

STEPTOE & JOHNSON^{LLP}

ATTORNEYS AT LAW

David H. Coburn
202.429.8063
dcoburn@steptoe.com

1330 Connecticut Avenue, NW
Washington, DC 20036-1795
Tel 202.429.3000
Fax 202.429.3902
steptoe.com

ET-929

July 16, 2004

VIA HAND DELIVERY

Mr. Kenneth H. Blodgett
Environmental Protection Specialist
Section of Environmental Analysis
Surface Transportation Board
1925 K Street, N.W.
Washington, D.C. 20423

Re: **Tongue River Railroad Company, Inc. - Finance Docket 31086 (Sub-No. 3) - Construction and Operation of the Western Alignment**

Update on Discussions with Montana Department of Fish, Wildlife & Parks on Miles City Fish Hatchery

Dear Mr. Blodgett:

This letter provides an update on the Tongue River Railroad Company's efforts to address concerns that have been raised about the impact of its proposed line on the Miles City Fish Hatchery, including meetings and correspondence exchanged with the Montana Department of Fish, Wildlife and Parks (FW&P). We last wrote to you about this matter on January 21, 2004 in a letter from TRRC's Doug Day; this letter summarizes developments since that date.

As Mr. Day's January 21 letter indicates, TRRC exchanged correspondence in late 2003 with FW&P on a variety of issues of concern to FW&P. These issues were further discussed by the parties at a meeting held on February 5, 2004. That meeting was attended by Dan Walker (Chairman, FW&P Commission); Jeff Hagener (Director, FW&P); Chris Hunter (Administrator, Fisheries Division, FW&P); Larry Peterman (Chief of Field Operations, FW&P); Gary Bertellotti (Hatchery Bureau Chief, FW&P)

and Doug Day of TRRC. The current status of each of the issues addressed with FW&P is summarized below.

Protection of the Hatchery's water supply lines -- TRRC has offered several design measures intended to protect these lines from any impacts of the rail line, which measures were spelled out in an attachment submitted to you by TRRC with Mr. Day's January 21 letter. FW&P has advised that the TRRC proposed measures are acceptable, adding that specifics of the design measures will need to be reviewed by FW&P at the time of final rail line design and engineering.

Weed Control Management Plan -- Prior to the beginning of construction, TRRC will develop a Weed Control Management Plan in conjunction with appropriate state and local agencies, as well as a fire protection plan. The Management Plan will incorporate mechanical means of weed control in the right of way adjacent to the hatchery. TRRC will provide for prior FW&P review of any herbicides that might be necessary to control weed infestation along the right of way in proximity to the hatchery. FW&P concurs with the approach provided that there is adequate enforcement of the program and that the FW&P retains an appropriate role with respect to advance review of the Management Plan.

Coal Dust -- Based on information provided by TRRC, including train speed in the area of the hatchery, FW&P has acknowledged that coal dust will not be an issue.

Alternative Route Analysis -- Although this matter was not discussed at the February 5 meeting, TRRC has previously provided FW&P with a copy of the alternative routing analysis set forth in the *TRRC I EIS* documents. Further, TRRC understands that this discussion will be incorporated into the forthcoming Supplemental DEIS.

Conservation Easements/Fishing Access to Tongue River -- This matter was discussed at the February 5 meeting, at which time TRRC addressed FW&P's concerns about river access and explained that there are relatively few points where the rail line would be between the Tongue River and the roads providing public access. It was agreed that these issues are not related to the Hatchery and are best addressed during the ROW acquisition process with individual private landowners.

Vibration/Baseline Study -- This issue remains unresolved. At the February 5 meeting, TRRC presented information about, and photos of, a number of fish hatcheries around the country that are located in close proximity to operating rail lines. A copy of the hatchery information is attached hereto. TRRC explained that it had had discussions with personnel at a number of these hatcheries and that none of these personnel were aware of any issues or concerns relative to hatchery operations as a result of the nearby operations on these rail lines.

Nonetheless, FW&P, through Mr. Gary Bertelotti, presented a monitoring program proposal at the February 5, 2003 meeting prepared by Beard Environmental and

Technical Assistance LLC. The proposal, a copy of which is attached, was prepared based on the understanding by Beard that there may be a need for such a program. The program contemplates pre-construction geotechnical investigations, noise/vibration measurements, development of hatchery production data and construction and post-construction monitoring.

TRRC does not agree that the type of study contemplated by Beard is warranted. Pre-construction geotechnical investigations and noise/vibration measurements and assessment were conducted as part of the 1999 Womack & Associates, Inc. study that TRRC commissioned in connection with the vibration issues raised by FW&P. The 1999 Womack study plan was reviewed and agreed to by FW&P in the fall of 1998. That Study was presented to FW&P on March 1999 and concluded that vibration from the rail line would not present a problem for the Miles City Fish Hatchery, just as the BNSF line, which is also proximate to that Hatchery, does not create any problems.

In May 2004, in response to comments on the 1999 Womack Study made by the Montana Department of Natural Resources and Conservation, Womack finalized the "Miles City Fish Hatchery Supplemental Geotechnical and Vibration Analysis," which responds to those comments. TRRC submitted this Supplemental Analysis to FW&P under cover of a letter dated May 13, 2004. See attached transmittal letter and Supplemental Analysis. The Womack Supplemental Analysis validates the findings in Womack's 1999 Study that there will not be any significant vibration impacts on the Hatchery resulting from the rail line's construction or operation. In that regard, the Supplemental Analysis concludes that, "[T]he predicted ground vibration levels at the Miles City Fish Hatchery from construction and operation of the TRR are extremely low and potential damage to the ponds and raceway from train vibration is not indicated by the models conducted for other rail projects, including the DM&E."

Further, the Supplemental Analysis also reports on vibration studies prepared for SEA by Wilson, Ihrig & Associates, Inc. in connection with the proposed DM&E line in Minnesota, South Dakota and Wyoming. Notably, according to the Supplemental Analysis, the information in the Wilson, Ihrig studies validates the methodology used in the 1999 Womack study.

It is also important to note the Beard proposal made by FW&P references a 1999 report on potential vibration impacts prepared in the DM&E proceeding for the City of Mankato, Minnesota by David Braslau Associates, Inc. However, the Beard proposal apparently did not take into consideration the findings of the subsequent vibration investigations conducted by Wilson, Ihrig. We understand that vibration mitigation imposed in the DM&E case was largely based on the findings of the latter study.

TRRC has not heard further from FW&P since the submission by TRRC of the Supplemental Analysis in May 2004. TRRC assumes that FW&P is awaiting the issuance of the Draft Supplemental EIS by the Board, and the completion of the Board's processes, before taking any action on TRRC's right of way easement application.

Mr. Kenneth H. Blodgett

July 16, 2004

Page 4

Granting of that easement is essential for rail construction to take place since otherwise the TRRC line could not cross Hatchery property.

Notwithstanding the findings of the original and supplemental Womack studies reporting on the lack of any significant vibration impact to the Miles City Fish Hatchery resulting from the TRRC line, TRRC has expressed a willingness to discuss with FW&P some form of appropriate, limited monitoring program during and after construction. At the same time, TRRC is concerned that, in the absence of some specific time frame for such discussions to be completed, these discussions may not come to an expeditious or mutually satisfactory conclusion consistent with TRRC's desire to move forward toward construction, particularly if FW&P continues to promote a proposal for an extended study such as that which it presented at the February 5 meeting.

For that reason, TRRC proposes that SEA consider, in connection with the formulation of its recommended mitigation conditions, that TRRC report to SEA if TRRC has failed to reach an agreement with FW&P within six months from the date that the Board issues a final decision in this proceeding. If no agreement is reached during that period, and unless both parties advise SEA that they would like additional time, we believe that SEA should take appropriate steps to determine whether any additional mitigation is warranted and, if so, to fashion such mitigation. Further, TRRC would be willing to submit periodic reports to SEA on the progress of its discussions with FW&P as frequently as SEA deems appropriate.

Please let me know if you have any questions.

Sincerely,



David H. Coburn

Attorney for Tongue River Railroad
Company, Inc.

cc: Victoria Rutson
Scott Steinwert
Douglas Day
Betty Jo Christian



U.S. Fish & Wildlife Service

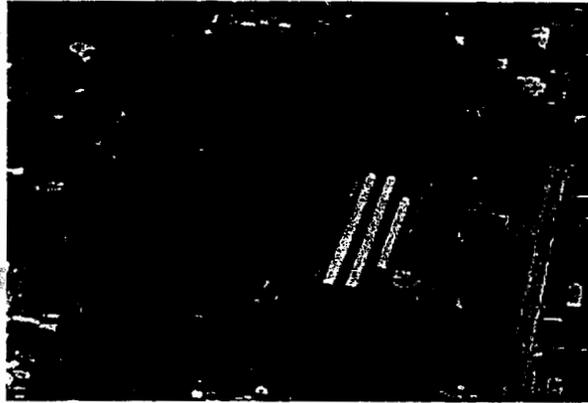
Neosho National Fish Hatchery

— Oldest Operating Federal Fish Hatchery in U.S. —



Hatchery History:

The Neosho National Fish Hatchery is the oldest federal hatchery in operation today. It was established in 1888. Neosho was chosen for the hatchery site because of access to spring water and the railroad. Land for the fish hatchery was purchased from Lemuel B. and Mary A. Hearrell for \$2,472. The first source of water for the hatchery, Hearrell Spring, was purchased from the Hearrell's for \$1 and provided 300 gallons per minute water flow. By 1890, the fish hatchery was a productive fish station raising seven species of warm and cold water fish. In 1907, McMahon Spring was added to increase the hatchery water supply to 1,000 gallons per minute.



Rail

A rehabilitation program was undertaken at the fish hatchery in 1961. A new, modern, tile and brick hatchery building replaced the 1890 hatching house. All trout rearing facilities were removed and replaced with 12 concrete raceways. The title was obtained for 244 acres of land on the Fort Crowder Military Reservation near Neosho upon which Elm and

*Kansas City Southern
Railway
No-So Heavy haul, i.e., coal,
grain, freight
10 trains/day
40 mph*



U.S. Fish & Wildlife Service

Neosho National Fish Hatchery

-- Oldest Operating Federal Fish Hatchery in U.S. --

Hatchery Facts

- Oldest operating Federal Fish Hatchery in the U.S.
- Established in 1888

Geographic Areas Covered

- Missouri-Ozark Ecosystem
- Missouri-Arkansas/Red Rivers Ecosystem
- Kansas-Platte/Kansas Ecosystem
- Oklahoma/Kansas-Arkansas/Red Rivers Ecosystems
- Wisconsin- Great Lakes Ecosystem

Rail →



Hatchery Mission

- Provide statutory mitigation rainbow trout for Lake Taneycomo, MO
- Provide for the protection of the endangered blind Ozark cavefish in Neosho, MO
- Provide recovery of pallid sturgeon, as the regional lead hatchery in partnership with several other Fish & Wildlife field stations, to the lower Missouri river.
- Provide rainbow trout for reimbursable agreement to Fort Riley Army Base, KS
- Provide environmental education & outreach to public

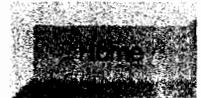
Current Fish Species and Capability

- Rainbow Trout, 225,000 @ 9.5-10.0 inches
- Pallid Sturgeon, 2,000-5,000 @ 9.0 inches

- Walleye, 50,000 @ 2.0 inches
- Ozark Cavefish, protection of existing local population
- Endangered Native Mussel host fish production as needed

Public Use Opportunities

- Over 40,000 visitors annually
- Endangered Ozark Cavefish display
- Hatchery tours
- Off-site presentations
- Walking/exercise perimeter road inside hatchery
- Display room
- Aquaria



[USFWS Home Page](#)  [Region 3 Home Page](#)

Region 3, U.S. Fish and Wildlife Service

1 Federal Drive
BHW Federal Building
Fort Snelling, MN 55111
[E-Mail Us! R3 Public Affairs](#)
[Disclaimer](#)



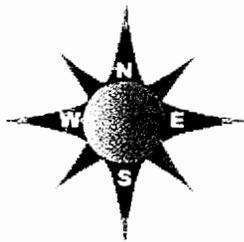
[Advanced Find](#) | [Info](#) | [Download](#) |

Search TerraServer [Home](#) [Image](#)

Navigate

View:

Neosho, Missouri, United States 03 Mar 1997



1 meter resolution



Map Size:

- [Advanced Find](#)
- [Famous Places](#)
- [Web Services](#)
- [About](#)

Related Links:

Other Imagery:

Partners:

Waterproof Map

ClickWeather.com
Forecast for Thu.
94F 71F
36.9N 94.4W [Details >](#)

CLICK HERE and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

Schools, Crime and
Demographics for 64850



0 100M 0 100yd

Image courtesy of the U.S. Geological Survey
Source=82721 Center=(-94.3608,36.8626) 0ms Running Time

Bartholic Springs are located. This provided an additional 500 gallons per minute to the hatchery's water supply. Today these four springs supply the hatchery with 1,500 gallons per minute water flow, in the 54 to 64 degree range, annually.



[USFWS Home Page](#)



[Region 3 Home Page](#)

Region 3, U.S. Fish and Wildlife Service

1 Federal Drive

BHW Federal Building

Fort Snelling, MN 55111

[E-Mail Neosho National Fish Hatchery!](#)

[Disclaimer](#)



Volume 4, No. 5.
February 2002

U.S. Fish & Wildlife Service

Inside Region 3

Information from the Accomplishment Reporting System

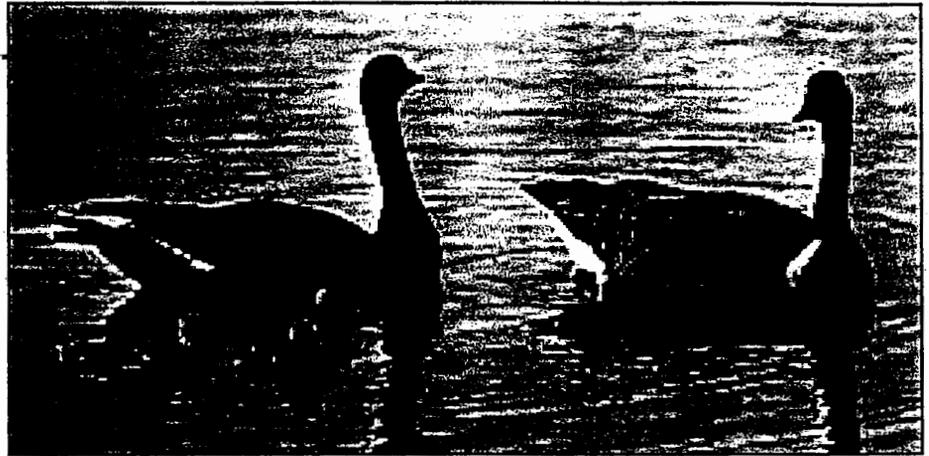
Service Proposal Would Grant States More Control of Resident Canada Geese

The U.S. Fish and Wildlife Service is proposing the creation of a new regulation to allow state wildlife management agencies to actively manage populations of resident Canada geese that cause personal and public property damage and, in some cases, pose a threat to public health and safety.

Under the proposed alternative identified in the draft Environmental Impact Statement released Mar. 4, the Service would grant states the authority to undertake approved population control strategies, such as nest and egg destruction, trapping and culling programs, and expanded hunting opportunities.

"The Service believes that the problems caused by resident Canada geese can be best addressed at the state level," said Service Director Steve Williams. "To that end, we are committed to providing state wildlife management agencies with as much flexibility as possible to address the issue."

