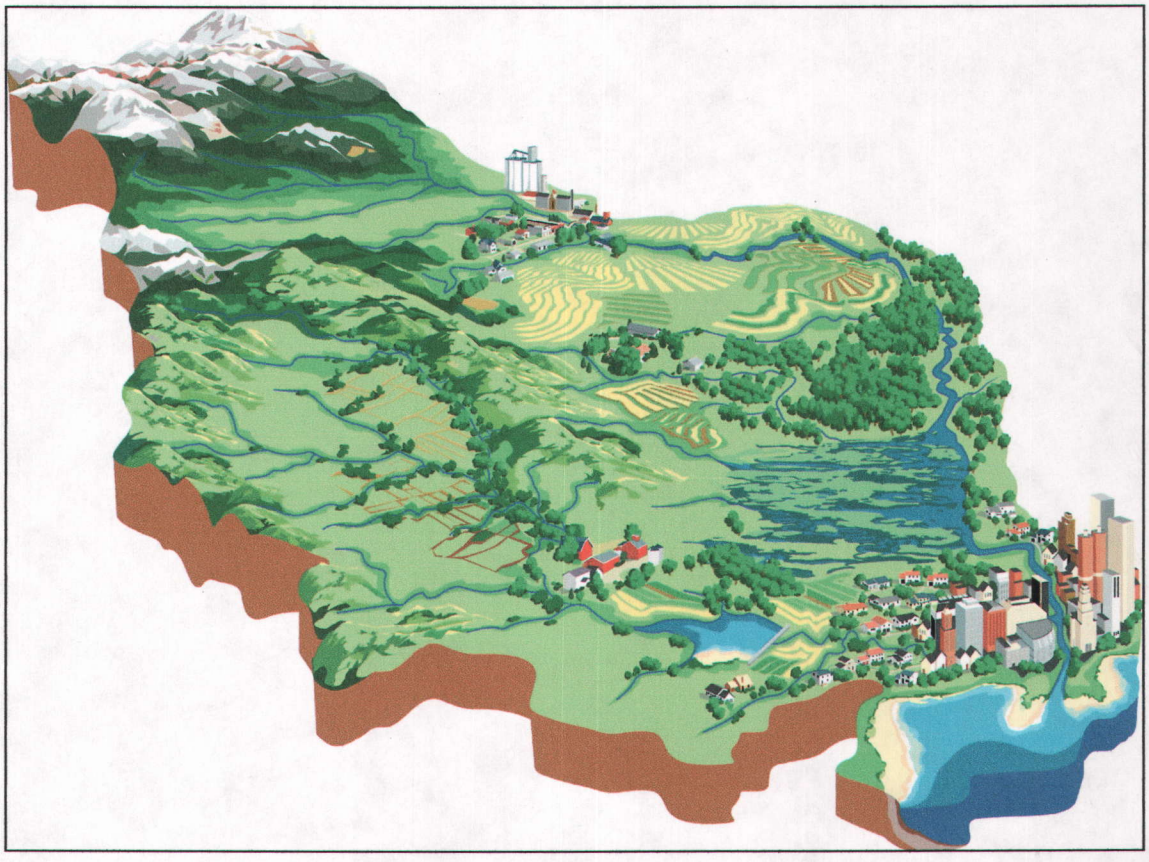
WATERSHED ASSESSMENT FOR TRIBUTARIES TO THE TRUCKEE RIVER

APPENDIX



Prepared for
Washoe County Regional Water Planning Commission

Prepared by
Michael Widmer
Washoe County Department of Water Resources
and
Jeff Jesch
Washoe Storey Conservation District

July 30, 2002

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Chemistry collected by Nevada Division of Environmental Protection
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Stream Assessment Procedures

During the months of January and February extensive field surveys of the streams were conducted. These surveys made assessments of the "functionality" of these streams. A properly functioning stream, as described by the US Bureau of Land Management (1988), can:

- dissipate stream energy associated with high water flow, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid floodplain development;
- improve flow-water retention and ground water recharge;
- develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding and other uses; and
- support greater biodivesity.

Stream Health Ratings are based upon the BLM manual "Riparian Area Management, A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas" (BLM, 1998). Streams are rated as "Properly Functioning", "Functioning at Risk", and "Non-Functional" based upon loss of habitat, excessive erosion and water quality degradation, development encroachment, and invasive plant species (Tall Whitetop). Impacted stream zones deemed "Critical" for this report reflects where the stream is no longer functioning properly. This is "critical" in the sense that water quality is degraded, riparian habitat is lost and in some cases flood protection is reduced. The "quality of life" for residents and the general public is also reduced. "Sensitive" sections refer to a "Properly Functioning Stream at Risk" whereby the stream could easily be rendered "Critical". A sensitive rating means that while the creek is acting in a natural form, alteration of the creek or development encroachment can degrade the creek to a non-functional state. These areas are located in urbanized settings and are shown in Figure 2.9. "Good" areas obviously are Properly Functioning Streams and are found throughout most of these drainages.

Peavine Watershed Summary

Peavine Mountain is located northwest of Reno, east of Verdi and west of Stead. Five predominant streams flow from the south slopes to the Truckee River. From west to east, the streams are Bull Ranch Creek, Unnamed stream, Chalk Creek/Rainbow Creek, Peavine Creek, and Evans Creek. Middle reaches are developing into residential and commercial subdivisions. Development is rapid and a new subdivision is under construction west of Northgate Golf Course that will include over two thousand new homes. Outside of developments, streams are typically in good condition. Conditions vary within subdivisions. Some steams are very impacted by encroachment and questionable construction practices, while other areas have been nicely preserved as parks and open space.

Water quality is impacted by sediment from construction activities, naturally occurring salts and lawn care chemicals. Improperly functioning sewer lines may also contribute to water pollution. Algae were observed in most of the streams. Pollution from Peavine Mountain creeks influence Truckee River water quality.

In the upper reaches and along streams set aside for open space, vegetation is healthy and relatively undisturbed by human activities. In other areas, riparian vegetation was removed and streams were channelized by development. Peavine streams and springs are a source of water and habitat for wildlife, such as deer, coyotes, small mammals, birds and reptiles. Streams that are not disturbed by development are typically stable and able to convey flood flows without damage to the environment or property.

Bull Ranch Creek

The stream flows from the west slopes of Peavine Mountain to the Truckee River near East Verdi, it is relatively undisturbed by human activities. Water quality appears good and vegetation along the channel provides suitable habitat for wildlife. Channel geometry is good and not affected by encroachment from development.

Unnamed Creek

The unnamed stream is located west of the Northgate Golf course and converges with the Truckee River near Mogal. The upper reaches usually flow well into the summer, while the lower reaches dry up in early spring. The riparian vegetation along the stream provides very good wildlife habitat. The stream has its origins in springs and is recharged by snowmelt and rain. The undisturbed upper reaches are in excellent condition, while the lower reach has recently been severely impacted by encroachment from new development.

A development is under construction in the lower alluvial reach that proposes more than 2000 new homes. A sewer pipeline, that will service the development, is under construction along the stream in the steep canyon north of Mogal. The sewer line is constructed in the floodplain very near the flow line of the creek. Runoff, from sewer line construction, enters the Truckee River less than one mile away. The alignment relative to

the stream is very risky and may threaten Truckee River water quality, increase the risk of flooding, and may result in damage to the sewer line.

Chalk Creek/Rainbow Creek

The stream is located on the south slope of Peavine Mountain and flows toward the developments near McQueen High School. The watershed is roughly between Rob Drive and McCarran Boulevard. The stream converges with the Truckee River about one mile west of McCarran Boulevard. The stream usually flows year round and is fed by springs, rain, snow melt and runoff from development. The riparian vegetation along the stream provides very good wildlife habitat for deer, coyotes, small mammals, reptiles and birds. The upper reaches are undisturbed and enter the developed areas in good condition. In the lower reaches, near Mae Anne Avenue, the stream is within a park setting with a multi use trails and interpretive signs. The natural vegetation and channel geometry is preserved and the stream is in good condition.

Peavine Creek

Peavine Creek flows from the seven thousand-foot level on Peavine mountain towards Reno just east of McQueen High School. South of McCarran Boulevard, the steam flows parallel to Kings Row. The creek appears to be ephemeral and flows in response to intense storm events and snow melt. Two large detention basins prevent most sediment from reaching the Truckee River. The stream flows through residential and commercial developments created in the 1980s and 1990s. Vegetation is appropriate for the setting and provides habitat for wildlife along most of the reach. Vegetation includes stands of willows, rushes, sedges and trees. Detention basins control the risk of flooding.

Evans Creek

Evans Creek is located north of Rancho San Rafael Park in North Reno. It flows from the southeast slopes of Peavine Mountains in a relatively undisturbed setting north of McCarran Boulevard. South of McCarran Boulevard, it enters the park and a one-acre reservoir, before flowing to Manzaneta Lake at the University of Nevada. The stream leaves Manzaneta lake and enters the Ore Ditch on the University property. The upper reaches are used as open space and trails. Water quality is good in the upper reaches above McCarran Boulevard. In the park, there is a risk of nutrients entering the creek from ranching and sod maintenance. Vegetation and channel geometry are good along most of the reach and the stream provides good wildlife habitat. In the past, the channel has been a source of flooding at the University of Nevada. A proposed flood control project would provide detention in the canyon north of McCarran Boulevard.

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Hunter Creek

Team Observers: Jeff Jesch Date: 01/08/02

Reach – Landmarks:

Start	Diversion Dam on Hunter Creek, south of the Steamboat canal
Stop	Hunter Creek enters the Truckee River

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A 2 B 2 C____ D____ E____ F____ G____

Land use

X WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW XX VERY LOW

Yes	No	N/A	Hydrologic
X			Floodplain inundated in "relatively frequent" events (1-3 years)
X			Active/stable grade control
X			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
X			Riparian zone is widening
X			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
X			Land use does not contribute to water quality degradation
X			Erosion does not degrade water quality
X			Stormwater is not a significant source of water pollution
X			Fertilizers, pesticides, and herbicides do not impact water quality
X			Upland watershed not contributing to riparian degradation

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
X			Diverse age structure of vegetation
X			Diverse composition of vegetation
X			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
X			Riparian plants exhibit high vigor
X			Adequate vegetative cover present to protect banks and dissipate energy during high flows
X			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
X			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
X			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
X			Point bars are revegetating
X			Lateral stream movement is associated with natural sinuosity
X			System is vertically stable
X			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The stream channel is in very good condition. Dirt roads, trails and irrigation canal crossings do not impact the channel stability. Vegetation is recovering nicely following a recent burn through the riparian corridor. The burn did not affect the channel stability. The stable characteristics of the channel make it well suited for public use such as trails and wildlife viewing.

Summary

Functional Rating:

- X Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Alum Creek (1)

Team Observers: Jeff Jesch, Ben Jesch Date: 01/10/02

Reach – Landmarks:

Start	Caughlin Parkway (south of the Caughlin Ranch Subdivision) crosses Alum Creek
Stop	McCarran Boulevard crosses Alum Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 4 C ____ D ____ E ____ F ____ G ____

Land use

☐ WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL x OPEN SPACE x FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH x MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
	x		Fertilizers, pesticides, and herbicides do not impact water quality
	x		Upland watershed not contributing to riparian degradation

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Alum Creek Flows through open space within a low density urban setting. The vegetation is groomed turf sod with little or no woody riparian vegetation adjacent to the stream channel. Some minor bank erosion was observed, while the majority of the reach is relatively stable. Grade controls consist of boulder placements, trail and road crossings. A pedestrian trail is adjacent to the channel. Upstream of the Caughlin Parkway crossing, the channel is relatively undisturbed.

Storm water runoff from the Seasons Subdivision, a smaller subset of Caughlin Ranch, is contributing significant sediment load to the channel. A recent storm event appears to have resulted in approximately 200 to 300 yards of sediment deposited in the creek. City officials and the developer were notified.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- x Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Standard Checklist

Name of Riparian-Wetland Area: Alum Creek (2)

Team Observers: Jeff Jesch, Ben Jesch Date: 01/04/02

Reach – Landmarks:

Start	Box culvert – McCarren Blvd. crosses Alum Cr.
Stop	Box culvert – Mayberry Dr. crosses Alum Cr.

Watershed Physical Description – Rosgen Morphological Description
(See attached table)

A ____ B 5 C ____ D A5 E ____ F ____ G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL X OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Impact Sensitivity

☐ HIGH X MEDIUM ☐ LOW

Yes	No	N/A	Hydrologic
X			Floodplain inundated in "relatively frequent" events (1-3 years)
X			Active/stable grade control
X			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	X		Riparian zone is widening
X			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Vegetative
X			Diverse age structure of vegetation
X			Diverse composition of vegetation
X			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	X		Riparian plants exhibit high vigor
X			Adequate vegetative cover present to protect banks and dissipate energy during high flows
	X		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	X		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
X			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
X			Point bars are revegetating
X			Lateral stream movement is associated with natural sinuosity
X			System is vertically stable
X			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Yes	No	N/A	Water Quality (Pollution Sources)
X			Land use does not contribute to water quality degradation
X			Erosion does not degrade water quality
X			Stormwater is not a significant source of water pollution
X			Fertilizers, pesticides, and herbicides do not impact water quality
X			Upland watershed not contributing to riparian degradation

Remarks

Alum Creek flows through a park setting with natural, established riparian vegetation along the channel. The park setting has low impact on the stream, and it is in good condition.

Summary

Functional Rating:

- X Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- X Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- X No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slop failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Standard Checklist

Name of Riparian-Wetland Area: Alum Creek

Team Observers: Jeff Jesch & Ben Jesch (3) Date: 01 04 02

Reach – Landmarks:

Start	Box culvert – Mayberry Dr. crosses Alum Cr.
Stop	Truckee River at Crissie Caughlin Park

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 4&5 C ____ D ____ E ____ F ____ G ____

Land use

☐ WILD X URBAN ☐ AGRICULTURAL ☐ COMMERCIAL X OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH X MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
		x	Upland watershed not contributing to riparian degradation

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

[1] Rosgen, Dave. *Applied River Morphology.* Page 5-5
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	X		Woody vegetation is not removed for flood control

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
	x		Fertilizers, pesticides, and herbicides do not impact water quality

Remarks

Alum Creek Flows through open space within a medium density urban setting. The vegetation is groomed turf sod with little or no woody riparian vegetation adjacent to the stream channel. Some minor bank erosion was observed near Mayberry Drive. Grade controls consist of boulder placements and trail crossings. A pedestrian trail parallels the channel. The lack of riparian vegetation increases the risk of soil erosion during high stream flows. Existing vegetation does not provide significant wildlife habitat. A riparian buffer zone along the creek would limit fertilizers, and other chemicals associated with lawn care, from reaching the stream. Near the confluence of Alum Creek and the Truckee River, very good riparian vegetation was observed. The vegetation included rushes, sedges, willows, and other woody vegetation, and would be appropriate along the rest of the reach.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- X Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- X Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- X Reduce application of fertilizers, herbicides, and pesticides
- X Encourage riparian buffer zones to replace sod adjacent to streams
- X Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- X No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slop failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Dog Creek

Team Observers: Mike Widmer, Jeff Jesch (1) Date: 02/11/02

Reach – Landmarks:

Start	Dog Valley Canyon
Stop	Dog Creek crosses Petroleum pipeline, north of meadow and ranch structures

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2&3 C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL x OTHER LOW DENSITY RESIDENTIAL

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* Page 5-5
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Dog Creek flows through a terraced floodplain in this canyon setting. Evidence of an intense flood event is seen in a damaged diversion structure, large boulder and cobble deposits, and channel scour. Vegetation within the channel appears to be less than fifty years old, indicating the age of the intense flood event. Vegetation is healthy and the riparian zone provides very good habitat for wildlife, such as deer, beaver, coyotes, and birds. The channel is stable. Woody debris, rocks and boulders prevent erosion. Water quality appears good. Flows are clear and free of human influences.

Homes, perched on the south ridge above the creek, are threatened by soil erosion and slope instability. High flows will continue to carve away at the toe of the slopes, increasing the risk of damage to structures. In some cases, it may be necessary to armor the toe of the slopes to prevent erosion and slope movement.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- x Install durable toe protection
- ☐ Implement soil bioengineering
- x Other – slope stabilization

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Dog Creek (2)

Team Observers: Mike Widmer, Jeff Jesch Date: 02/11/02

Reach – Landmarks:

Start	Dog Creek crosses a petroleum pipeline north of ranch structures
Stop	Dog Creek enters the Truckee River

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G2

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL x OTHER, ABBANDONED RANCH

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
		x	Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The channel flows through a meadow setting that is the site of an abandoned ranch. The natural stream is channelized, and was moved to the side of the meadow to accommodate ranching operations. A berm confines the east bank of the channel and the new alignment places the creek at the toe of a slope near a road. The confined channel is carving away at the fill material that supports the road, causing slope instability and erosion. This jeopardizes the integrity of the road and is a source of sediment transport to the Truckee River. The 1997 flood caused some channel incision and bank erosion. The evidence of this is seen in hanging roots and undercut banks. Slope instability and erosion are occurring on slopes below existing homes. A property owner built a substantial retaining structure at the toe of the slope to stabilize damage following the 1997 flood. It is important that future homes and roads do not encroach on the creek.

Vegetation is in good condition and recovering from high flows associated with the 1997 flood. The riparian vegetation is good habitat for deer, birds and small mammals. Beaver sign was observed in the form of damaged trees along the creek. Water flows clear, however, healthy algae was observed in the creek that may be an indicator of under-treated septic reaching the stream.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- x Control road encroachment
- x Other – encourage proper maintenance and operation of septic systems.

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- x Install durable toe protection
- x Implement soil bioengineering
- x Other – Stabilize banks to protect roads and structures.

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Sunrise Creek

Team Observers: Mike Widmer, Jeff Jesch Date: 02/11/02

Reach – Landmarks:

Start	Headwaters of Sunrise Creek
Stop	Sunrise Creek enters the Truckee River

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 3a C____ D ____ E ____ F ____ G____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL x OTHER LOW DENSITY RESIDENTIAL

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The headwaters of Sunrise Creek are developed by low-density residential homes, at about one house per five acre. The watershed is slightly modified to channel storm flows away from home sites and roadways. Homes are on individual septic systems. A forest fire in 1994 removed most of the timber and brush from hills and riparian areas. Emerging Trees, shrubs and grasses provide protection from soil erosion. Vegetation along the channel is vigorous and healthy, and provides good habitat for deer, coyotes, small mammals and birds. Water quality is good. No algae was observed in the stream and the water flows clear. The channel morphology is good and does not appear to be impacted by human activities. Flooding does not appear to damage property or the environment, as homes and roads do not encroach on the stream. Development should not be allowed within the channel floodplain and road crossings should be designed to span riparian vegetation.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Unnamed Channels flowing through Lama Ranch in Verdi

Team Observers: Mike Widmer, Jeff Jesch Date: 02/11/02

Reach – Landmarks:

Start	West end of the lama ranch
Stop	Truckee River

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 5

Land use

☐ WILD ☐ URBAN x AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
		x	Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	X		Land use does not contribute to water quality degradation
	X		Erosion does not degrade water quality
	X		Stormwater is not a significant source of water pollution
		X	Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	X		Diverse age structure of vegetation
	X		Diverse composition of vegetation
	X		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	X		Riparian plants exhibit high vigor
	X		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	X		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		X	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	X		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	X		Point bars are revegetating
	X		Lateral stream movement is associated with natural sinuosity
	X		System is vertically stable
	X		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

A lama ranching operation discharges irrigation water, storm water and ephemeral stream flows to natural drainages that enter the Truckee River. Over-grazing has removed pasture and meadow grasses, leaving much of the ranch area in bare soil that is subject to erosion. Sheet flow and standing water is conveyed off-site in unprotected ditches that erode and are a source of sediment. Untreated animal waste is a source of pollution. Water leaving the site is very milky in color and sediment and silt is deposited in the channel downstream of the ranch. Head cut erosion was observed in many of the channels that flow from the ranch. High flows have the potential to cause significant erosion and may cause environmental and property damage. The lack of vegetation limits the suitability of the channels for wildlife habitat.

Clean stream flows entering the site should be conveyed through the ranch in stable channels that are protected from livestock trampling and animal wastes. Runoff from the sites should be detained in treatment basins before discharge to the Truckee River. Livestock should be kept out of ditches and live streams. Bare soils should be revegetated and livestock should be limited to the carrying capacity of the range.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- x Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- x Control road encroachment
- x Other –implement ranch management practices that promote vegetative ground cover

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- x Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- x Other – construct sediment and nutrient treatment basins

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Chalk Creek/Rainbow Creek

Team Observers: Mike Widmer, Jeff Jesch Date: 04/11/02

Reach – Landmarks:

Start	Mae Anne Boulevard crosses Chalk Creek
Stop	Interstate 80 crosses Chalk Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 4&5 D ____ E ____ F ____ G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL x OPEN SPACE ☐FLOOD CONTROL x OTHER, HAUL ROADS TO DEVELOPMENT, NUMEROUS CANNALS AND FLUMES.

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
		x	Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
		x	Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
	x		Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* *Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The stream is located on the south slope of Peavine Mountain and flows toward the developments near McQueen High School. The watershed is roughly between Rob Drive and McCarran Boulevard, with headwaters at about the seven thousand-foot level. The stream converges with the Truckee River at an elevation of about five thousand feet. The stream usually flows year round and is fed by springs, rain, snow melt and runoff from development. The riparian vegetation along the stream provides very good wildlife habitat for deer, coyotes, small mammals, reptiles and birds. In the lower reaches near Mae Anne Avenue the stream is within a park setting and is paralleled by multi-use trails. The natural vegetation and channel geometry is preserved and the stream is in good condition.

