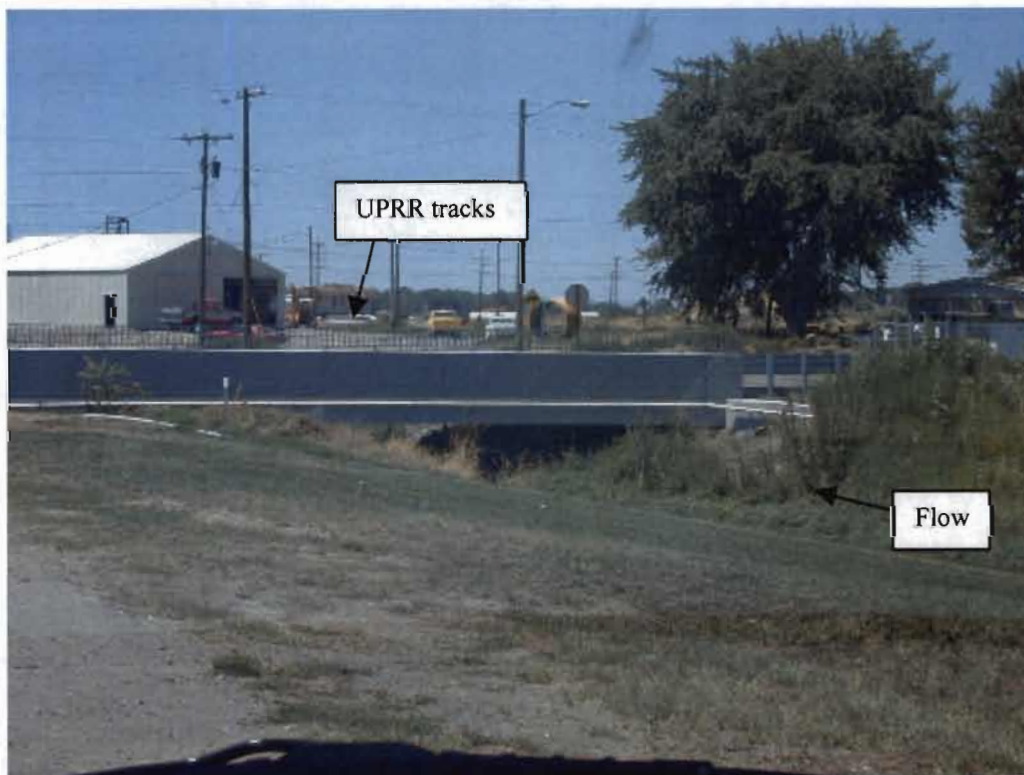


Photo No. 71: View looks downstream (northwest) at upstream face of bridge  
on SW Sherman St. along west edge of town.

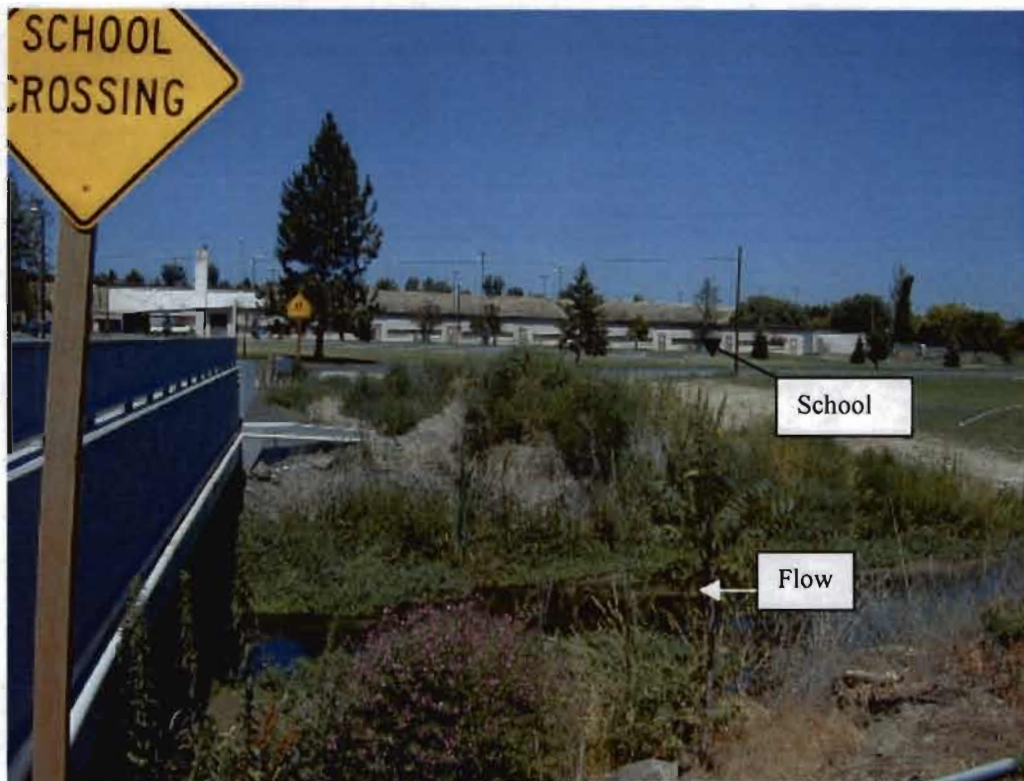


Photo No. 72: View looks north from Sherman St. bridge at elementary school.



Photo No. 73: View looks downstream (west) at Stage Gulch and UPRR tracks from Sherman St. bridge.

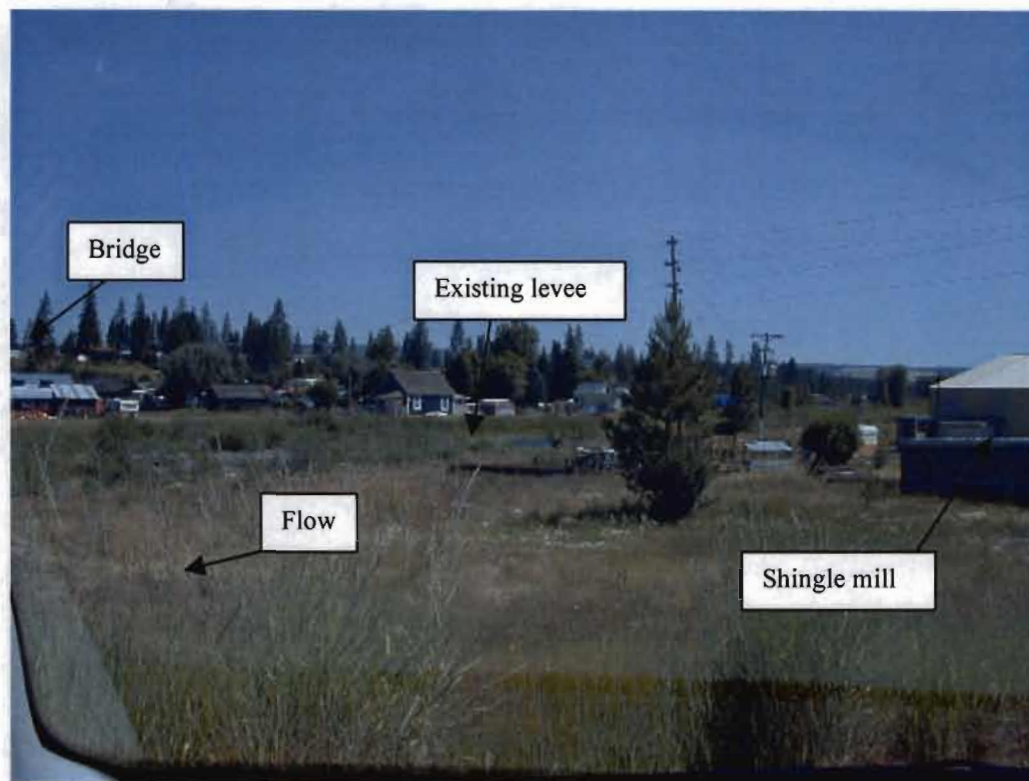


Photo No. 74: View looks east at Camas Creek (on south edge of town).  
Taken from south end of bridge on Soap Hill Road.



Photo No. 75: View looks upstream (south) at Pine Creek from bridge on Main St.



Photo No. 76: View looks downstream (north) at Pine Creek from bridge on Main St.