The draft EIS evaluates a range of alternatives in relation to their ability to reduce and stabilize resident Canada goose populations, reduce conflicts with humans and minimize impacts to property and human health and safety. Aside from the proposed alternative, the EIS analyzes other alternatives, including continuing current management practices unchanged;



-USFWS Photo

Resident (non-migratory) Canada goose populations have continued to grow in many urban areas. The Service has developed a draft Environmental Impact Statement which, if approved, will allow states greater flexibility in managing local populations of resident geese.

5,200 Endangered Pallid Sturgeon Arrive at Neosho National Fish Hatchery

Endangered Pallid Sturgeon arrived at the Neosho National Fish Hatchery on Feb. 26, 2002. Rod May (Assistant Manager) and Nick Starzl (Fishery Biologist) travelled to South Dakota and met with staff from the Miles City Montana State Fish Hatchery to transfer the pallids over to Neosho. There are three family lots totalling 5,200 fish. These fish will be reared to nine inches, tagged with pit tags and stocked into the Lower Missouri River as part of recovery efforts.

Neosho's excellent water quality, closed water system, recirculation system and ability to control water temperature, makes it an optimum place to produce endangered pallid sturgeon, as well as other recovery species.

The hatchery has had great success with lake sturgeon production and expects nothing less with the pallids.

This is a cooperative effort with the Columbia Fisheries Resource Office, Columbia Ecological Services Office, Army Corps of Engineers, and the Neosho National Fish Hatchery. *David Hendrix, Neosho NFH*

Continued on next page

*Information from the U.S. Fish and Wildlife Service
Region 8 Accomplishment Reporting System. Includes
accomplishments for the period Feb. 10 - Mar. 8, 2002*



U.S. FISH & WILDLIFE SERVICE

Neosho National Fish Hatchery

- Oldest Operating Federal Fish Hatchery in U.S. -



Quick
Sheet

Fisheries Related Programs:



-  Provide recovery efforts for endangered Pallid Sturgeon
-  Provide protection for endangered Ozark Cavefish
-  Provide recovery efforts for threatened or endangered Native Mussels
-  Provide restoration efforts for candidate species, Lake Sturgeon
-  Provide restoration efforts for candidate species, Paddlefish
-  Provide mandated mitigation of Rainbow Trout for Lake Taneycomo, MO

Provide outreach and educational opportunities for public through guided hatchery tours & offsite presentations

[USFWS Home Page](#)



[Region 3 Home Page](#)

Region 3, U.S. Fish and Wildlife Service

1 Federal Drive

BHW Federal Building

Fort Snelling, MN 55111

[E-Mail Neosho National Fish Hatchery!](#)

[Disclaimer](#)

Search TerraServer [Home](#) [Image](#)

Navigate

View:

Neosho, Missouri, United States 03 Mar 1997



1 meter resolution



Map Size:

- [Advanced Find](#)
- [Famous Places](#)
- [Web Services](#)
- [About](#)



0 100M

0 100yd

Related Links:

Other Imagery:

Partners:



Waterproof Map

ClickWeather.com

Forecast for Fri.

50F 23F
36.9N 94.4W [Details](#)

[CLICK HERE](#) and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

[+](#) Schools, Crime and
Demographics for 64850

Image courtesy of the U.S. Geological Survey
Source=3609414NW Center=(-94.3608,36.8626) 796ms Running Time

**TerraServer-USA
Sponsors**



© 2003 Microsoft Corporation.
Server=TK2TERRAWE12

[Terms of Use](#) [Privacy Statement](#)

Search TerraServer Home Image

GO

Navigate

View: **Aerial Photo**

Neosho, Missouri, United States 03 Mar 1997 **USGS**



2 meter resolution



Map Size: **Medium**

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1981

Partners:



Waterproof Map

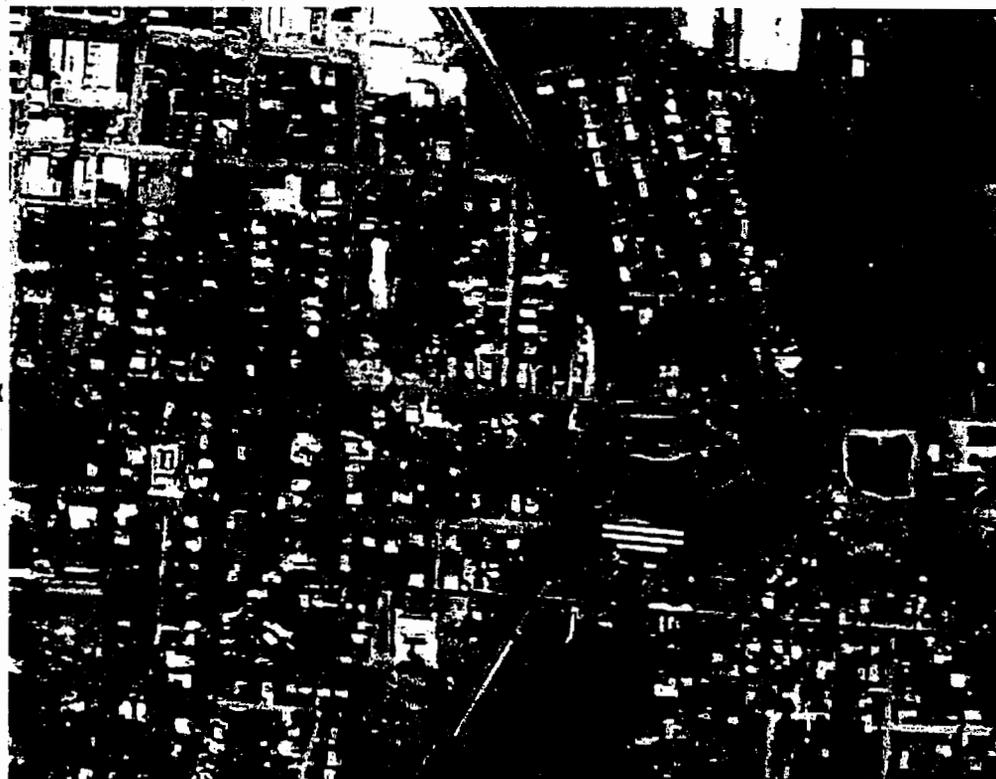
ClickWeather.com

Forecast for Fri.
50F 23F
36.9N 94.4W **Details**

CLICK HERE and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

Schools, Crime and
Demographics for 64850



0 200M

0 200yd

Image courtesy of the U.S. Geological Survey
Source=3609414NW Center=(-94.3619,36.8635) 486ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation.
Server=TK2TERRAWE12

Terms of Use Privacy Statement

Search TerraServer Home Image

GO

Navigate

View: Aerial Photo

Neosho, Missouri, United States 03 Mar 1997 USGS



8 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1980

Partners:



Waterproof Map

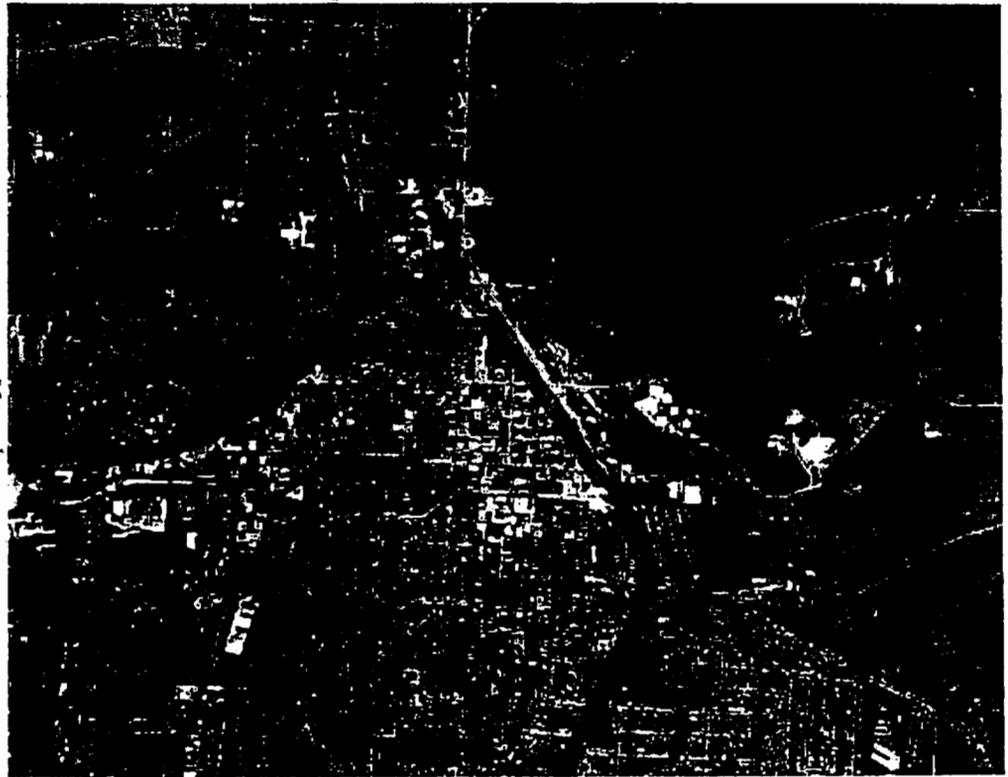
ClickWeather.com

Forecast for Fri. 50F 23F 36.9N 94.4W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 64850



0 1Km 0 1.5MI

Image courtesy of the U.S. Geological Survey Source=3609414NW Center=(-94.3642,36.8653) 656ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE12

Terms of Use Privacy Statement

Search TerraServer Home Image

GO

Navigate

View: Aerial Photo

Neosho, Missouri, United States 08 Mar 1996 USGS



16 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1980

Partners:



Waterproof Map

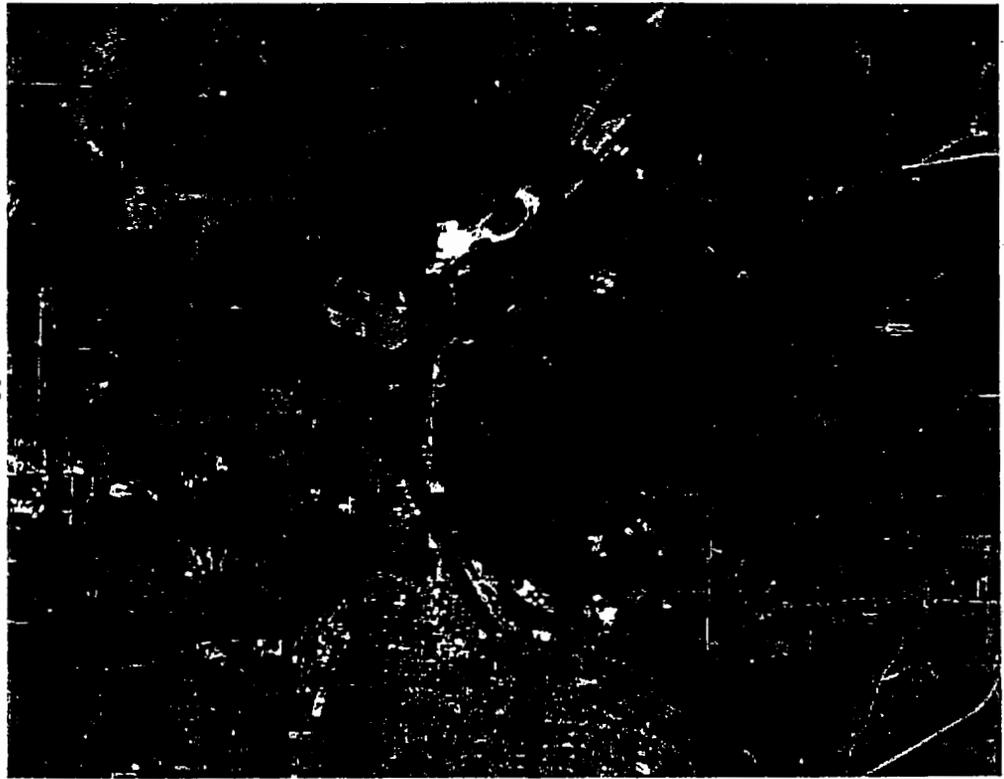
ClickWeather.com

Forecast for Fri. 50F 23F 36.9N 94.4W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 64850



0 2Km 0 1MI

Image courtesy of the U.S. Geological Survey Source=3609405SE Center=(-94.3554,36.8726) 576ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE21

Terms of Use Privacy Statement



Advanced Find | Info | Download | Print | Waterproof M

Search TerraServer Home Image

GO

Navigate

View: Aerial Photo

3 km E of Neosho, Missouri, United States 01 Jul 1973 USGS

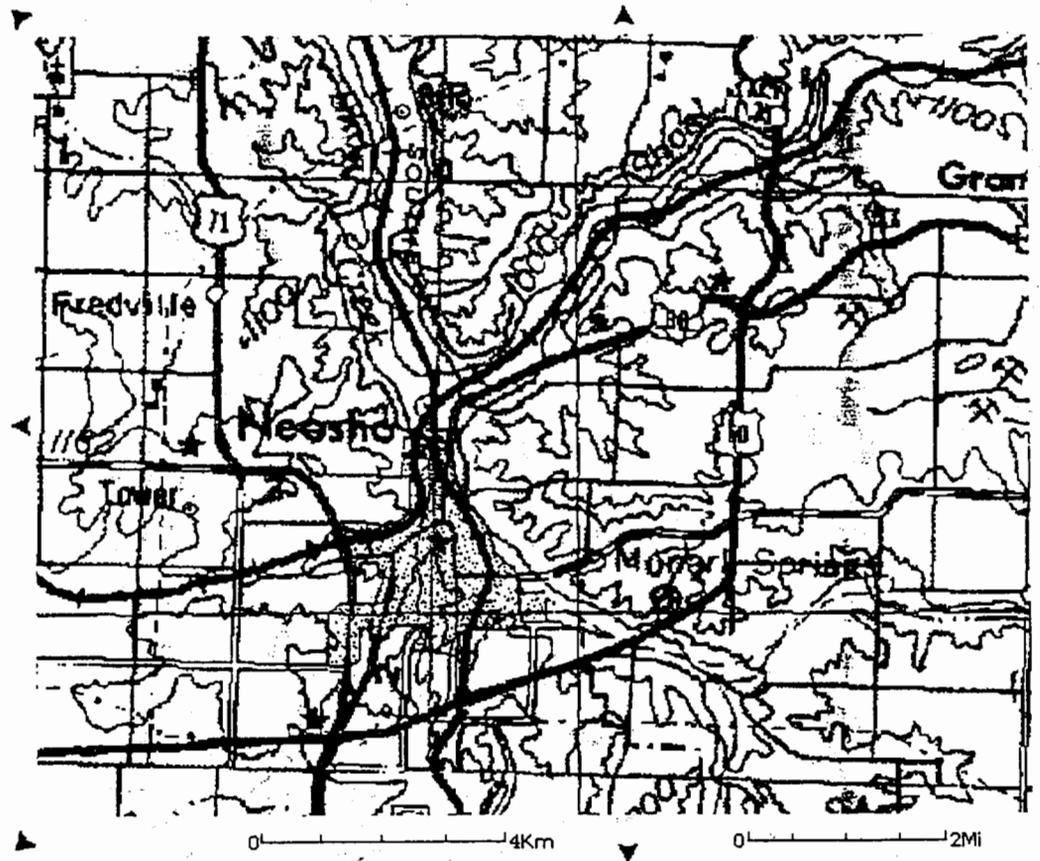


32 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About



0 4Km 0 2Mi

Related Links:

Other Imagery:

USGS Aerial Photo 8 Mar 1996

Partners:



Waterproof Map

ClickWeather.com

Forecast for Fri. 50F 23F 36.9H 94.3W Details

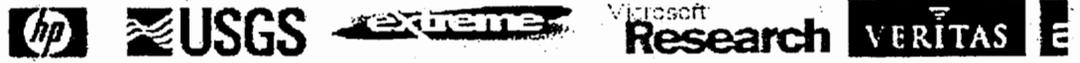
CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 64850