Cannel function is good along the reach. No excessive down cutting or unusual erosion was observed. Natural sinuosity erodes slopes in some areas, however, this is a natural process that does not appear to overload the system with sediment. Tests indicate that dissolved solids and nutrients affect water quality. Some of the dissolved solids are the result of salts leaching out of the soil and some may be from improperly functioning sewer lines and over applications of lawn care chemicals. Sediment does not appear to influence the system. Vegetation is good and includes Salix and Black willows, cottonwood trees, and typical native brush. Some rushes and sedges are growing along the channel. Tall whitetop weeds threaten native vegetation. A management plan should be developed that controls weeds and encourages the existing riparian vegetation. Overall, the stream is in good condition in the reach is an excellent site for the open space and multi use trails. Flood flows do not threaten homes or damage the environment.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- x Other – Control tall whitetop

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: **Chalk Creek/Rainbow Creek**

Team Observers: **Mike Widmer, Jeff Jesch** Date: **04/11/02**

Reach – Landmarks:

Start	I-80 Crosses Chalk Creek
Stop	Chalk Creek enters the Truckee River

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 5 D ____ E ____ F ____ G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL X OTHER, HAUL ROADS TO DEVELOPMENT, NUMEROUS CANNALS AND FLUMES.

Sensitivity to disturbance (See attached table[2])

X VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	X		Floodplain inundated in "relatively frequent" events (1-3 years)
X			Active/stable grade control
X			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	X		Riparian zone is widening
	X		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	X		Land use does not contribute to water quality degradation
X			Erosion does not degrade water quality
	X		Stormwater is not a significant source of water pollution
	X		Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	X		Diverse age structure of vegetation
X			Diverse composition of vegetation
X			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
X			Riparian plants exhibit high vigor
X			Adequate vegetative cover present to protect banks and dissipate energy during high flows
X			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
X			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
X			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
X			Point bars are revegetating
	X		Lateral stream movement is associated with natural sinuosity
X			System is vertically stable
X			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The stream is located on the south slope of Peavine Mountain and flows roughly toward the developments near McQueen High School. The watershed is roughly between Rob Drive and McCarran Boulevard, with headwaters at about the seven thousand-foot level. The stream converges with the Truckee River at an elevation of about five thousand feet, about one mile west of McCarran Boulevard. The stream usually flows year round and is fed by springs, rain, snow melt and runoff from development. The riparian vegetation along the stream provides very good wildlife habitat for deer, coyotes, small mammals, reptiles and birds. In the lower reaches near Mae Anne Avenue the stream is within a park setting and is paralleled by multi use trails. The natural vegetation and channel geometry is preserved and the stream is in good condition. South of Interstate 80, the stream is slightly impacted by encroachment from roads and canals.

South of the Freeway, flows in the creek appear to be limited by culverts and detention basins. It appears that out of bank flows have not occurred for some time. This has limited the natural lateral movement of the stream. It appears that riparian vegetation in the floodplain is being replaced by upland species such as sage, bitterbrush, and rabbit brush. Tall whitetop, Scotch thistle and other weeds are beginning to out-compete colonies of excellent native grasses, rushes and sedges along the creek. A management plan should be developed that controls weeds, and encourages the existing riparian vegetation. Overall, the stream is in good condition in the reach and would be a good site for open space and multi use trails.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- x Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- x Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist, (revised 08/02/02)

Name of Riparian-Wetland Area: Unnamed Channel

Team Observers: Mike Widmer and Jeff Jesch Date: 04/11/02

Reach – Landmarks:

Start	Stream flows west of Northgate Subdivision
Stop	Stream enters Mogul Subdivision

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2a C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
	x		Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
		varies	Diverse age structure of vegetation
		varies	Diverse composition of vegetation
		varies	Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
		varies	Riparian plants exhibit high vigor
		varies	Adequate vegetative cover present to protect banks and dissipate energy during high flows
		varies	Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
		varies	Point bars are revegetating
		varies	Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
		varies	Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The unnamed stream is located on the south slope of Peavine Mountain and has about five square miles of watershed. It flows south from the peaks of Peavine Mountain, passes just west of the Northgate Golf Course and converges with the Truckee River near Mogul. The upper reaches usually flow well into the summer, while the lower reaches dry up in early spring. The riparian vegetation along the stream and at the springs provides very good wildlife habitat for deer, coyotes, small mammals, reptiles and birds. The stream has its origins in springs and is recharged by snowmelt and rain. The headwaters are at about the seven thousand-foot level and it converges with the Truckee River at an elevation of about five thousand feet.

A development is under construction in the lower alluvial reach that proposes more than 2000 new homes. A sewer pipeline, that will service the development, is under construction along the stream in the steep canyon north of Mogul. The sewer line is constructed in the floodplain very near the flow line of the creek. Runoff, from sewer line construction, enters the Truckee River less than one mile away.

Two retention basins were built in the stream channel to limit peak flows. The basins are located in canyons in the alluvial fan, between proposed residential and commercial property. The project Grading Plan proposed silt fencing to prevent pollution from sediment, and post construction sediment control includes armoring slopes steeper than 3:1 with rock rip rap.

Project limitations:

1. Sediment enters the creek during construction due to the proximity of the pipeline trench to the stream. Typically, a buffer zone is maintained between a creek and pipeline installation. The buffer zone provides an area to implement Best Management Practices and a natural filter between disturbed areas and the creek. The approved plan allows sewer installation within the stream. This does not allow for proper installation or maintenance of erosion and sediment control devices.

2. The sewer line could be exposed and damaged if the excavated sewer line trench captures the stream flow. The straight alignment would erode very quickly during high flows and could expose the pipe.

3. The risk of erosion is increased by the removal of riparian vegetation and disturbed soil along the banks of the stream.

4. Increased impervious surfaces, associated with development, will increase flows in the creek. This will also increase the risk of channel erosion.

A stream restoration specialist should review the project reclamation plans. Recommendations should be developed that protect the natural function of the stream and protect the sewer line from damage. Many of the BMPs at the site are improperly installed and BMPs identified in the Grading Plans were not in place. The BMP plan should be reviewed and modified by a Certified Professional in Erosion and Sediment Control and the contractor should be trained in installation techniques.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- X Stormwater runoff treatment
- X Reduce application of fertilizers, herbicides, and pesticides
- X Encourage riparian buffer zones to replace sod adjacent to streams
- X Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- x Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- x Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: North Truckee Drain

Team Observers: Mike Widmer, Jeff Jesch (1) Date: 02/06/02

Reach – Landmarks:

Start	Wetlands near Wingfield Springs in Spanish Springs
Stop	Ranch property south of Spanish Springs Valley

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 6c

Land use

☐ WILD ☐ URBAN x AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
		x	Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
		x	Diverse age structure of vegetation
		x	Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
		x	Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
		x	Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The North Truckee Drain flows through Spanish Springs valley in the reach. The playa soils are silty and clayey with a white crust of salts. The existing creek is channelized along the edge of the valley. Periodic dredging is required, and the channel lacks the geometry expected in a natural stream. Vegetation in the channel is good. Rushes, sedges, and salt grass are reestablishing nicely in disturbed areas. The channel is fair habitat for wildlife.

Development is encroaching on existing wetlands in the valley. This may affect water quality by reducing groundwater recharge and increasing total dissolved solids in stormwater runoff. Inadequate construction site erosion and sediment control result in increased suspended solids in the North Truckee Drain. A 200-300' wide 8' deep flood control channel replaces the existing channel in developing areas. The geometry of the new channel is appropriate, and is revegetating nicely.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: North Truckee Drain (2)

Team Observers: Mike Widmer, Jeff Jesch Date: 02/06/02

Reach – Landmarks:

Start	North Truckee Drain enters the Ranch south of Spanish Springs Valley
Stop	North Truckee Drain parallels Sparks Boulevard

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G5

Land use

☐ WILD ☐ URBAN x AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		x	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The North Truckee Drain has a slightly steeper gradient as it flows through the ranch setting. The agricultural property is used to produce hay and cattle. The stream is channelized, and moved to the edge of the valley, to simplify pasture management. Vegetation along the creek provides some wildlife habitat and is mostly pasture grasses with some riparian species at the edge of the channel. The channel is fenced to keep livestock out of the creek. Flood flows can spread out across the pasture without damaging property and would probably not cause significant erosion.

Restoration may be appropriate if the ranch property is developed. This may include excavation to develop an appropriate floodplain and create a meandering low flow channel. Development should not encroach on the channel. High flows should have room to spread out across a wide floodplain without impacting property.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- x Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: North Truckee Drain

Team Observers: Mike Widmer, Jeff Jesch (3) Date: 02/06/02

Reach – Landmarks:

Start	The North Truckee Drain parallels Sparks Boulevard
Stop	The North Truckee Drain parallels Sparks Boulevard

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 5c

Land use

☐ WILD x URBAN ☐ AGRICULTURAL x COMMERCIAL x OPEN SPACE x FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
	x		Fertilizers, pesticides, and herbicides do not impact water quality
x			Upland watershed not contributing to riparian degradation

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
x	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
		x	Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The North Truckee Drain enhances Sparks Boulevard by serving as open space with walking trails and landscaped areas. The channel has a very straight alignment with fairly steep banks. Rock and boulder grade control structures prevent channel incision. Water Quality is poor. The water has a gray-green color and the visibility is about one foot. Construction site and urban stormwater runoff may cause the poor water quality. Vegetation along the channel is poor to fair. Willows, trees, rushes and sedges are doing well in some areas, while in other areas, favorable vegetation is out-competed by Tall Whitetop weeds. It appears that some woody vegetation is removed to improve flood characteristics. Flood flows are conveyed without damage to property and the banks of the channel resist erosion. Vegetation along the channel provides some wildlife habitat.

Restoration may include increasing the width of the floodplain and improving riparian vegetation. Weed abatement should be implemented to control Tall Whitetop and riparian species should be planted.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: North Truckee Drain 4

Team Observers: Mike Widmer, Jeff Jesch Date: 02/06/02

Reach – Landmarks:

Start	North Truckee Drain Passes west of Wild Waters
Stop	North Truckee Drain converges with the Truckee River

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G5

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL X COMMERCIAL ☐OPEN SPACE X FLOOD CONTROL X OTHER, INDUSTRIAL

Sensitivity to disturbance (See attached table[2])

X VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	X		Floodplain inundated in "relatively frequent" events (1-3 years)
	X		Active/stable grade control
	X		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	X		Riparian zone is widening
	X		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	X		Land use does not contribute to water quality degradation
	X		Erosion does not degrade water quality
	X		Stormwater is not a significant source of water pollution
	X		Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		x	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
		x	Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The channel flows through commercial and industrial properties with very straight alignment and virtually no characteristics of a natural stream. The banks of the channel are very steep and up to 15 feet high. The channel banks are unstable in some areas. This contributes sediment to the channel during flooding and high flows. Willows grow along the banks of the channel and provide some soil reinforcement and wildlife habitat. Water quality is bad. The water has a bad smell and is gray green in color. Bubbles form in eddies and debris floats on the surface. Visibility is about eight inches. A sediment plume is clearly visible where the North Truckee Drain enters the Truckee River. The Sparks Marina Drain converges with the North Truckee Drain. The water quality in the Marina Drain appears to be worse than the North Truckee Drain. Recent grading activities, at the confluence, include installation of culvert headwalls, reshaping and armoring channel banks. The construction includes very steep, unprotected banks that may erode and contribute sediment to the Truckee River during high flows.

Restoration may include reducing the steepness of the channel banks to prevent erosion and encouraging riparian vegetation. A water treatment facility should be considered. Water pollution sources should be investigated and pollution ordinances enforced.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- x Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- x Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- x Other – enforce stormwater runoff regulations at industrial sites.

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Ophir Creek \

Team Observers: Jeff Jesch, Keith Widmer Date: 02/07/02

Reach – Landmarks:

Start	Ophir Creek Canyon
Stop	Alluvial fan transitions to wetland meadow

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A 2 B ____ C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Ophir Creek is adapting to the large sediment load discharged during the Price lake-Slide Mountain landslides. The channel flows through boulder and cobble debris, vegetation is slow to emerge due to the lack of suitable soil. Existing vegetation is fair wildlife habitat. Flood flows are able to spread out across the floodplain without causing damage to property. Maintenance will be an ongoing issue as sediment is transported downstream. Culverts, diversions and ditches may become clogged. Water quality is not impacted as sediment is mostly sands that do not become suspended in the creek.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Franktown Creek (1)

Team Observers: Jeff Jesch, Keith Weaver Date: 02/07/02

Reach – Landmarks:

Start	Franktown Creek emerges from the canyon
Stop	Old Highway 395 crosses Franktown Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2&3 C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The reach of Franktown Creek is in good condition. There has been very little human impact, aside from diversions and road building. Vegetation is healthy and provides very good habitat for wildlife. Flood flows have room to expand across the floodplain without impacting property. The rocky soil, dense vegetation, and access to the floodplain prevent high flows from causing erosion. Water quality appears good, however the color has a red tint. This may be from naturally occurring oxidized iron.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Franktown Creek

Team Observers: Jeff Jesch, Keith Weaver Date: 02/07/02

Reach – Landmarks:

Start	Old Highway 395 crosses Franktown Creek
Stop	Franktown Creek enters Washoe Lake

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 5 D ____ E ____ F ____ G____

Land use

☐ WILD ☐ URBAN x AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH x HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* *Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
x	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
x	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		x	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
		x	Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The reach of Franktown Creek flows through a low gradient meadow used for cow and horse pasture. The stream has fair to good channel geometry, with the exception of sections that are channelized and used as irrigation ditches. Riparian vegetation is absent, probably due to livestock grazing. Existing vegetation is mostly wetland grass species, which extend from the meadow to the edge of the creek. Livestock trample the banks of the creek in some areas, resulting in bare soil and the risk of erosion. Culverts and road crossings serve as grade control and the channel is vertically stable. The lack of riparian vegetation limits the stream's usefulness as wildlife habitat. Flood flows can spread out across the meadow without damaging property or causing erosion. Only one structure exists near the creek and it does not encroach on the channel.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Musgrove Creek

Team Observers: Jeff Jesch, Keith Weaver Date: 02/07/02

Reach – Landmarks:

Start	Franktown Road crosses Musgrove Creek
Stop	The Old Highway 395 crosses Musgrove Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 3 upper C 5 lower D ____ E ____ F ____ G ____

Land use

☐ WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL x OTHER- GOLF COURSE

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH x MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
X			Floodplain inundated in "relatively frequent" events (1-3 years)
X			Active/stable grade control
X	X		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	X		Riparian zone is widening
X			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	X		Land use does not contribute to water quality degradation
	X		Erosion does not degrade water quality
	X		Stormwater is not a significant source of water pollution
	x		Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	X		Diverse age structure of vegetation
	X		Diverse composition of vegetation
	X		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	X		Riparian plants exhibit high vigor
	X		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	X		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x	X	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	X		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
		X	Point bars are revegetating
X			Lateral stream movement is associated with natural sinuosity
X			System is vertically stable
		X	Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Musgrove Creek enters Washoe Valley in an elite, low-density, urban setting. The creek is relatively undisturbed and has good geometry in the upper reach. The lower reach enters a golf course where the alignment is contrived. Sinuosity is good in the upper and lower reaches. Vegetation is removed in the golf course and sod replaces riparian vegetation. There is a potential for golf course fertilizers and other chemicals to enter the creek. The golf course does not provide riparian wildlife habitat. Sediment and nutrients affect water quality. The Old Highway 395 road swale concentrates irrigation and storm flows, then channels them to the creek. This is a significant source of pollution. Stabilizing the road swale, revegetating channels, establishing riparian buffer zones and fencing livestock from the creeks would benefit water quality.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- x Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- x Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- x Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- X Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Musgrove Creek

Team Observers: Jeff Jesch, Keith Weaver Date: 02/07/02

Reach – Landmarks:

Start	Old Highway 395 crosses Musgrove Creek
Stop	Musgrove Creek enters Washoe Lake

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F 5 G____

Land use

☐ WILD x URBAN x AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
		x	Land use does not contribute to water quality degradation
	X		Erosion does not degrade water quality
		x	Stormwater is not a significant source of water pollution
		x	Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
		x	Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The creek is channelized with very straight alignment through small ranches and low density urban development. It is entrenched about five feet and the banks are near vertical. Homes, ranch structures and fences encroach on the stream. Evidence of dredging and vegetation removal was observed. Water quality appears good, however, the incised channel may be affected by adjacent septic leach fields and animal wastes from grazing and horses. Bank erosion during high flows contributes sediment to the creek. It appears that flooding is controlled by continually dredging the channel. This prevents healthy riparian vegetation from reestablishing and inhibits the natural rejuvenation process of the channel morphology. Willows, perched at the top of the channel banks, appear healthy and provide habitat for wildlife.

Some of the Musgrove Creek flows are diverted through a golf course. The diverted channel has good sinuosity and high flows may come out of bank to access the floodplain. Riparian vegetation is absent within the golf course boundary. Since turf grows adjacent to the banks of the creek with no riparian buffer zone, fertilizers, herbicides and pesticides are not filtered before entering the creek.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- x Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- x Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Jumbo Creek

Team Observers: Jeff Jesch Date: 01/27/02

Reach – Landmarks:

Start	Aggregate pit on Jumbo Grade Road
Stop	Residential area about ½ mile east of East Lake Blvd.

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 4&5

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL x OFF ROAD VEHICLES

Sensitivity to disturbance (See attached table[2])

x EXTREME ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

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[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Jumbo Creek flows through a relatively steep canyon and is undeveloped along this reach. The area is used for recreation, off road vehicles and there is a soil and aggregate pit. A road parallels the creek that has existed since the Virginia City mining days. Vertical instability and steep channel banks are the result of road encroachment on the creek. The soil is very erodable and sediment is carried downstream during high storm flows. Off-road vehicle use accelerates erosion by concentrating and direction sheet flows to the creek.

The channel is unstable during periods of high flows, and erosion reduces water quality. Riparian vegetation is perched on the steep banks of the channel. Roots have difficulty reaching the low water table and new vegetation cannot take hold along the eroding channel bottom. Existing riparian vegetation is good wildlife habitat, but as the water table recedes, the willows are impacted.

Restoration opportunities may include excavation that develops an active floodplain. Reducing the steepness of the channel banks will prevent erosion and improve revegetation potential. Bioengineering solutions, that use vegetation to stabilize the channel, can also be implemented.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- x Control impacts from vehicles
- ☐ Control building-site encroachment
- x Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- x Raise channel bottom to reconnect stream to floodplain
- x Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- x Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Jumbo Creek

Team Observers: Jeff Jesch Date: 01/27/02

Reach – Landmarks:

Start	Residential area about ½ mile east of East Lake Blvd.
Stop	Jumbo Creek enters Washoe Lake

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 5

Land use

☐ WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE x FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x extreme ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		x	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
		x	System is vertically stable
		x	Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Jumbo Creek has a very straight alignment through residential lots and along the Jumbo Grade Road. The creek was pushed to the property lines to economize development, the road shoulder forms the south bank of the creek. West of East Lake Boulevard, the channel was reshaped, armored and grade control structures were installed to control flooding and erosion. Improvements to the channel extent west from East Lake Boulevard, about ½ mile. Downstream of the improvements, Jumbo creek is channelized along roadways before it enters Washoe Lake. This reach of Jumbo Creek is characterized by straight alignment, steep banks that erode, and a channel that is vertically unstable. The lack of vegetation does not provide habitat for wildlife and erosion impacts water quality. There is a risk of damage to property and the environment from flooding. The channel does not possess any characteristics of a natural functioning stream.

Options for restoration are limited due to encroachment from residential lots and roads. Installing grade control structures and establishing riparian vegetation may improve wildlife habitat, reduce the risk of flood damage and prevent erosion. Care should be taken when constructing these structures to ensure they do not become outflanked by storm flows.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- x Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- x Raise channel bottom to reconnect stream to floodplain
- x Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- x Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Evans Creek

Team Observers: Jeff Jesch, Ben Jesch Date: 10/09/02

Reach – Landmarks:

Start	2000 feet west of the confluence of South and North Evans Creek
Stop	Lakeside Drive crosses Evans Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B2&3a C ____ D ____ E ____ F ____ G ____

Land use

x WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAl x OPEN SPACE ☐FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
		x	Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality
x			Upland watershed not contributing to riparian degradation

[1] Rosgen, Dave. *Applied River Morphology.* *Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Evans Creek flows through medium density residential developments along this reach. The relatively undisturbed stream corridor is lined with dense vegetation that serves as excellent wildlife habitat. Homes and fences do not encroach on the stream system. Water quality is good. Rocks, Boulders, vegetation and root structures resist erosion. The channel appears to be capable of conveying anticipated flood flows without damage to the environment or property. Segments of pedestrian trails exist along the creek, and an extensive trail system lies within the Washoe County-Bartly Ranch Park just down stream. Planners should encourage continuing the existing trails. This helps connect the community to the watershed. Native vegetation should be preserved and not replaced with sod and landscape species.

Flows are diverted from Evans Creek and routed to the Lake Ridge Subdivision. Roads and ditches cross the stream in several locations. Some erosion is associated with the crossings, however, the durable characteristics of the channel limit the extent of disturbance. A five-foot deep head cut was observed, and its effect was dissipated within about 500 lineal feet. It appears the head cut was naturally occurring. A real-estate sigh indicates the potential for development upstream.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Evans Creek

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/09/02

Reach – Landmarks:

Start	Lakeside Drive crosses Evans Creek
Stop	Highway 395 crosses Evans Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 3

Land use

☐ WILD ☐ URBAN X AGRICULTURAL ☐ COMMERCIAL X OPEN SPACE X FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

X VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		x	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Evans Creek flows through a public park and small ranches in this reach. The creek is channelized in a straight alignment to economize land use and improve flood flows. The stream banks are vertically unstable and the channel is widening. High stream flows and flooding have caused property damage and erosion in the past. Flood events overtop banks in about ten year intervals. Existing trees and shrubs have exposed roots and trees lean due to soil loss around roots. The lack of vegetation causes thermal pollution and wildlife habitat is not available. The channel characteristics do not promote aquatic life.

Based on the site characteristics, stream restoration may be appropriate. Much of the property is located on publicly owned land within a park setting. The public could potentially support a restoration project that would provide watershed education, wildlife habitat, pedestrian trails and an example of natural functioning and natural appearing stream restoration. A stream restoration is under construction, on Evans Creek, Just upstream of Highway 395 and a second, adjacent, restoration is in the planning stage.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- X Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- X Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- X Public education
- X Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- X Improve existing riparian corridor vegetation
- X Create floodplain (excavate)
- X Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- X Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Evans Creek

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	South Virginia crosses Evans Creek near the Shell Station
Stop	Evans Creek converges with Dry Creek near the Sierra Pacific Building

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 5 D ____ E ____ F ____ G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL X OPEN SPACE X FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

X VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
		x	Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x	x	Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The creek is confined in a wide flood control channel as it flows through commercial properties in relatively flat terrain. The straight alignment, lack of riparian vegetation and hard armoring limit the channels natural characteristics. Woody vegetation is removed to improve flood flows. This reduces the usefulness of the stream for wildlife habitat. Water quality is impacted by land uses upstream, that include; animal waste, poorly functioning individual septic systems, soil erosion, and stormwater runoff from commercial properties. Water visibility is poor and algae is observed growing in the creek. The channel design appears adequate to convey flood flows without damage to property.