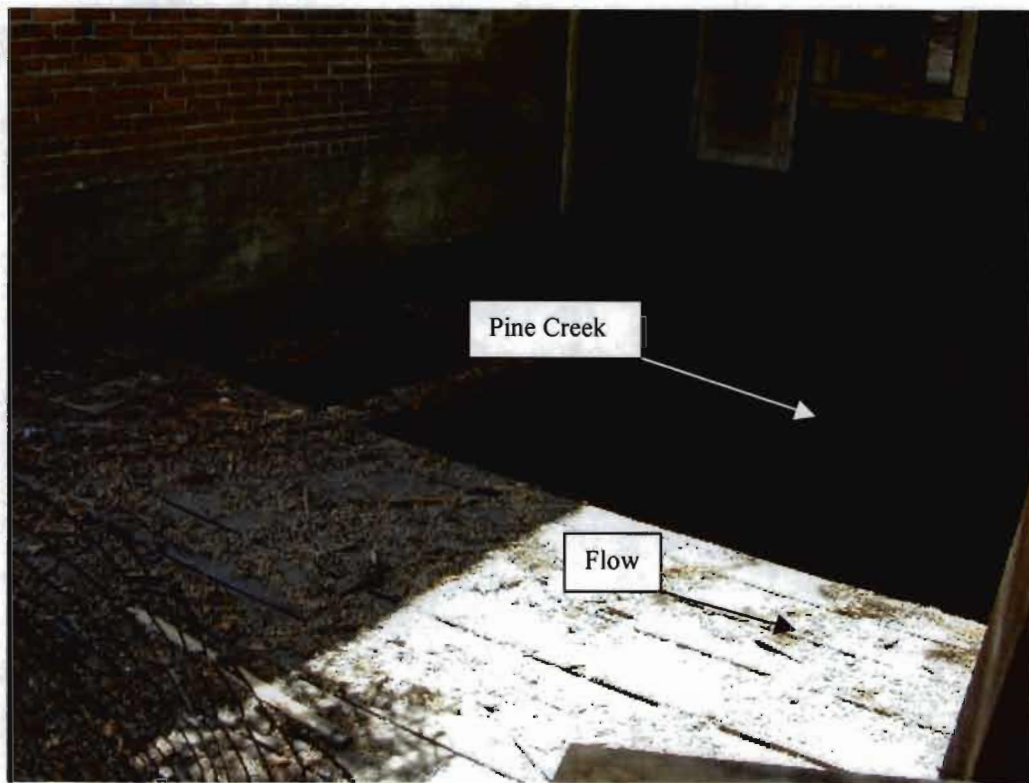


Photo No. 77: View looks upstream at downstream face of bridge on Main St.

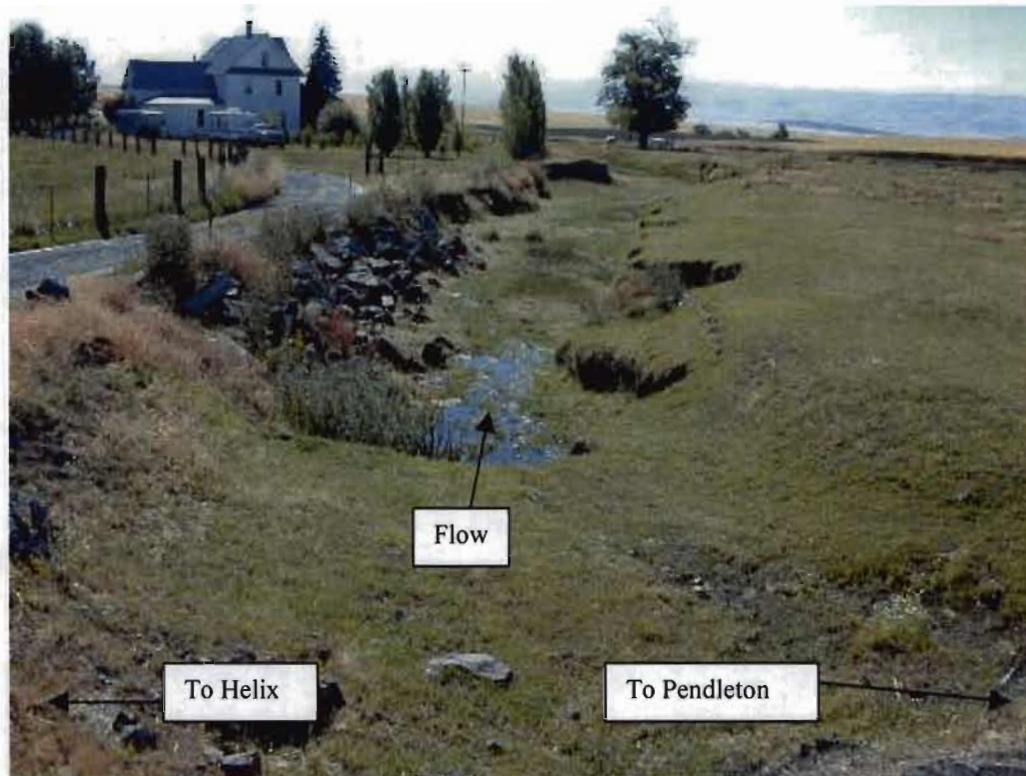


Photo No. 78: View of typical northeastern Umatilla County road crossing.  
(Actually the Little Greasewood Creek crossing, south of Helix). Looks  
downstream or southeast.

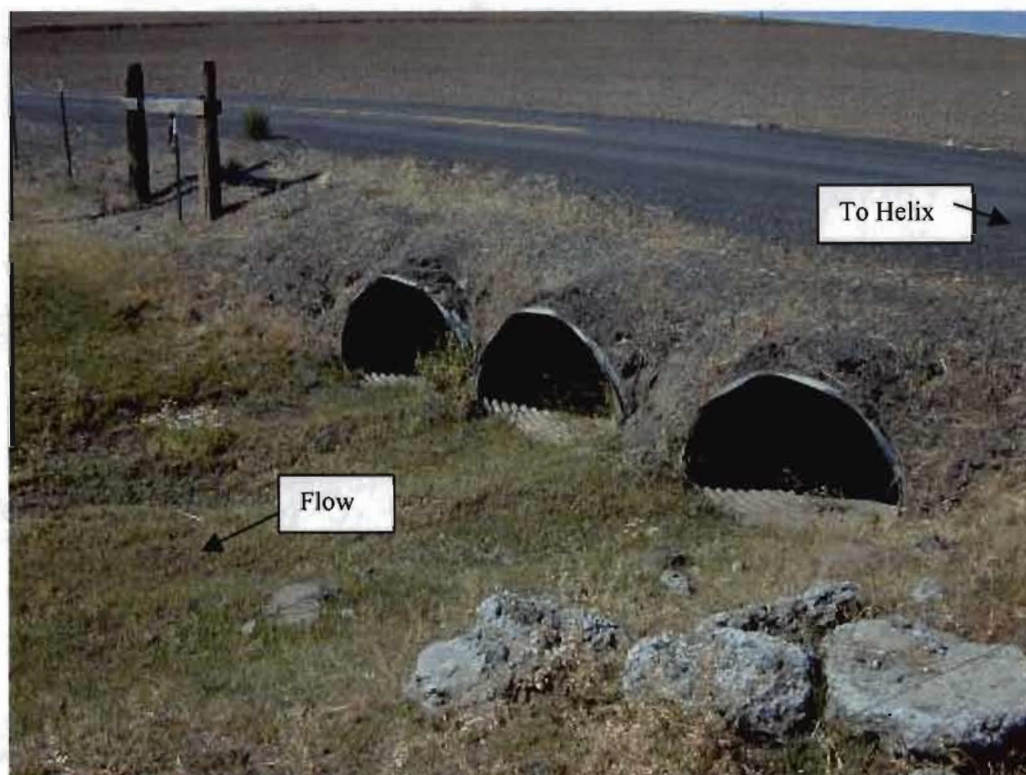


Photo No. 79: View looks at downstream end of culverts under county road to Helix.

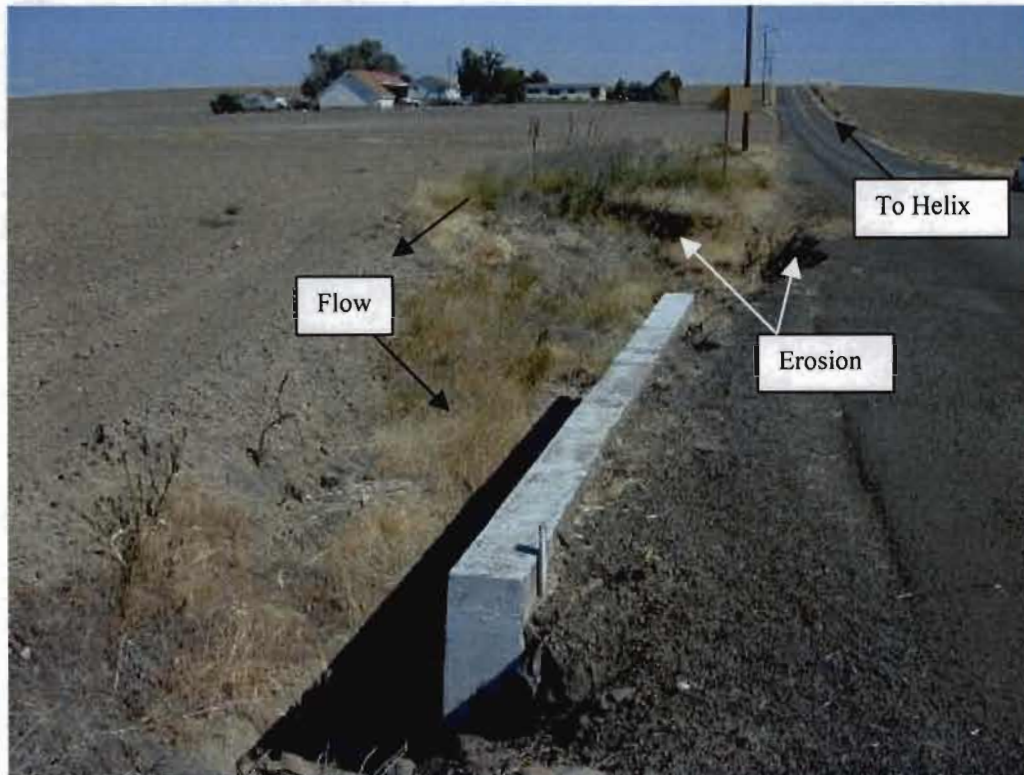


Photo No. 80 : View looks at upstream side of culverts showing headwall and county road shoulder erosion caused by high water flow in creek.