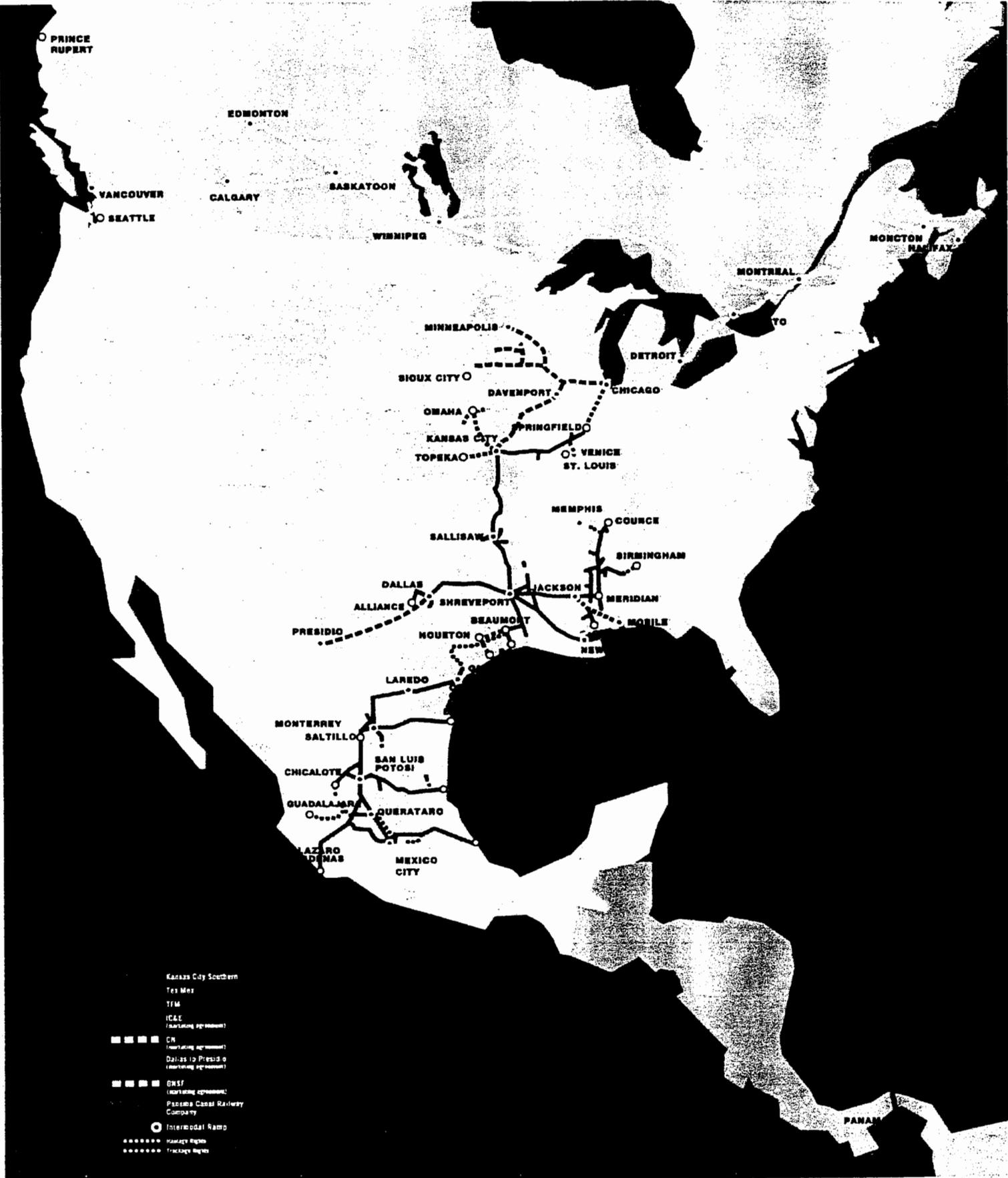
Image courtesy of the U.S. Geological Survey Source=c36094a1 Center=(-94.3372,36.8584) 153ms Running Time

TerraServer-USA Sponsors



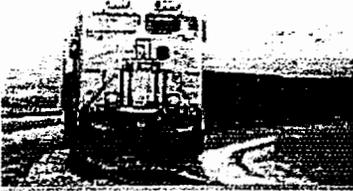
© 2003 Microsoft Corporation. Server=TK2TERRAWE11

Terms of Use Privacy Statement





KANSAS CITY SOUTHERN



- >For Customers
- >For Investors
- >For Employees & Friends
- >For the Media
- >For Your Safety



Kansas City Southern Railway

Kansas City Southern is a Class I rail system which operates over 3,13 track miles in 10 central and southeastern states. Founded in 1887 with vision of providing the most direct salt water access from the Midwest, today has the shortest route between Kansas City and the Gulf of Mexico serving the ports of Port Arthur, Texas, New Orleans and West Lake Charles, La. and Gulfport, Miss.

KCS transports a diverse mix of commodities with no one commodity exceeding 25% of total carloads. With connections to all the other Class rail carriers and coordinated operations with the other entities that comprise the NAFTA Railway, KCS is strategically positioned to serve the growing number of North American shippers requiring reliable, efficient rail transportation.

[Facts about KCS](#)
[History](#)

Search



[Home](#) / [Customers](#) / [Investors](#) / [Employees & Friends](#) / [Media](#) / [Safety](#) / [Site Map](#) / [Em](#)

427 W. 12TH ST. / KANSAS CITY, MO 64105 / P.O. BOX 219335 / KANSAS CITY, MO 64121-9335 / 816-98

[Copyright & Legal Disclaimer](#) / [FAQ](#)



IDAHO FISH AND GAME

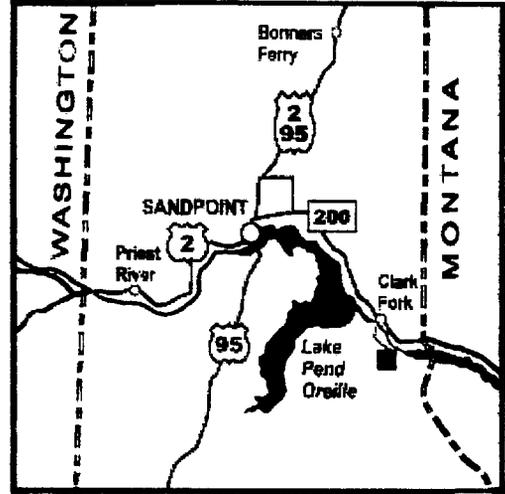
Montana Rail Link
Main Line
ave 15 to 20 trains/day
high 35 trains/day
45 mph
Bruce Thompson - manager

Cabinet Gorge Hatchery

HCR 493
Clark Fork, ID 83811
(208) 266-1431

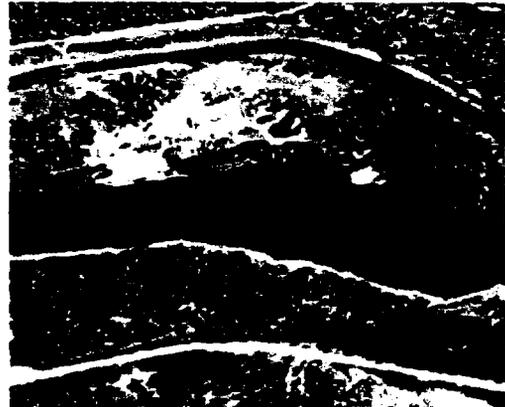
Cabinet Gorge Fish Hatchery is located in North Idaho, on the south side of the Clark Fork River, approximately 8 miles SE of the town of Clark Fork, ID.

The hatchery was constructed in 1985 to mitigate for fish losses caused by the construction of hydroelectric dams on the Pend Oreille River system. The project was co-funded by Avista Corp., Bonneville Power Administration, and the Idaho Department of Fish and Game.



Site Overview

Water for fish rearing at the hatchery is supplied by 6 ground water well pumps. A total of 10,995 gallons per minute of water is supplied by these pumps and routed to 64 individual raceways. Each raceway can hold 250,000 two inch kokanee salmon.

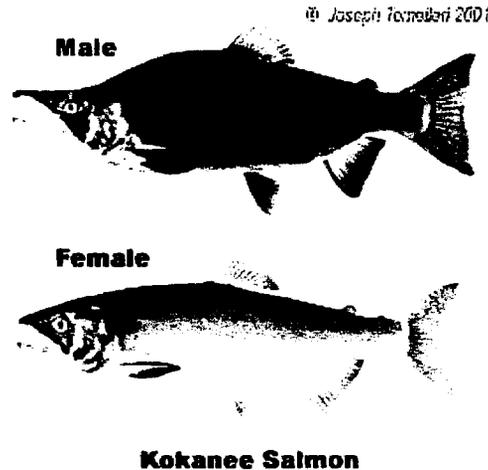


Visitors

Visitors are welcome 7 days a week from 8:00 a.m. to 4:00 p.m. If you call ahead, accommodations can be made for large group tours. There are no fish on station July through September.

Species Production

The primary species of fish reared is kokanee salmon. The hatchery can take up to 20 million eggs and rear up to 16 million fish to two inches. All of the kokanee are then released onto Lake Pend Oreille in June each year. Other species of fish raised are rainbow trout, westslope cutthroat and fall chinook salmon.



cutthroat and fall chinook salmon.

[Search](#) | [Feedback](#)

[About Us](#) | [What's News](#) | [Hunting](#) | [Fishing](#) | [Information](#) | [Home](#)

Copyright © 2004 Idaho Fish and Game

[Privacy Policy](#) | [Terms and Conditions](#)

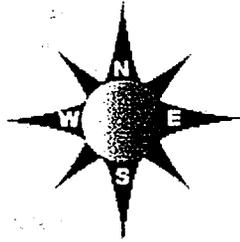
Search TerraServer Home Image

GO

Navigate

View: Aerial Photo

Cabinet, Idaho, United States 28 Jul 1995 USGS



1 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

Partners:



Waterproof Map

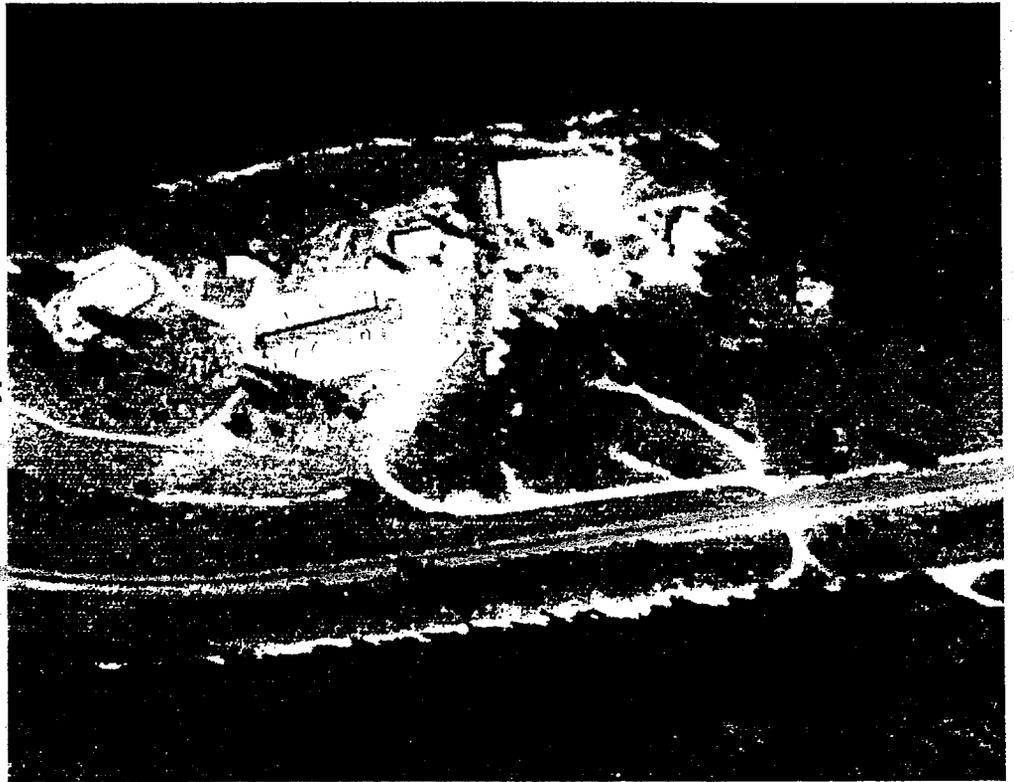
ClickWeather.com

Forecast for Wed. 21F 13F 48.1N 116.1W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet

House and Home:

Schools, Crime and Demographics for 83811



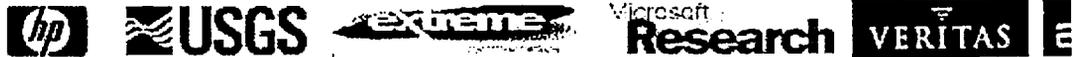
0 100M

0 100yd

Image courtesy of the U.S. Geological Survey Source=4811664NW Center=(-116.0748,48.0844) 2873ms Running Time

CH-40 always

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE21

Terms of Use Privacy Statement

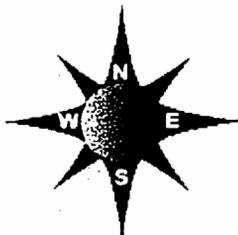
Search TerraServer Home Image

Search input field with a 'GO' button

Navigate

View: Aerial Photo

Cabinet, Idaho, United States 28 Jul 1995 USGS



2 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1992

Partners:



Waterproof Map

ClickWeather.com

Forecast for Thu. 30F 27F 48.1N 116.1W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 83811



0 200M 0 200yd

Image courtesy of the U.S. Geological Survey Source=4811664NW Center=(-116.0735,48.0853) 703ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE23

Terms of Use Privacy Statement

Search TerraServer Home Image

Navigate

View:

Cabinet, Idaho, United States 28 Jul 1995 



2 meter resolution



Map Size:

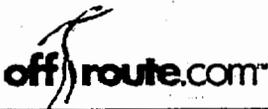
- [Advanced Find](#)
- [Famous Places](#)
- [Web Services](#)
- [About](#)

Related Links:

Other Imagery:

 Topo Map 1 Jul 1992

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed.
21F 13F
48.1N 116.1W [Details](#)

[CLICK HERE](#) and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

 Schools, Crime and
Demographics for 83811



0 200M 0 200yd

Image courtesy of the U.S. Geological Survey
Source=4811664NW Center=(-116.0788,48.0854) 1343ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Terms of Use Privacy Statement
Server=TK2TERRAWE23

Search TerraServer [Home](#) [Image](#)

Navigate

View:

2 km E of Cabinet, Idaho, United States 28 Jul 1995



8 meter resolution



Map Size:

- [Advanced Find](#)
- [Famous Places](#)
- [Web Services](#)
- [About](#)

Related Links:

Other Imagery:

Topo Map 1 Jul 1984

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed.
21F 13F
48.1N 116.1W [Details](#)

[CLICK HERE](#) and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

[Schools, Crime and
Demographics for 83811](#)



0 1Km 0 0.5Mi

Image courtesy of the U.S. Geological Survey
Source=4811664NE Center=(-116.0548,48.0798) 4236ms Running Time

TerraServer-USA
Sponsors



© 2003 Microsoft Corporation. [Terms of Use](#) [Privacy Statement](#)
Server=TK2TERRAWE23

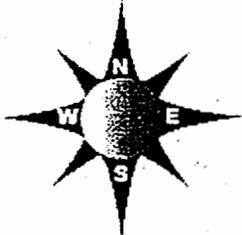
Search TerraServer Home Image

(GO)