Establishing woody riparian vegetation and realignment of the low flow channel would improve the appearance of the channel and improve wildlife habitat. This may also provide water quality benefits. Upstream impacts should also be addressed.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- x Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- x Other – restore the entire reach by creating a floodplain, defined low flow channel and establishing riparian vegetation.

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Dry Creek (1)

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/10/02

Reach – Landmarks:

Start	Three Dry Creek Tributaries in Undisturbed areas about one mile west of Lakeside Drive
Stop	Lakeside Drive crosses Dry Creek Tributaries

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2 C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
		x	Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The three tributaries flow through steep canyons in the alluvial fan setting. The south and middle reaches are relatively undisturbed and not influenced by urban development. A recent fire, summer of 1999, swept through the riparian vegetation along all three tributary channels. Vegetation recovery is robust along the channels, and the rocky soil and existing root structure prevents erosion.

Many property owners, along the north tributary, have developed ponds along the channel. Vegetation along the north channel is mostly special landscape species and very little undisturbed channel exists.

The stream channel corridors have relatively stable characteristics. The riparian areas are well suited for pedestrian trails and open space. This should be considered when planning for urban development.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Dry Creek (2)

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/10/02

Reach – Landmarks:

Start	South, Middle and North Tributaries of Dry Creek cross Lakeside Drive
Stop	South Virginia Street crosses Dry Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 4&5

Land use

☐ WILD ☐ URBAN X AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL X OTHER
Small ranches from 2.5 to 10 acres.

Sensitivity to disturbance (See attached table[2])

X VERY HIGH ☐ HIGH ☐ MODEORATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		x	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Three tributaries of Dry Creek flow through small ranches that range from 2.5 to 10 acres. Impact from livestock grazing is intense along the riparian corridor. Numerous dams exist along the channels. The structures often result in downstream erosion and sediment deposition.

The channel has a high potential to recover if the current impact is reduced. Management changes such as fencing riparian areas and better livestock management could potentially improve the stream corridor. Enforcement of existing ordinances and public education may reduce impact on the stream.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- x Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Stream-Riparian area: Dry Creek (3)

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver **Date:** 01/10/02

Reach – Landmarks:

Start	McCarran Crosses Dry Creek near the South end of the Reno-Tahoe Airport.
Stop	South Virginia Street Crosses Dry Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 6 D ____ E ____ F ____ G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL X COMMERCIAL ☐ OPEN SPACE X FLOOD CONTROL X OTHER
Drainage / Groundwater Discharge

Sensitivity to disturbance (See attached table[2])

X VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
		x	Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Dry Creek is channelized, in this reach, to accommodate anticipated flood flows through commercial and industrial development. The valley bottom is about 60 feet wide. The banks of the channel are sloped at about 2:1. Most of the banks of the channel are armored with rock rip rap, however, geotextile fabric armors the banks of the reach near McCarran Boulevard. A low flow channel is developing sinuosity. Riparian vegetation includes rushes and sedges. Willows and other woody vegetation is removed to improve flood capacity.

The relatively wide floodplain, combined with an active low-flow channel promotes healthy riparian vegetation and the potential for the channel hydrology to be in balance with the landscape setting. The riparian vegetation provides relatively good wildlife habitat for shore birds, hawks and small mammals. It appears that native species out compete invasive weeds. The restored channel floodplain serves as open space available to the public and includes a pedestrian trail system. This promotes a connection between the community and the watershed and is a good practice.

Woody vegetation such as willows, cotton wood and elm trees are removed for flood control. The lack of vegetative cover results in thermal pollution, reduces wildlife habitat, and does not protect the channel banks from erosion.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- x Other – encourage channel management policies that allow woody vegetation in the stream channel
- x Other- control the spread of noxious weeds

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Dry Creek (4)

Team Observers: Mike Widmer, Jeff Jesch and Keith Weaver Date: 01/10/02

Reach – Landmarks:

Start	McCarran Boulevard crosses Boynton Slough (Dry Creek)
Stop	McCarran Boulevard crosses Dry Creek near the south end of Reno-Tahoe Airport

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F 6 G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE X FLOOD CONTROL X OTHER
Drainage and groundwater discharge

Sensitivity to disturbance (See attached table[2])

X VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Boynton Slough (Dry Creek) does not have characteristics of a natural functioning stream along this reach. There is no defined low flow channel and the banks are very steep. The flow line slope is very low and flows are slow. Tall Whitetop weeds out compete native riparian species. The reach is poor wildlife habitat, due to the lack of riparian vegetation. Vertical banks slough off and contribute sediment to the channel, this increases channel maintenance costs.

There is a high potential for successful stream restoration. Undeveloped land is adjacent to the stream that could allow for excavation and floodplain development. Restorations upstream can serve as examples of suitable restoration methods along this reach. Restoration could incorporate pedestrian trails, open space and wildlife viewing.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Thomas Creek (V)

Team Observers: Mike Widmer, Jeff Jesch Date: 01/12/02

Reach – Landmarks:

Start	Timberline Road crosses Thomas Creek
Stop	South Arrowcreek Parkway crosses Thomas Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2&3a C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Thomas Creek flows through the alluvial fan setting in a steep canyon. The creek is vegetated with healthy riparian vegetation such as willows, alder, aspen trees and wetland grasses. The stream is good wildlife habitat, suitable for deer, raccoons, birds, hawks and fish. Water quality is good along the reach. The channel is functioning as a natural, stable stream, capable of carrying flood flows without damage to the environment or structures. The stream is well suited for pedestrian trails and other low impact recreational uses.

Some vertical instability was observed associated with a new stream crossing of a waterline. Erosion is accelerated by Sand bags and straw bales placed in the channel.

Some property owners have stored vehicles and other belongings within the channel floodplain. In addition, landscapes and structures encroach on the floodplain. This should be addressed with public education.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Thomas Creek (2)

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	Thomas Creek enters the south-west boundary of Arrowcreek Subdivision
Stop	Steamboat ditch crosses Thomas Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2&3a C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* Page 5-5
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Thomas Creek flows through low-density urban development. The relatively undisturbed channel is situated in a canyon with undisturbed banks and a functioning floodplain. Much of the reach is paralleled by a unimproved walking trail that receives light traffic. The reach is capable of conveying flood flows without risk of property damage or erosion. Healthy riparian vegetation serves as good wildlife habitat. The natural functioning channel does not require maintenance. Water quality is good and the reach is not a source of sediment or pollution.

The Southwest Vista subdivision conveys storm flows to a large detention basin located at Ventana Prkwy crossing over Thomas Creek. Flows are metered through two 24" (?) culverts that discharge directly to Thomas Creek. The culvert inlets are very low in the basin, therefore, the detention basin has no sediment storage capability and sediment is carried to the creek. The low elevation of the culvert inlet also increases the risk of the basin becoming clogged with sediment and potentially impairing it's functionality. Raising the culvert inlets may allow for sediment storage and limit the risk of the culverts becoming blocked. The storm drain culverts discharge to the west bank of Thomas Creek about five feet above the channel invert. This has resulted in bank erosion.

Venata Prkwy crosses Thomas Creek in a box culvert located east of Southwest Vista. The natural functioning and natural appearing stream was replaced by approximately 250 lineal feet of channel armored with white rock riprap. No characteristics of the existing channel were preserved. There are very few signs of riparian vegetation emerging, therefore, benefits to wildlife are not available. There is no defined low flow channel. The stream spreads out across

a 70 foot wide flat channel bottom. This configuration can have serious impacts on aquatic life, including trout populations that can no longer pass through this obstructed section. This type of stream treatment is unfortunate, especially in an area so highly visible to the public. This small reach is non-functioning. Possible restoration could include defining a low flow channel through the rock rip rap, reintroducing riparian vegetation and developing natural appearing drops and pool structures.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- X Yes, box culvert
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- x Other – develop a functional low flow channel

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Thomas Creek (3)

Team Observers: Mike Widmer, Jeff Jesch Date: 01/15/02

Reach – Landmarks:

Start	Steamboat Ditch crosses Thomas Creek
Stop	Last Chance Ditch crosses Thomas Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 3&4 C ____ D ____ E ____ F ____ G ____

Land use

x WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH x MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
		x	Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

This section of Thomas Creek is relatively undisturbed and exists as a natural functioning and natural appearing stream. The creek resists erosion and there is little risk of damage to structures during flood events. Along this reach, riparian vegetation is healthy, wildlife habitat is good and Water quality is not impacted.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Thomas Creek (4)

Team Observers: Mike Widmer, Jeff Jesch Date: 01/15/02

Reach – Landmarks:

Start	Last Chance Ditch crosses Thomas Creek
Stop	Highway 395 crosses Thomas Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 3&4

Land use

☐ WILD x URBAN x AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
		x	Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Thomas Creek flows through large residential lots that range from two and a half to ten acres in size. Historically the land was irrigated pasture that produced hay and livestock. Recently, residential lots, with expansive areas of manicured turf, are replacing pastures. These residences still rely on surface irrigation water. New development has treated the stream channel fairly well. The lots typically do not encroach on the stream and in some cases, fencing protects the stream buffer zone.

Existing ranch operations impact the creek. The creek is channelized and realigned to optimize pasture irrigation. The realignment causes bank erosion that contributes sediment to the system. The modified alignment requires annual maintenance such as dredging. Animal waste is stockpiled along the creek, adding nutrients to the stream, and degrading water quality.

The reach has a good potential for recovery. This may be accomplished by implementing low cost management changes such as; enforcing the buffer zone specified in the stream ordinance, limit dredging and channeling, and removal of animal waste and other debris stockpiled along the creek.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- x Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- x Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Thomas Creek South Fork (6)

Team Observers: Mike Widmer, Jeff Jesch Date: 01/14/02

Reach – Landmarks:

Start	Highway 395 crosses the South Fork of Thomas Creek
Stop	Lake Alexander

Watershed Physical Description – Rosgen Morphological Description 1000 feet east of Highway 395
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F 6 G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL x COMMERCIAL ☐ OPEN SPACE x FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
		x	Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
		x	Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
		x	Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
		x	Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
		x	Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Roughly three stream treatment types characterize Thomas creek, east of Highway 395. They include relatively narrow channels with steep banks, broad channels with 3:1 banks and streams that serve as amenities to landscapes. The narrow channels are the most problematic. The landscaped channels and the broad flood control channels are stable, provide wildlife habitat and, in many cases the channel geometry and vegetation are rejuvenating.

Thomas Creek emerges from under Highway 395 in two locations. The South fork box culvert is located near the Marriott Hotel. A sheet-pile grade control structure exists about 30 feet downstream of the culvert. A constructed wetland is just to the north. The confined channel extends about 1000 feet east of the Highway and is the most impacted reach of Thomas creek east of Highway 395. The channel has very steep banks and no active floodplain. Significant erosion is occurring near the grade control structure and along the banks. Tall white top is the only plant species observed. This is problematic as it serves as a seed source downstream. Development encroaches on the banks of the channel limiting restoration opportunities. The stream corridor is poor wildlife habitat. Erosion and sediment problems will result in continuing maintenance costs. The stream has no aesthetic benefits to the public. The channel cross section appears small relative to downstream channels designed to carry the 100-year flood event.

While the upstream portion of the reach has limited potential, the lower section exhibits many positive characteristics. The improved channel geometry will reduce the risk of channel and bank

erosion. The new channel is revegetating nicely and offers improved wildlife habitat. Tall Whitetop weeds are out competed by more desirable species.

The North Fork of Thomas Creek is mostly used for landscape features such as ponds, waterfalls and natural appearing streams. The channel is capable of resisting erosion, as well as conveying anticipated flood flows. Landscape and native plant species provide wildlife habitat and stabilize the channel banks. Pedestrian trails invite the public to interact with the watershed, which promotes stewardship.

The North Fork and South fork of Thomas Creek converge in a created lake. The combined flows leave the lake and flow to Lake Alexandria in a very broad flood channel. Thomas Creek continues beyond Lake Alexandria in a narrow, incised channel to Steamboat Creek.

Challenges to improving the riparian corridor will involve approving woody riparian vegetation within the flood control channel and controlling Tall Whitetop weeds. Developers have shown an eagerness to include streams as amenities to landscapes. This is a good practice and should be encouraged.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- X Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- x Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Whites Creek \

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	Dirt road to Government lots crosses Whites Creek
Stop	Splitter box diversion on Whites Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2a C ____ D ____ E ____ F ____ G ____

Land use

x WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
		x	Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

In this reach, Whites Creek exists in a natural and relatively undisturbed condition. The riparian vegetation is healthy and provides good wildlife habitat. The channel is stable and capable of carrying flood flows without damage to property or the environment.

The primary land use is low-density residential development. Development is beginning to occur atop the steep slopes overlooking the creek. Monitoring construction will ensure storm water runoff and fill pushed into the canyon does not affect the creek.

Storm water runoff from the Mount Rose Highway, and development, has resulted in erosion and sediment transported to Whites Creek. Storm water flows to Whites creek in an unprotected, natural drainage. Armoring the gully, created by the storm flows, may prevent further erosion. It appears that over 100 yards of soil and roadbed material was transported to Whites Creek. NDOT and Washoe County should investigate this.

New construction was observed east of the Whites Creek split. The building pad is located in the crotch of the two channels. The site appears to be at risk from flood damage. This assumption is based on observations of a large fan of rock and gravel debris that appears to have avulsed from the stream channel just above the site. Further, the site does not comply with the Washoe County Stream Ordinance that requires a 35' buffer zone. Washoe County should investigate this.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: South Fork of Whites Creek

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	Whites Creek diversion splitter
Stop	Steamboat Ditch crosses South Fork of Whites Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A 2&3 B ____ C ____ D ____ E ____ F ____ G ____

Land use

x WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* *Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Whites creek flows split about equally between the North Fork and the South Fork at the concrete splitter, located just upstream from the government-housing tract. Undisturbed areas as well as sections affected by property owners characterize this reach.

The undisturbed creek is stable and conveys flood flows without risk of property or environmental damage. Vegetation is healthy and provides good wildlife habitat.

The stream is impacted in areas of higher urban density. Land owners have modified the creek to create water features in landscapes, channelized the stream to better convey flood flows and removed riparian vegetation.

Stream characteristics are relatively stable along the reach and would respond rapidly to limited restoration efforts. Riparian areas, impacted by property owners, could be improved by removing stream channel modifications and reestablishing riparian vegetation. This could reduce maintenance costs, limit flooding risks and improve wildlife habitat.

The upstream watershed is contributing significant sediment loads to the creek. This should be controlled by enforcing construction site Best Management Practices and properly conveying storm water runoff from local roads and the Mount Rose Highway.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: South fork of Whites Creek 2

Team Observers: Jeff Jesch Date: 01/23/02

Reach – Landmarks:

Start	Steamboat Ditch Crosses The south fork of Whites Creek
Stop	South Virginia Street Crosses the south fork of Whites Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G ____

Land use

☐ WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE x FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	X		Floodplain inundated in "relatively frequent" events (1-3 years)
X			Active/stable grade control
	X		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	X		Riparian zone is widening
	X		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
X			Land use does not contribute to water quality degradation
	X		Erosion does not degrade water quality
	X		Stormwater is not a significant source of water pollution
X			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	X		Diverse age structure of vegetation
	X		Diverse composition of vegetation
	X		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	X		Riparian plants exhibit high vigor
	X		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	X		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	X		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
X			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	X		Point bars are revegetating
X			Lateral stream movement is associated with natural sinuosity
	X		System is vertically stable
	X		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

The South Fork of Whites Creek has been channelized and moved to the edge of subdivision property lines. The channel does not retain any characteristics of a natural functioning or natural appearing stream and more closely resembles a ditch. Channel erosion contributes sediment to the watershed and riparian processes do not improve water quality. The stream is poor wildlife habitat and is of little aesthetic value to the community.

Restoration of the creek would be challenging in high-density urban settings. Encroachment by roads and development limit opportunities to create a functioning riparian corridor. Downstream from existing developments, restoration sites include a park setting just west of the 395 Freeway. The publicly owned park has sufficient property to develop a natural appearing and functioning stream that would benefit the entire region. A second site across the freeway would be suitable for restoration. The property owner abandoned the existing Whites Creek channel and riparian vegetation was removed in preparation for development. The steam was rerouted in a ditch along the property line. As mitigation, the developer has been directed to restore the existing ditch to function as a natural stream. The drainage currently has some problems; it is severely eroding, contributing sediment to the watershed. The banks of the ditch failed in the upper reach, and flows spread across the property causing erosion and property damage. The community has expressed their displeasure with the stream treatment in Citizen Advisory Board meetings.

Restorations that restore a floodplain, reestablish riparian vegetation, and incorporate appropriate channel geometry have good potential for success.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: South Fork of Whites Creek 3

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	395 Freeway crosses the South Fork of Whites Creek
Stop	Whites Creek converges with Thomas Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 5c D ____ E ____ F ____ G 5c

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL x COMMERCIAL x OPEN SPACE x FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
x			Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* Page 5-5
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	x		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
		x	Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Two stream types characterize the South Fork of Whites Creek in the Double Diamond Subdivision. They include newly constructed flood control channels designed to carry the one hundred year event and existing incised channels. The flood control channels are approximately five feet deep and about one hundred feet wide. Defined low flow channels are incorporated into the design and disturbed areas were reseeded with appropriate seed mix. Unimproved channels are incised up to nine feet, with vertical banks.

The flood control channel is rejuvenating following its construction. Vegetation is emerging and the riparian area is already good habitat for wildlife, including small mammals, shore birds and hawks. The channel geometry is suitable for the landscape setting and wide enough to convey anticipated flood flows without damage to property or the environment.

The existing channel will be modified to carry anticipated flood flows as new development expands. The incised stream is considered functionally at risk, since riparian vegetation is not fully established and the steep banks are subject to erosion during high stream flow events. Steep banks and emerging vegetation provides relatively good cover for wildlife.

Maintenance will be the main challenge in the flood control channels. Tall Whitetop weeds threaten to out-compete native species. Methods such as mowing, herbicide applications, grazing and pulling are potential weed management tools. Local agencies should partner with developers to test new weed control methods. Jurisdictions should allow some woody riparian vegetation to establish within the flood control channels. This would benefit wildlife and enhance channel characteristics that improve water quality. Upland watershed practices that

contribute sediment to the stream should be controlled. This may include watershed restoration, enforcing construction site sediment control, and controlling storm water runoff from roads and parking lots.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- x Other – Partner with developers to manage the spread of Tall Whitetop weeds
- x Other – jurisdictions should allow woody riparian vegetation to grow along low flow channels

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Whites Creek, North Fork \

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	Splitter diversion in Whites Creek
Stop	Field Creek Golf Course

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2&3 C ____ D ____ E ____ F ____ G ____

Land use

x WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Whites creek flows split about equally between the North Fork and the South Fork at the concrete splitter, located just upstream from the government housing tract. The North fork flows south to north along a fault scarp that appears to be unsuitable for development. The stream exists in an undisturbed natural condition along this reach. Riparian vegetation is good to very good and provides habitat for wildlife. Flood flows are not confined by encroachment from development, therefore there is little risk of property damage or need for channel maintenance. The stream characteristics resist erosion and the channel geometry is in balance with the riparian setting.

The upstream watershed is contributing significant sediment loads to the creek. This should be controlled by enforcing construction site Best Management Practices and properly conveying storm water runoff from area roads.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- x Other – control storm water runoff and associated sediment coming from the Mount Rose Highway.

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist 2

Name of Riparian-Wetland Area: North Fork of Whites Creek

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	Entrance to Wolf Run Golf Course crosses Whites Creek
Stop	Highway 395 Crosses Whites Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F 3b G ____

Land use

☐ WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH x MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
	x		Stormwater is not a significant source of water pollution
	x	x	Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Urban development and encroachment control the channel characteristics of Whites Creek in the reach that extends east from the Wolf Run Golf Course to Highway 395.

A box culvert and detention basin were installed to accommodate the Field Creek Subdivision and Wolf Run Golf Course. The construction resulted in filling the riparian area and encroaching on the Creek. This has caused significant channel degradation that includes, channel erosion and increased sediment loads to the creek. The encroachment may also increase the risk of flood damage to existing property downstream.

The Field Creek detention basin, located adjacent to Whites Creek, is a potential source of sediment. The steep, unvegetated slopes are eroding and should be stabilized.

Several property owners are in violation of the Washoe County Stream ordinance by filling riparian zones, building structures, and removing riparian vegetation within 35' of the Creek. Washoe County should control encroachment.

Existing development encroaches on Whites Creek downstream of the Field Creek box culvert. There is little opportunity for stream improvement along this reach due to its complexity. Numerous property owners, difficult access and proximity of structures to the creek are challenges to stream restoration. The confined channel results in flooding, high maintenance

costs associated with repairing bank erosion, water quality is impacted by sediment load and illicit discharges, and poor riparian vegetation provides little wildlife habitat.

Whites Creek is conveyed in a ditch along Wal Mart's north property line. The straight alignment increases the risk of bank erosion that contributes sediment to the creek. Poor riparian vegetation does not provide habitat benefits for wildlife. Stream bank erosion will result in ongoing maintenance costs. Untreated storm water runoff is directed from the Wal mart parking lot, to Whites Creek. Whites Creek is conveyed under Old Virginia City Road in undersized culverts. Evidence of overflow and associated erosion was observed at the stream crossing. This contributes sediment to the watershed.

The reach of Whites Creek along Wal Mart's north property line is a good site for stream restoration. This may involve excavation to create a floodplain, reshaping the channel banks and establishing riparian vegetation. This would result in improved flood characteristics, reduced maintenance costs and wildlife habitat that could be enjoyed by the public.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- x Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- x Control road encroachment
- x Other – reduce impact from landscaping practices by enforcing existing ordinances.