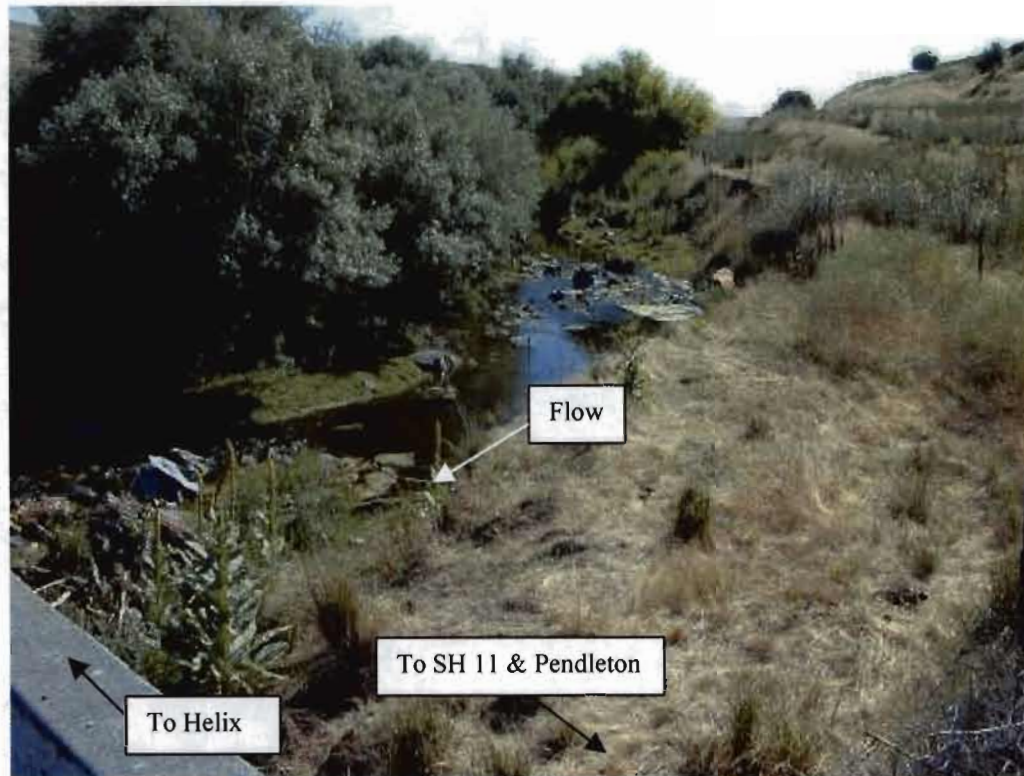


Photo No. 81: View looks upstream at Wildhorse Creek. Taken from east end of bridge.

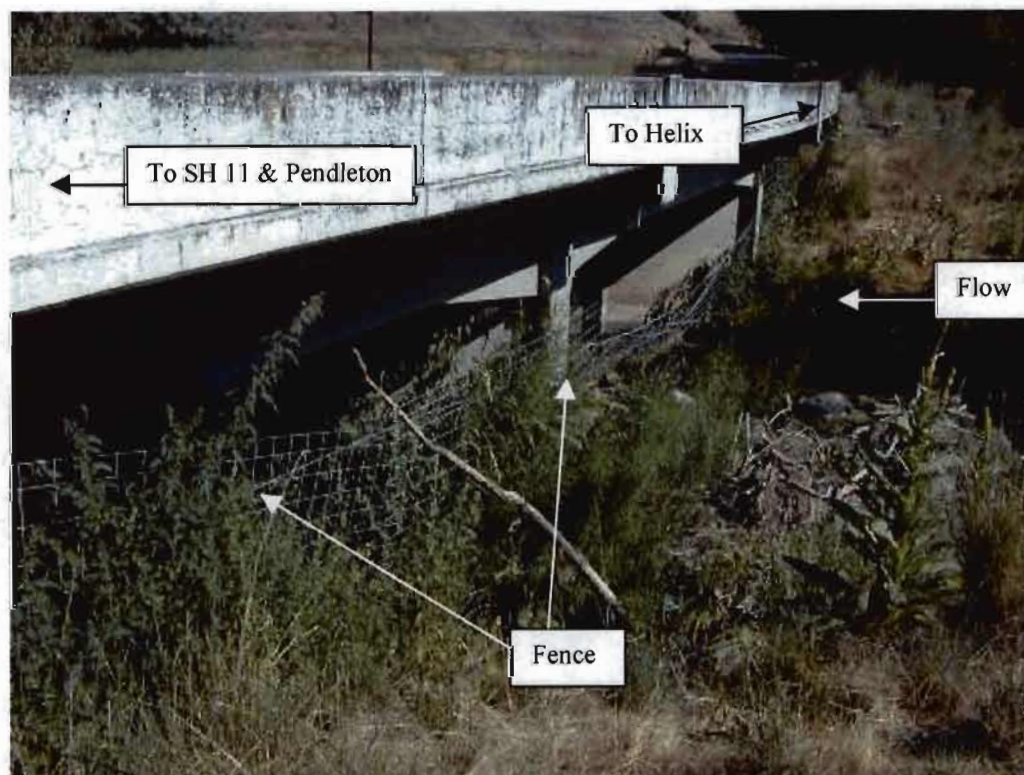


Photo No. 82: View looks downstream at the u/s side of bridge, showing fence, possible obstruction to debris during flood.



Photo No. 83: View looks downstream (southwest) at Wildhorse Creek, taken from middle of bridge south of Helix.

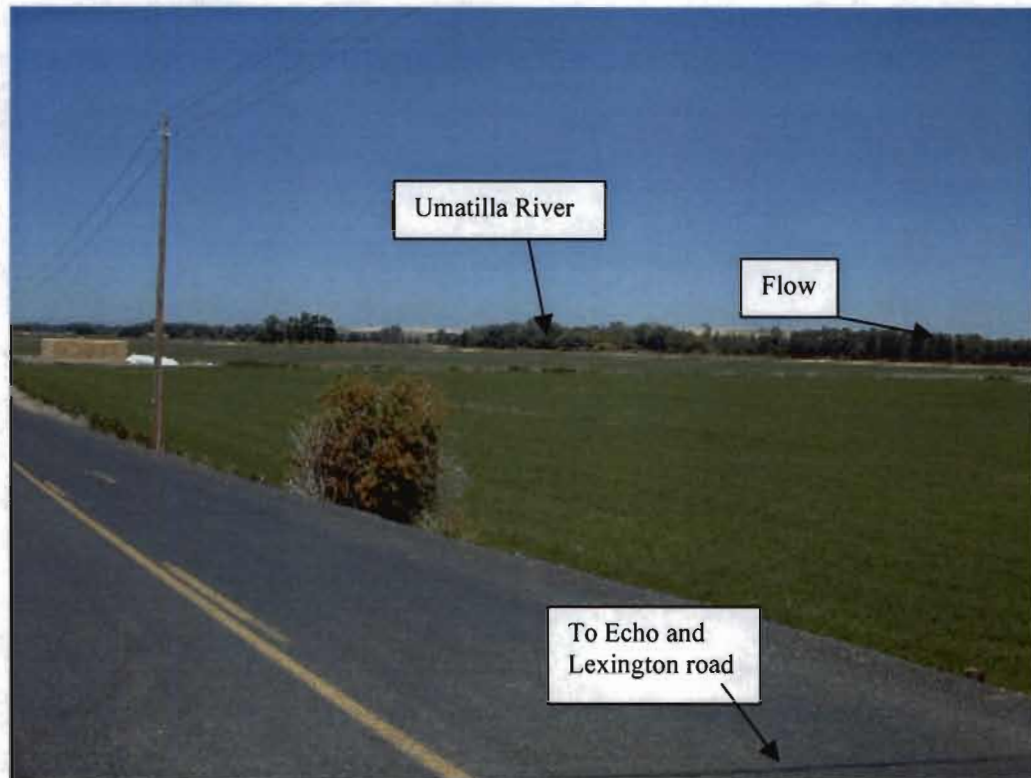


Photo No. 24: View looks northwest at Echo Meadows area from south. Taken from Westland Irrigation District canal crossing county road. Typical of area between Hermiston and Echo along the Umatilla River.