Navigate

View:

3 km NE of Cabinet, Idaho, United States 28 Jul 1995



32 meter resolution



Map Size:

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

Topo Map 1 Jul 1966

Partners:



Waterproof Map

ClickWeather.com

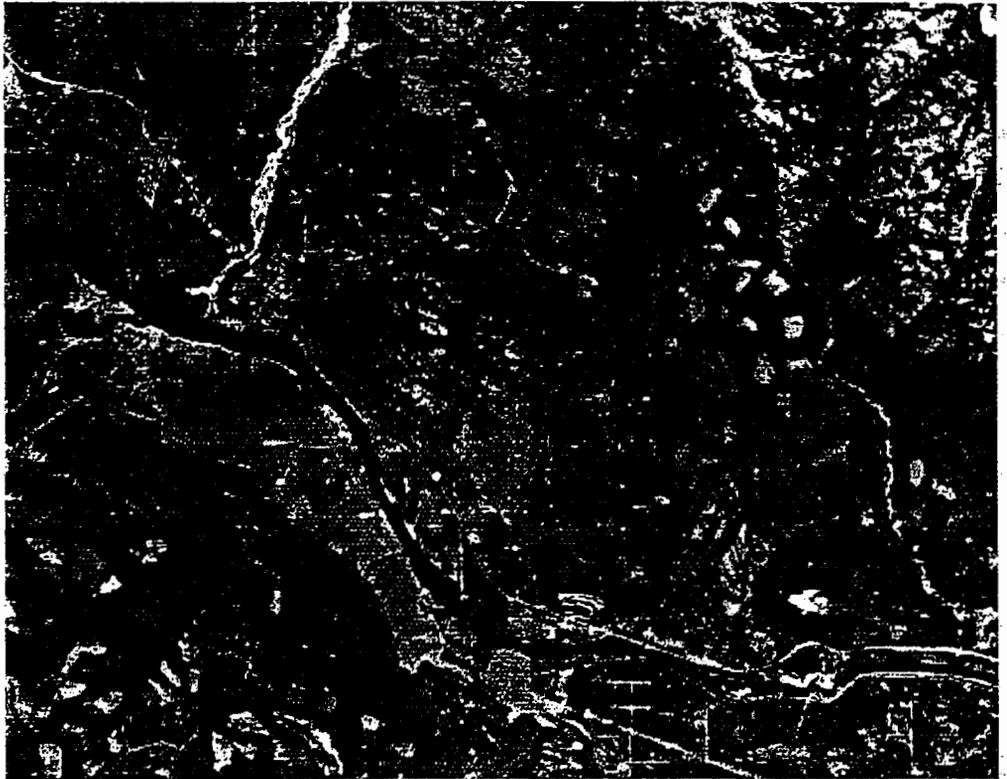
Forecast for Mon.

32F 20F
48.1N 116.1W [Details](#)

CLICK HERE and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

Schools, Crime and
Demographics for 83811-



0 4Km

0 2Mi

Image courtesy of the U.S. Geological Survey

Source=4811655SE Center=(-116.1081,48.1018) 766ms Running Time

TerraServer-USA
Sponsors



© 2003 Microsoft Corporation.
Server=TK2TERRAWEB12

[Terms of Use](#) [Privacy Statement](#)

IDAHO

Great Potatoes. Tasty Destinations.

[Search](#) | [Contacts](#) | [Links](#)

HOME

[ABOUT IDAHO](#)

[FAQ](#)

[LODGING](#)

[ATTRACTIONS](#)

[OUTDOOR RECREATION](#)

[FESTIVALS & EVENTS](#)

[REGIONAL INFO](#)

[LEWIS & CLARK](#)

[PASSPORT PROGRAM](#)

[MAPS, IMAGES & VIDEO](#)

[NEWS & MEDIA](#)

[FREE PUBLICATIONS](#)

[COOL PACKAGE DEALS](#)

[WINTER IN IDAHO](#)

[SIGN UP FOR](#)

[IDAHO E-MAIL](#)

[NEWSLETTERS](#)



[CHECK YOUR ITINERARY](#)

Cabinet Gorge Fish Hatchery

Constructed in 1985, this fish hatchery operated by the Idaho Department of Fish and Game is designed to raise up to 16 million Kokanee salmon annually. They also raise westslope cutthroat trout, fall chinook salmon and rainbow trout. All of the fish are released into Lake Pend Oreille each June. The hatchery is open to the public from July to October for maintenance. Daily tours are available.

[Add to Planr](#)

Location:	Northern Idaho, NE of Sandpoint	Phone:	208 266-1431
County:	Bonner	Season:	All Year
Nearest City:	Hope / Clark Fork	Hours:	Daily, 8am - 4pm; call ahead for
Contact:	Cabinet Gorge Fish Hatchery	Fees:	Free
Mailing Address:	HCR 493 1070 Cabinet Gorge Rd. Clark Fork, ID 83811	Facilities:	Rest Rooms, Parking, Handicap A
Web:		Map Location:	
E-Mail:			
Activities:	Fishing, Guided Tours		
Winter:			

Related Sites in this City:

- [Beyond Hope Resort](#)
- [Diamond T Guest Ranch](#)
- [Idaho Country Resort](#)
- [Jeb & Margaret's Trailer Haven](#)
- [Pend Oreille Shores Resort](#)
- [Red Fir Resort](#)



[Quick Links](#)

© Idaho Department of Commerce
OFFICIAL STATE TRAVEL PLANNER

[State of Idaho](#)
[Privacy Policy](#)

Bonneville Dam Fish Hatchery

Star Route B, Box 12
Cascade Locks, OR 97014
(541) 374-8393

Hydrounit Basin: Lower Columbia River - Sandy River

River in kilometers: 234.001km*

* River KM were taken from PTAGIS database, Pacific States Marine Fisheries Commission.

Operated by: Oregon Dept. of Fish and Wildlife

Hatchery Location: Directions: Take I-84 to Exit 40 - Bonneville Dam/Fish Hatchery (about 40 miles east of Portland).

Lat/Long: 45.632263 / -121.955994

Fish Species: Tule Fall Chinook, URB Fall Chinook, Spring Chinook, and Coho

This is a chinook and coho salmon hatchery. Display ponds also offer a relaxing place to feed large rainbow trout and view adult white sturgeon measuring more than six feet long. There is a gift shop open during summer months. Interpretive displays inside and out, including a viewing area to watch fall spawning activities. Outside accessible restrooms.

Bonneville Hatchery was constructed in 1909 and was originally funded by the State of Oregon. In 1957 the facility was remodeled and expanded as part of the Columbia River Fisheries Development Program (Mitchell Act). The hatchery underwent another renovation in 1974 as part of the U.S. Army Corps of Engineer's mitigation of fish losses from the construction of the John Day Dam. This hatchery provides fish for the ocean and river fisheries and eggs to other programs. Neighboring Bonneville Dam also has a visitor center. Tours are available. Please call ahead.

union Pacific mainline
Hinkle to Portland
25 to 30 trains/day
Train speed 40 mph
I-84 20,000 vehicle/day



Advanced Find | Info | Download

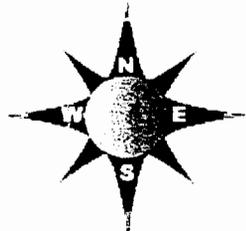
Search TerraServer Home Image

Search input field with (GO) button

Navigate

View: Aerial Photo dropdown menu

1 km SW of Bonneville, Oregon, United States 01 Aug 1993



2 meter resolution



Map Size: Medium dropdown menu

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1996

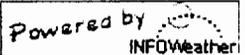
Partners:



Waterproof Map

ClickWeather.com

Click to get: Weather Forecast Maps for this point:

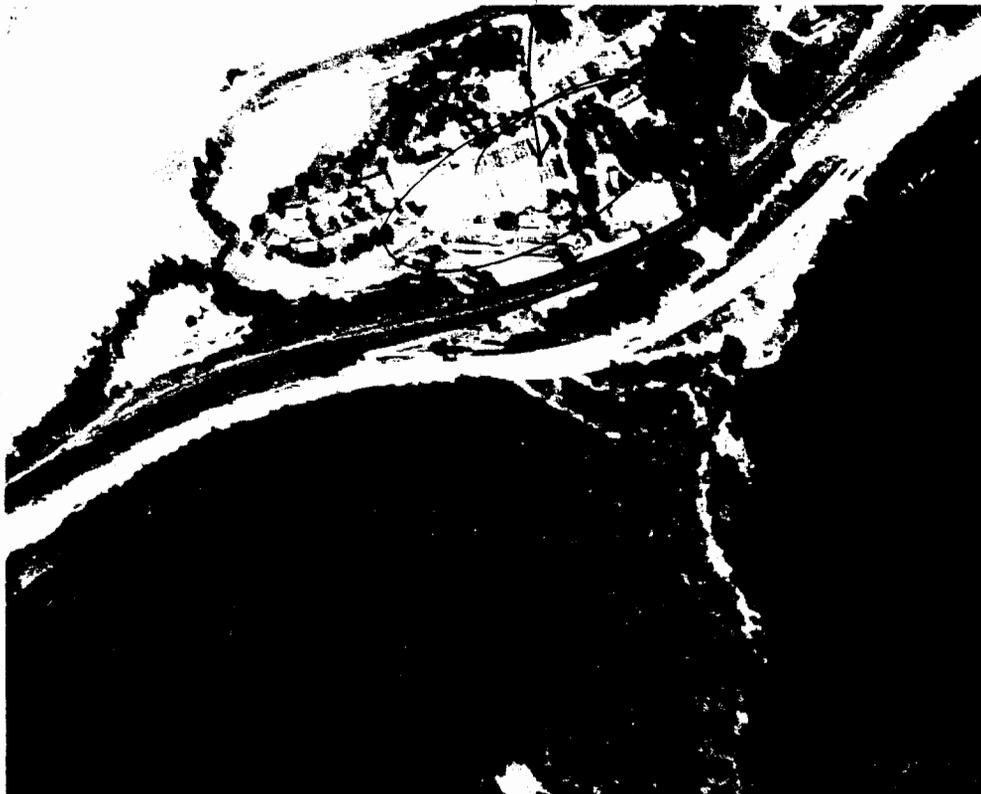


House and Home:

- Schools, Crime and Demographics for 97019
Schools, Crime and Demographics for 98648

USGS Stream Gauge

USGS COLUMBIA R BLW BONNEVILLE DAM, OR



0 200M

0 200yd

Image courtesy of the U.S. Geological Survey
Source=211633 Center=(-121.9557,45.6294) 0ms Running Time



Advanced Find | Info | Download |

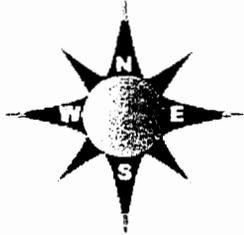
Search TerraServer Home Image

GO

Navigate

View: Aerial Photo

Bonneville, Oregon, United States 04 Aug 2000 USGS



1 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

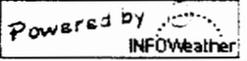
Partners:



Waterproof Map

ClickWeather.com

Click to get: Weather Forecast Maps for this point:



House and Home:

- Schools, Crime and Demographics for 97019
- Schools, Crime and Demographics for 98548

USGS Stream Gauge

USGS COLUMBIA R BLW BONNEVILLE DAM, OR



0 100M 0 100yd

Image courtesy of the U.S. Geological Survey Source=211609 Center=(-121.9569,45.6321) 30ms Running Time



Advanced Find | Info | Download

Search TerraServer

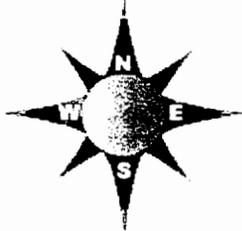
Home Image

GO

Navigate

View: Aerial Photo

1 km SW of Bonneville, Oregon, United States 01 Aug 1993



4 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1996

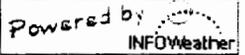
Partners:



Waterproof Map

ClickWeather.com

Click to get Weather Forecast Maps for this point



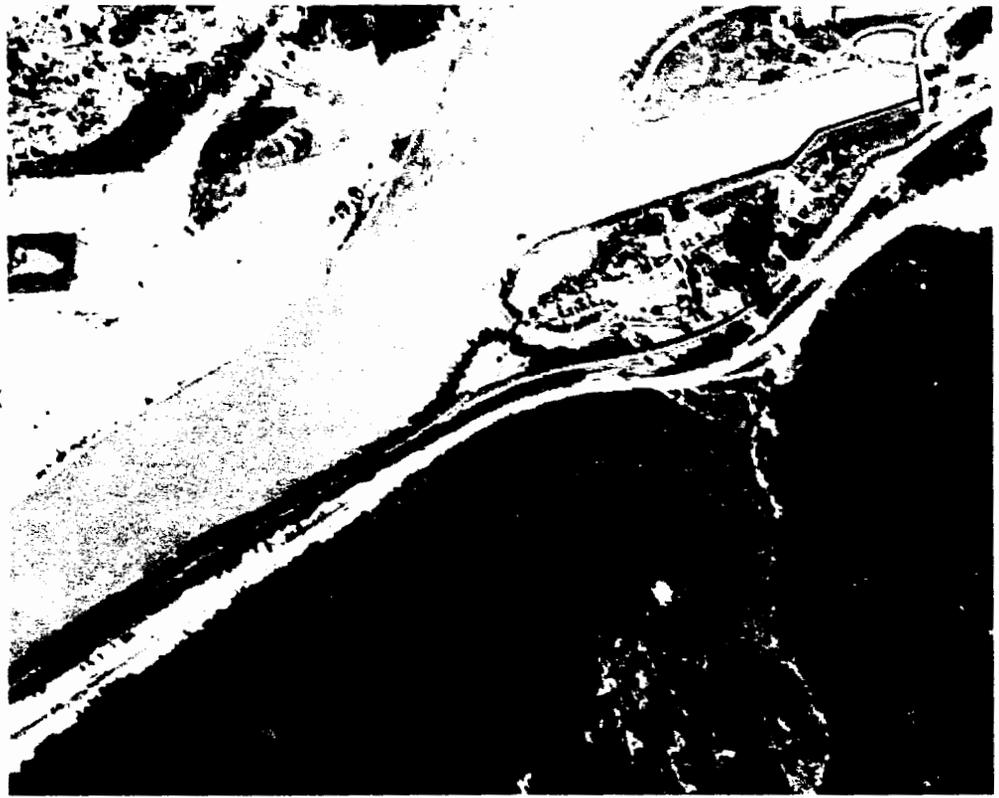
House and Home:

Schools, Crime and Demographics for 97019

Schools, Crime and Demographics for 98648

USGS Stream Gauge

USGS COLUMBIA R BLW BONNEVILLE DAM, OR



0 0.5Km

0 0.25Mi

Image courtesy of the U.S. Geological Survey
Source=211633 Center=(-121.9583,45.6276) 0ms Running Time

Search TerraServer

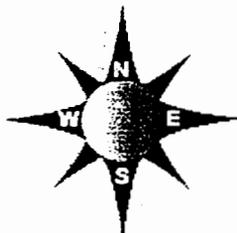
Home Image

Search input field with a GO button

Navigate

View: Topo Map

1 km SW of Bonneville, Oregon, United States 01 Jul 1996 USGS



2 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Aerial Photo 1 Aug 1993

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed. 34F 25F 45.6N 122.0W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 97019
Schools, Crime and Demographics for 98648