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist 3

Name of Riparian-Wetland Area: North Fork of Whites Creek

Team Observers: Mike Widmer, Jeff Jesch, Keith Weaver Date: 01/16/02

Reach – Landmarks:

Start	395 Freeway crosses the north fork of Whites Creek
Stop	The north fork of Whites Creek converges with Thomas Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 5c D 5c E ____ F ____ G ____

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL x COMMERCIAL ☐ OPEN SPACE x FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
X			Floodplain inundated in "relatively frequent" events (1-3 years)
X			Active/stable grade control
	X		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
X			Riparian zone is widening
	X		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
		X	Land use does not contribute to water quality degradation
X			Erosion does not degrade water quality
		X	Stormwater is not a significant source of water pollution
	X		Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	X		Diverse age structure of vegetation
	X		Diverse composition of vegetation
	X		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
X			Riparian plants exhibit high vigor
	X		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	X		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
	X		Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	X		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
X			Point bars are revegetating
	X		Lateral stream movement is associated with natural sinuosity
X			System is vertically stable
		X	Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Whites Creek flows through Double Diamond Subdivision in engineered flood control channels, constructed within the last six years. The channels are approximately five feet deep and about one hundred thirty feet wide. Some of the channel banks are armored with rock rip rap and slopes range from 2:1 to 3:1. Defined low flow channels are incorporated into the design and disturbed areas were reseeded with appropriate riparian species.

The new stream is rejuvenating following its construction. Vegetation is emerging and the riparian area is already good habitat for wildlife, including small mammals, shore birds and hawks. The channel geometry is suitable for the landscape setting and wide enough to convey anticipated flood flows without damage to property or the environment.

Channel maintenance will be the main challenge in the near future. Tall Whitetop weeds threaten to out compete native species. Methods such as mowing, herbicide applications, grazing and pulling are potential weed management tools. Local agencies should partner with developers to test new weed control methods. Jurisdictions should allow some woody riparian vegetation to establish within the flood control channels. This would benefit wildlife and enhance channel characteristics that improve water quality. Upland watershed practices that contribute sediment to the stream should be controlled. This may include watershed restoration, enforcing construction site sediment control, and controlling storm water runoff from roads and parking lots.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- ☐ Reduce impact from livestock and animal wastes
- x Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- x Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- x Other – implement weed management program to control Tall Whitetop

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Jones Creek

Team Observers: Mike Widmer, Jeff Jesch Date: 01/22/02

Reach – Landmarks:

Start	Montreux property line crosses Jones Creek
Stop	Callahan Ranch Road crosses Jones Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2&3a C ____ D ____ E ____ F ____ G ____

Land use

X WILD X URBAN ☐ AGRICULTURAL ☐ COMMERCIAL X OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE X LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Jones creek is relatively undisturbed and exists in is natural condition along this reach. The land use is low density residential lots that typically do not encroach on the stream. A walking and bicycle trail parallels about one mile of the creek.

While the stream is healthy along the reach, there are some concerns. Channel erosion is occurring in areas that lack dense vegetative cover and unusual sediment deposits were observed. The rocky channel characteristics appear to resist erosion. Therefore, disturbances are typically limited to short segments, say thirty to sixty lineal feet.

The erosion observed along the creek may be caused by increased peak flows associated with upstream development. It is also possible that the creek experienced high flows following an unusually intense storm event, and the erosion is naturally occurring.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- x Unknown

If yes, what are the changes?

- x Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Jones Creek 2

Team Observers: Jeff Jesch, Keith Weaver Date: 01/18/02

Reach – Landmarks:

Start	Callahan Ranch Road crosses Jones Creek
Stop	Jones Creek converges with Galena Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G6

Land use

☐ WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐OPEN SPACE ☐FLOOD CONTROL x low DENSITY RESIDINTIAL

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
	x		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
		x	Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Jones Creek is severely entrenched through the meadow setting. Four to six foot, unstable, vertical banks continue to erode and contribute sediment to the watershed. The once wet meadow is now de-watered. Sagebrush and rabbit brush are replacing wetland grasses as the water table lowers. Vegetation is slow to emerge, in the channel, due to constantly eroding soils. The creek no longer provides valuable wildlife habitat and there is very little value to the public. The high sediment load diminishes water quality.

The Galena Creek channel incised several feet during the 1997 flood. This new lowered elevation may have resulted in head cut erosion transitioning upstream from its confluence with Jones Creek. Additionally, undersized culverts crossing Callahan Ranch Road created flow velocities that exceeded the streams capacity to resist erosion and the armoring at the outfall of the culvert may have been inadequate. Potential restoration could include excavation to create a wide, revegetated floodplain. This would improve flood characteristics, enhance riparian vegetation that would attract wildlife, improve water quality and reduce maintenance costs associated with bank instability.

The meadow was subdivided into about 6 lots several years ago, however, only one lot has been developed. The Soil Survey of Northern Nevada indicates that the meadow development is at risk of flooding during unusually intense storm events and the risk can only be reduce by construction of major flood control structures. The developer should inform potential buyers of the risk of flooding before sale.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- ☐ Functional – At Risk
- x Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Galena Creek

Team Observers: Mike Widmer, Jeff Jesch Date: 01/22/02

Reach – Landmarks:

Start	Mount Rose Highway crosses Galena Creek
Stop	Callahan Ranch Road crosses Galena Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2a C ____ D ____ E ____ F ____ G ____

Land use

x WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
		x	Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Galena Creek flows through a low density residential development in an undisturbed natural condition. Residential lots typically do not encroach on the stream channel and a pedestrian trail parallels the reach.

Galena Creek has responded to the 1997 flood event by incising six to twenty four inches. Roots are exposed and vertical banks exist. This appears to be a natural process not accelerated by development. The channel characteristics are very stable. Boulders, woody debris and roots resist further erosion. Water quality is good and healthy riparian vegetation provides good wildlife habitat. Erosion may continue to occur, during high stream flow, causing damage to trails and fences.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Galena Creek 2

Team Observers: Jeff Jesch, Keith Weaver Date: 01/18/02

Reach – Landmarks:

Start	Callahan Ranch Road crosses Galena Creek
Stop	Galena Creek enters pleasant Valley

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2&3a C ____ D ____ E ____ F ____ G ____

Land use

x WILD ☐ URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW x VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Galena Creek flows from a broad meadow near Callahan Ranch Road to a steep rocky canyon. The creek is relatively undisturbed along the reach. The channel geometry is in balance with the watershed and topography. Vegetation is healthy and provides good wildlife habitat. Water quality is not affected in the reach.

The 1997 flood event incised the channel six to twenty four inches. The erosion appears to be a natural process, however erosion was accelerated downstream of the Callahan Ranch Road box culvert. The flood also damaged fill and the banks of the channel near the box culvert. The damage has since been repaired.

The north bank of the creek was bermed, apparently to protect a development in the adjacent meadow. The meadow was subdivided into about 6 lots several years ago. The Soil Survey of Northern Nevada indicates that the meadow development is at risk of flooding during unusually intense storm events. The berm along Galena Creek prevents the creek from spreading across the meadow during high flows, this increases channel erosion.

The 1997 flood caused a massive gully at the mouth of the canyon in Pleasant Valley. A forty foot wide, fifteen foot deep and five hundred foot long canyon was carved by the flood flows. Fortunately the stream corridor is undamaged and is currently in good condition.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Galena Creek 3

Team Observers: Jeff Jesch, Keith Weaver Date: 01/18/02

Reach – Landmarks:

Start	Galena Creek enters Pleasant Valley at Maplewood Stables
Stop	Highway 395 crosses Galena Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 3 C ____ D ____ E ____ F ____ G 3

Land use

☐ WILD x URBAN x AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH x MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	x		Floodplain inundated in "relatively frequent" events (1-3 years)
x			Active/stable grade control
	x		Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	x		Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
x			Diverse age structure of vegetation
x			Diverse composition of vegetation
x			Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
x			Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
	x		Lateral stream movement is associated with natural sinuosity
	x		System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Galena Creek flows through horse ranch property along this reach. The upper section is narrow with very little floodplain. Encroachment from ranching operations and channelization cause bank erosion. Vegetation is good, provides wildlife habitat and stabilizes the channel banks. Water quality may be impacted by nutrients from ranching operations. Maintenance will be ongoing to keep flows in the bermed channel. Restoration opportunities are limited due to proximity of structures along the creek, but could include floodplain development and reshaping channel banks.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- x Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- x Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Galena Creek 4

Team Observers: Jeff Jesch Date: 01/18/02

Reach – Landmarks:

Start	Highway 395 crosses Galena Creek
Stop	Galena Creek enters Steamboat Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C ____ D ____ E ____ F ____ G 4&5

Land use

☐ WILD ☐ URBAN x AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

x VERY HIGH ☐ HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
	X		Floodplain inundated in "relatively frequent" events (1-3 years)
	X		Active/stable grade control
X			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
X			Riparian zone is widening
	X		Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
	X		Land use does not contribute to water quality degradation
	X		Erosion does not degrade water quality
X			Stormwater is not a significant source of water pollution
X			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* *Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	X		Diverse age structure of vegetation
	X		Diverse composition of vegetation
	X		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	X		Riparian plants exhibit high vigor
	X		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	X		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
X			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	X		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
X			Point bars are revegetating
X			Lateral stream movement is associated with natural sinuosity
X			System is vertically stable
	X		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Galena Creek is very entrenched east of Highway 395, where it flows through cow pastures. Significant incision and bank erosion occurred during the 1997 flood. High stream flows continue to erode the channel banks as a new floodplain evolves. Livestock accelerate the bank erosion. Erosion and animal waste influence water quality. Riparian vegetation is beginning to emerge in the channel, however livestock grazing slows recovery. Wildlife habitat is minimal.

Restoration may include excavating a wide floodplain and revegetating with willows and other woody plants. The channel would benefit from fencing that prevents livestock from grazing in the creek.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- x Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- x Encourage riparian buffer zones to replace sod adjacent to streams
- x Public education
- x Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- x Improve existing riparian corridor vegetation
- x Create floodplain (excavate)
- x Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- x Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Browns Creek

Team Observers: Mike Widmer, Jeff Jesch Date: 01/22/02

Reach – Landmarks:

Start	Joy Lake Road crosses Browns Creek
Stop	Browns Creek converges with Steamboat Creek near US395

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B 2a C ____ D ____ E ____ F ____ G ____

Land use

x WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL ☐ OPEN SPACE ☐ FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH ☐ HIGH ☐ MODERATE x LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
x			Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology. Page 5-5*
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
x			Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
x			Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
x			Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
x			Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
x			Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
x			Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Browns Creek flows through low-density residential development and undeveloped canyons in the reach. The creek was significantly altered during the 1997 flood. This resulted in bank erosion and up to twenty inches of channel incision. The impact is probably a natural process. Riparian vegetation is healthy and provides good wildlife habitat. Development does not encroach on the stream and flood flows are conveyed without damaging property. Water quality is not impacted along the reach.

Summary

Functional Rating:

- x Proper Functioning Condition
- ☐ Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- ☐ Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- ☐ Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- ☐ No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

Watershed Protection Program
Stream Assessment Checklist

Name of Riparian-Wetland Area: Bailey Creek

Team Observers: Jeff Jesch Date: 01/27/02

Reach – Landmarks:

Start	Mouth of the Old Virginia City Road canyon and east of residential area.
Stop	Bailey Creek enters Steamboat Creek

Watershed Physical Description – Rosgen Morphological Description
(See attached table[1])

A ____ B ____ C 3,4,5 b D ____ E ____ F ____ G ____

Land use

☐ WILD x URBAN ☐ AGRICULTURAL ☐ COMMERCIAL x OPEN SPACE ☐FLOOD CONTROL ☐ OTHER

Sensitivity to disturbance (See attached table[2])

☐ VERY HIGH x HIGH ☐ MODERATE ☐ LOW ☐ VERY LOW

Yes	No	N/A	Hydrologic
x			Floodplain inundated in "relatively frequent" events (1-3 years)
	x		Active/stable grade control
x			Sinuosity, width/depth ratio, and gradient are in balance with the landscape setting (i.e. landform, geology, and bioclimatic region)
	x		Riparian zone is widening
x			Upland watershed not contributing to riparian degradation

Yes	No	N/A	Water Quality (Pollution Sources)
x			Land use does not contribute to water quality degradation
	x		Erosion does not degrade water quality
x			Stormwater is not a significant source of water pollution
x			Fertilizers, pesticides, and herbicides do not impact water quality

[1] Rosgen, Dave. *Applied River Morphology.* Page 5-5
[2] Rosgen, Dave. *Applied River Morphology.* Page 8-9

Yes	No	N/A	Vegetative
	x		Diverse age structure of vegetation
	x		Diverse composition of vegetation
	x		Streambank vegetation is comprised of those plants or plant communities that have root masses capable of withstanding high streamflow events
	x		Riparian plants exhibit high vigor
	x		Adequate vegetative cover present to protect banks and dissipate energy during high flows
	x		Plant communities in the riparian area are an adequate source of coarse and/or large woody debris
x			Woody vegetation is not removed for flood control

Yes	No	N/A	Erosion Deposition
	x		Floodplain and channel characteristics (i.e., rocks, coarse and/or large woody debris) adequate to dissipate energy)
	x		Point bars are revegetating
x			Lateral stream movement is associated with natural sinuosity
x			System is vertically stable
	x		Stream is in balance with the water and sediment being supplied by the watershed (i.e., no excessive erosion or deposition)

Remarks

Bailey Creeks flows through an alluvial fan in a low and medium density urban setting. The stream only flows following snow melt and storm events. The channel does not receive enough flow to promote riparian vegetation, therefore, plants are mostly upland species such as bitter brush, sage brush and rabbit brush. Existing and new development has encroached on the creek and has resulted in vertical instability and stream bank erosion.

Planners should avoid allowing new development to place fill in the floodplain, or the stream channel, as this results in erosion and reduced water quality.

Summary

Functional Rating:

- ☐ Proper Functioning Condition
- x Functional – At Risk
- ☐ Nonfunctional
- ☐ Unknown

Trend for Functional – At Risk

- ☐ Upward
- x Downward
- ☐ Not Apparent

Can factors contributing to unacceptable conditions be controlled by management changes?

- x Yes
- ☐ No
- ☐ Unknown

If yes, what are the changes?

- ☐ Stormwater runoff treatment
- ☐ Reduce application of fertilizers, herbicides, and pesticides
- ☐ Encourage riparian buffer zones to replace sod adjacent to streams
- ☐ Public education
- ☐ Reduce impact from livestock and animal wastes
- ☐ Enforce construction site erosion and sediment control
- ☐ Control impacts from vehicles
- x Control building-site encroachment
- ☐ Control road encroachment
- ☐ Other –

Stream Restoration is appropriate?

- ☐ Yes
- x No
- ☐ Unknown

If yes, what are the recommendations?

- ☐ Modify watershed runoff and sediment loads
- ☐ Raise channel bottom to reconnect stream to floodplain
- ☐ Establish grade control structurally
- ☐ Improve existing riparian corridor vegetation
- ☐ Create floodplain (excavate)
- ☐ Shape banks to reduce slope failure hazard
- ☐ Install durable toe protection
- ☐ Implement soil bioengineering
- ☐ Other –

General Discussion on Water Quality and Sampling Procedures

Grab samples were taken using standard methods. The general chemistry analyses were conducted at the Nevada State Health Lab. The samples were analyzed for general minerals, total suspended solids, total kjeldahl nitrogen, total phosphate, fecal coliform, fecal streptococci, field pH, conductivity, dissolved oxygen (the meter proved unreliable) and temperature. An exception to this suite occurred with the sampling of three streams in Washoe Valley due to a miscommunication. Within each chapter certain constituents are tabled and discussed. The full water chemistry results are in the Appendix.

Total dissolved solids (TDS) is a compilation of the dissolved constituents within the water such as calcium, sodium, and bicarbonate. As an example, the Truckee River, near Verdi, has a TDS concentration in the range of 80 - 120 mg/l. The North Truckee Drain or Steamboat Creek have more variable TDS ranges of 300 - 600 mg/l. Total suspended solids (TSS) is a measure of the amount of sediment the streams are carrying. Total phosphate (TP) is a measure of both dissolved phosphate and organic phosphate. Nitrate and Total Kjeldahl Nitrogen (NO_3 and TKN) measure the dissolved and organic nitrogen (suspended in the water) respectively. Indicators of animal and human feces waste are measured by the concentration of fecal bacteria as fecal coliform and fecal streptococci. The fecal ratio is an indicator of whether or not the bacteria is human (>2) or animal (<1) derived where ratios between 1 and 2 are difficult to assess.

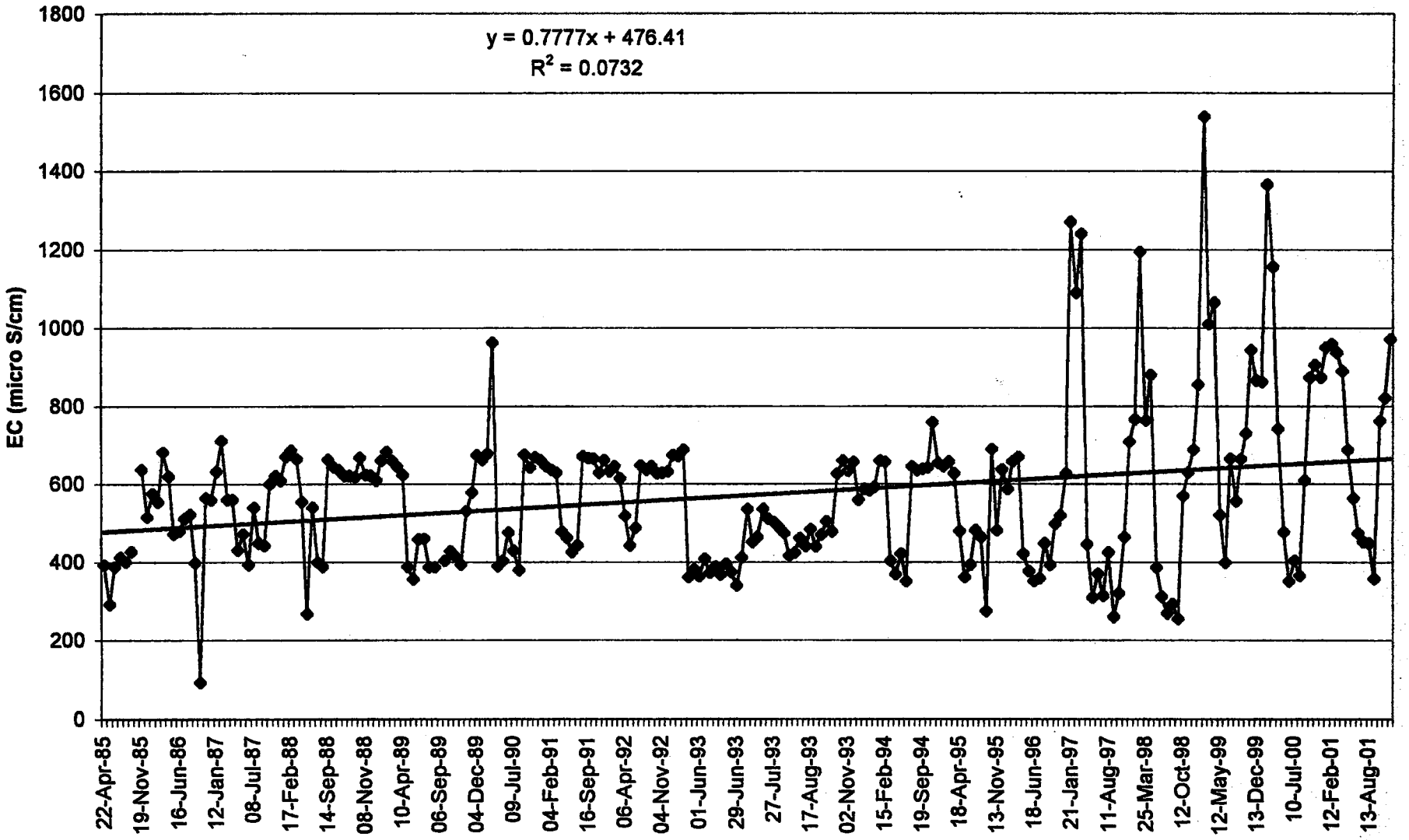
Federal standards recommend colony counts of <1 fecal coliform/100 ml of potable water for private supplies, such as wells, or the recovery of <1 fecal coliform/100ml per month from a public distribution system. If contamination exists, the construction of a fecal coliform/fecal streptococcus (FC/FS) ratio may provide an indication of the source of contamination, with a ratio of:

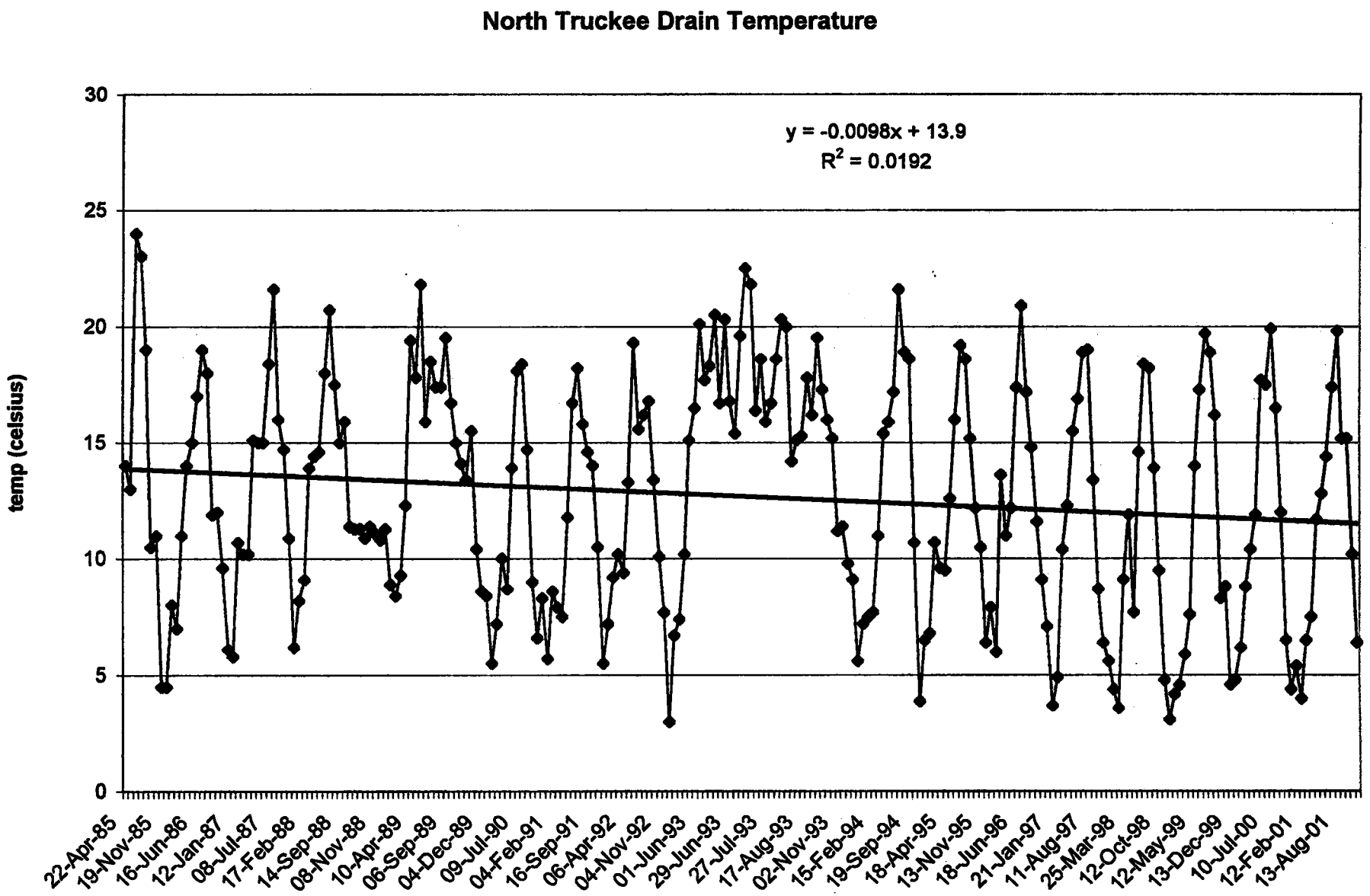
1. >4.1 indicating human contamination
2. 0.7-4.1 indicating mixed contamination of human and animal sources
3. <0.7 pollution by animal sources

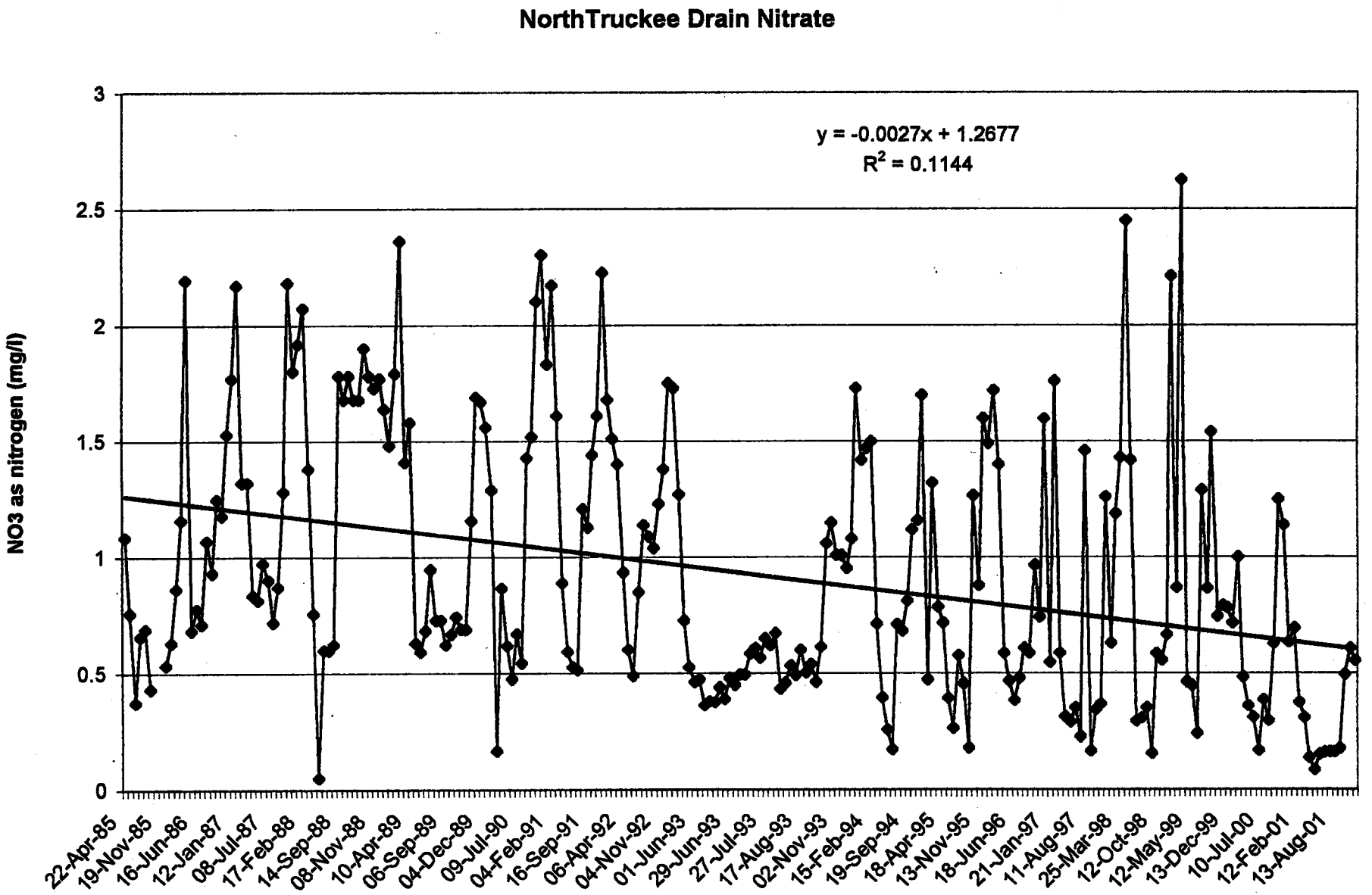
The standard plate count is used to attain the total number of heterotrophs from a given source. In determining the total numbers of heterotrophic bacteria in water, one is faced with the same problems that are encountered with soil. Water organisms have great variability in physiological needs, and no single medium, pH, or temperature is ideal for all types. In spite of the fact that only small numbers of organisms in water will grow on nutrient media, the standard plate count can serve an important function in water testing. This count is performed by spread plating the water sample onto Plate Count Agar (PCA) then incubating these plates at two different temperatures. PCA medium is used to grow microorganisms that normally live in dilute environments, because it has fewer nutrients than a general purpose medium. By varying the temperature of growth, one can determine a total count of heterotrophic organisms (25°C) and a count of heterotrophic organisms that grow at body temperature (37°C). In general, potable waters may not contain >500 heterotrophic cells/ml (total count).

Note: Refer to the appendix for descriptions of m-Endo, KF Strep and PCA plate media.

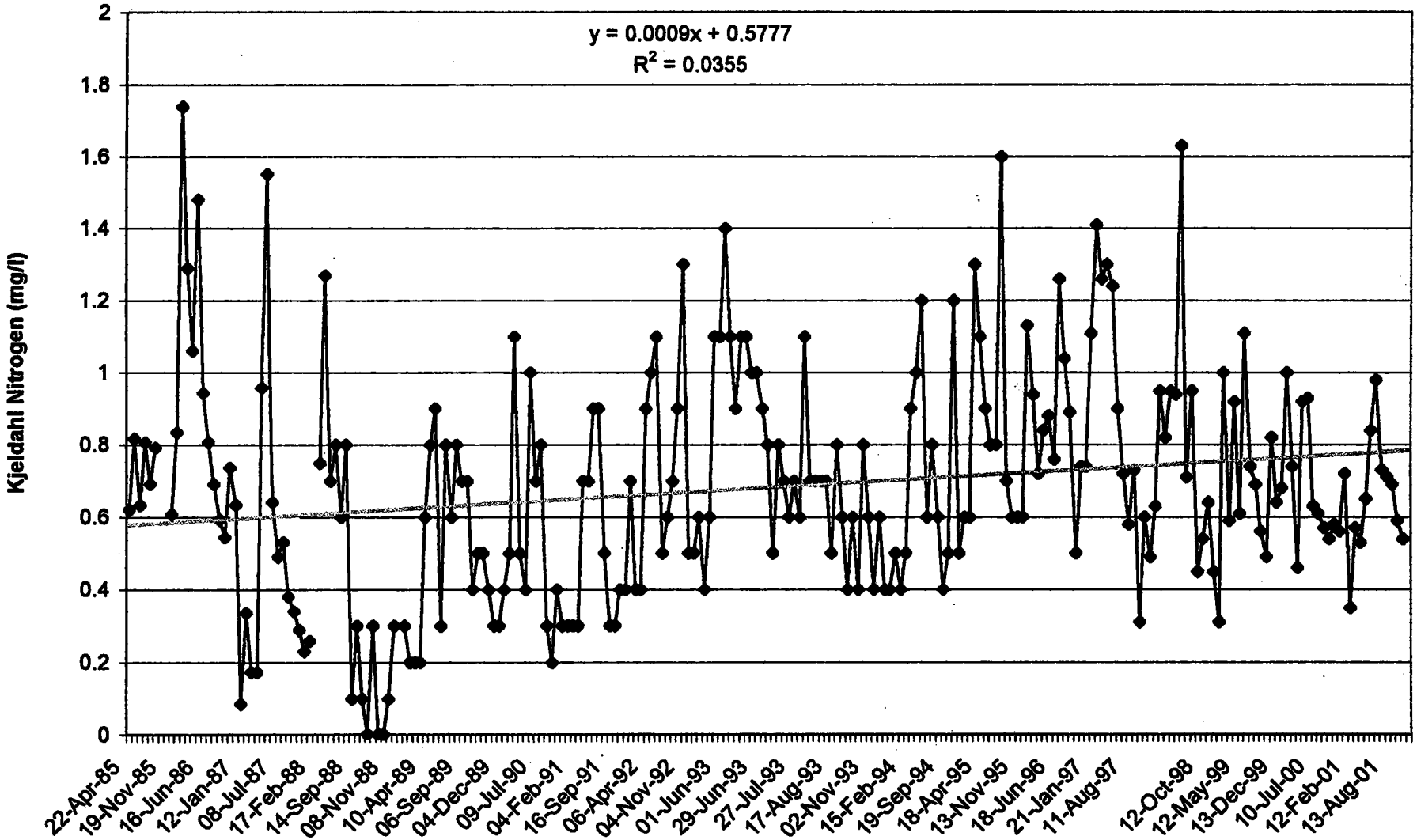
North Truckee Drain Electrical Conductivity

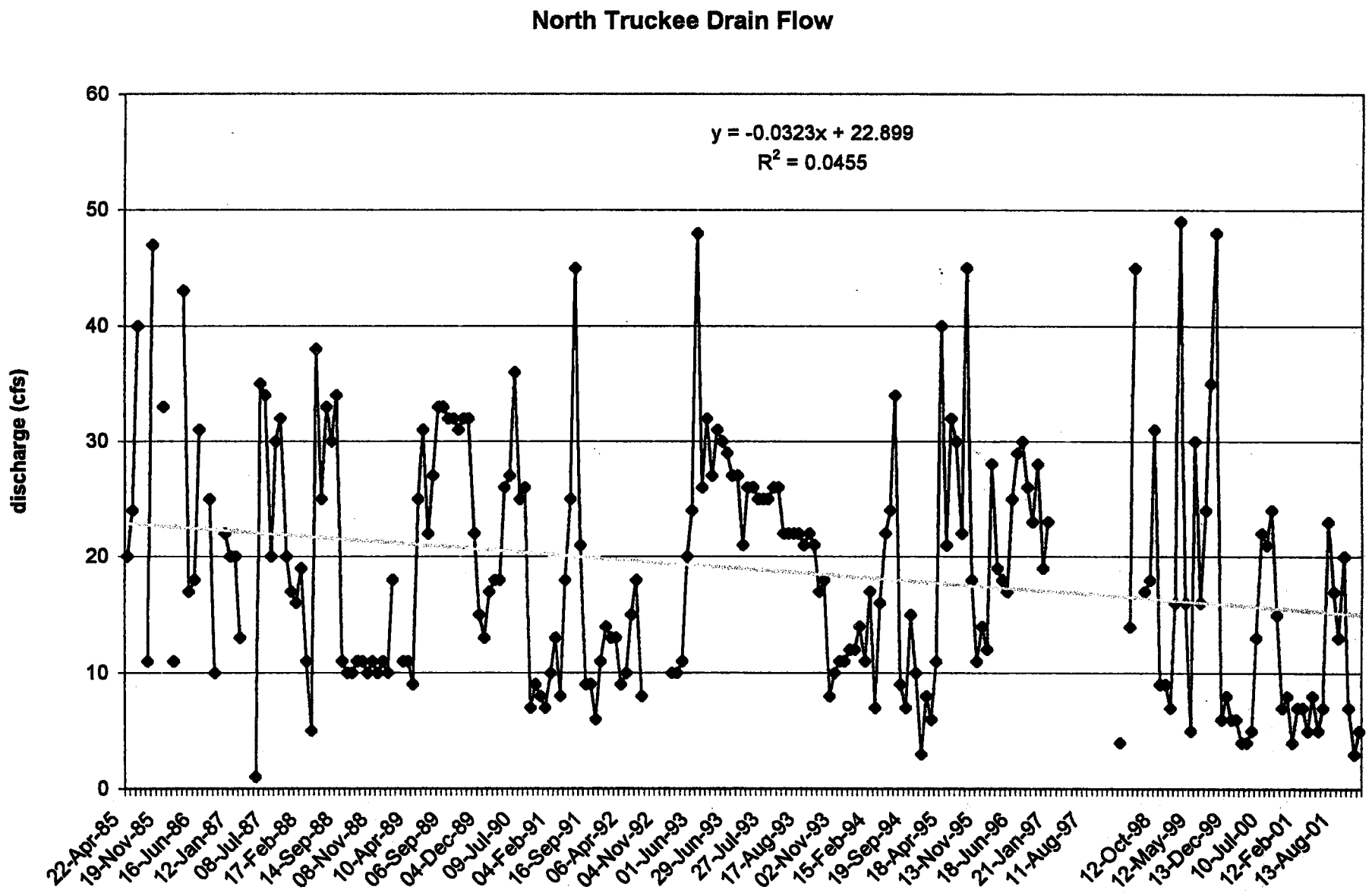



North Truckee Drain Temperature
y = -0.0098x + 13.9
R2 = 0.0192
temp (celsius)
30
25
20
15
10
5
0
22-Apr-85
19-Nov-85
16-Jun-86
12-Jan-87
08-Jul-87
17-Feb-88
14-Sep-88
08-Nov-88
10-Apr-89
06-Sep-89
04-Dec-89
09-Jul-90
04-Feb-91
16-Sep-91
06-Apr-92
04-Nov-92
01-Jun-93
29-Jun-93
27-Jul-93
17-Aug-93
02-Nov-93
15-Feb-94
19-Sep-94
18-Apr-95
13-Nov-95
18-Jun-96
21-Jan-97
11-Aug-97
25-Mar-98
12-Oct-98
12-May-99
13-Dec-99
10-Jul-00
12-Feb-01
13-Aug-01


NorthTruckee Drain Nitrate
y = -0.0027x + 1.2677
R2 = 0.1144
NO3 as nitrogen (mg/l)
3
2.5
2
1.5
1
0.5
0
22-Apr-85
19-Nov-85
16-Jun-86
12-Jan-87
08-Jul-87
17-Feb-88
14-Sep-88
08-Nov-88
10-Apr-89
06-Sep-89
04-Dec-89
09-Jul-90
04-Feb-91
16-Sep-91
06-Apr-92
04-Nov-92
01-Jun-93
29-Jun-93
27-Jul-93
17-Aug-93
02-Nov-93
15-Feb-94
19-Sep-94
18-Apr-95
13-Nov-95
18-Jun-96
21-Jan-97
11-Aug-97
25-Mar-98
12-Oct-98
12-May-99
13-Dec-99
10-Jul-00
12-Feb-01
13-Aug-01

North Truckee Drain Kjeldahl Nitrogen




North Truckee Drain Flow
y = -0.0323x + 22.899
R2 = 0.0455
discharge (cfs)
60
50
40
30
20
10
0
22-Apr-85
19-Nov-85
16-Jun-86
12-Jan-87
08-Jul-87
17-Feb-88
14-Sep-88
08-Nov-88
10-Apr-89
06-Sep-89
04-Dec-89
09-Jul-90
04-Feb-91
16-Sep-91
06-Apr-92
04-Nov-92
01-Jun-93
29-Jun-93
27-Jul-93
17-Aug-93
02-Nov-93
15-Feb-94
19-Sep-94
18-Apr-95
13-Nov-95
18-Jun-96
21-Jan-97
11-Aug-97
12-Oct-98
12-May-99
13-Dec-99
10-Jul-00
12-Feb-01
13-Aug-01

(PLEASE PRINT OR TYPE)

NEVADA STATE HEALTH LABORATORY
NEVADA DIVISION OF HEALTH
1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

DEC 13 2001
WASHOE COUNTY DEPT. OF WATER RESOURCES

151813

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 18 Range 19 Section 24
General Location Thomas Creek
Source Address near Welcome Way

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/24/01
Owner Washoe County Phone 9544655
Address 4930 Energy Way
City Reno State NV

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other

Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

0.0280 39 0.87 FOR LABORATORY USE ONLY 1467 151813

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW Constituent	ppm
T.D.S. @ ~~103°~~ C.	90	Chloride	0	Iron	0.27	Color	12		
Hardness	39	Nitrate N	0.1	Manganese	0.01	Turbidity	0.4		
Calcium	9	Alkalinity	56	Copper	0.00	pH	7.87		
Magnesium	4	Bicarbonate	66	Zinc	0.00	EC	110		
Sodium	7	Carbonate	0	Barium	0.05	SIGDC	-0.31		
Potassium	2	Fluoride	0.00	Boron	0.0				
Sulfate	1	Arsenic	0.003	Silica	12				
TKN	0.19	TSS	2						
PO4	0.06								

RECEIVED
DEC 0 8 2001
SDWA

Fee
Collected by PO# 201042
WS I.D.
SDWA—Pri Sec
1st 2nd 3rd
Date Rec'd Init.

ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks
sample labeled Thomas @ Arrow Creek
per Mike PO4 = T-P 10/25/01 @ 815A. S.
MC 11/20/01
MC 11/27/01 RESULTS REPORTED
NOV 29 2001

O-1561 (Rev. 4-92)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

PO ~~221383~~ 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

mid Thomas

152168

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

RECEIVED
01 NOV 15 PM 3:24
NEVADA STATE HEALTH LABORATORY

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

[X] Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 18N Range 20E Section 8
General Location Mid-Thomas
Source/Address @ 395

SAMPLING INSTRUCTIONS:
The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 11/15/01
Owner Washoe Co Phone 9544655
Address PO Box 11130
City Reno State NV ~~89502~~ 89520

REASON FOR ANALYSIS:
- [ ] Loan
- [ ] Personal health reasons
- [ ] Purchase of the property
- [ ] Rental or sale of property
- [ ] Subdivision approval
- [X] Other Raw water

USE OF WATER:
- [ ] Domestic drinking water
- [ ] Geothermal
- [ ] Industrial or mining
- [ ] Irrigation
- [ ] Other
Initials

REPORT TO:
Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

SOURCE OF WATER:
Filter [ ] Yes [ ] No
Public [ ] Yes [ ] No
Spring
Well .... Depth .... ft.
Hot .... Cold ....
IN USE: [ ] Yes [ ] No

Type
Name
Surface
Casing diameter .... in.
Casing depth .... ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

0.1103 148 0.70 22.2 4.2 0.0 378 152168

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 180° C.	133	Chloride	4	Iron	0.57	Color	15
Hardness	73	Nitrate -N	0.4	Manganese	0.06	Turbidity	12.0
Calcium	16	Alkalinity	84	Copper	0.00	pH	7.88
Magnesium	8	Bicarbonate	102	Zinc	0.01	EC	190
Sodium	10	Carbonate	0	Barium	0.08	SI@20C	-0.48
Potassium	4	Fluoride	0.05	Boron	0.0		
Sulfate	4	Arsenic	< 0.003	Silica	48		
TP 0.12	~~0.14~~	TSS	62				
TKN	~~0.62~~	TKN	0.62				

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. .... Sec. ....
1st .... 2nd .... 3rd ....
Date Rec'd .... Init. ....