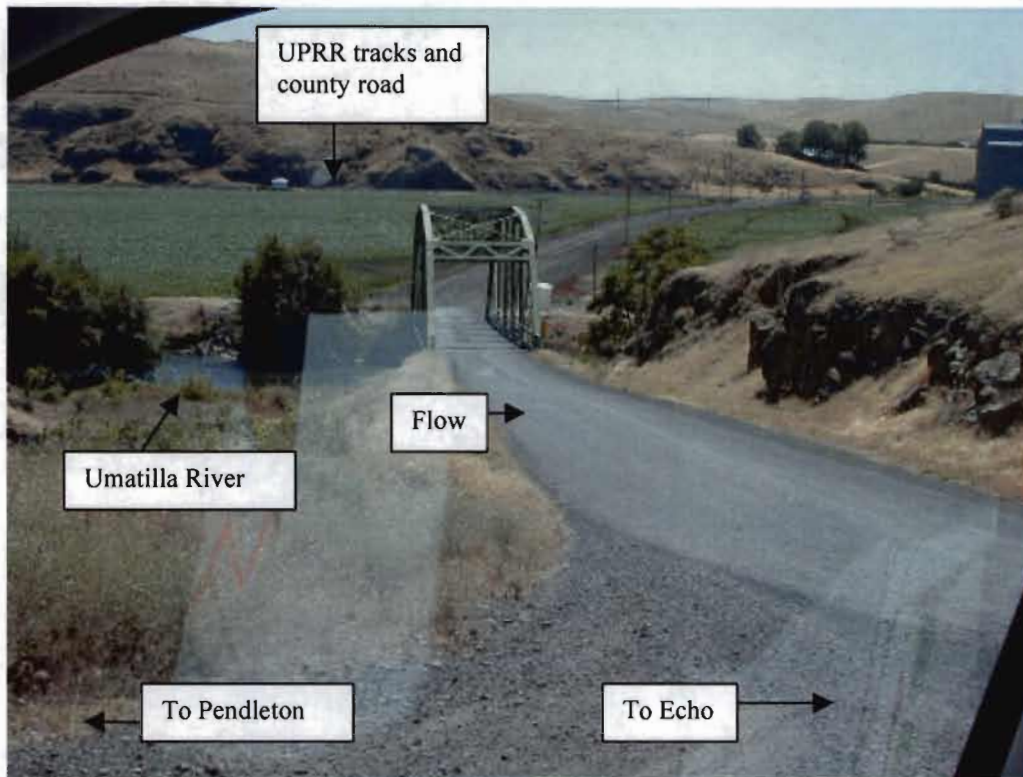


Photo No. 85: View looks south at bridge at Nolin to Cunningham Sheep Ranch. Area repaired during 1996 flood to left but off photo.

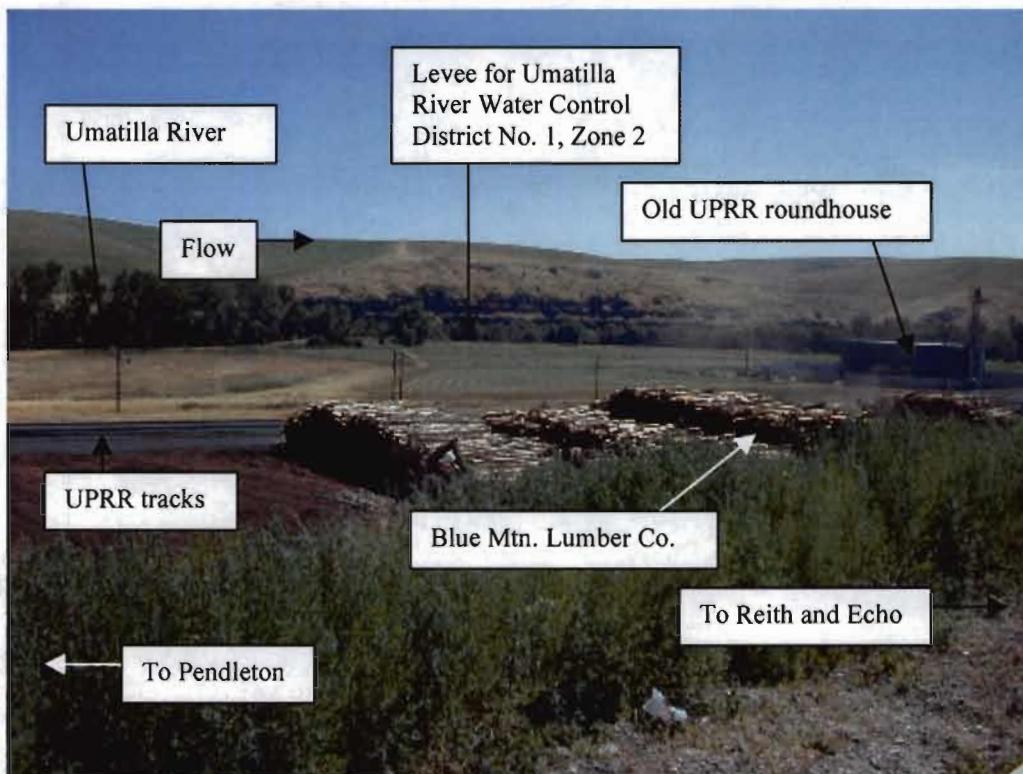


Photo No. 86: View looks southwest at Blue Mountain Lumber Co. and area protected by Seg. 3 of the URWCD1Z2 levee (around old UPRR roundhouse at Reith).

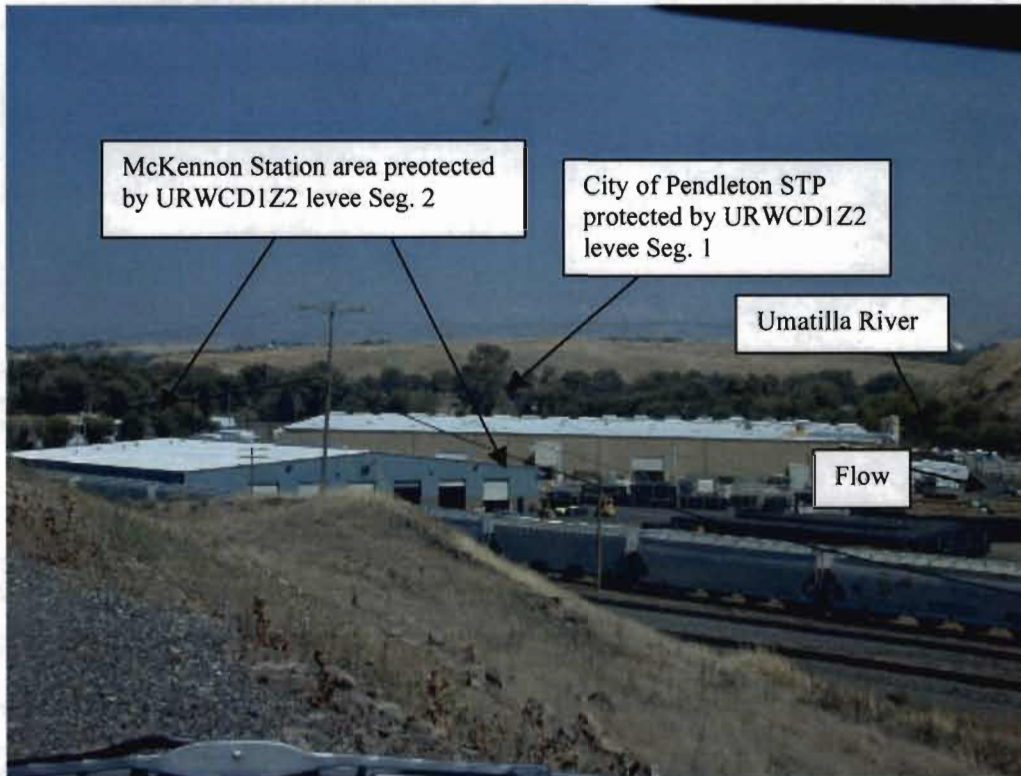


Photo No. 87: View looks east at McKennon Station industrial area southwest of Pendleton. Taken from road to Reith and Echo (Old River Road).