USGS Stream Gauge

USGS COLUMBIA R BLW BONNEVILLE DAM, OR

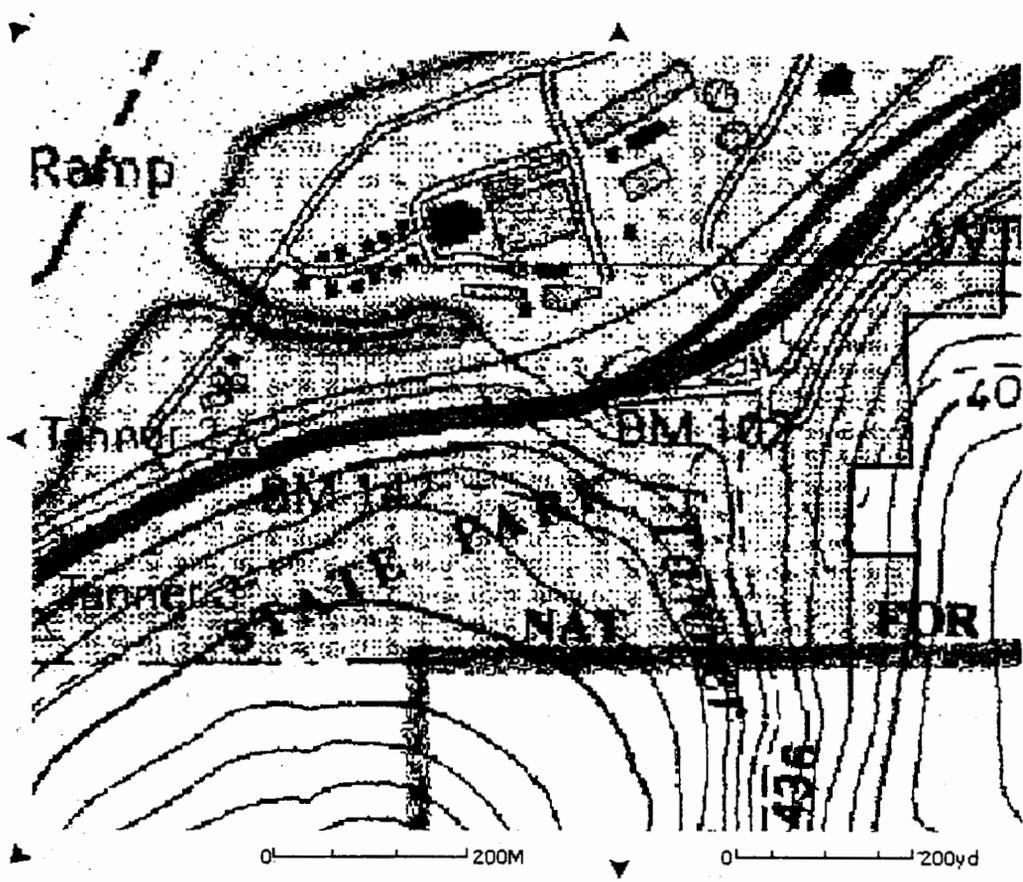


Image courtesy of the U.S. Geological Survey
Source=o45121f8 Center=(-121.9557,45.6294) 533ms Running Time

TerraServer-USA Sponsors



Cascade Fish Hatchery

HC 66 Box 750

Cascade Locks, OR 97014

(541) 374-8381

Hydrounit Basin: Middle Columbia - Hood

Operated by: Oregon Dept. of Fish and Wildlife

Hatchery Location: Cascade Hatchery is located along Eagle Creek near the town of Cascade Locks, Oregon. *Directions:* Exit 41 on Interstate 84, about 41 miles east of Portland.

Lat/Long: 45.640888 / -121.926346

Fish Species: Coho Fall Chinook (adults are sometimes collected at this facility and used for backup for other programs)

Cascade Hatchery was authorized under the Mitchell Act and began operating in 1959 as part of the Columbia River Fisheries Development Program. The goal of the hatchery is to produce coho to help meet the goals the Columbia River Fisheries Development Program (U.S. v. Oregon Agreement). The hatchery is near the I-84 trail head for hiking Eagle Creek and other trails.

Best time to view: During the fall, visitors can view chinook and coho salmon below the fish rack at the bridge crossing Eagle Creek.

Union Pacific mainline
Hinkle to Portland
25 to 30 trains/day
Train speed 40 mph



Advanced Find | Info | Download

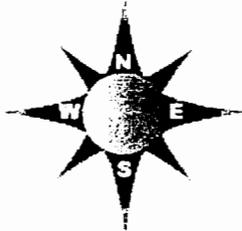
Search TerraServer Home Image

Search input field with a GO button

Navigate

View: Aerial Photo

60 km E of Portland, Oregon, United States 04 Aug 2000



1 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

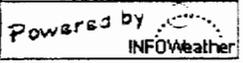
Partners:



Waterproof Map

ClickWeather.com

Click to get Weather Forecast Maps for this point:



House and Home:

- Schools, Crime and Demographics for 97014
- Schools, Crime and Demographics for 97019
- Schools, Crime and Demographics for 98548



Industrial



Image courtesy of the U.S. Geological Survey
Source=211609 Center=(-121.9286,45.6408) 143ms Running Time



Advanced Find | Info | Download

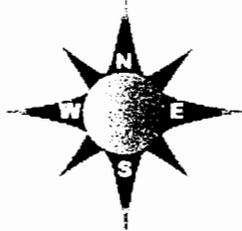
Search TerraServer Home Image

Search input field with GO button

Navigate

View: Aerial Photo dropdown menu

60 km E of Portland, Oregon, United States 04 Aug 2000



1 meter resolution



Map Size: Medium dropdown menu

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

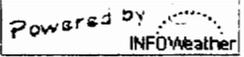
Partners:



Waterproof Map

ClickWeather.com

Click to get: Weather Forecast Maps for this point:



House and Home:

- Schools, Crime and Demographics for 97014
Schools, Crime and Demographics for 97019
Schools, Crime and Demographics for 98648



0 100M

0 100yd

Image courtesy of the U.S. Geological Survey
Source=211609 Center=(-121.9286,45.6408) 143ms Running Time

Search TerraServer Home Image

Navigate

View:

60 km E of Portland, Oregon, United States 01 Jul 1996 USGS



4 meter resolution

Map Size:

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:
 USGS Aerial Photo 4 Aug 2000

Partners:

Waterproof Map

ClickWeather.com
 Forecast for Wed.
 34F 25F
 45.6H 121.9W [Details >](#)
CLICK HERE and get
 Weather and Map Forecast
 for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 97014
- Schools, Crime and Demographics for 97019
- Schools, Crime and Demographics for 98648

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE23 Terms of Use Privacy Statement

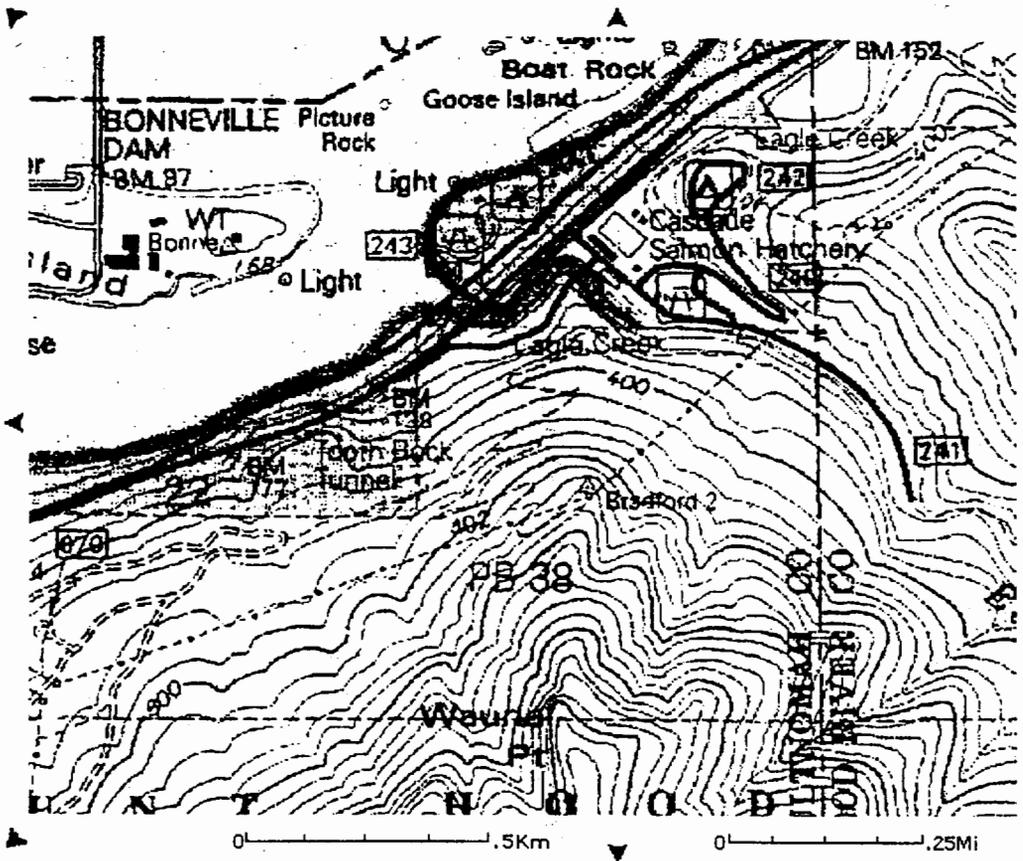
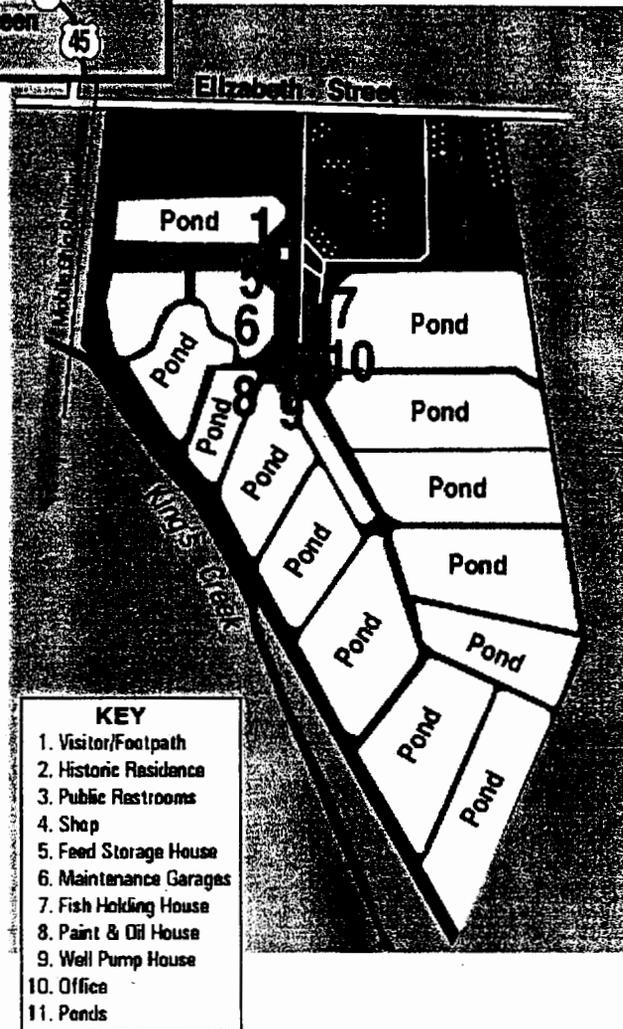
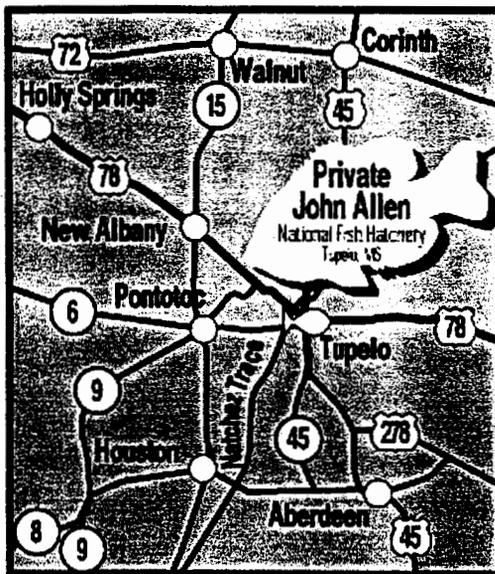


Image courtesy of the U.S. Geological Survey
 Source=o45121f8 Center=(-121.9274,45.6345) 500ms Running Time





Search TerraServer Home Image



Navigate

View: Aerial Photo

Tupelo, Mississippi, United States 01 Jul 1970 USGS



32 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Aerial Photo 17 Feb 1996

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed. 53F 30F 34.3N 88.7W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 38801

USGS Stream Gauge

USGS Town Cr @ Tupelo, MS

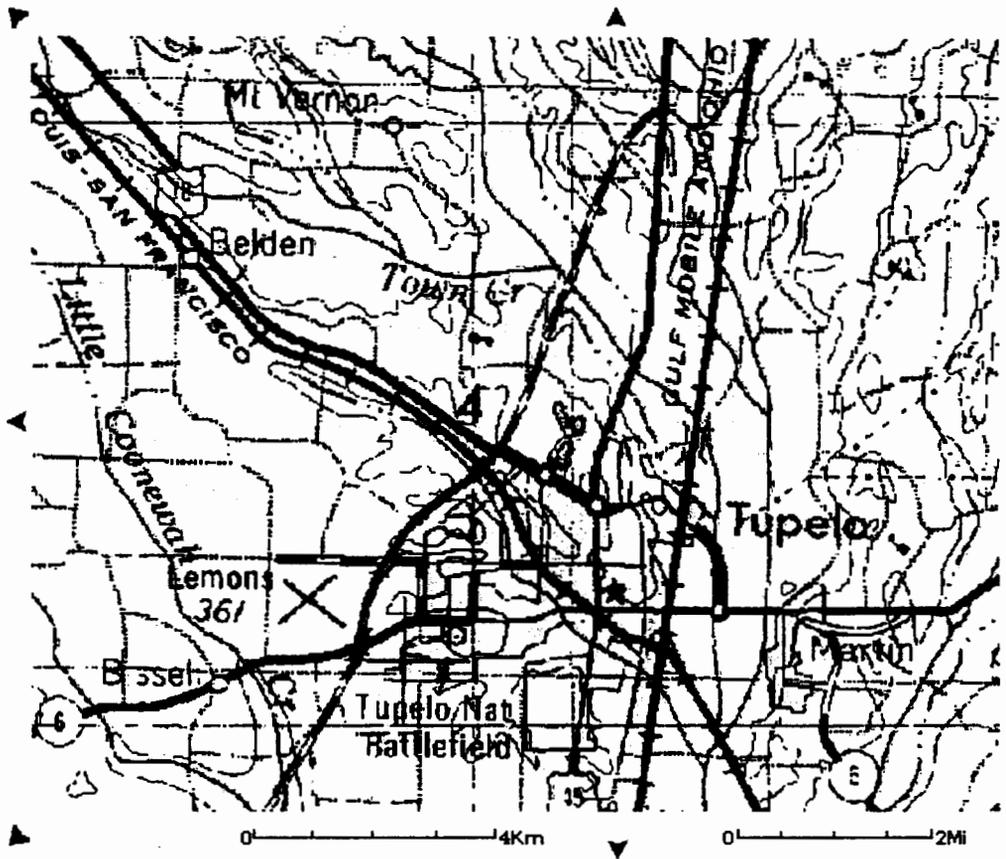


Image courtesy of the U.S. Geological Survey Source=c34088a1 Center=(-88.7117,34.2572) 30ms Running Time

TerraServer-USA Sponsors



Microsoft



© 2003 Microsoft Corporation. Server=TK2TERRAWE12

Terms of Use Privacy Statement



Advanced Find | Info | Download | Print | Waterproof

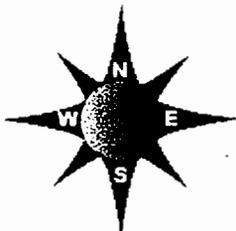
Search TerraServer Home Image



Navigate

View: Aerial Photo

Tupelo, Mississippi, United States 20 Jan 1997



8 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About



0 1Km 0 1.5Mi

↑ rail-line

Image courtesy of the U.S. Geological Survey
Source=3408843SW Center=(-88.7028,34.2501) 80ms Running Time

Related Links:

Other Imagery:

Topo Map 1 Jul 1983

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed.
53F 30F
34.2N 88.7W Details

CLICK HERE and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

Schools, Crime and
Demographics for 38801

USGS Stream Gauge

Town Cr @ Tupelo,
MS

TerraServer-USA
Sponsors



Microsoft



© 2003 Microsoft Corporation. Terms of Use Privacy Statement
Server=TK2TERRAWE22



-  Advanced Find
-  Info
-  Download
-  Print
-  Waterproof

Search TerraServer Home Image



Navigate

View: Aerial Photo 

Tupelo, Mississippi, United States 20 Jan 1997 



4 meter resolution



Map Size: Medium 

- [Advanced Find](#)
- [Famous Places](#)
- [Web Services](#)
- [About](#)

Related Links:

Other Imagery:

 Topo Map 1 Jul 1979

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed.
 53F 30F 
 34.2N 88.7W [Details](#)

[CLICK HERE](#) and get Weather and Map Forecast for any point on the Planet!