Remarks

AK 12/20/01

RESULTS REPORTED
DEC 2 4 2001

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/9

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

PO ~~201383~~ 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

L. Thomas 152165

RECEIVED
01 NOV 15 PM 3:24
NEVADA STATE HEALTH LABORATORY

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS:

State NV County Washoe
Township 18N Range 20E Section 4
General Location L. Thomas Creek
Source Address Trade Mark DR

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 11/15/01
Owner Washoe Co Phone 9544655
Address POBox 11130
City Reno State NV ~~89502~~ 89520

REPORT TO:

Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

☐ Loan
☐ Personal health reasons
☐ Purchase of the property
☐ Rental or sale of property
☐ Subdivision approval
☒ Other Raw water

USE OF WATER:

☐ Domestic drinking water
☐ Geothermal
☐ Industrial or mining
☐ Irrigation
☐ Other
Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
0.0462	239	0.54	15.7	6.4	0.0	903	152165
T.D.S. @ 180° C.	172	Chloride	12	Iron	0.34	Color	15
Hardness	109	Nitrate -N	0.1	Manganese	0.04	Turbitity	6.5
Calcium	24	Alkalinity	128	Copper	0.00	pH	8.05
Magnesium	12	Bicarbonate	156	Zinc	0.01	EC	320
Sodium	19	Carbonate	0	Barium	0.11	SI@20C	0.02
Potassium	6	Fluoride	0.11	Boron	0.5		
Sulfate	10	Arsenic	0.014	Silica	34		
TP	0.1	TSS	21				
TKN	0.68						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks MR 12/20/01

RESULTS REPORTED
DEC 24 2001

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

NEVADA DIVISION OF HEALTH
1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

151812

RECEIVED
DEC 13 2001
WASHOE COUNTY
DEPT. OF WATER RESOURCES

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/24/01
Owner Washoe County Phone 9544655
Address 4930 Energy Way
City Reno State NV

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 18 Range 20 Section 19
General Location Whites Creek & Fieldcreek Subd.
Source Address ⊙ Silverwolf

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 180° C.	64	Chloride	<1	Iron	0.15	Color	10
Hardness	28	Nitrate -N	0.7	Manganese	0.01	Turbitity	1.6
Calcium	8	Alkalinity	30	Copper	0.00	pH	7.89
Magnesium	2	Bicarbonate	37	Zinc	0.00	EC	83
Sodium	5	Carbonate	0	Barium	0.01	SI@20C	-1.18
Potassium	2	Fluoride	0.03	Boron	0.0		
Sulfate	7	Arsenic	< 0.003	Silica	28		
TKN	0.18	TSS	2				
PO4	0.02						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

RECEIVED
DEC 06 2001
HEALTH PROTECTION

Fee
Collected by D.H. # 201047
PWS I.D.
SDWA—Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.
ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks Sample labeled Whites @ Wolf Run
per Mike PO4 = T-P. 10/25/01 @ 815A.S

JK 11/20/01 JK 11/21/01

RESULTS REPORTED
NOV 29 2001

J K

O-1561 (Rev. 4-92)

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PO ~~201383~~ 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

L. whites

152167

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

RECEIVED
01 NOV 15 PM 3:24
NEVADA STATE HEALTH LABORATORY

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS

State NV County Washoe
Township 18N Range 20E Section 16
General Location @ old S. Virginia
Source Address L. whites

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 11/15/01
Owner Washoe Co Phone 9544655
Address POBox 11130
City Reno State NV ~~89502~~ 89520

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other Raw water

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

REPORT TO:

Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
~~-0.0032~~	65	0.78	12.7	1.6	0.0	****	152167
T.D.S. @ 180° C.	62	Chloride	1	Iron	0.11	Color	10
Hardness	28	Nitrate -N	0.0	Manganese	0.00	Turbitity	1.1
Calcium	8	Alkalinity	32	Copper	0.00	pH	7.90
Magnesium	2	Bicarbonate	39	Zinc	0.00	EC	80
Sodium	5	Carbonate	0	Barium	0.01	SI@20C	-1.14
Potassium	2	Fluoride	0.03	Boron	0.0		
Sulfate	8	Arsenic	< 0.003	Silica	27		
TP	0.02	TSS	<1				
TKN	0.26						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks
12-13-01 R

RESULTS REPORTED
DEC 21 2001
RECEIVED
DEC 26 2001
DEPT OF WATER RESOURCES

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

(PLEASE PRINT OR TYPE)

NEVADA DIVISION OF HEALTH
1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

DEC 13 2001
WASHOE COUNTY
DEPT. OF WATER RESOURCES

1518

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 17 Range 19 Section 2
General Location Galena, Upper
Source Address @ County Park, Collahan

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/24/01
Owner Washoe County Phone 9544655
Address 4930 Energy Way
City Reno State NV

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 105° C.	87	Chloride	7	Iron	< .10	Color	5
Hardness	40	Nitrate N	0.1	Manganese	0.01	Turbidity	3.7
Calcium	11	Alkalinity	50	Copper	0.00	pH	7.92
Magnesium	3	Bicarbonate	61	Zinc	0.01	EC	.130
Sodium	7	Carbonate	0	Barium	.03	SI@20C	0.80
Potassium	2	Fluoride	0.03	Boron	0.0		
Sulfate	3	Arsenic	< 0.003	Silica	30		
TKN	0.33	TSS	4				
PO4	0.02						

-0.0936 93 0.67 14.0 2.3 0.0 -445 151814

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

RECEIVED
DEC 06 2001
HEALTH PROTECTION

Fee
Collected by PO #20148
PWS I.D.
SDWA—Pri Sec
1st 2nd 3rd
Date Rec'd Init.
ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks
per Mike PO4 = T-P 10/25/01 @ 8154.S.

AH 11/20/01 AH 11/27/01 RESULTS REPORTED
NOV 29 2001

0-1561 (Rev. 4-92)

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1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

RECEIVED
DEC 13 2001
WASHOE COUNTY
DEPT. OF WATER RESOURCES

151815

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 17 Range 19 Section 12
General Location Mid Galena
Source Address Galena Canyon

TYPE OF ANALYSIS:

X Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/24/01
Owner Washoe County Phone 9544655
Address 4930 Energy Way
City Reno State NV

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

0.1369 133 0.74 23.6 3.5 5.0 305 151815

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW Constituent	ppm
T.D.S. @ ~~105°~~ C.	134	Chloride	7	Iron	0.65	Color	12		
Hardness	39	Nitrate N 0.2 0		Manganese	0.03	Turbidity	4.5		
Calcium	15	Alkalinity	79	Copper	0.00	pH	7.85		
Magnesium	3	Bicarbonate	96	Zinc	0.00	EC	180		
Sodium	10	Carbonate	0	Barium	0.04	SI@20C	-0.59		
Potassium	3	Fluoride	0.05	Boron	0.0				
Sulfate	1	Arsenic	< 0.003	Silica	30				
TKN	0.21	TSS	5						
PO4	0.04								

RECEIVED
DEC 06 2001
HEALTH DIVISION

Fee
Collected by PO #201040
PWS I.D.
SDWA—Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.
ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks
per Mike PO4 = T-P 10/25/01 @815A.S.

AM 11/20/01 AM 11/27/01 RESULTS REPORTED
J K NOV 29 2001

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1660 N. Virginia Street
Reno, Nevada 89503
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RECEIVED
DEC 13 2001
WASHOE COUNTY
DEPT OF WATER RESOURCES

151816

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 17 Range 20 Section 7
General Location Lower Galena cr
Source Address @ 395

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/24/01
Owner Washoe County Phone 9544655
Address 4930 Energy Way
City Reno State NV

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

0.0515 97 0.72 17.5 2.3 0.0 809 151816

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 103° C.	99	Chloride	7	Iron	1.11	Color	5
Hardness	41	Nitrate -N	0.0	Manganese	0.04	Turbidity	1.1
Calcium	10	Alkalinity	50	Copper	0.01	pH	8.05
Magnesium	4	Bicarbonate	61	Zinc	0.01	EC	160
Sodium	10	Carbonate	0	Barium	0.03	SI@20C	-0.77
Potassium	2	Fluoride	0.05	Boron	0.0		
Sulfate	3	Arsenic	< 0.003	Silica	37		

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

TKN	0.26	TSS	3				
PO4	0.09						

RECEIVED
DEC 06 2001
HEALTH PROTECTION

Fee
Collected by PO# 201447
PWS I.D.
SDWA—Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.
ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks
per Mike PO4 = T-P 10/25/01 @ 815A.S.

SL 11/20/01 SL 11/27/01 RESULTS REPORTED
NOV 29 2001

O-1561 (Rev. 4-92)

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NEVADA STATE HEALTH LABORATORY
NEVADA DIVISION OF HEALTH
1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

RECEIVED DEC 13 2001 DEPT. OF WATER RESOURCES

151865

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 19N Range 18E Section 7
General Location Dog creek @ Truckee
Source Address

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/31/01
Owner Washoe County Phone 9544655
Address 4930 Energy Way PO Box 11130
City Reno State NV 89520

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY
-0.1310 236 0.57 19.6 7.3 0.0 -318 151865

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 103° C.	172	Chloride	2	Iron	0.03	Color	7
Hardness	117	Nitrate -N	0.0	Manganese	0.00	Turbidity	0.5
Calcium	27	Alkalinity	146	Copper	0.00	pH	8.20
Magnesium	12	Bicarbonate	178	Zinc	0.00	EC	300
Sodium	12	Carbonate	0	Barium	0.04	SI@20C	0.28
Potassium	2	Fluoride	0.04	Boron	0.0		
Sulfate	3	Arsenic	< 0.003	Silica	42		
TKN	0.2	TP	0.03				
TSS	3						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

RECEIVED DEC 06 2001

Fee
Collected by
PWS I.D.
SDWA—Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.
ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks: JC 11/20/01 JC 11/27/01 R

Your sample for Nitrate was analyzed in a batch where the Laboratory Fortified Matrix (LFM) failed.

RESULTS REPORTED
NOV 29 2001

O-1561 (Rev. 4-93)

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NEVADA DIVISION OF HEALTH
1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

DEC 13 2001
WASHOE COUNTY
DEPT. OF WATER RESOURCES

151864

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township T19N Range R19E Section 16
General Location Alum Cr @ Truckee River
Source Address

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/31/01
Owner Washoe County Phone 9544655
Address ~~4930 Energy Way~~ PO Box 11130
City Reno State NV 89520

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No Type
Public ☐ Yes ☐ No Name
Spring Surface
Well Depth ft. Casing diameter in.
Hot Cold Casing depth ft.
IN USE ☐ Yes ☐ No

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY: -0.9021 747 0.74 18.7 5.1 0.0 -46 151864

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW: Constituent	ppm
T.D.S. @ 103° C.	740	Chloride	14	Iron	0.44	Color	12		
Hardness	410	Nitrate -N	0.0	Manganese	0.09	Turbidity	7.2		
Calcium	100	Alkalinity	102	Copper	0.01	pH	7.90		
Magnesium	39	Bicarbonate	124	Zinc	0.01	EC	1000		
Sodium	45	Carbonate	0	Barium	0.06	SI@20C	0.32		
Potassium	5	Fluoride	0.18	Boron	0.0				
Sulfate	420	Arsenic	0.006	Silica	40				
TKN	0.58	TP	0.11						
TSS	16								

RECEIVED
DEC 06 2001
HEALTH PROTECTION

Fee
Collected by
PWS I.D.
SDWA—Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks 11/20/01 JC 11/21/01

Your sample for Nitrate was analyzed in a batch where the Laboratory Fortified Matrix (LFM) failed.

RESULTS REPORTED
NOV 29 2001

O-1561 (Rev. 4-93)

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NEVADA STATE HEALTH LABORATORY
NEVADA DIVISION OF HEALTH
1660 N. Virginia Street
Reno, Nevada 89503
(702) 688-1335

RECEIVED
DEC 13 2001
WASHOE COUNTY
151863

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 19N Range 19E Section 19
General Location Hunter Cr @ Truckee R
Source Address

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by Michael Widmer Date 10/31/01
Owner Washoe County Phone 9544655
Address ~~4930~~ Energy Way PO Box 11130
City Reno State NV 89520

REPORT TO:

Name Michael Widmer, Water Resources
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY: -0.0357 120 0.64 16.7 2.2 0.0 -1167 151863

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW: Constituent	ppm
T.D.S. @ 103° C.	116	Chloride	1	Iron	0.16	Color	10		
Hardness	58	Nitrate -N	0.0	Manganese	0.02	Turbidity	1.6		
Calcium	15	Alkalinity	44	Copper	0.00	pH	7.75		
Magnesium	5	Bicarbonate	54	Zinc	0.00	EC	180		
Sodium	8	Carbonate	0	Barium	0.02	SI@20C	-0.91		
Potassium	3	Fluoride	0.05	Boron	0.0				
Sulfate	34	Arsenic	< 0.003	Silica	36				
TKN	0.15	TP	0.05						
TSS	~~45~~ 5								

DEC 06 2001

Fee
Collected by
WS I.D.
SDWA—Pri Sec
1st 2nd 3rd
Date Rec'd Init.

ppm = parts per million, milligrams per liter
S.U. = Standard Units

Remarks JK 11/20/01 SR 11/27/01 R

RESULTS REPORTED
NOV 29 2001

Your sample for Nitrate was analyzed in a batch where the Laboratory Fortified Matrix (LFM) failed.

O-1361 (Rev. 4-92)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

PO 201042

NEVADA STATE HEALTH LABORATORY

University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

Fourth

WATER CHEMISTRY ANALYSIS:

RECEIVED
01 NOV 20 AM 11:47
NEVADA STATE HEALTH LABORATORY

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 19N Range 19E Section 17
General Location Fourth St.
Source Address ⊙ West of McCarran

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 11/20/01
Owner Washoe Co Phone 9544655
Address PO Box 11130
City Reno State NV 89520

REPORT TO:

Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- ☒ Other Raw water

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

1 2381 | 2 0.88 | 3 14.5 | 4 152198

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 180° C.	3080	Chloride	120	Iron	0.01	Color	7
Hardness	1888	Nitrate -N	3.0	Manganese	0.01	Turbitity	0.5
Calcium	360	Alkalinity	290	Copper	0.00	pH	8.42
Magnesium	240	Bicarbonate	344	Zinc	0.00	EC	3500
Sodium	236	Carbonate	5	Barium	0.03	SI@20C	1.79
Potassium	5	Fluoride	0.18	Boron	0.0		
Sulfate	1800	Arsenic	0.014	Silica	67		
TP	0.26	TSS	<1				
TKN	0.35						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks
MC 12/20/01
J
☐ Unsealed
☐ Broken ☐ Leaking
Temp.
Holding Time OK ☐ Yes ☐ No
[ ] Preserved Correctly

RESULTS REPORTED
DEC 24 2001

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/9

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

PO 201042

NEVADA STATE HEALTH LABORATORY

University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

Shadow 152199

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

RECEIVED
01 NOV 20 AM 11:
NEVADA STATE HEALTH LABORATORY

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

X Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 20N Range 20E Section 27
General Location Shadow Ln
Source Address Sparks Blvd

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 11/20/01
Owner Washoe Co Phone 9544655
Address PO Box 11130
City Reno State NV 89520

REPORT TO:

Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

- ☐ Loan
- ☐ Personal health reasons
- ☐ Purchase of the property
- ☐ Rental or sale of property
- ☐ Subdivision approval
- X Other Raw water

USE OF WATER:

- ☐ Domestic drinking water
- ☐ Geothermal
- ☐ Industrial or mining
- ☐ Irrigation
- ☐ Other
- Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

-0.4438 896 | 0.61 16.0 12.8 0.1 -94 152199

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 180° C.	728	Chloride	70	Iron	1.48	Color	20
Hardness	210	Nitrate -N	1.8	Manganese	0.12	Turbitity	27.0
Calcium	51	Alkalinity	256	Copper	0.02	pH	8.37
Magnesium	20	Bicarbonate	307	Zinc	0.02	EC	1200
Sodium	182	Carbonate	2	Barium	0.06	SI@20C	0.90
Potassium	4	Fluoride	0.35	Boron	0.3		
Sulfate	260	Arsenic	0.015	Silica	34		

TP	0.18	TSS	52				
TKN	1.15						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

RESULTS REPORTED
DEC 24 2001

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks
jfc 12/20/01
J
☐ Unsealed
☐ Broken ☐ Leaking
Temp.
Holding Time OK ☐ Yes ☐ No
☐ Preserved Correctly

Reporting Limits
Calcium 1.0 ppm
Magnesium 1.0 ppm
Sodium 1.0 ppm
Potassium 1.0 ppm
Iron 0.10 ppm
Manganese 0.04 ppm
Copper 0.04 ppm
Zinc 0.10 ppm
Barium 0.04 ppm
Boron 0.2 ppm
Silica 2 ppm

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

IN TRIPLICATE
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PO ~~201383~~ 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

Lower North Truckee Drain 152166

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

RECEIVED
01 NOV 15 PM 3:21
NEVADA STATE HEALTH LABORATORY

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 19 N Range 20 E Section 11
General Location Alamo lot
Source Address L. N. Truckee drain @ S. of Truckee R.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 11/15/01
Owner Washoe Co Phone 9544655
Address PO Box 11130
City Reno State NV ~~89502~~ 89520

REPORT TO:

Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

☐ Loan
☐ Personal health reasons
☐ Purchase of the property
☐ Rental or sale of property
☐ Subdivision approval
☒ Other Raw water

USE OF WATER:

☐ Domestic drinking water
☐ Geothermal
☐ Industrial or mining
☐ Irrigation
☐ Other
Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent		Constituent		Constituent		Constituent		PRINT OTHER DESIRED CONSTITUENTS BELOW	
0.0598	679 ppm	0.59	16.4 ppm	13.2	0.0 -697	152166	S.U.	Constituent	ppm
T.D.S. @ 180° C.	532	Chloride	39	Iron	0.28	Color	10		
Hardness	296	Nitrate -N	0.6	Manganese	0.49	Turbitity	6.7		
Calcium	64	Alkalinity	264	Copper	0.00	pH	7.94		
Magnesium	33	Bicarbonate	322	Zinc	0.01	EC	900		
Sodium	74	Carbonate	0	Barium	0.09	SI@20C	0.59		
Potassium	6	Fluoride	0.13	Boron	0.2				
Sulfate	140	Arsenic	0.005	Silica	35				
TP	0.28	TSS	6						
TKN	0.53								

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks SIC 12/20/01

RESULTS REPORTED
DEC 24 2001

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/9

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(PLEASE PRINT OR TYPE)

PO ~~201383~~ 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

Marina

152164

WATER CHEMISTRY ANALYSIS:

RECEIVED
01 NOV 15 PM 3:24
NEVADA STATE HEALTH LABORATORY

Attention: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☒ Check here for ROUTINE DOMESTIC ANALYSIS
Circle the constituents needed for PARTIAL ANALYSIS

State NV County Washoe
Township 19 Range 20 Section 10
General Location Sparks
Source Address Marina discharge

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running about ten (10) minutes.

Sampled by M. Widmer Date 11/15/01
Owner Washoe Co Phone 9544655
Address PO Box 11130
City Reno State NV ~~89502~~ 89520

REPORT TO:

Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

☐ Loan
☐ Personal health reasons
☐ Purchase of the property
☐ Rental or sale of property
☐ Subdivision approval
☒ Other Raw water

USE OF WATER:

☐ Domestic drinking water
☐ Geothermal
☐ Industrial or mining
☐ Irrigation
☐ Other
Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
-0.2287	660	0.58	16.0	13.5	0.0	-182	152164
T.D.S. @ 180° C.	496	Chloride	38	Iron	0.34	Color	7
Hardness	345	Nitrate -N	0.1	Manganese	0.76	Turbitity	5.9
Calcium	74	Alkalinity	270	Copper	0.01	pH	7.75
Magnesium	39	Bicarbonate	329	Zinc	0.02	EC	850
Sodium	43	Carbonate	0	Barium	0.10	SI@20C	0.48
Potassium	7	Fluoride	0.06	Boron	0.2		
Sulfate	130	Arsenic	0.005	Silica	34		
TP	0.4	TSS	65				
TKN	0.47						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
WS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks
Entered by JK 12/20/01
Received by
Condition: ☐ Spoiled ☐ Unpreserved
☐ Broken ☐ Leaking
Temp
Headspace ☐ Yes ☐ No
Preservative

RESULTS REPORTED
DEC 24 2001

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

PO ~~2013~~ 201042

NEVADA STATE HEALTH LABORATORY

University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

152169

Boynton

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

RECEIVED
01 NOV 15 PM 3:24
NEVADA STATE HEALTH LABORATORY

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

[X] Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 19N Range 20E Section 21
General Location Boynton
Source Address McCarran

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 11/15/01
Owner Washoe Co Phone 9544655
Address PO Box 11130
City Reno State NV ~~89502~~ 89520

REASON FOR ANALYSIS:

- [ ] Loan
- [ ] Personal health reasons
- [ ] Purchase of the property
- [ ] Rental or sale of property
- [ ] Subdivision approval
- [X] Other Raw water

USE OF WATER:

- [ ] Domestic drinking water
- [ ] Geothermal
- [ ] Industrial or mining
- [ ] Irrigation
- [ ] Other
- Initials

REPORT TO:

Name Michael Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

SOURCE OF WATER:

Filter [ ] Yes [ ] No
Public [ ] Yes [ ] No
Spring
Well Depth ft.
Hot Cold
IN USE: [ ] Yes [ ] No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

-0.0805 462 0.62 27.7 10.7 0.1 -517 152169

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	S.U.
T.D.S. @ 180° C.	374	Chloride	17	Iron	0.39	Color	5
Hardness	172	Nitrate -N	1.5	Manganese	0.05	Turbidity	11.0
Calcium	41	Alkalinity	214	Copper	0.00	pH	8.44
Magnesium	17	Bicarbonate	256	Zinc	0.01	EC	600
Sodium	58	Carbonate	2	Barium	0.12	SI@20C	0.82
Potassium	7	Fluoride	0.60	Boron	0.3		
Sulfate	64	Arsenic	~~0.022~~ 0.025	Silica	59		
TP	0.14	TSS	16				
TKN	0.62						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks
Delivered by SK 12/20/01
Received by
Condition: [ ] Sealed [ ] Unsealed
[ ] Broken [ ] Leaking
Temp.
Holding Time Exc. [ ] Yes [ ] No
Thermometer Correction

RESULTS REPORTED DEC 24 2001

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/9

RSITY OF NEVADA SCHOC
1660 N. Virginia Stre
Reno, Nevada 8950

~~X~~ B40151 W01 27579 W01 27580

Sam Michael Widmer Date 10/24/01 Hour 9 30 Am

Location Thomas Cr. @ Arrowcreek County Washoe

Public Water System none

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

PC# 20104-5

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

creek water, no dilution

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1:	/100 ml.
Fecal Coliform 1: 8	/100 ml.
E. Coli 1:	/100 ml.
Fecal Streptococcus 1: 34	/100 ml.
Enterococcus 1:	/100 ml.

Date 10-25-01 Tech

(Rev 10-97)

WATER BACTERIOLOGY

$\frac{C}{S} = 0.24$ livestock

PO # 201042

AB40161

UNIVERSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

Sam,... Michael Widmer Date 11/15/01 Hour 1:45

Location Mid Thomas County Washoe

Public Water System — W01 28094

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance W01 28095

T

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other .....

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date ..... Tech .....

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ..... ☐ Confluent Growth ..... ☐

Received > 20°C ..... ☐ < 100 mls ..... ☐

> 200 Other bacteria .... ☐ Other ..... ☐

Sediment ..... ☐ @ .....

creek water

☒ Raw or Wastewater Analysis

Methods: dilute 1:10 and 1:100

☐ Membrane Filter ☐ MPN

☐ Other .....