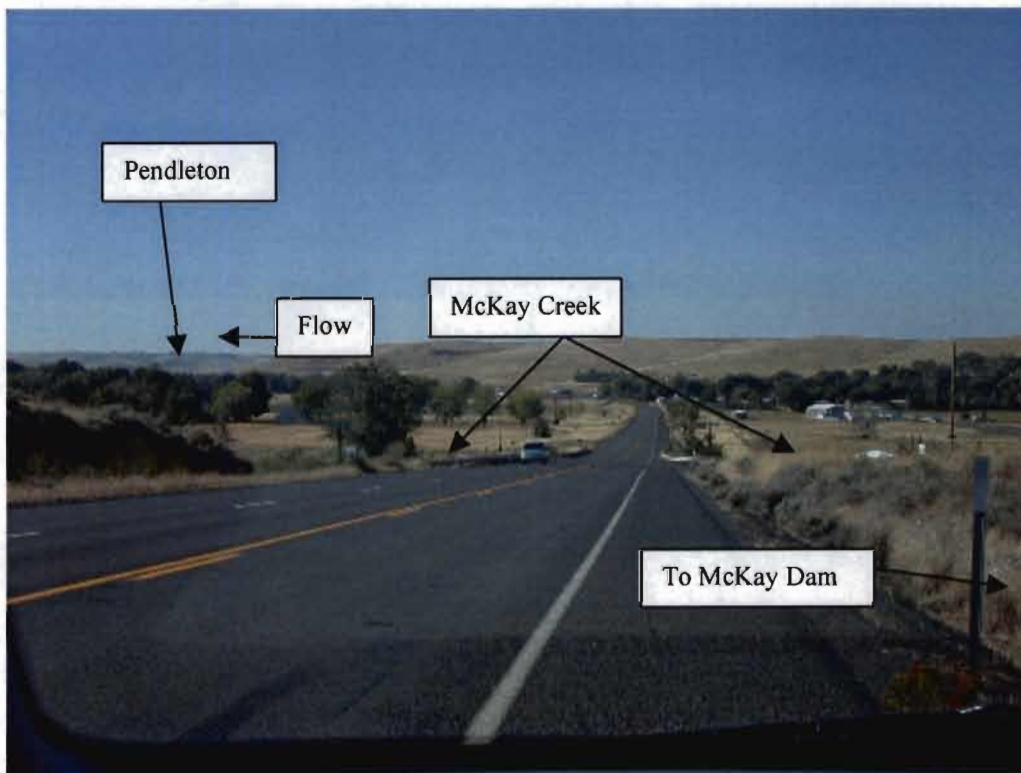


Photo No. 88: View looks north at McKay Creek area downstream from McKay Dam and Reservoir, south of Pendleton.

***REPORT OF***

***FLOOD FIGHT POTENTIAL SITES***

***in***

***UMATILLA COUNTY, OREGON***

*Prepared By: Jerry R. Gardenhire*  
*CENWP-EC-DC*  
*7/25/00*  
*Rev. 1 11/3/03*



## Flood Fight Planning - Umatilla County

I. General. This report documents findings regarding potential flood fight locations in the portion of Umatilla County that is within the Portland District, Corps of Engineers (COE) boundary. The northeast corner of the county is within the boundary of the Walla Walla District. Primarily, that area is the watershed of the Walla Walla River and its two forks. In addition, approximately the eastern half of the county is located within the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). Primary responsibility for flood fighting lies with the affected city and/or county. The Corps can assist in flood fight efforts if the city, county, and state are fully involved with flood response and require additional assistance. Advance planning is required to mount an effective flood fight. For example, a conceptual plan of action must be determined, easements obtained over potential work areas, material sources need to be identified, construction equipment needs to be located and identified, and elevation bench marks must be identified and/or established. COE flood fighting in Umatilla County depends upon having enough time to mobilize needed forces to conduct the flood fight. A potential flooding scenario involving conditions like a heavy snow pack in the watershed above the floodlight site and notification of an approaching warm and wet rainstorm would probably afford enough mobilization time. Notification of the approach of a thunderstorm wouldn't afford the needed mobilization time.

### II. Methodology.

A. The COE does not flood fight agricultural areas and we usually cannot demonstrate economic justification for most rural areas because of the extensive measures that would need to be taken over a large area to protect scattered infrastructure. Therefore, I limited my evaluations to "urban infrastructure" such as hospitals, potable water treatment plants, sanitary sewage treatment plants, schools, access points to those facilities, and residential areas of more than one or two homes.

B. The methodology I used was to first collect the FEMA flood plain mapping for the county and any included communities. I inspected the flood plain maps to see if flood plains existed within the communities and in the unincorporated part of the county. In unincorporated areas of the county, I looked for road crossings that could possibly stop access to a town. I attempted to establish landmarks and mileages to specific areas I wanted to visit in the field. I then spent 2-1/2 days driving to the sites identified on the flood plain mapping to see if it was possible to mount a flood fight or if there was a need to make such a flood fight.

### III. Inspection Findings.

#### A. Adams.

1. **Community Description:** Adams, Oregon is a small farming/ranching community located approximately 10 miles northeast from Pendleton, the Umatilla County seat. The town is situated immediately west of State Highway 11, on the way to Walla Walla, WA. No commercial transportation services are



available in Adams. Commercial rail service is available in Pendleton, OR. Commercial air service is available in Pendleton, OR and Walla Walla, WA.

**2. Flood Plain Description:** Adams is potentially affected by flooding from a short piece of Sand Hollow Creek and Wildhorse Creek. Sand Hollow Creek empties into Wildhorse Creek, just upstream from town. Sand Hollow Creek is an ephemeral creek, that is, one that runs part of the year, depending upon weather conditions. Wildhorse Creek is a permanent flowing stream that starts in the Blue Mountains east of Adams and south of Weston, Oregon. The town of Adams is quite flat; therefore, flooding from either stream can affect approximately half of the town. The majority of flood flows can be attributed to Wildhorse Creek. The flood plain for the 100-year flood extends approximately 400 - 600 feet from the stream in the north portion of town and 100 - 200 feet from the stream in the south portion of town. The main development of Adams has historically taken place west of the stream, but more homes have been built east of Wildhorse Creek. In addition, construction of a new subdivision has begun at the east end of William Street, in the abbreviated flood plain of Sand Hollow Creek. See Photos 1 and 2.

**3. Type of Flooding:** Due to the flood plain of approximately 600 feet wide, flooding in Adams can be characterized as *widespread*. For a large area in town, the west edge of the creek could be bermed to stop further flooding, if started early enough. However, that would likely cause increased flooding on the east side of the creek, exacerbating the problems for the people living on that side of the creek. Access to the town from Highway 11 is by a road crossing bridges at the north and south end of town. There is little that could be done to protect these bridges, except to patrol them for debris clogging their openings. It is likely that back roads into and out of Adams could be used in case both roads to Highway 11 are blocked. Flooding at Adams is not preventable without pre-flood measures and those measures do include moving of some houses in the southern part of town along Wildhorse Creek. A levee built along Wildhorse Creek would probably prevent flooding along this channel. The bridges should be replaced at a higher elevation appropriate to the 100-year flood elevation. A levee along Sand Hollow Creek to its confluence with Wildhorse Creek would probably prevent flooding along this channel. Given enough time, flood fighting in Adams could be done to protect the areas affected by Wildhorse Creek.

B. Athena.

**1. Community Description:** Athena, Oregon is a small farming/ranching community located approximately 16 miles northeast from Pendleton, the Umatilla County seat. The town is situated immediately west of State Highway 11, on the way to Walla Walla, WA. No commercial transportation services are available in Athena. Commercial rail service is available in Pendleton, OR. Commercial air service is available in Pendleton, OR and Walla Walla, WA.



**2. Flood Plain Description:** Athena is potentially affected by flooding from Waterman Creek/Gulch that subsequently empties into Wildhorse Creek and Wildhorse Creek. Waterman Creek is a permanent flowing stream that starts northwest of town. Wildhorse Creek is a permanent flowing stream that starts in the Blue Mountains east of Adams and south of Weston, Oregon. The town of Athena is somewhat "flume" shaped in cross section, from north to south. Waterman Creek formed this "channel". The majority of flood flows can be attributed to Waterman Creek. The flood plain for the 100-year flood extends approximately 400 - 600 feet from the stream in the north portion of town and 100 - 200 feet from the stream in the south portion of town. The main development of Athena has historically taken place east of the stream. However, with the abandonment of the railroad track into town paralleling Waterman Creek, the "industrial" section of town has been depleted. Wildhorse Creek is an integral part of the city park adjacent to the school complex. The remainder of Wildhorse Creek flows in farm fields. See Photos 3 - 17.

**3. Type of Flooding:** Due to the flood plain of approximately 600 feet wide, flooding in Athena can be characterized as *widespread*. However, the flood plain is mostly empty, ex-industrial property. The creek has a berm/dike along most of the east bank protecting some newer homes. The west edge of the creek could be bermed to stop further flooding westward, if started early enough. However, that would likely cause increased flooding on the east side of the creek, exacerbating the problems for the people living on that side of the creek. Access to the town from Highway 11 is by several roads, only one of which crosses a bridge at the south end of town. There is little that could be done to protect this bridge, except to patrol it for debris clogging the opening. It is likely that back roads into and out of Athena could be used in case the roads to Highway 11 are blocked. A dike/levee built along the east side of Waterman Creek could prevent flooding at Athena. This might require new, higher bridges to clear the 100-year flood. A dike/levee built along Wildhorse Creek would prevent flooding along this channel, but construction might require some structures to be moved. Given enough time, flood fighting in Athena could be done to protect the areas affected by Wildhorse Creek.

- C. Cayuse. This community is located on the CTUIR and will be covered under the CTUIR report.
- D. Echo.