House and Home:

 Schools, Crime and Demographics for 38801

USGS Stream Gauge

 Town Cr @ Tupelo, MS



0 .5Km 0 .25Mi

Image courtesy of the U.S. Geological Survey
Source=3408851NW Center=(-88.7071,34.2464) 110ms Running Time

TerraServer-USA Sponsors



Microsoft Research



© 2003 Microsoft Corporation. Terms of Use Privacy Statement
Server=TK2TERRAWE23



American Falls Hatchery

Address/Phone Number

2974 S. Hatchery Rd.
American Falls, ID 83211
(208) 226-2015

Location

The American Falls fish hatchery is located one mile downstream from American Falls dam. From I-86, take exit 39, on Highway 39, heading toward Aberdeen. After crossing American Falls dam, turn left, and then immediately left again. This is Fish Hatchery Road. Follow the road for one mile to the hatchery.

Site Overview

The hatchery is a modern production facility, with 20 outdoor raceways, and a nursery and incubation building.

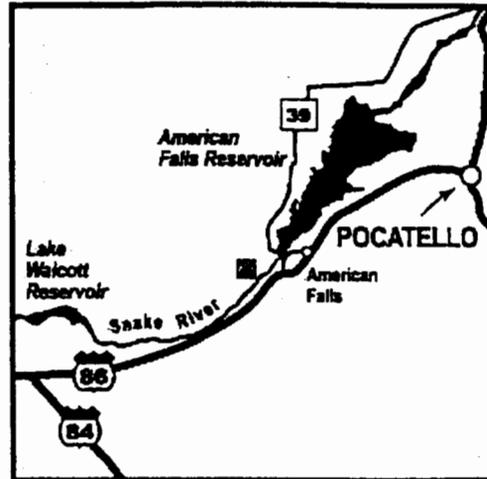
Visitors

Visitors are welcome at the American Falls hatchery from dawn to dusk, 365 days a year. Guided tours are available from 7:30 am to 4:00 pm every day. Reservations are suggested. Call (208)226-2015. The hatchery also has a self-guided nature trail on the property which can take from 30 minutes to 2 hours to complete, depending on the route chosen.

Species Production

The hatchery raises mostly rainbow trout, placed in the waters of Southeast Idaho, and northern Idaho for anglers to catch. This year, we will experiment with raising cutthroat trout.

The hatchery is funded with fishing license dollars, and with an endowment from the American Falls reservoir company.



© Joseph Tomelleri 2001

Rainbow

Union Pacific
mainline Pocatello-Nampa
30-35 trains/day
Train speed 60-65 mph

Search TerraServer Home Image

(GO)

Navigate

View:

3 km SW of American Falls, Idaho, United States 24 May 1992



2 meter resolution



Map Size:

Advanced Find

Famous Places

Web Services

About



0 200M

0 200yd

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1991

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed.
27F 25F
42.8N 112.9W Details

CLICK HERE and get
Weather and Map Forecast
for any point on the Planet

House and Home:

Schools, Crime and
Demographics for 83211

USGS Stream Gauge

USGS Snake R @ Neeley bl
Am Falls, ID

Image courtesy of the U.S. Geological Survey
Source=4211209SE Center=(-112.8847,42.7664) 4466ms Running Time

*American Falls
Hatchery*

TerraServer-USA
Sponsors



Microsoft



© 2003 Microsoft Corporation.
Server=TK2TERRAWEB22

Terms of Use Privacy Statement

Search TerraServer

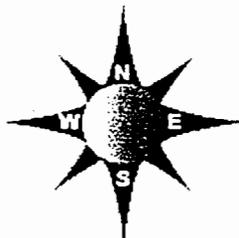
Home Image

GO

Navigate

view: Aerial Photo

2 km SW of American Falls, Idaho, United States 24 May 1992



8 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1980

Partners:



Waterproof Map

ClickWeather.com
 Forecast for Wed.
 25F 7F
 42.8N 112.9W [Details](#)

CLICK HERE and get
 Weather and Map Forecast
 for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 83211

USGS Stream Gauge

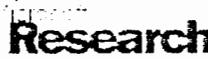
USGS Snake R @ Neeley bl Am Falls, ID



0 1Km 0 .5Mi

Image courtesy of the U.S. Geological Survey
Source=4211209SE Center=(-112.8774,42.7683) 2800ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE11

Terms of Use Privacy Statement



Advanced Find | Info | Download | Print | Waterproof M

Search TerraServer

Home Image

GO

Navigate

View: Topo Map

4 km S of American Falls, Idaho, United States 01 Jul 1980 USGS



16 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

USGS Aerial Photo 24 May 1992

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed. 25F 7F 42.7N 112.9W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 83211

USGS Stream Gauge

USGS Snake R @ Neeley bl Am Falls, ID

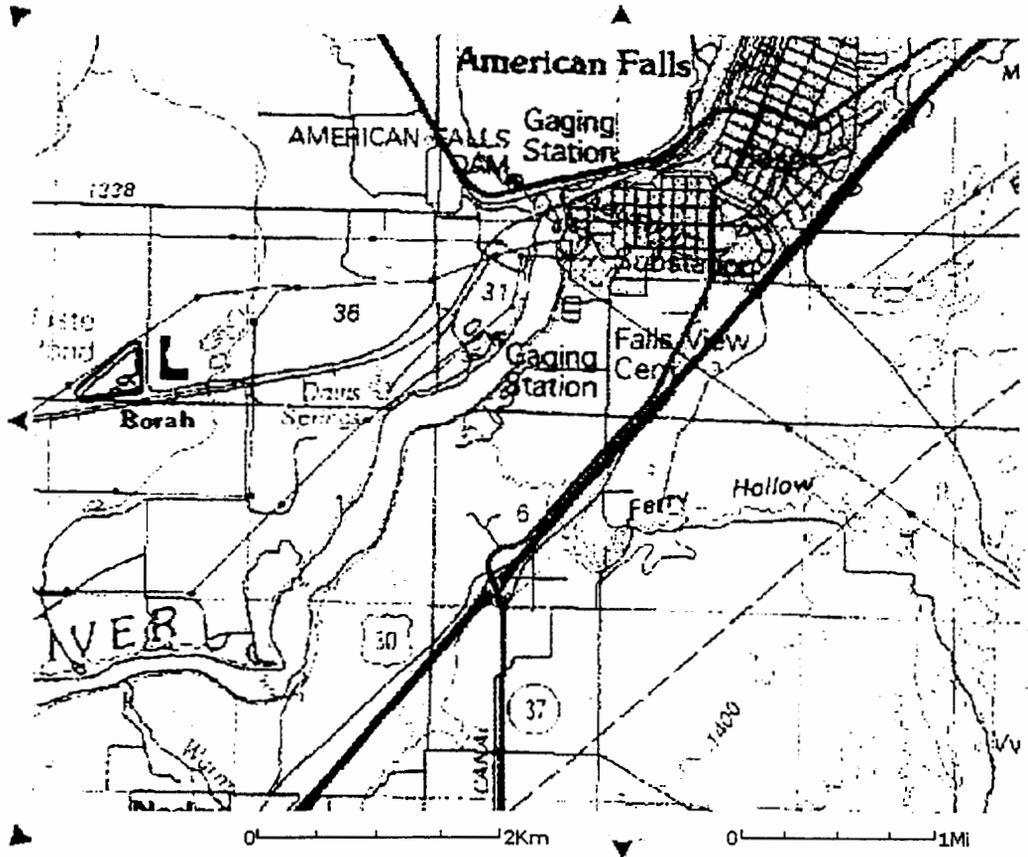
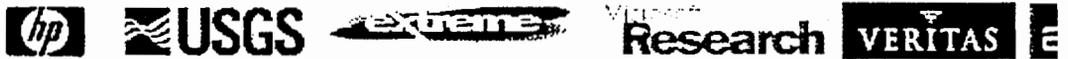


Image courtesy of the U.S. Geological Survey Source=f42112e1 Center=(-112.8670,42.7469) 1326ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE22

Terms of Use Privacy Statement

IowaDNR Fish and Fishing

The Iowa Department of Natural Resources

Leading
in care
of our na

Search our site:

Go

About the DNR

DNR News

Contact Us

Fish and Fishing

DNR Home

Fish & Fishing Home

Where to Fish

Fishes of Iowa

Regulations

Offices

News

Fishing Report

Trout Stocking

2003 Forecast

Programs

Aquatic Education

Aquatic Nuisance Species

Fish Hatcheries

Fisheries Management and
Research

Other

Fish Consumption Advisories

Farm Pond Information

State Record Fish

Rathbun Fish Hatchery



The Rathbun Hatchery in Appanoose County is seven miles north of on road J5T. Although Rathbun Hatchery is relatively new, it is a project. Planning began in December 1970 with construction beginning in 1974. The facility was opened on June 11, 1977. The cost was nearly \$6 million

coming from three sources. The Iowa Legislature appropriated \$2.3 million from the general fund. The U.S. Army Corps of Engineers provided \$700,000, and the sale of hunting and fishing licenses financed approximately \$3 million. Annual operating funds are provided entirely by the sale of hunting and fishing licenses.

Rathbun Fish Hatchery Duties

The Rathbun Fish Hatchery is an intensive warm water fish hatchery. That is, the species of fish propagated here grow best in water temperatures between 50 and 90 degrees Fahrenheit. Channel catfish is the primary fish species raised at the hatchery; however, other species include walleye, saugeye, and largemouth bass and are used statewide. Brood stock channel catfish are maintained at this facility and annually provide more than 1 million fry for use across the state. Brood stock walleye are annually collected in April from Lake Rathbun from gill nets. These fish are taken back to the hatchery where they are spawned and are then returned to the lake. The facility has the ability to raise a number of species to large fingerling size for fishery management and research applications.



Fish produced at this facility are stocked statewide in Iowa farm ponds, rivers and more than 250 lakes and reservoirs. Annually, more than 300,000 large fingerling catfish, 100,000 small fingerling catfish, 35 million walleye fry, 5 million saugeye fry, 6 million walleye fingerlings and 15,000 largemouth bass fingerlings are produced at Rathbun. In addition, more than 100,000 four- to six-inch catfish are provided for county boards and cities each year for their caged-catfish rearing programs.

Tours:

- Open year-round Monday through Friday, 8 a.m. to 4 p.m.
- Large groups must call ahead to make an appointment.
- Small groups are self-guided.

Iowa, Chicago &
Eastern Railroad

Agriculture &
Commodities

4-5 trains/day

40 mph

Rathbun Fish Hatchery



The Rathbun Hatchery is located in Appanoose County seven miles north of Centerville on road J5T. Although the Rathbun Hatchery facility is relatively new, it is not a new project. Planning officially began in December 1970, with construction beginning in March 1974. The facility was completed on June 11, 1977. The project cost nearly \$6 million, coming from three sources. The Iowa Legislature appropriated \$2.3 million from Iowa's general fund. The U.S. Army Engineers provided \$700,000, and the sale of hunting licenses financed approximately \$3 million. Annual operating funds are provided entirely by the sale of hunting licenses.

Rathbun Fish Hatchery Duties

The Rathbun Fish Hatchery is an intensive warm water fish hatchery. That is, the species of fish propagated here grow best in water temperatures between 50 and 90 °F. Channel catfish is the primary fish species raised at the hatchery; however, other species include walleye, saugeye, and largemouth bass and are used statewide. Brood stock channel catfish are maintained at this facility and annually provide more than 1 million fry for use across the state. Brood stock walleye are annually collected in April from Lake Rathbun from gill nets. These fish are taken back to the hatchery where they are spawned and are then returned to the lake. The facility has the ability to raise a number of species to large fingerlings for use in a number of fishery management and research applications.



Fish produced at this facility are stocked statewide in Iowa farm ponds, rivers and more than 250 lakes and reservoirs. Annually, more than 300,000 large fingerling catfish, 100,000 small fingerling catfish, 35 million walleye fry, 5 million saugeye fry, 60,000 walleye fingerlings and 15,000 largemouth bass fingerlings are produced at Rathbun. In addition, more than 100,000 four- to six-inch catfish are provided for county conservation boards and cities each year for their catfish rearing programs.

Tours:

- Open year-round Monday through Friday, 8 a.m. to 4 p.m.
- Large groups must call ahead to make an appointment.
- Small groups are self-guided.