RECEIVED NOV 15 PM 3:22 STATE LABORATORY

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: _____ ..... /100 ml.

Fecal Coliform 1: -1-2 ..... 20/<1 /100 ml

E. Coli 1: _____ ..... /100 ml.

Fecal Streptococcus 1: -1-2 ..... 110/<10 /100 ml

Enterococcus 1: _____ ..... /100 ml.

Date 11-16-01 Tech [signature]

9 11-18-01

(Rev 10

WATER BACTERIOLOGY

1:10 1:100

20/110 = 0.18 ∴ <100/100

Washed

Donna confirmed

PO # 201042

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

Al Bilotes

Sam... Mike Widmer Date 11-15-01 Hour 10:00

Location Lower Thomas Creek County Washoe

Public Water System

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28098

W01 28099

TH

YOUR RETURN ADDRESS

Name Mike Widmer

Address GLC

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date ..... Tech .....

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment

NEVADA STATE HEALTH LABORATORY
RECEIVED
01 NOV 15 PM 2:22

☒ Raw or Wastewater Analysis

Methods: 1:10 and 1:100

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1: _____	50 /100 ml.
Fecal Coliform 1: -1/-2	<100 /100 ml.
E. Coli 1: _____	130 /100 ml.
Fecal Streptococcus 1: -1/-2	200 /100 ml.
Enterococcus 1: _____	/100 ml.

Date 11-17-01 Tech AC
+ 11-18-01

(Rev 10-97)

WATER BACTERIOLOGY

1:10

$\frac{50}{130} = 0.4$

1:100

$\frac{<100}{200}$

livestock

RSITY OF NEVADA SCHOOL OF MEDICINE
1500 N. Virginia Street
Reno, Nevada 89503

A-B40162

PO # 201042

Sam Michael Widmer Date 11/15/01 Hour 2:30

Location L. whites @ S. Virginia County Washoe

Public Water System —

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28092

W01 28093 Y

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth

Received > 20°C ☐ < 100 mls

> 200 Other bacteria ☐ Other

Sediment

RECEIVED 2001 NOV 15 PM 3:22 STATE LABORATORY

☐ Raw or Wastewater Analysis

Methods: 1:10 dilute 1:10

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: _____ 50 /100 ml.

Fecal Coliform 1: _____ <1.0 /100 ml.

E. Coli 1: _____ K /100 ml.

Fecal Streptococcus 1: _____ <1.0 /100 ml.

Enterococcus 1: _____ /100 ml.

Date 11-17-01 Tech

11-18-01

(Rev 10-97)

WATER BACTERIOLOGY

1:10

$\frac{50}{80} = 0.62$

MWSock

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

W01 27577 W01 27578

~~AB40150~~

Sam Michael Widmer Date 10/24/01 Hour 9 Am

Location Whites Creek @ County Washoe

Public Water System none

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

PC# 20150

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

creek water, no dilution

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1: _____	/100 ml.
Fecal Coliform 1: _____	29 /100 ml.
E. Coli 1: _____	/100 ml.
Fecal Streptococcus 1: _____	>60 /100 ml.
Enterococcus 1: _____	/100 ml.

Date 10/25/01 Tech MW

(Rev 10-97)

WATER BACTERIOLOGY

S S 20.5 livestock

RSITY OF NEVADA
1660 N. Virgi
Reno, Neva

W01 27581 W01 27582

ABY0152

Sam Michael Widmer Date 10/24/01 Hour 1300

Location Galena Creek @ Park (Upper) County Washoe

Public Water System —

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

P + 20/5/3

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other

Sediment ☐

creek water, no dilution

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: _____ /100 ml.

Fecal Coliform 1: _____ 51 /100 ml.

E. Coli 1: _____ /100 ml.

Fecal Streptococcus 1: _____ >60 /100 ml

Enterococcus 1: _____ /100 ml

Date 10-25-01 Tech WW

(Rev

WATER BACTERIOLOGY

$\frac{C}{S} < 0.25$ livestock

RSITY OF NEVA
1660 N.
Reno, N

W01 27583 W01 27584

AB40153

Sam Michael Widmer Date 10/24/01 Hour 1400

Location Mid Galena Creek County Washoe

Public Water System —

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

P/A 20134

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

Creek water, no dilution

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1: _____	/100 ml.
Fecal Coliform 1: _____	14 /100 ml.
E. Coli 1: _____	/100 ml.
Fecal Streptococcus 1: _____	22 /100 ml.
Enterococcus 1: _____	/100 ml.

Date 10/25/01 Tech uw

(Rev 10-97)

WATER BACTERIOLOGY

$\frac{C}{S} = 0.64$ livestock

RSITY OF NEVADA S
1660 N. Virgir
Reno, Neva

AKB401571 W01 27585 W01 27586

Sam Michael Widmer Date 10/25/01 Hour 1430

Location Lower Galena @ 395 County Washoe

Public Water System

ID No. For Compliance

Chlorine Residual Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name Michael Widmer

Address WC DWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

PO# 701012

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other

Sediment ☐

creek water, no dilution

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1:	/100 ml.
Fecal Coliform 1:	34 /100
E. Coli 1:	/100 ml.
Fecal Streptococcus 1:	22 /100
Enterococcus 1:	/100 ml.

Date 10/25/01 Tech

(Rev

WATER BACTERIOLOGY

5/5 = 1.5 grab once, but close to human source

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

WU1 27679
W01 27680

A 240157

Sam Michael Widmer Date 10/31/01 Hour 1130

Location Dog Creek @ Truckee River County Washoe

Public Water System

ID No. For Compliance

Chlorine Residual Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name WCWR

Address

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

Creek water, no dilution

☐ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: /100 ml.

Fecal Coliform 1: <1 /100 ml.

E. Coli 1: /100 ml.

Fecal Streptococcus 1: 11 /100 ml.

Enterococcus 1: /100 ml.

Date 11-02-01 Tech

(Rev 10-97)

WATER BACTERIOLOGY

$\frac{<1}{11} \leq 0.09$

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

W01 27678

A Bugoisle

Sam, MICHAEL WIDNER Date 10/31/01 Hour 1030

Location Hunter Creek @ Truckee River County Washoe

Public Water System

ID No. For Compliance

Chlorine Residual Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name WCDWR

Address

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

creek water, no dilution

☐ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: /100 ml.

Fecal Coliform 1: 2 /100 ml.

E. Coli 1: /100 ml.

Fecal Streptococcus 1: 20 /100 ml.

Enterococcus 1: /100 ml.

Date 11-02-01 Tech

(Rev 10-97)

WATER BACTERIOLOGY

$\frac{2}{20} = 0.1$

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

A Bullock

PO 201042

Sam. Alum Cr Date 11/20/01 Hour 1030

Location Idelwild County Washoe

Public Water System —

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28131

W01 28132

YOUR RETURN ADDRESS

Name M. Widmer

Address 4930 Energy Way

Reno 89502

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date ..... Tech .....

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment

Creek water

☐ Raw or Wastewater Analysis

Methods: Please dilute 1:10 & 1:100

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: _____ /100 ml.

Fecal Coliform 1: _____ 30 / <10 /100 ml.

E. Coli 1: _____ 350 /100 ml.

Fecal Streptococcus 1: _____ 300 /100 ml.

Enterococcus 1: _____ /100 ml.

Date 11-21-01 Tech

11-22-01

(Rev 10-97)

WATER BACTERIOLOGY

1:10

$\frac{30}{350} = 0.08$

1:100

$\frac{<100}{300}$

livestock

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

W01 27675

W01 27676

AFB401 55

Sam Michael Widmer Date 10/31/01 Hour 10 00

Location Alum Cr @ Truckee River County Washoe

Public Water System

ID No. For Compliance

Chlorine Residual Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name WCDWR

Address

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls

> 200 Other bacteria ☐ Other

Sediment ☐

Raw water, no dilution

☐ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: /100 ml.

Fecal Coliform 1: >60 /100 ml.

E. Coli 1: /100 ml.

Fecal Streptococcus 1: >60 /100 ml.

Enterococcus 1: /100 ml.

Date 11-02-01 Tech JOan

(Rev 10-97)

WATER BACTERIOLOGY

>60
>60 ⇒ 1

resample

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

A-B101616 PO 201042

Sam Fourth Date 11/20/01 Hour 1045

Location Fourth St. & McCarran County Washoe

Public Water System /

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28135

W01 28136

YOUR RETURN ADDRESS

Name M. Widmer

Address 4930 Energy Way

Reno, 89502

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment

RECEIVED
2001 NOV 20 A 11:59
NEVADA STATE HEALTH LABORATORY

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: _____ /100 ml

Fecal Coliform 1: _____ <10 /100 ml

E. Coli 1: _____ <10 /100 ml

Fecal Streptococcus 1: _____ <100 /100 ml

Enterococcus 1: _____ /100 ml

Date 11-21-01 Tech

11-22-01

(Rev 10-97)

WATER BACTERIOLOGY

clear

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

A-B40163 P0201042

Sam... ~~M widmer~~ Shadow Date 11/20/01 Hour 945

Location Shadow Ln. Sparks Blvd County Washoe

Public Water System —

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28133

W01 28134

YOUR RETURN ADDRESS

Name Michael Widmer

Address 4930 Energy Way

Reno 89502

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other .....

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date ..... Tech .....

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment .....

Creek water

☐ Raw or Wastewater Analysis

Methods: dilution ☐ MPN

☐ Membrane Filter

☐ Other .....

RECEIVED
2001 NOV 20 AM 11:59
NEVADA STATE HEALTH LABORATORY

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: 10 & 1:100 2005 /100 ml.

Fecal Coliform 1: 10 & 1:100 640 /100 ml.

E. Coli 1: _____ /100 ml.

Fecal Streptococcus 1: _____ /100 ml.

Enterococcus 1: _____ /100 ml.

Date 11-21-01 Tech

(Rev 10-

WATER BACTERIOLOGY

PO # 201042

A-240153

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

Sam_... Michael Widmer Date 11/15/01 Hour 11:00

Location Lower N. Truckee Drain County Washoe

Public Water System

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28102

W01 28103 Y

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date ..... Tech .....

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment

RECEIVED NOV 15 3:22 HEALTH LABORATORY NEVADA STATE

☒ Raw or Wastewater Analysis Please

Methods: dilute 1:10 and 1:100

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1: _____	150 /100 ml.
~~Fecal Coliform~~ 1: -1/-2	100 /100 ml.
E. Coli 1: _____	180 /100 ml.
Fecal Streptococcus 1: -1/-2	100 /100 ml.
Enterococcus 1: _____	..... /100 ml.

Date 11-17-01 Tech JDavis
11-18-01

(Rev 10-97)

WATER BACTERIOLOGY

1:10

$\frac{150}{180} = 0.5$

1:100

$\frac{100}{100} = 1$

livestock

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

AB40159

PO # 201042

Sam Michael Widmer Date 11/15/01 Hour 1130

Location Marina County Washoe

Public Water System —

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28100

W01 28101

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date ..... Tech .....

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment

NEVADA STATE HEALTH LABORATORY
01 NOV 15 PM 3:22

☐ Raw or Wastewater Analysis Please

Methods: dilute to 100 and

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed) RESULTS

Total Coliform 1: _____ 1100 /100 ml.

~~Fecal Coliform~~ 1: -1/-2 100 /100 ml.

E. Coli 1: _____ 90 /100 ml.

~~Fecal Streptococcus~~ 1: -1/-2 100 /100 ml.

Enterococcus 1: _____ /100 ml.

Date 11-17-01 Tech

& 11-18-01

(Rev 10-97)

WATER BACTERIOLOGY

1:10

1100 / 90 = 12.2

1:100

100 / 100 = 1

human

7

PO # 201042

RSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

A-DH0160

Sam Michael Widmer Date 11/15/01 Hour 13:30

Location Boynton Canyon County Washoe

Public Water System —

ID No. _____ For Compliance

Chlorine Residual _____ Not for Compliance

W01 28096

W01 28097

YOUR RETURN ADDRESS

Name Michael Widmer

Address WCDWR

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment

NEVADA STATE HEALTH LABORATORY
01 NOV 15 PM 3:22
RECEIVED

☒ Raw or Wastewater Analysis

Methods: dilute and 1:10 MPN

☐ Membrane Filter

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1: _____	>600 /100 ml.
Fecal Coliform 1: -1/-2	n.a. /100 ml.
E. Coli 1: _____	340 /100 ml.
Fecal Streptococcus 1: -1/-2	340 /100 ml.
Enterococcus 1: _____	..... /100 ml.

Date 11-17-01 Tech

11-18-01

(Rev. 10-97)

WATER BACTERIOLOGY

1:10 1:100

$\frac{>600}{340}$ $\frac{1100}{300} = 3.67$ mixed bact ⇒ Septage

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Sierra Environmental Monitoring
1135 Financial Blvd.
Reno, NV 89502
Job#:

Attn: John Seher
Phone: (775) 857-2400
Fax: (775) 857-2404

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	(S200111-0795) Lower Thomas	TPH-E (Jet Fuel)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH-E (Diesel)	ND	0.50 mg/L	11/15/01	11/18/01
Lab ID :	SEM01111608-01A	TPH-E (Oil)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH Purgeable	ND	0.50 mg/L	11/15/01	11/25/01
Client ID :	(S200111-0796) Lower N. Truckee Drain	TPH-E (Jet Fuel)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH-E (Diesel)	ND	0.50 mg/L	11/15/01	11/18/01
Lab ID :	SEM01111608-02A	TPH-E (Oil)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH Purgeable	ND	0.50 mg/L	11/15/01	11/25/01
Client ID :	(S200111-0797) Marina	TPH-E (Jet Fuel)	ND	0.50 mg/L	11/15/01	11/18/01
Lab ID :	SEM01111608-03A	TPH-E (Diesel)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH-E (Oil)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH Purgeable	ND	0.50 mg/L	11/15/01	11/25/01
Client ID :	(S200111-0798) Boynton	TPH-E (Jet Fuel)	ND	0.50 mg/L	11/15/01	11/18/01
Lab ID :	SEM01111608-04A	TPH-E (Diesel)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH-E (Oil)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH Purgeable	ND	0.50 mg/L	11/15/01	11/25/01
Client ID :	(S200111-0799) Mid Thomas	TPH-E (Jet Fuel)	ND	0.50 mg/L	11/15/01	11/18/01
Lab ID :	SEM01111608-05A	TPH-E (Diesel)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH-E (Oil)	ND	0.50 mg/L	11/15/01	11/18/01
		TPH Purgeable	ND	0.50 mg/L	11/15/01	11/25/01

ND = Not Detected

R Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 498-3312 / Wichita, KS • (316) 722-5890 / info@alpha-analytical.com

11/30/01
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

Washoe County Water Resources
4930 Energy Way
Reno, NV 89502
Job#:

Attn: Mike Widmer
Phone: (775) 954-4641
Fax: (775) 954-4610

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B/DHS LUFT Manual

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**N. Truckee Drain**	TPH-E (Gasoline)	ND		0.50 mg/L	01/09/02	01/16/02
Lab ID :	WCW02010927-01A	TPH-E (Jet Fuel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Diesel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Oil)	0.71	*G	0.50 mg/L	01/09/02	01/16/02
		Surr: Nonane	85		%REC	01/09/02	01/16/02
Client ID :	**Boynton Slough**	TPH-E (Gasoline)	ND		0.50 mg/L	01/09/02	01/16/02
Lab ID :	WCW02010927-02A	TPH-E (Jet Fuel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Diesel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Oil)	0.85	*G	0.50 mg/L	01/09/02	01/16/02
		Surr: Nonane	103		%REC	01/09/02	01/16/02
Client ID :	**Thomas Cr.**	TPH-E (Gasoline)	ND		0.50 mg/L	01/09/02	01/16/02
Lab ID :	WCW02010927-03A	TPH-E (Jet Fuel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Diesel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Oil)	0.71	*G	0.50 mg/L	01/09/02	01/16/02
		Surr: Nonane	98		%REC	01/09/02	01/16/02
Client ID :	**Evans Cr.**	TPH-E (Gasoline)	ND		0.50 mg/L	01/09/02	01/16/02
Lab ID :	WCW02010927-04A	TPH-E (Jet Fuel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Diesel)	ND		0.50 mg/L	01/09/02	01/16/02
		TPH-E (Oil)	0.64	*G	0.50 mg/L	01/09/02	01/16/02
		Surr: Nonane	101		%REC	01/09/02	01/16/02

*Note: Reported oil concentration may include some undifferentiated additional lighter-end hydrocarbons.
G = Compounds outside the range of diesel have varying amounts of recovery.
ND = Not Detected

R Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 498-3312 / Wichita, KS • (316) 722-5890 / info@alpha-analytical.com

1/22/02
Report Date

N TRIPLICATE
PLEASE PRINT OR TYPE)

Po# 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

152709

WATER CHEMISTRY ANALYSIS:

RECEIVED
02 JAN -9 PM 2:13
NEVADA STATE HEALTH LABORATORY

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☐ Check here for ROUTINE DOMESTIC ANALYSIS
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 18 Range 20 Section 8
General Location Thomas cr
Source Address US 395

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Date 1/9/02
Owner Washoe County Phone 9544655
Address PO Box 11130
City RENO 89520 State NV

REPORT TO:

Name M. Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

REASON FOR ANALYSIS:

☐ Loan
☐ Personal health reasons
☐ Purchase of the property
☐ Rental or sale of property
☐ Subdivision approval
☐ Other RAW

USE OF WATER:

☐ Domestic drinking water
☐ Geothermal
☐ Industrial or mining
☐ Irrigation
☐ Other
Initials

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent 152709	S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW: Constituent	ppm
T.D.S. @ 180° C.	149	Chloride		Iron		Color			
Hardness		Nitrate N	0.3	Manganese		Turbitity			
Calcium		Alkalinity		Copper		pH			
Magnesium		Bicarbonate		Zinc					
Sodium		Carbonate		Barium					
Potassium		Fluoride							
Sulfate		Arsenic							
TKN	0.6	TP	0.21						
TSS	84								

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks JE 1/23/02
Delivered by
Received by
Condition: ☐ Broken
Temp:
Holding Time OK: ☐ Yes ☐ No
[ ] Preserved Correctly

RESULTS REPORTED
JAN 25 2002

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

Po# 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

152710

RECEIVED
02 JAN -9 PM 2:13
NEVADA STATE HEALTH LABORATORY

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☐ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 18 Range 20 Section 6
General Location EVANS CR
Source Address S. Virginia

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Time Coll.
Sampled by M. Widmer Date 1/9/02
Owner Washoe County Phone 9544655
Address PO Box 11130
City RENO 89520 State NV

REASON FOR ANALYSIS:

☐ Loan
☐ Personal health reasons
☐ Purchase of the property
☐ Rental or sale of property
☐ Subdivision approval
☐ Other RAW

USE OF WATER:

☐ Domestic drinking water
☐ Geothermal
☐ Industrial or mining
☐ Irrigation
☐ Other
Initials

REPORT TO:

Name M. Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent 152710	S.U.
T.D.S. @ 180° C.	212	Chloride		Iron		Color	
Hardness		Nitrate -N	0.5	Manganese		Turbitity	
Calcium		Alkalinity		Copper		pH	
Magnesium		Bicarbonate		Zinc			
Sodium		Carbonate		Barium			
Potassium		Fluoride					
Sulfate		Arsenic					
TKN	0.8	TP	0.16				
TSS	40						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks MR 1/23/02
Delivered by
Received by
Condition: ☐ Sealed ☐ Unsealed ☐ Broken ☐ Leaking
Temp:
Holding Time OK: ☐ Yes ☐ No
[ ] Preserved Correctly

RESULTS REPORTED
JAN 25 2002

ppm = parts per million. milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

Po# 201042

NEVADA STATE HEALTH LABORATORY
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

152708

RECEIVED
02 JAN -9 PM 2:13
NEVADA STATE HEALTH LABORATORY

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

State NV County Washoe
Township 19 Range 20 Section 21
General Location Boynton Slough
Source Address McCarran

TYPE OF ANALYSIS:

☐ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Time Coll.
Sampled by M. Widmer Date 1/9/02
Owner Washoe County Phone 9544655
Address PO Box 11130
City RENO 89520 State NV

REASON FOR ANALYSIS:

☐ Loan
☐ Personal health reasons
☐ Purchase of the property
☐ Rental or sale of property
☐ Subdivision approval
☐ Other RAW

USE OF WATER:

☐ Domestic drinking water
☐ Geothermal
☐ Industrial or mining
☐ Irrigation
☐ Other
Initials

REPORT TO:

Name M. Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent 152708	S.U.
T.D.S. @ 180° C.	240	Chloride		Iron		Color	
Hardness		Nitrate N	1.9	Manganese		Turbitity	
Calcium		Alkalinity		Copper		pH	
Magnesium		Bicarbonate		Zinc			
Sodium		Carbonate		Barium			
Potassium		Fluoride					
Sulfate		Arsenic					
TKN	1.0	TP	0.27				
TSS	104						

PRINT OTHER DESIRED CONSTITUENTS BELOW

Constituent	ppm

Fee
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks AK 1/23/02
Delivered by
Received by
Condition: ☐ Sealed ☐ Unsealed ☐ Broken ☐ Leaking
Temp:
Holding Time OK: ☐ Yes ☐ No
Preserved Correctly:

RESULTS REPORTED
JAN 25 2002

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

IN TRIPLICATE
(PLEASE PRINT OR TYPE)

PO# 201042

NEVADA STATE HEALTH LABORATORY 152707
University of Nevada School of Medicine/385
Reno, Nevada 89557
(775) 688-1335

RECEIVED JAN 28 2002

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NEVADA STATE HEALTH LABORATORY

WATER CHEMISTRY ANALYSIS:

Attn: Fees may apply to some types of samples.

All of the information below must be filled in or the analysis will not be performed.

TYPE OF ANALYSIS:

☐ Check here for ROUTINE DOMESTIC ANALYSIS.
Circle the constituents needed for PARTIAL ANALYSIS.