**1. Community Description:** Echo, Oregon is a small farming/ranching community located approximately 23 miles west from Pendleton, the Umatilla County seat. The town is situated 1 mile south of Interstate Highway 84, south of Stanfield, Oregon. Commercial rail service is available here, in Pendleton, Stanfield and Hermiston. Commercial air service is available in Pendleton, OR and Pasco, WA.



**2. Flood Plain Description:** Echo is potentially affected by flooding from the Umatilla River and at least two main supply irrigation canals. There are two areas from Umatilla River flooding that affect town. One area is from the south and the other is from the west. The Umatilla River is a permanent flowing stream that starts east of town in the Blue Mountains. A majority of Echo is not threatened directly by flooding. On the south end, the town sits approximately 6 - 8 feet above farm fields that are directly exposed to the river flood flows. Bank erosion during flood times, however, can cause trouble to the town. An arm of the southern flooding extends along the Union Pacific Railroad tracks into town, but there are few homes in this area. There is a small area affected by 100 - 500 year flows adjacent to the County Road Bridge to Lexington. Currently, this area is the city park commemorating Fort Henrietta of Oregon Trail fame. A new bridge was built in late 1999 and early 2000 and presumably was built to the correct elevation. It is about 7 - 8 feet higher than the old bridge, which was being removed on 7/11/00. There has been a flood caused by breaching of the irrigation canal along the hillside north of town. The canal flow quickly flooded the residential area downhill of the canal. This flooded area is a bowl, so floodwater could not escape, except by pumping or evaporation. See Photos 18 - 22.

**3. Type of Flooding:** Due to the lack of a flood plain in town, flooding in Echo can be characterized as *limited*. However, the flood plain south of town could be flood fought if erosion is considered a problem. The irrigation canal flood problem was a unique problem that probably won't be repeated, as the canal is no longer used, with the advent of the Bureau of Reclamation (BOR) Umatilla Basin Project. Access to Echo off I-84 would not be affected by flooding. A levee/dike built along the south and west edges of Echo (from the UPRR tracks on the east to the new bridge on the west) and armoring the riverward slope with riprap, could prevent flooding. Given enough time, flood fighting in Echo could be done to protect the areas affected by the Umatilla River.

E. Gibbon. This community is located on the CTUIR and will be covered under the CTUIR report.

F. Helix.

**1. Community Description:** Helix, Oregon is a small farming/ranching community located approximately 12 miles north from Pendleton, the Umatilla County seat. The town is situated approximately 10 miles west of State Highway 11, at Athena. No commercial transportation services are available in Helix. Commercial rail service is available in Pendleton, OR. Commercial air service is available in Pendleton, OR and Walla Walla, WA.

**2. Flood Plain Description:** Helix is potentially affected by flooding from Greasewood Creek in the approximate center of town and from the "Southwest Drainage" a channel that carries runoff along the county road to Holdman, Oregon. Greasewood Creek is an ephemeral stream that starts east of town. The



water table is quite high, so water exists in the creek channel, but not always on the surface. Most of Helix is affected by Greasewood Creek flooding. Berming along Greasewood Creek could be done if known early enough. Sandbagging could also be effective in parts of town. A recent flood was caused by frozen ground covered by snow, and then a warm rain melted the snow. At that time, the town received about 3 - 4 inches of floodwater and mud in most of the town. The city hall/library were flooded. An advance measure could be to deepen the Greasewood Creek channel. Sediment from adjacent farm fields has run off the fields and deposited in the creek channel, thereby decreasing its carrying capacity. See Photos 23 - 36.

3. **Type of Flooding:** Due to the flood plain in town, flooding in Echo can be characterized as *widespread*. If known about early enough an effective flood fight could be done here along Greasewood Creek by berming or by sandbagging some parts of town. Townsfolk are experienced at this type of work due to the recent flood. Dredging the Greasewood Creek channel to increase the channel capacity and building a levee/dike along the east side of the creek to help direct the floodwater away from downtown Helix, could prevent flooding at Helix. Enlarging the channel to its confluence with Greasewood Creek could prevent flooding from the adjacent Southwest Drainage along the county road to Holdman. Flood fighting in Helix would probably be only by local interests.

G. Hermiston.

1. **Community Description:** Hermiston, Oregon is a moderately-sized farming/ranching community located approximately 30 miles northeast from Pendleton, the Umatilla County seat. The town is situated approximately 6 miles north of I-84 and approximately 4 miles east of I-82. Commercial rail service is available in here. Commercial air service is available in Pendleton, OR and Pasco, WA.

2. **Flood Plain Description:** Hermiston itself is not potentially affected by any flooding. However, the surrounding area does have some places where the Umatilla River flood plain may affect local residents and/or access to the city of Hermiston. Between Umatilla and Hermiston, there is one place where floodwater from the Umatilla River would block River Road. South of town there are several places where county roads would be blocked by Umatilla River floodwater. There is one large area along the Umatilla River and the Stanfield Meadows Road that is completely within the Umatilla River flood plain. There are scattered homes in the area and in one place I-84 is affected.

2. **Type of Flooding:** Due to the lack of a flood plain in town, flooding in Hermiston can be characterized as *nonexistent*. However, flooding in adjacent areas can be characterized as both *limited* in the case of scattered road blockages and *widespread* in the Stanfield Meadows Road area. Berming or sandbagging could be effective along River Road to keep it open or to protect local residents.



South of Hermiston, there is little that can be done. Perhaps local sandbagging or berming would help protect the individual homes. Definitely, berming along I-84 would help to keep that important road open for travel. Flood fighting in Hermiston is probably going to be limited to local efforts.

H. Holdman.

1. **Community Description:** Holdman, Oregon is a remnant of a small farming/ranching community located approximately 15 miles northeast from Pendleton, the Umatilla County seat. The town is situated on Cold Springs Creek in a narrow canyon along State Highway 37 and approximately 11 miles south of the Columbia River. The community consists of probably 1 - 2 families located around the old school building plus associated farm buildings on both sides of the creek. No commercial transportation services are available in Holdman. Commercial rail service is available in Pendleton, Umatilla, and Hermiston, OR and Wallula, WA. Commercial air service is available in Pendleton, OR and Pasco, WA.

2. **Flood Plain Description:** Holdman does not have FEMA flood plain mapping either for the community or for a larger area. However, there is evidence of erosion damage by high water in the creek both upstream and downstream of the community.

3. **Type of Flooding.** Flooding in Holdman can be characterized as *limited*, because it is such a small community. Access along Highway 37 can be affected by high water from Cold Springs Creek and its forks, plus other waterways that the highway follows. It is likely that flooding events are short term and rapidly forming and dissipating, although the flooding caused by frozen ground and rapid snowmelt probably also affects the flood flows. It is probably not a good candidate for COE flood fighting assistance. Building a levee/dike around the buildings could prevent flooding in Holdman.

I. Milton-Freewater. This town is located within the Walla Walla District and it will not be discussed further.

J. Mission. This community is located on the CTUIR and will be covered under the CTUIR report.

K. Pendleton.

1. **Community Description:** Pendleton, Oregon is a moderately sized farming/ranching/commercial center community located approximately 212 miles east from Portland and is the Umatilla County seat. The town is situated on I-84/US Highway 30, US Highway 395, State Highways 11 and 37, numerous Umatilla County roads, the UPRR, and has scheduled commercial air service provided by Horizon Airlines.



**2. Flood Plain Description:** Pendleton is potentially affected by flooding from: the Umatilla River (See Photos 37 - 41 and 51 - 52), McKay Creek (See Photos 53 - 56), Tutuilla Creek (See Photos 45 - 50), and Nelson Creek (See Photos 42 - 44). Most of the downtown part of town is protected by a levee along the south bank of the river. The levee starts near the eastern city limit at a rock bluff and proceeds downstream to US Highway 30 and the UPRR mainline tracks, and switches to the western bank of the river until it reaches the I-84 bridge over the Umatilla River. Two further levee segments along both banks downstream, protect the city's sewage treatment plant from both the Umatilla River and McKay Creek and an industrial site dominated by Pendleton Grain Growers (PGG) McKennon Station grain elevator, a travel trailer plant, and a plastic pipe plant. The second flood plain is from the previously mentioned McKay Creek, from the Bureau of Reclamation reservoir south of town to the mouth on the Umatilla River by the sewage treatment plant. A residential area called the Montee Addition is situated along both banks of McKay Creek and has been subjected to flooding in the past, even though the dam regulates the stream flow. Flooding was caused by cloudbursts the last two times flooding occurred. One time it was upstream of the reservoir, which was full at the time, and it caused the dam operators to release more water than the stream banks could contain. The second time the cloudburst happened between the dam and the residential area, also increasing the flow beyond the carrying capacity of the banks. The third area is Tutuilla Creek, which is a small drainage north of McKay Creek. There is a small residential area in town that is subject to flooding when Tutuilla Creek experiences high water events. The houses are built very close to the creek, leaving no room for protective devices. The last flood plain is from a small ravine on the northwest edge of town, called Nelson Creek. This valley follows State Highway 37. This small creek is essentially an ephemeral stream handling only runoff, but probably any frozen ground/rapid snow melt floods like the Helix event, also. This creek exits into the Umatilla River by the US Highway 30 bridge.