Advanced Find | Info | Download | Print | Waterproof M

Search TerraServer Home Image

Search input field with a GO button

Navigate

View: Aerial Photo dropdown menu

3 km NE of Rathbun, Iowa, United States 18 Apr 1994 *rain*



4 meter resolution



Map Size: Medium dropdown menu

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

Topo Map 1 Jul 1966

Partners:



Waterproof Map

ClickWeather.com

Forecast for Tue.
26F 9F
40.8N 92.9W [Details](#)

[CLICK HERE](#) and get
Weather and Map Forecast
for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 52544
- Schools, Crime and Demographics for 52571
- Schools, Crime and Demographics for 52574

USGS Stream Gauge

Chariton R. nr Rathbun, IA



0 .5Km

0 .25Mi

Image courtesy of the U.S. Geological Survey
Source=4009209NE Center=(-92.8719,40.8201) 4296ms Running Time

TerraServer-USA Sponsors



Microsoft



Search TerraServer

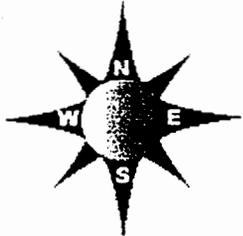
Home Image

GO

Navigate

View: **Topo Map**

2 km S of Rathbun, Iowa, United States 01 Jul 1975 **USGS**



32 meter resolution



Map Size: **Medium**

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

USGS Aerial Photo 18 Apr 1994

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed.
41F 19F
 40.8N 92.9W **Details**

CLICK HERE and get
 Weather and Map Forecast
 for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 52544**
- Schools, Crime and Demographics for 52574**

TerraServer-USA
 Sponsors



© 2003 Microsoft Corporation.
 Server=TK2TERRAWE21

[Terms of Use](#) [Privacy Statement](#)

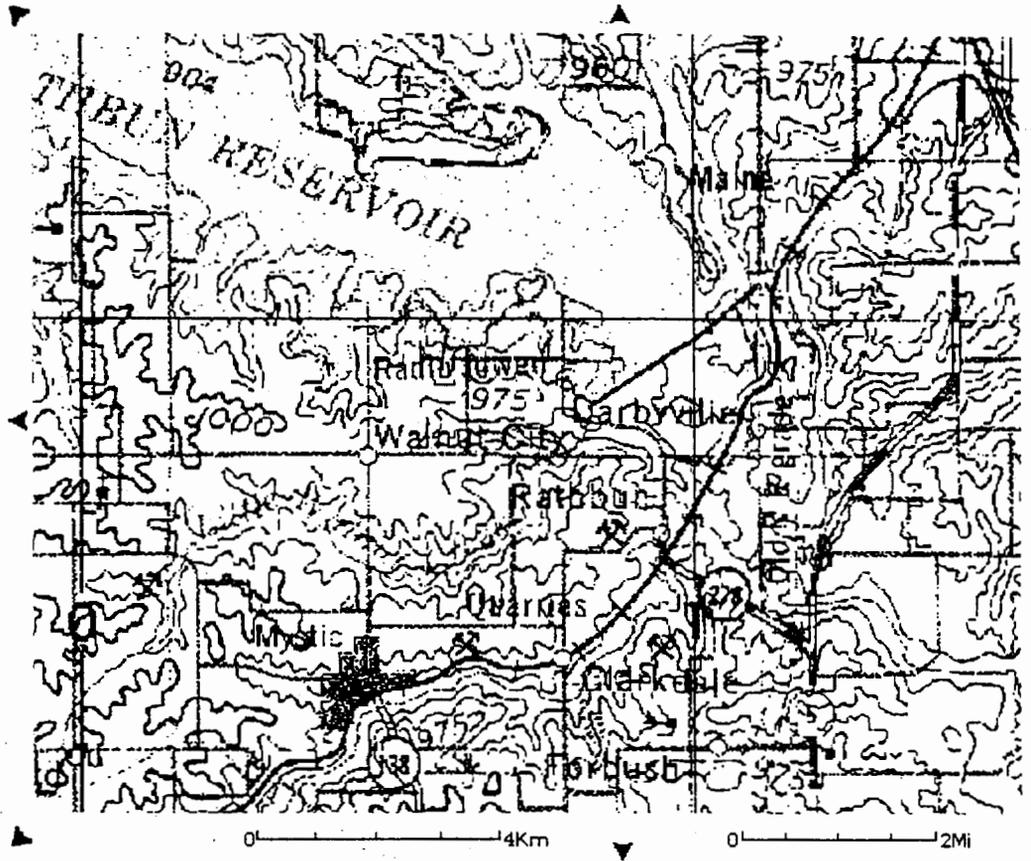


Image courtesy of the U.S. Geological Survey
 Source=c40092a1 Center=(-92.8957,40.7877) 3170ms Running Time

Search our site:

Go

About the DNR

DNR News

Contact Us

Fish and Fishing

- DNR Home
- Fish & Fishing Home
- Where to Fish
- Fishes of Iowa
- Regulations
- Offices

News

- Fishing Report
- Trout Stocking
- 2003 Forecast

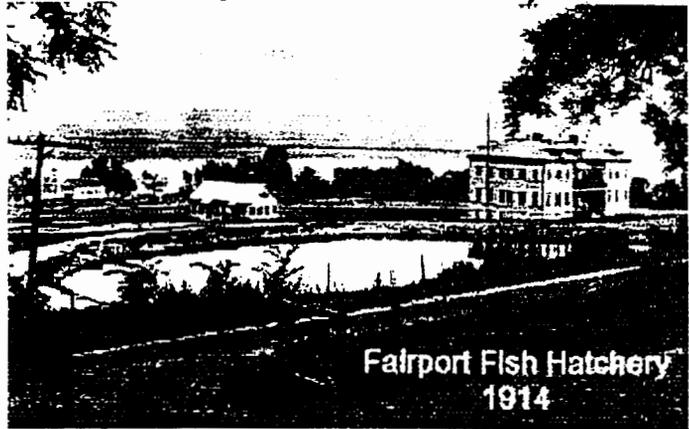
Programs

- Aquatic Education
- Aquatic Nuisance Species
- Fish Hatcheries
- Fisheries Management and Research

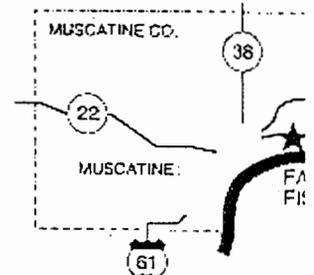
Other

- Fish Consumption Advisories
- Farm Pond Information
- State Record Fish

Fairport Fish Hatchery



The Fairport Fish Hatchery is located along Iowa Highway 22, eight miles east in Muscatine County. It has a very rich history, serving Iowa's natural resource anglers for many years. The facility is located along the scenic upper Mississippi valley. The land where the hatchery is located was donated to the federal government by the Association of Button Manufacturers. It was established as a biological station by Congress in 1908. The station was set up for freshwater mussel research and production which was of economic importance to the region at the time. In 1929 the station was converted to a fish hatchery and during the late 1960's the Bureau of Sport Fisheries and Wildlife spent more than \$200,000 renovating and modernizing it. In 1973, the bureau suffered severe budget cuts and the federal farm pond stocking program was abolished. The operation of the Fairport Fish Hatchery was turned over to the Department of Natural Resources. It was an opportunity to add - without cost to Iowa anglers - an excellent managed hatchery to the system. **Fairport Fish Hatchery Duties** The Fairport Hatchery is a warmwater extensive culture station located on the Mississippi River near Muscatine. Eighteen ponds are used to hatch and rear warmwater angling favorites such as largemouth bass and bluegill. Adult fish such as largemouth bass are kept at the hatchery year-around. These fish are referred to as brood stock and are annually placed in ponds for spawning. When the ponds are drained the fish are gathered and transferred to the holding house for sorting prior to transporting them to lakes. In addition to largemouth bass and bluegill the facility annually produces walleyes and white amur for use throughout the state. In addition, the hatchery is responsible for the statewide farm pond stocking program.

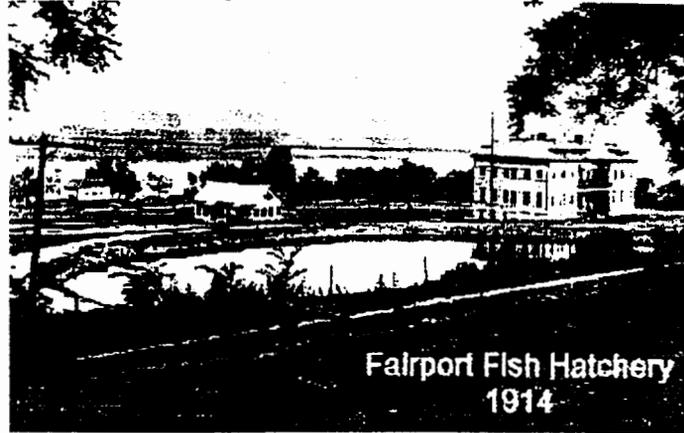


Hatchery Address and Phone

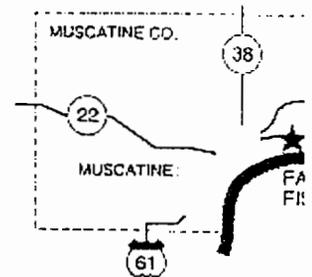
State of Iowa Home | DNR Home
webmaster@dnr.state.ia.us © Iowa Department of Natural Resources

*Iowa, Chicago & Eastern Railroad
Agriculture, grain
5 to 6 trains/day
40 mph*

Fairport Fish Hatchery



The Fairport Fish Hatchery is located along Iowa Highway 22, eight miles east of Muscatine in Muscatine County. It has a very rich history, serving Iowa's natural resources and its anglers for many years. The facility is located along the upper Mississippi River valley. The land where the hatchery is located was donated to the federal government by the Association of Button Manufacturers. It was established as a biological station by Congress in 1908. The station was used for freshwater mussel research and propagation, which was of economic importance to the region at the time. The station became a fish hatchery and during the late 1960's the Bureau of Sport Fisheries and Wildlife spent more than \$200,000 renovating and modernizing it. In 1973, the bureau suffered from severe budget cuts and the federal stocking program was abolished. As a result, operation of the Fairport Fish Hatchery was turned over to the Department of Natural Resources. It was an opportunity to add - without cost to Iowa anglers - an excellent, well-managed hatchery system. **Fairport Fish Hatchery Duties** The Fairport Fish Hatchery is a warmwater extensive culture station on the Mississippi River near Muscatine. Eighteen ponds are used to hatch and rear warm-water angling favorites such as largemouth bass and bluegill. Adult fish such as largemouth bass are kept at the hatchery year-around. These fish are referred to as brood stock and are annually placed in ponds for spawning. When the ponds are drained the fish are gathered and transferred to the holding house for sorting prior to transporting them to lakes. In addition to largemouth bass and bluegill the facility annually produces walleyes and white amur for use throughout the state. In addition, the hatchery is responsible for the statewide farm pond stocking program.



Search TerraServer

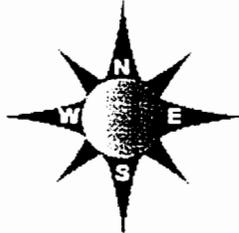
Home Image

Search input field with a GO button

Navigate

View: Aerial Photo

29 km SW of Davenport, Iowa, United States 31 Mar 2000



2 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1991

Partners:



Waterproof Map

ClickWeather.com

Forecast for Tue.

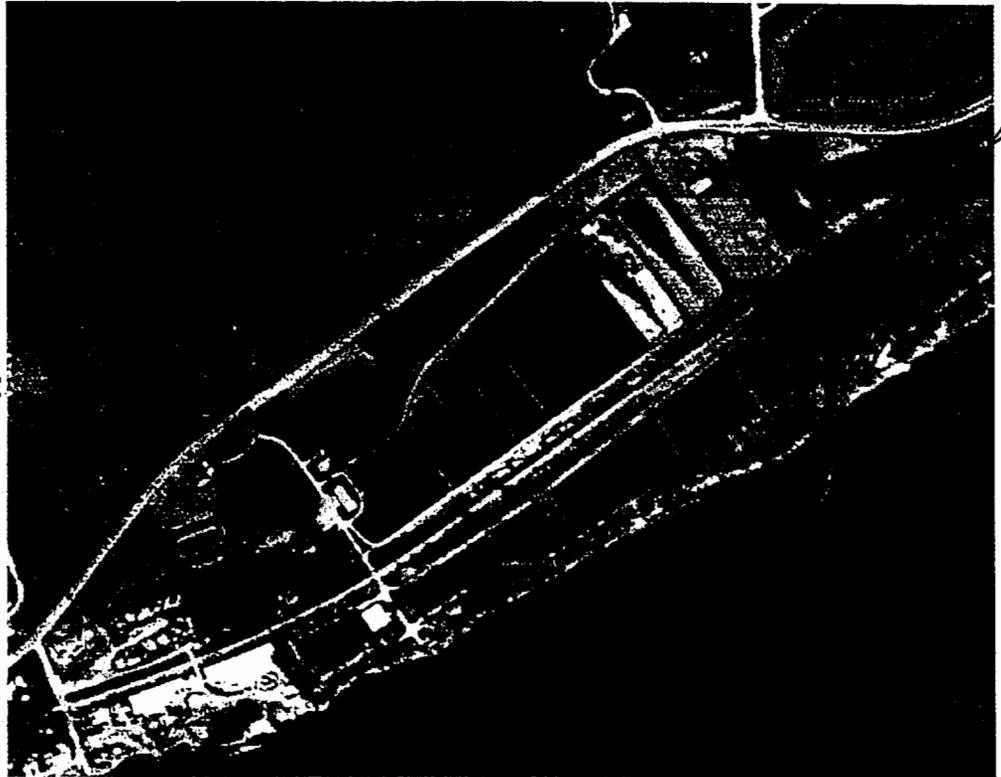
21F 7F

41.4N 90.9W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 52761
Schools, Crime and Demographics for 61259



0 200M

0 200yd

Image courtesy of the U.S. Geological Survey
Source=4109033SE-1 Center=(-90.8958,41.4369) 1093ms Running Time

TerraServer-USA Sponsors



Microsoft



© 2003 Microsoft Corporation. Server=TK2TERRAWEB23

Terms of Use Privacy Statement

Search TerraServer

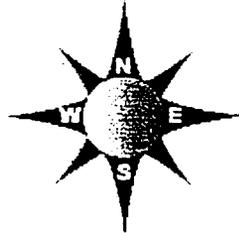
Home Image

GO

Navigate

View:

30 km SW of Davenport, Iowa, United States 31 Mar 2000



4 meter resolution



Map Size:

[Advanced Find](#)

[Famous Places](#)

[Web Services](#)

[About](#)

Related Links:

Other Imagery:

[USGS Topo Map 1 Jul 1991](#)

Partners:



[Waterproof Map](#)

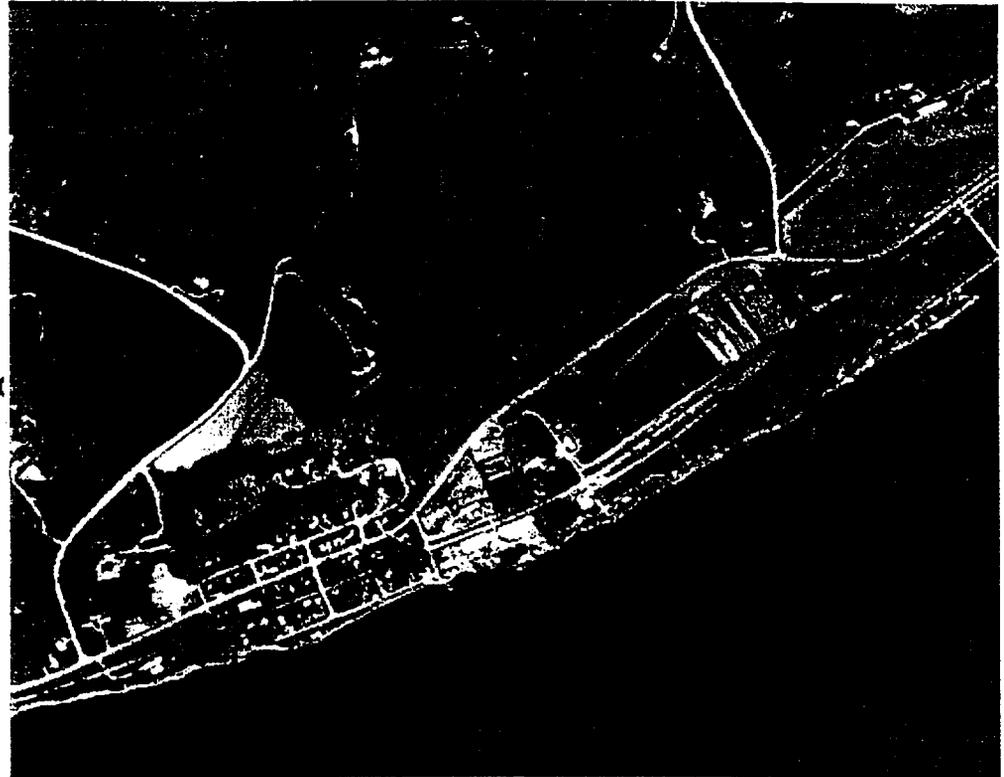
ClickWeather.com

Forecast for Wed.
37F 14F
41.4N 90.9W [Details](#)

**CLICK HERE and get
Weather and Map Forecast
for any point on the Planet!**

House and Home:

- [Schools, Crime and Demographics for 52761](#)
- [Schools, Crime and Demographics for 61259](#)



0 ——— .5Km

0 ——— .25Mi

Image courtesy of the U.S. Geological Survey
Source=4109033SE-1 Center=(-90.8982,41.4352) 826ms Running Time

TerraServer-USA
Sponsors



© 2003 Microsoft Corporation.
Server=TK2TERRAWE12

[Terms of Use](#) [Privacy Statement](#)

Search TerraServer

Home Image

Search input field with a GO button

Navigate

View: Aerial Photo

29 km SW of Davenport, Iowa, United States 31 Mar 2000



8 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1989

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed. 37F 14F 41.4N 90.9W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 52761
- Schools, Crime and Demographics for 61259



0 1Km

0 5Mi

Image courtesy of the U.S. Geological Survey Source=4109033NE-1 Center=(-90.8933,41.4387) 953ms Running Time

TerraServer-USA Sponsors



Microsoft



© 2003 Microsoft Corporation. Server=TK2TERRAWE12

Terms of Use Privacy Statement

Search TerraServer

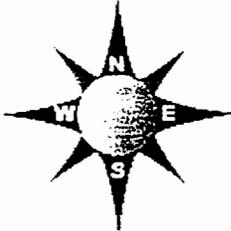
Home Image

Search input field with a GO button

Navigate

View: Aerial Photo

30 km SW of Davenport, Iowa, United States 31 Mar 2000



16 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1989

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed.