State NV County Washoe
Township 19 Range 20 Section 10
General Location N. Truckee Drain
Source Address Kleppe LN

SAMPLING INSTRUCTIONS:

The sample submitted must be representative of the source. Spring and surface water samples should be as free of dirt and debris as possible. Wells should be pumped thoroughly before sampling, changing the water in the casing at least three times. Product water from filters should be sampled after running for about ten (10) minutes.

Sampled by M. Widmer Time Coll:
Owner Washoe County Date 1/9/02
Address POBox 11130 Phone 9544655
City RENO 89520 State NV

REASON FOR ANALYSIS:

☐ Loan
☐ Personal health reasons
☐ Purchase of the property
☐ Rental or sale of property
☐ Subdivision approval
☐ Other RAW

USE OF WATER:

☐ Domestic drinking water
☐ Geothermal
☐ Industrial or mining
☐ Irrigation
☐ Other
Initials

REPORT TO:

Name M. Widmer
Address 4930 Energy Way
City Reno
State NV Zip 89502

SOURCE OF WATER:

Filter ☐ Yes ☐ No
Public ☐ Yes ☐ No
Spring
Well Depth ft.
Hot Cold
IN USE: ☐ Yes ☐ No

Type
Name
Surface
Casing diameter in.
Casing depth ft.

The results below are representative only of the sample submitted to this laboratory.

FOR LABORATORY USE ONLY

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent 152707	S.U.	PRINT OTHER DESIRED CONSTITUENTS BELOW Constituent	ppm
T.D.S. @ 180° C.	312	Chloride		Iron		Color			
Hardness		Nitrate as N	0.9	Manganese		Turbitity			
Calcium		Alkalinity		Copper		pH			
Magnesium		Bicarbonate		Zinc					
Sodium		Carbonate		Barium					
Potassium		Fluoride							
Sulfate		Arsenic							
TKN	1.6	TP	0.36						
TSS	232								

Fee 52
Collected by
PWS I.D.
SDWA — Pri. Sec.
1st 2nd 3rd
Date Rec'd Init.

Remarks A.L. 1/23/02
Delivered By:
Received By:
Condition: ☐ Sealed ☐ Unsealed ☐ Broken ☐ Leaking
Temp.:
Holding Time OK: ☐ Yes ☐ No
[ ] Preserved Correctly:

RESULTS REPORTED JAN 25 2002

ppm = parts per million, milligrams per liter; S.U. = Standard Units

(Rev. 6/99)

UNIVERSITY OF NEVADA
SCHOOL OF MEDICINE
Nevada State Health Laboratory
1660 N. Virginia St.
Reno, Nevada 89503-1783
(775) 688-1335
FAX: (775) 688-1460

Lab ID: 153979 Sampled: 5/22/02
Sample Type: SDWA Received: 5/22/02

SAMPLE INFORMATION
Township: 16 Range: 19
Section: 4
General Location: WASHOE VALLEY
Source Address: FRANKTOWN UPSTREAM

REPORT TO
Name: ATTN MICHAEL WIDMER
Company: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

OWNER
Name: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

The results below are representative only of the sample submitted to this laboratory.

ROUTINE DOMESTIC:	Result in ppm	Reporting Limit
TDS @ 180 Deg. C:	65	10
Hardness:	17	N/A
Calcium:	5	5
Magnesium:	1	5
Sodium:	5	5
Potassium:	1	5
Sulfate:	1	5
Chloride:	2	5
Nitrate as N:	0.0	0.1
Alkalinity:	24	10
Bicarbonate:	29	N/A
Carbonate:	0	N/A
Fluoride:	0.02	0.1
Arsenic:	< 0.003	0.003
Iron:	0.59	0.05
Manganese:	0.01	0.02
Copper:	0.00	0.02
Zinc:	0.01	0.05
Barium:	0.01	0.02
Boron:	0.0	0.1
Silica:	22	1
Color:	30 SU	3 SU
Turbidity:	4.6 NTU	0.4 NTU
pH:	7.58 SU	N/A
EC:	55 SU	15 SU
SI @ 20 deg. C:	-1.79	N/A

temp at time of pH 20.6 deg. C

TRACE METALS:	Results in ppm	Reporting Limit
Cadmium:		0.001
Chromium:		0.001
Lead:		0.001
Mercury:		0.0005
Selenium:		0.001
Silver:		0.001
Antimony:		0.001
Beryllium:		0.001
Nickel:		0.001
Thallium:		0.0005
OTHER:		
MBAS:		0.1
Nitrite-N:		0.01
Cyanide:		0.005
BOD:		2
COD:		10
Kjeldahl-N:		0.1
Ortho-P:		0.01
Total-P:		0.01
Aluminum:		0.02
Ammonia:		0.1
RADIOCHEMISTRY:	pCi/l	pCi/l
Gross Alpha:		3
Gross Beta:		3
Uranium:		

ppm = parts per million, milligrams per liter
S.U. = Standard Units
Remarks: Trace metal reporting limits (excluding mercury) reflect undiluted sample, multiply reporting limit by ____ for this sample.

6-13-02

RESULTS REPORTED
JUN 14 2002

Lab ID: 153980 Sampled: 5/22/02
Sample Type: SDWA Received: 5/22/02

UNIVERSITY OF NEVADA SCHOOL OF MEDICINE

Nevada State Health Laboratory
1660 N. Virginia St.
Reno, Nevada 89503-1783
(775) 688-1335
FAX: (775) 688-1460

SAMPLE INFORMATION
Township: 17 Range: 19
Section: 34
General Location: WASHOE VALLEY
Source Address: OPHIR CREEK UPSTREAM

REPORT TO
Name: ATTN MIKE WIDMER
Company: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

OWNER
Name: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

The results below are representative only of the sample submitted to this laboratory.

ROUTINE DOMESTIC:	Result in ppm	Reporting Limit
TDS @ 180 Deg. C:	61	10
Hardness:	19	N/A
Calcium:	6	5
Magnesium:	1	5
Sodium:	5	5
Potassium:	1	5
Sulfate:	0	5
Chloride:	5	5
Nitrate as N:	0.0	0.1
Alkalinity:	22	10
Bicarbonate:	27	N/A
Carbonate:	0	N/A
Fluoride:	0.02	0.1
Arsenic:	< 0.003	0.003
Iron:	0.26	0.05
Manganese:	0.01	0.02
Copper:	0.00	0.02
Zinc:	0.01	0.05
Barium:	0.01	0.02
Boron:	0.0	0.1
Silica:	17	1
Color:	15 SU	3 SU
Turbidity:	2.2 NTU	0.4 NTU
pH:	7.67 SU	N/A
EC:	67 SU	15 SU
SI @ 20 deg. C:	-1.65	N/A

temp at time of pH 20.7 deg. C

TRACE METALS:	Results in ppm	Reporting Limit
Cadmium:		0.001
Chromium:		0.001
Lead:		0.001
Mercury:		0.0005
Selenium:		0.001
Silver:		0.001
Antimony:		0.001
Beryllium:		0.001
Nickel:		0.001
Thallium:		0.0005
OTHER:		
MBAS:		0.1
Nitrite-N:		0.01
Cyanide:		0.005
BOD:		2
COD:		10
Kjeldahl-N:		0.1
Ortho-P:		0.01
Total-P:		0.01
Aluminum:		0.02
Ammonia:		0.1
RADIOCHEMISTRY:	pCi/l	pCi/l
Gross Alpha:		3
Gross Beta:		3
Uranium:		

ppm = parts per million, milligrams per liter
S.U. = Standard Units
Remarks: Trace metal reporting limits (excluding mercury) reflect undiluted sample, multiply reporting limit by ____ for this sample.

6-13-02

RESULTS REPORTED
JUN 14 2002

Lab ID: 153981 Sampled: 5/22/02
Sample Type: SDWA Received: 5/22/02

UNIVERSITY OF NEVADA SCHOOL OF MEDICINE

Nevada State Health Laboratory
1660 N. Virginia St.
Reno, Nevada 89503-1783
(775) 688-1335
FAX: (775) 688-1460

SAMPLE INFORMATION
Township: Range:
Section:
General Location: WASHOE VALLEY
Source Address: OPHIR DOWNSTREAM @ 395

REPORT TO
Name: ATTN MIKE WIDMER
Company: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

OWNER
Name: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

The results below are representative only of the sample submitted to this laboratory.

ROUTINE DOMESTIC:	Result in ppm	Reporting Limit
TDS @ 180 Deg. C:	63	10
Hardness:	19	N/A
Calcium:	6	5
Magnesium:	1	5
Sodium:	5	5
Potassium:	1	5
Sulfate:	0	5
Chloride:	5	5
Nitrate as N:	0.0	0.1
Alkalinity:	22	10
Bicarbonate:	27	N/A
Carbonate:	0	N/A
Fluoride:	0.02	0.1
Arsenic:	< 0.003	0.003
Iron:	0.30	0.05
Manganese:	0.01	0.02
Copper:	0.00	0.02
Zinc:	0.01	0.05
Barium:	0.01	0.02
Boron:	0.0	0.1
Silica:	17	1
Color:	15 SU	3 SU
Turbidity:	3.1 NTU	0.4 NTU
pH:	7.67 SU	N/A
EC:	67 SU	15 SU
SI @ 20 deg. C:	-1.65	N/A

temp at time of pH 20.4 deg. C

TRACE METALS:	Results in ppm	Reporting Limit
Cadmium:		0.001
Chromium:		0.001
Lead:		0.001
Mercury:		0.0005
Selenium:		0.001
Silver:		0.001
Antimony:		0.001
Beryllium:		0.001
Nickel:		0.001
Thallium:		0.0005
OTHER:		
MBAS:		0.1
Nitrite-N:		0.01
Cyanide:		0.005
BOD:		2
COD:		10
Kjeldahl-N:		0.1
Ortho-P:		0.01
Total-P:		0.01
Aluminum:		0.02
Ammonia:		0.1
RADIOCHEMISTRY:	pCi/l	pCi/l
Gross Alpha:		3
Gross Beta:		3
Uranium:		

ppm = parts per million, milligrams per liter
S.U. = Standard Units
Remarks: Trace metal reporting limits (excluding mercury) reflect undiluted sample, multiply reporting limit by ____ for this sample.

RESULTS REPORTED
JUN 14 2002

R 6-13-02 JK

Nevada State Health Laboratory
1660 N. Virginia St.
Reno, Nevada 89503-1783
(775) 688-1335
FAX: (775) 688-1460

Lab ID: 153982 Sampled: 5/22/02
Sample Type: SDWA Received: 5/22/02

SAMPLE INFORMATION
Township: 16 Range: 19
Section: 28
General Location: WASHOE VALLEY
Source Address: MUSKGROVE CREEK UPSTREAM

REPORT TO
Name: ATTN MIKE WIDMER
Company: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

OWNER
Name: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

The results below are representative only of the sample submitted to this laboratory.

ROUTINE DOMESTIC:	Result in ppm	Reporting Limit
TDS @ 180 Deg. C:	80	10
Hardness:	31	N/A
Calcium:	9	5
Magnesium:	2	5
Sodium:	7	5
Potassium:	1	5
Sulfate:	0	5
Chloride:	0	5
Nitrate as N:	0.1	0.1
Alkalinity:	42	10
Bicarbonate:	51	N/A
Carbonate:	0	N/A
Fluoride:	0.04	0.1
Arsenic:	< 0.003	0.003
Iron:	0.59	0.05
Manganese:	0.01	0.02
Copper:	0.00	0.02
Zinc:	0.01	0.05
Barium:	0.01	0.02
Boron:	0.0	0.1
Silica:	26	1
Color:	15 SU	3 SU
Turbidity:	4.0 NTU	0.4 NTU
pH:	7.86 SU	N/A
EC:	84 SU	15 SU
SI @ 20 deg. C:	-1.02	N/A

temp at time of pH 20.5 deg. C

TRACE METALS:	Results in ppm	Reporting Limit
Cadmium:		0.001
Chromium:		0.001
Lead:		0.001
Mercury:		0.0005
Selenium:		0.001
Silver:		0.001
Antimony:		0.001
Beryllium:		0.001
Nickel:		0.001
Thallium:		0.0005
OTHER:		
MBAS:		0.1
Nitrite-N:		0.01
Cyanide:		0.005
BOD:		2
COD:		10
Kjeldahl-N:		0.1
Ortho-P:		0.01
Total-P:		0.01
Aluminum:		0.02
Ammonia:		0.1
RADIOCHEMISTRY:	pCi/l	pCi/l
Gross Alpha:		3
Gross Beta:		3
Uranium:		

ppm = parts per million, milligrams per liter
S.U. = Standard Units
Remarks: Trace metal reporting limits (excluding mercury) reflect undiluted sample, multiply reporting limit by ____ for this sample.

6-13-02

RESULTS REPORTED
JUN 14 2002

UNIVERSITY OF NEVADA SCHOOL OF MEDICINE

Nevada State Health Laboratory
1660 N. Virginia St.
Reno, Nevada 89503-1783
(775) 688-1335
FAX: (775) 688-1460

Lab ID: 153983 Sampled: 5/22/02
Sample Type: SDWA Received: 5/22/02

SAMPLE INFORMATION
Township: 16 Range: 19
Section: 23
General Location: WASHOE VALLEY
Source Address: MUSKGROVE CREEK DOWNSTREAM

REPORT TO
Name: ATTN MIKE WIDMER
Company: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

OWNER
Name: WASHOE COUNTY
Address: 4930 ENERGY WAY
City: RENO
State: NV Zip: 89502

The results below are representative only of the sample submitted to this laboratory.

ROUTINE DOMESTIC:	Result in ppm	Reporting Limit
TDS @ 180 Deg. C:	224	10
Hardness:	104	N/A
Calcium:	30	5
Magnesium:	7	5
Sodium:	27	5
Potassium:	1	5
Sulfate:	12	5
Chloride:	12	5
Nitrate as N:	0.0	0.1
Alkalinity:	126	10
Bicarbonate:	154	N/A
Carbonate:	0	N/A
Fluoride:	0.29	0.1
Arsenic:	< 0.003	0.003
Iron:	0.38	0.05
Manganese:	0.02	0.02
Copper:	0.00	0.02
Zinc:	0.01	0.05
Barium:	0.06	0.02
Boron:	0.0	0.1
Silica:	24	1
Color:	30 SU	3 SU
Turbidity:	5.4 NTU	0.4 NTU
pH:	7.81 SU	N/A
EC:	320 SU	15 SU
SI @ 20 deg. C:	-0.15	N/A

temp at time of pH 20.5 deg. C

TRACE METALS:	Results in ppm	Reporting Limit
Cadmium:		0.001
Chromium:		0.001
Lead:		0.001
Mercury:		0.0005
Selenium:		0.001
Silver:		0.001
Antimony:		0.001
Beryllium:		0.001
Nickel:		0.001
Thallium:		0.0005
OTHER:		
MBAS:		0.1
Nitrite-N:		0.01
Cyanide:		0.005
BOD:		2
COD:		10
Kjeldahl-N:		0.1
Ortho-P:		0.01
Total-P:		0.01
Aluminum:		0.02
Ammonia:		0.1
RADIOCHEMISTRY: pCi/l		pCi/l
Gross Alpha:		3
Gross Beta:		3
Uranium:		

ppm = parts per million, milligrams per liter
S.U. = Standard Units
Remarks: Trace metal reporting limits (excluding mercury) reflect undiluted sample, multiply reporting limit by ____ for this sample.

R 6-13-02

RESULTS REPORTED
JUN 14 2002

NEVADA STATE HEALTH LABORATORY
UNIVERSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

A 105894

Sampler Keith Weaver Date 5/22/02 Hour 11:35 am

Location Franktown Upstream County Washoe

Public Water System

ID No. For Compliance

Chlorine Residual Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name Michael Widmer

Address 4730 Energy Way

Reno NV 89502

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ <100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)	RESULTS
Total Coliform 1: 10	137 /100 ml.
Fecal Coliform 1: 10	<10 /100 ml.
E. Coli 1: 10	<10 /100 ml.
Fecal Streptococcus 1:	/100 ml.
Enterococcus 1:	/100 ml.

Date 5-23-2 Tech LW

(Rev. 10-97)

WATER BACTERIOLOGY

[redacted] NEVADA STATE HEALTH LABORATORY
UNIVERSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

105892

[redacted]

ipler Keith Weaver Date 5/22/02 Hour 12:45 pm

ation Cyclic Creek Downstream @ 395 County Washoe

lic Water System

No. _____ For Compliance

orine Residual _____ Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

ne Michael Widmer

lress 4930 Energy Way

Reno NV 89502

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

Drinking Water Analysis

thods:

Membrane Filter ☐ MPN

Presence/Absence ☐ Other

ults:

	PRESENT	ABSENT
tal Coliform	☐	☐
Coli	☐	☐

e Tech

absence of coliforms meets Nevada State Health ision bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

☐ Other

Test Required: (Dilutions if Needed)		RESULTS
✗ Total Coliform 1:	10	20 /100 ml.
✓ Fecal Coliform 1:	10	<10 /100 ml.
✗ E. Coli 1:	10	<10 /100 ml.
Fecal Streptococcus 1:		/100 ml.
Enterococcus 1:		/100 ml.

Date 5-23-2 Tech UM

(Rev. 10-97)

WATER BACTERIOLOGY

[redacted] NEVADA STATE HEALTH LABORATORY
UNIVERSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

5889

[redacted]

Keith Weaver Date 5/22/02 Hour 11:10 am

Cyclic Creek Upstream County Washoe

System

For Compliance

sidual Not for Compliance

THIS SPACE FOR LAB USE ONLY

OUR RETURN ADDRESS

chael Widmer

930 Energy Way

NV 89502

ASSURE IDENTIFICATION, SE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

Water Analysis

rane Filter ☐ MPN

ce/Absence ☐ Other

	PRESENT	ABSENT
form	☐	☐
	☐	☐

Tech

e of coliforms meets Nevada State Health cteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐

Received > 20°C ☐ < 100 mls ☐

> 200 Other bacteria ☐ Other ☐

Sediment ☐

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN

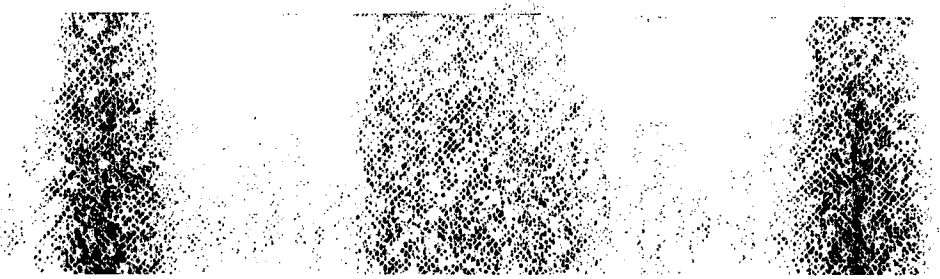
☐ Other

Test Required: (Dilutions if Needed)		RESULTS
✓ Total Coliform 1:	10	53 /100 ml.
✗ Fecal Coliform 1:	10	<10 /100 ml.
✗ E. Coli 1:	10	<10 /100 ml.
Fecal Streptococcus 1:		/100 ml.
Enterococcus 1:		/100 ml.

Date 5-23-2 Tech UM

(Rev. 10-97)

WATER BACTERIOLOGY



NEVADA STATE HEALTH LABORATORY
UNIVERSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

RECEIVED
MAY 28 2002
WASHOE COUNTY
DEPT. OF WATER RESOURCES

A 105891

Sampler Keith Weaver Date 5/22/02 Hour 3:35 pm
Location Muskgrove Downstream County Washoe
Public Water System
ID No. For Compliance
Chlorine Residual Not for Compliance

THIS SPACE FOR LAB USE ONLY

YOUR RETURN ADDRESS

Name Michael Widmer
Address 4730 Energy Way
Reno NV 89502

TO ASSURE IDENTIFICATION, PLEASE LABEL SPECIMEN BOTTLE WITH NAME ALSO.

☐ Drinking Water Analysis

Methods:

☐ Membrane Filter ☐ MPN
☐ Presence/Absence ☐ Other

Results:

	PRESENT	ABSENT
Total Coliform	☐	☐
E. Coli	☐	☐

Date Tech

The absence of coliforms meets Nevada State Health Division bacteriological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐
Received > 20°C ☐ < 100 mls ☐
> 200 Other bacteria ☐ Other ☐
Sediment ☐

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN
☐ Other

Test Required: (Dilutions if Needed)	RESULTS
☒ Total Coliform 1: 10	1452 /100 ml.
☒ Fecal Coliform 1: 10	10 /100 ml.
☒ E. Coli 1: 10	10 /100 ml.
Fecal Streptococcus 1:	/100 ml.
Enterococcus 1:	/100 ml.

Date 5-23-2 Tech

(Rev. 10-97)

WATER BACTERIOLOGY

NEVADA STATE HEALTH LABORATORY
UNIVERSITY OF NEVADA SCHOOL OF MEDICINE
1660 N. Virginia Street
Reno, Nevada 89503

893

Sampler Keith Weaver Date 5/22/02 Hour 3:10 pm
Location Muskgrove Upstream County Washoe
System
No. For Compliance
Residual Not for Compliance

THIS SPACE FOR LAB USE ONLY

UR RETURN ADDRESS

ichael Widmer
730 Energy Way
NV 89502

SSURE IDENTIFICATION, LABEL SPECIMEN BOTTLE WITH NAME ALSO.

ater Analysis

e Filter ☐ MPN
/Absence ☐ Other

	PRESENT	ABSENT
m	☐	☐
	☐	☐

Tech

of coliforms meets Nevada State Health riological standards for safe drinking water.

Invalid Sample Please Repeat ☐

Received > 30 Hrs ☐ Confluent Growth ☐
Received > 20°C ☐ < 100 mls ☐
> 200 Other bacteria ☐ Other ☐
Sediment ☐

☒ Raw or Wastewater Analysis

Methods:

☐ Membrane Filter ☐ MPN
☐ Other

Test Required: (Dilutions if Needed)	RESULTS
☒ Total Coliform 1: 10	178 /100 ml.
☒ Fecal Coliform 1: 10	<10 /100 ml.
☒ E. Coli 1: 10	<10 /100 ml.
Fecal Streptococcus 1:	/100 ml.
Enterococcus 1:	/100 ml.

Date 5-23-2 Tech

(Rev. 10-97)

WATER BACTERIOLOGY