**3. Type of Flooding:** Umatilla River flooding can be characterized as *widespread*, if the downtown levee overtops an/or breaches. Otherwise there is no flood threat. McKay Creek flooding can also be characterized as *widespread* flooding along McKay Creek in the residential area, including one elementary school and a new assisted living center for senior citizens. Tutuilla Creek and Nelson Creek flooding can both be characterized as *limited* flooding, due to their small flood plain areas. However, this shouldn't minimize the disruption to those families affected by the flooding. Floods fighting can be effective if the downtown levee overtops and/or breaches, given enough time to mobilize the COE. Of course local efforts can be undertaken. Flood fighting can be effective along parts of McKay Creek, given enough time to mobilize. It is possible to flood fight the Tutuilla Creek and Nelson Creek flooding, also, given enough time to mobilize. Flash flooding in any drainage would make flood fighting by the COE unlikely. The existing downtown levee will control flooding in Pendleton,



as long as it remains in place and operable. Clearing the channel and/or building a dike/levee along the sides of Tutuilla Creek with homes could prevent flooding along this channel. Building levees along the creek upstream and downstream from Quinney Avenue could prevent flooding along McKay Creek. This will be difficult due to the houses built close to the creek. There is a flash flood potential along the hillside in the southwest part of the Montee Addition. Deepening existing ditches or constructing new ditches along the roads, providing a bigger catchment areas for runoff, and possibly by increasing the size of the culvert under the road into the existing drainage channel could prevent flooding in this part of Montee Addition. Building a levee along the Umatilla River to protect the entire area could prevent flooding in the Riverside area. The existing levees around the sewage treatment plant and the industrial area by McKennon Station will control flooding in those locations as long as they are maintained and are operable.

L. Pilot Rock.

1. **Community Description:** Pilot Rock, Oregon is a small farming/ranching community located approximately 14 miles south from Pendleton, the Umatilla County seat. The town is situated on US Highway 395, State Highway 74, numerous Umatilla County roads, and a little used UPRR spur. Commercial air service is available in Pendleton, OR.

2. **Flood Plain Description:** Pilot Rock is potentially affected by flooding from: the West Fork of Birch Creek (See Photos 57 - 58), the East Fork of Birch Creek, and Birch Creek (See Photos 58 - 59) downstream from the confluence of the two forks. The main stem of Birch Creek has a concrete bridge at the US Highway 395 crossing and passes by a trailer park on the east bank, which experiences flooding. There is a relatively new (3 years old) fish ladder adjacent to the trailer park. The West Fork has a bridge that Main Street crosses. Buildings were constructed right on the creek banks, eliminating any possible flood fighting construction along the banks. The East Fork has a bridge near the junction of Cedar Street and US Highway 395. Houses were built very close to the creek banks, also eliminating any flood fighting construction along this fork of Birch Creek.

3. **Type of Flooding:** Flooding from the two forks of Birch Creek can be characterized as *limited*, until they merge to form Birch Creek, where it becomes *widespread* flooding. Some limited sandbagging may be possible along streets to stop the spread of localized flooding. The only infrastructure threatened by flooding is the fish ladder and it has little to be damaged. Both schools are located high above the creeks. Flash flooding in any drainage would make flood fighting by the COE unlikely. Without major moving of buildings and the bridges, flooding in Pilot Rock probably can't be prevented.



M. Stanfield.

1. **Community Description:** Stanfield, Oregon is a small farming/ranching community located approximately 24 miles west from Pendleton, the Umatilla County seat. The town is situated on US Highway 395, several Umatilla County roads, and the UPRR. Commercial air service is available in Pendleton, OR and Pasco, WA.

2. **Flood Plain Description:** Stanfield is potentially affected by flooding from Stage Gulch and the Umatilla River backing up into Stage Gulch. The majority of historic flooding has come from Stage Gulch. Generally, this stream is an overflow channel for irrigation canals, but with the advent of the BOR's Umatilla Basin Project, it has become a small stream in it's own right. The city of Stanfield has been working on flood protection activities for several years. They have moved some mobile homes situated on the creek banks and widened the stream channel downstream of the US Highway 395. The creek slopes have been cut back to a very flat grade and grassed. The area has become a park and athletic fields. Some houses that were built very close to the creek banks, are still there. There is generally room to build a berm or do sandbagging along the creek banks or on some of the streets, if need be. Flooding from the Umatilla River directly is unlikely, because the UPRR railroad fill acts as a dike, except for the Stage Gulch channel. See Photos 60 - 73.

3. **Type of Flooding:** Flooding in Stanfield can be characterized as *widespread* flooding. Some limited sandbagging may be possible along streets to stop the spread of localized flooding. No infrastructure is threatened by flooding. Both schools are located high above the main part of town in the "valley" of Stage Gulch. Berm construction is possible if enough time is given to mobilize. Flash flooding in any drainage would make flood fighting by the COE unlikely. Building a levee along both sides of Stage Gulch throughout Stanfield could prevent flooding here.

N. Ukiah.

1. **Community Description:** Ukiah Oregon is a small logging/ranching community located approximately 50 miles south from Pendleton, the Umatilla County seat. The town is situated on US Highway 395, a USFS highway, and State Highway 244. No commercial transportation services are available in Adams. Commercial rail service is available in Pendleton, OR. Commercial air service is available in Pendleton, OR.

2. **Flood Plain Description:** Ukiah has been historically affected by flooding from Camas Creek. Although the FEMA flood mapping shows only two small areas affected by flooding, historical flooding experience indicates that more of the adjoining area is affected. Flooding comes from typical high water events and from ice dams formed on the gravel bars formed upstream of the Soap Hill Road



bridge on the south edge of town. There is a low height levee along the creek in town that was maintained by Umatilla County for several years. They stopped sponsoring the levee in favor of the local community forming a special levee district however, the local residents failed to reach an agreement to form such a district. As a result, no maintenance has been performed on the levee. The area affected by historic flooding is residential only. See Photo 74 for a view of the Ukiah area.

**3. Type of Flooding:** Flooding in Ukiah can be characterized as *limited* flooding. Some limited sandbagging or berming may be possible along streets (or on the existing levee) to stop the spread of localized flooding. No infrastructure is threatened by flooding. Both schools are located high above the main part of town. Berm construction is possible if enough time is given to mobilize. Flash flooding in any drainage would make flood fighting by the COE unlikely. Maintaining the existing levee and dredging the existing gravel bar along the levee in town could prevent flooding in Ukiah.

O. Umapine. This town is located within the Walla Walla District and it will not be discussed further.

P. Umatilla.

**1. Community Description:** Umatilla, Oregon is a farming community located approximately 40 miles north from Pendleton, the Umatilla County seat. The town is situated on US Highway 730, Interstate I-82, a state highway, and a UPRR spur. No commercial transportation services are available in Umatilla. Commercial rail service is available in Hermiston and Pendleton. Commercial air service is available in Pendleton, OR and Pasco, WA.

**2. Flood Plain Description:** Umatilla is potentially affected by flooding from the Umatilla and Columbia Rivers. Umatilla River flooding affects only a small area, currently containing athletic fields and part of the city park. Columbia River flooding affects an area along the north edge of town, currently not developed, probably due to the FEMA flood mapping. River Road between Umatilla and Hermiston has several places where Umatilla River high water could possibly block the road. However, I-82 is higher than that area and could provide a bypass in case of floodwater blocking River Road. There are several residential sites that would be affected by flooding or flooding blocked access.

**3. Type of Flooding:** Flooding in Umatilla can be characterized as *limited* flooding. Sandbagging or berming may be possible along River Road to stop the spread of localized flooding. Except for short parts of River Road, no other infrastructure is threatened by flooding. Schools are located high above the rivers and the sewage treatment plant is built higher than the 100-year flood. Flooding from the Columbia River would affect only the COE park/marina. Raising the flood-prone segments of River Road above the flood elevation could prevent



flooding here. A levee and/or floodwalls built along the Columbia River could protect the threatened north part of Umatilla from flooding. Flood fighting in Umatilla is unlikely.

Q. Weston.

1. **Community Description:** Weston, Oregon is a small farming/ranching community located approximately 20 miles northeast from Pendleton, the Umatilla County seat. The town is situated immediately east of State Highway 11, on the way to Walla Walla, WA. It is also located on State Highway 244. No commercial transportation services are available in Weston. Commercial rail service is available in Pendleton, OR. Commercial air service is available in Pendleton, OR and Walla Walla, WA.

2. **Flood Plain Description:** Weston is potentially affected by flooding from Pine Creek. Pine Creek is a permanent flowing stream that starts in the Blue Mountains southeast of Weston. The town of Weston is shaped like a "flume" caused no doubt by Pine Creek therefore, flooding from the stream can affect approximately three-fourths of the town. The flood plain for the 100-year flood extends approximately 300 feet from the stream in the middle portion of town and 100 - 200 feet from the stream in the north and south portions of town. The main development of Weston historically has taken place along the stream. Houses were built along and in one case on top of the creek, preventing flood-fighting construction in those areas. It is possible that some limited sandbagging could be effective in stopping some localized flooding. See Photos 75 - 77.

3. **Type of Flooding:** Due to the flood plain being in the middle of town, flooding in Weston can be characterized as *widespread*. Limited sandbagging or berm construction could be effective in small areas, but in general, flood fighting in Weston is probably not a priority. Without major moving of buildings, construction of levees, and raising bridges, flooding in Weston probably can't be prevented. COE flood fighting is possible from the Walla Walla District but questionable from the Portland District because the distance from Portland to Weston is about 300 miles vs. about 20 miles to Walla Walls, WA.

R. Unincorporated Areas.

1. **Community Description:** The unincorporated areas visited were road crossings. The crossing structures varied from corrugated metal culverts (CMP) to concrete box culverts, to bridges of various kinds.

2. **Flood Plain Description:** Flood plains varied depending upon the waterway crossing the road. In most cases, the crossing structures probably wouldn't be directly damaged, but perhaps the abutments or the road immediately before and after the bridges would be. One specific site that I visited was the Wildhorse Creek bridge south of Helix. It currently has a fence across the creek below the



bridge that presents a debris-clogging problem and would be a problem during high water events. Birch Creek, south of the Umatilla River, has many bridges that appear to be within the flood plain. In addition, some of the county roads that provide access into and across Birch Creek have several places, especially in the lower valley, closer to the Umatilla River that appear to be in danger of having floodwater blocking them. The area of the Stanfield and Echo Meadows Roads appear to be entirely within the Umatilla River 100-year flood plain with little potential for flood fighting because the area is very flat. Access though or into these areas will be severely restricted during a flood. See Photos 78 - 88.

3. **Type of Flooding:** Due to the small area for each of the crossings, flooding would be characterized as *limited*. Flooding cannot be prevented over the entire area of unincorporated part of Umatilla County due to the extensive area to protect. Most of the flood prone areas are also too big to protect in their entirety. Bridges could be raised, obstructions removed, trash racks built, and levees built to protect abutments to prevent blocking of the roads at the crossings. COE flood fighting in the unincorporated part of Umatilla County is unlikely, regardless of the District involved.

#### IV. Conclusions and Recommendations.

##### A. Conclusions.

1. There are 6 areas that I considered as having *widespread* flooding threat: Adams, Athena, Helix, Holdman, Stanfield, and Weston. Of these 6 sites, 6 have a good potential for flood fighting, if time permits. Those communities are: Athena, Helix, and Stanfield. The other 3 sites with widespread flooding have limited potential for flood fighting due to the community's location in relation to the waterway and development along the waterway (Adams, Holdman, and Weston).
2. Because at least some of the flooding problems are caused by rapidly developing storms and because the Portland District lies about 200 miles away from the area, the likelihood of flood fighting by the COE is severely limited.
3. The only site in the unincorporated area that presented a potential for stopping access to a community is the Wildhorse Creek bridge, south of Helix.
4. The areas between I-84 and the Umatilla River south of Hermiston and Hinkle and between I-84 and the road from Echo to Lexington are almost entirely covered by the 100-year flood. Reportedly in the past, I-84 has been threatened by flooding from the Umatilla River south of the highway and just west of the I-84/Umatilla River bridge.



5. Birch Creek has numerous bridges for county roads that will probably be damaged or covered in the event of a flood. In this event, access from one side of the creek to the other will be severely restricted.

6. The county has a flood plan written that covers many of these sites and items discussed above.

**B. Recommendations.**

1. Provide Umatilla County with this report and solicit their input and comments.
2. Determine if the county is interested in developing site-specific flood response plans for the sites identified (and for the Umatilla River Water Control District 1, Zone 2 and the Riverside-Mission Water Control District).



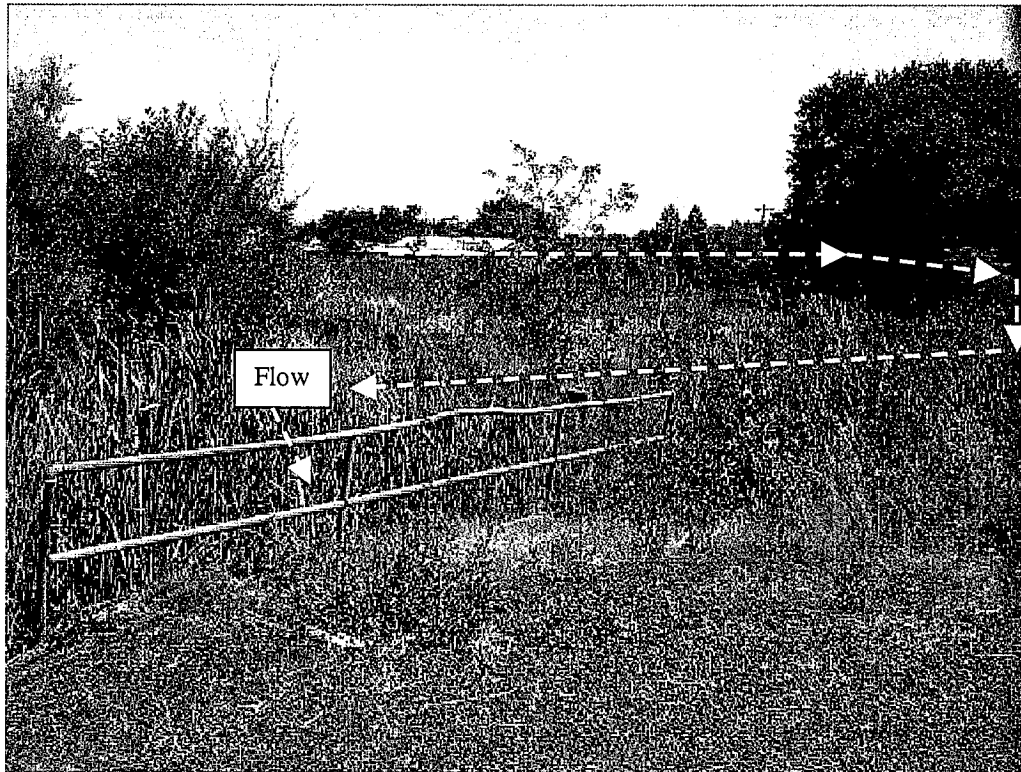


Photo No. 13: View looks upstream (north) at Waterman Creek/Gulch from bridge/concrete box culvert on Main St.

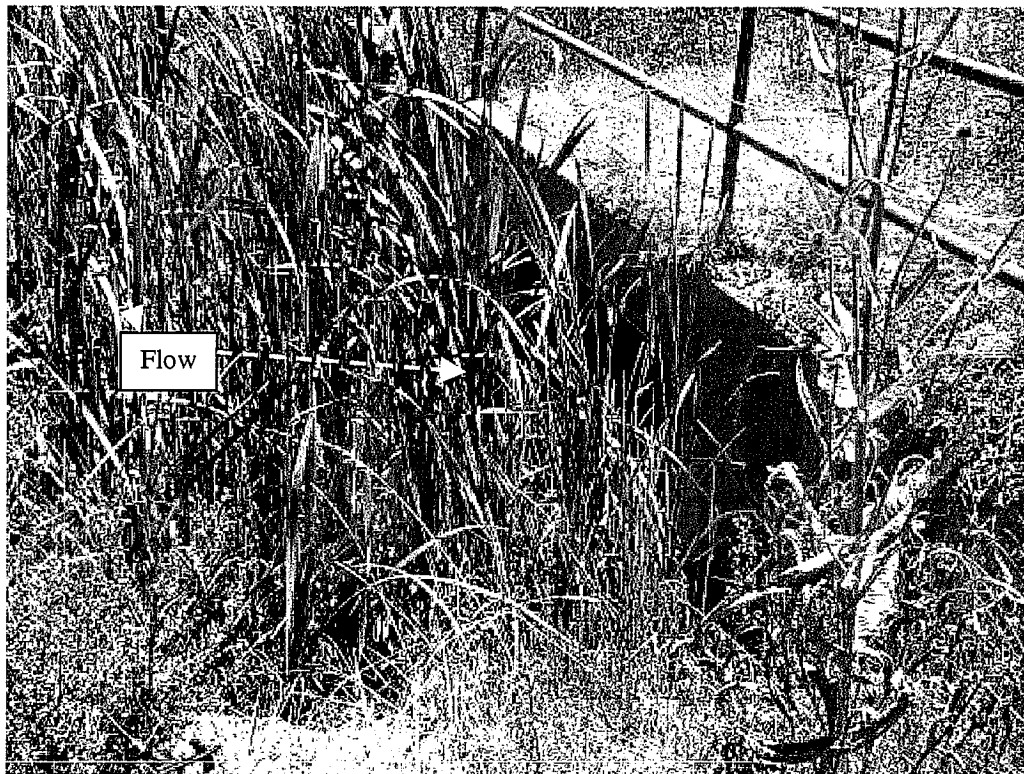


Photo No. 14: View looks southeast at upstream face of Main St. box culvert/bridge.