37F 14F

41.4N 90.9W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 52761

Schools, Crime and Demographics for 61259



0 2Km

0 1Mi

Image courtesy of the U.S. Geological Survey Source=4109033SE-1 Center=(-90.8845,41.4169) 640ms Running Time

TerraServer-USA Sponsors



Microsoft



© 2003 Microsoft Corporation. Server=TK2TERRAWEB12

Terms of Use Privacy Statement

Search TerraServer

Home Image

GO

Navigate

View: Topo Map

30 km SW of Davenport, Iowa, United States 01 Jul 1989 USGS



16 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Aerial Photo 31 Mar 2000

Partners:



Waterproof Map

ClickWeather.com

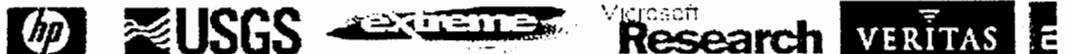
Forecast for Wed. 37F 14F 41.4N 90.9W Details >

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 52761
Schools, Crime and Demographics for 61259

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE11

Terms of Use Privacy Statement

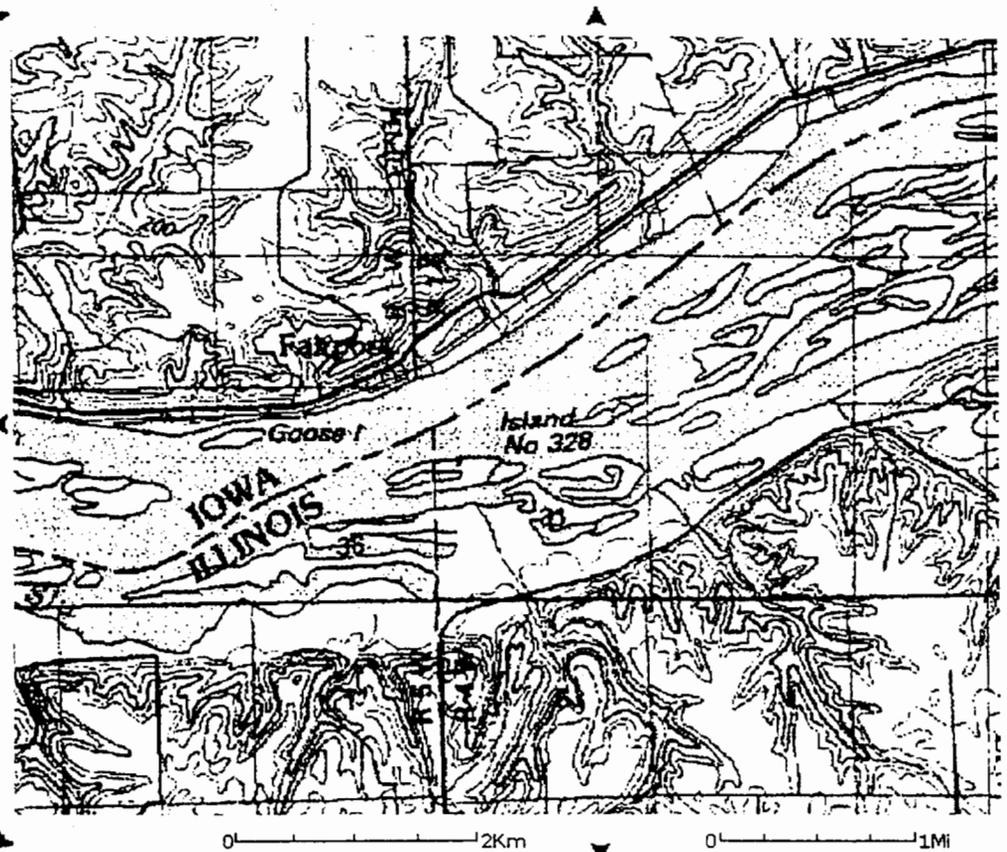


Image courtesy of the U.S. Geological Survey Source=f41090a1 Center=(-90.8845,41.4169) 780ms Running Time



- About KDWP
- Hunting
- Fishing
- Boating
- State Parks
- Office Locations
- Education
- Non Game
- Magazine
- Brochures
- Outdoor Store
- Legislative Update
- Links

**Other Kansas
Dept. of
Wildlife and
Parks
Hatcheries**

- Milford
- Pratt
- Meade

Kansas Fishing

- FISHING FORECAST
- FISH STOCKINGS
- FISHING REPORTS
- FISH RECORDS
- FISH HATCHERIES
- TROUT FISHING
- LICENSES & PERMITS
- FISH ATAS & PRIVATE WATERS LEASED FOR PUBLIC FISHING
- KANSAS FISHING REGULATIONS**



BNSF Line
6-10 trains/day
50 mph

FARLINGTON HATCHERY

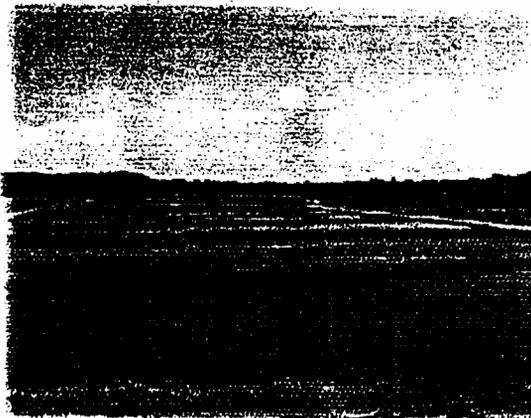
The Farlington Fish Hatchery is north of Girard in Crawford County. Construction of this facility began in 1939, was interrupted by World War II, and was finished shortly after the war. Thirty earthen ponds provide more than 32 surface acres of water, which is supplied by Crawford State Fishing Lake.

Three full-time employees (Randy Nelson, manager, Dan Mosier II and Tim Ellis, Fish Bio. Specialists) operate the facility producing: channel catfish, bluegill, redear sunfish, hybrid sunfish, striped bass, striped bass hybrids, walleye, sauger, saugeye, and grass carp. In addition to the hatchery, the Farlington staff also oversee production of channel catfish at Woodson Rearing Pond, located about 65 miles west at Woodson State Fishing Lake near Toronto.

The Farlington Fish Hatchery has undergone several renovation projects since 1989.

Among these are a new "fish house" used for hatching, sorting and holding fish, rebuilding of some pond dikes to reduce leaks and construction of new water control structures and harvest "kettles".

Tours are available by prior arrangement by calling (620) 362-4166. April and June are the best times to find a variety of fish in the fish house. Most fish are reared in ponds and are not readily viewable.



Search TerraServer

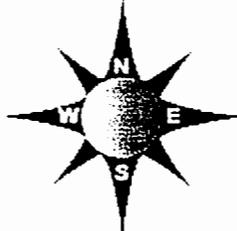
Home Image

GO

Navigate

View: Aerial Photo

163 km S of Kansas City, Missouri, United States 12 Oct 1991



4 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1977

Partners:



Waterproof Map

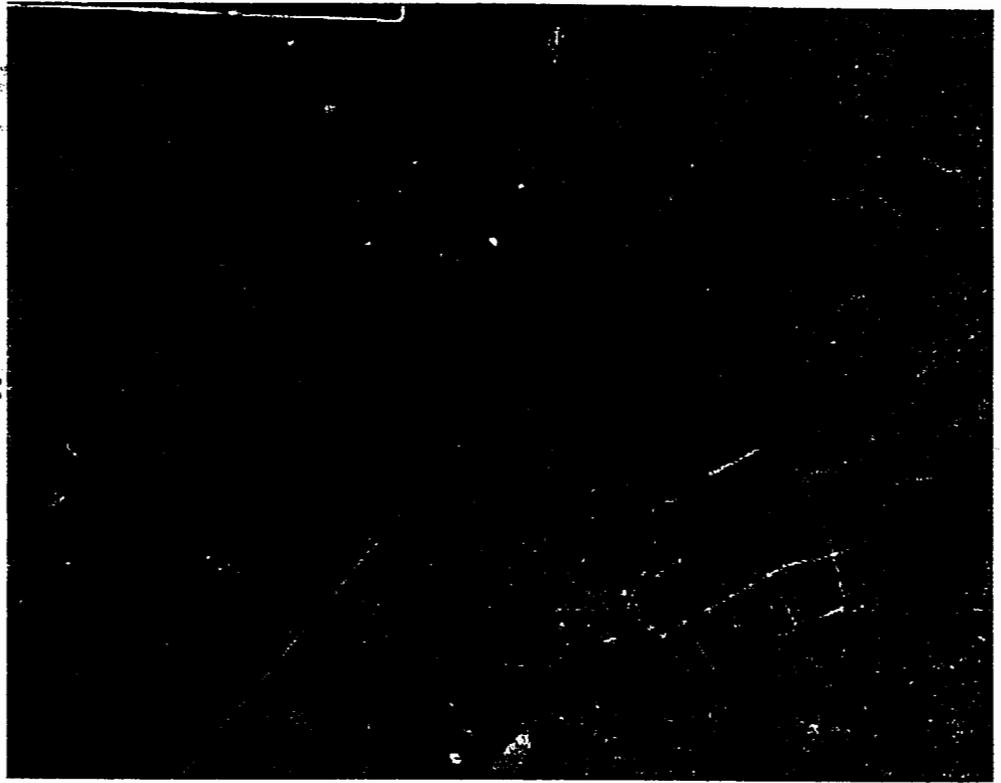
ClickWeather.com

Forecast for Tue. 35F 19F 37.6N 94.8W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 66734

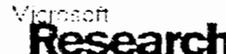


0 1.5Km 0 .25Mi

Image courtesy of the U.S. Geological Survey Source=3709418SW Center=(-94.8092,37.6489) 7453ms Running Time

TerraServer-USA Sponsors

© 2003 Microsoft Corporation. Server=TK2TERRAWEB23



Terms of Use Privacy Statement



Advanced Find | Info | Download | Print | Waterproof M

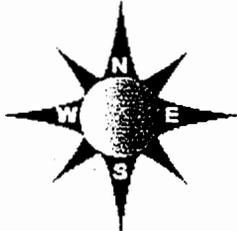
Search TerraServer Home Image

GO

Navigate

View: Topo Map

163 km S of Kansas City, Missouri, United States 01 Jul 1991 USGS



16 meter resolution



Map Size: Medium

- Advanced Find
- Famous Places
- Web Services
- About

Related Links:

Other Imagery:

USGS Aerial Photo 12 Oct 1991

Partners:



Waterproof Map

ClickWeather.com

Forecast for Wed. 45F 26F 37.6N 94.8W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 66734

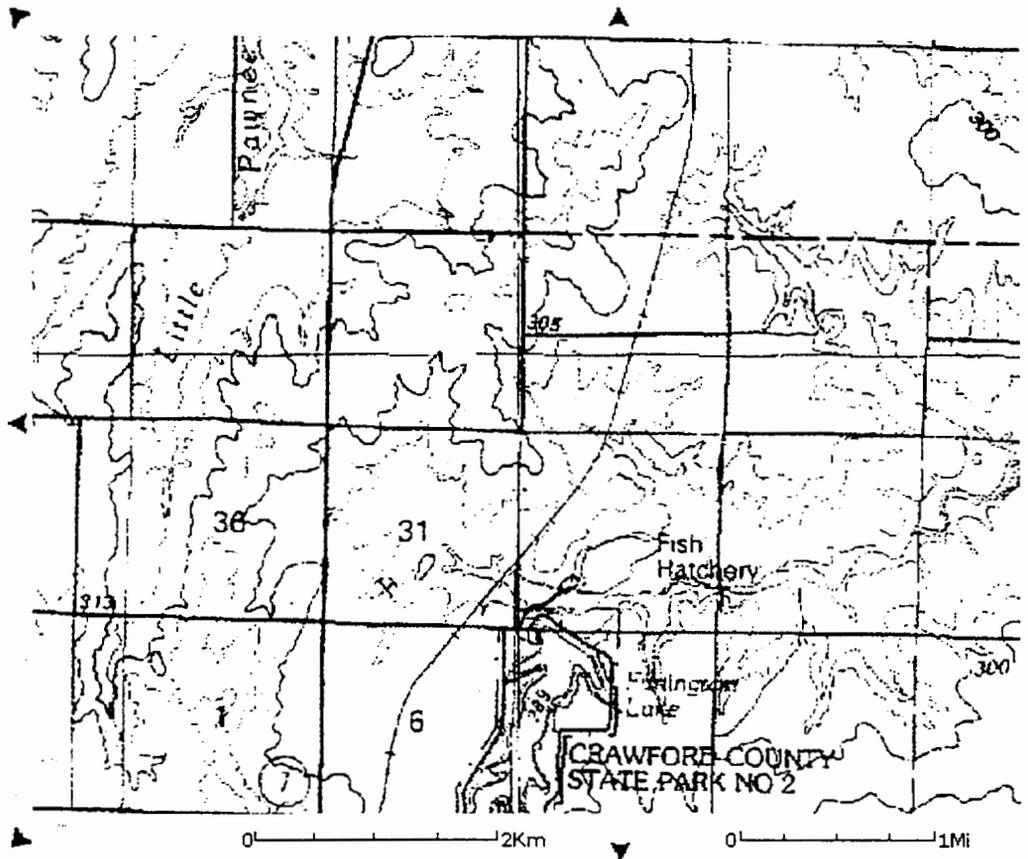


Image courtesy of the U.S. Geological Survey Source=f37094e1 Center=(-94.8045,37.6454) 233ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE12

Terms of Use Privacy Statement

Search our site:

Go

[About the DNR](#)

[DNR News](#)

[Contact Us](#)

Fish and Fishing

- [DNR Home](#)
- [Fish & Fishing Home](#)
- [Where to Fish](#)
- [Fishes of Iowa](#)
- [Regulations](#)
- [Offices](#)

News

- [Fishing Report](#)
- [Trout Stocking](#)
- [2003 Forecast](#)

Programs

- [Aquatic Education](#)
- [Aquatic Nuisance Species](#)
- [Fish Hatcheries](#)
- [Fisheries Management and Research](#)

Other

- [Fish Consumption Advisories](#)
- [Farm Pond Information](#)
- [State Record Fish](#)

Spirit Lake Fish Hatchery

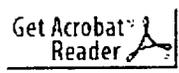


The first fish hatchery at was established in 1880. since that time include a hatchery building which constructed in 1915 and in 1927. This building wa 1963 when it was replac new facility currently bei only major structural ch construction of the new f

enlargement of the tank room for the intensive rearing of walleye and muskellu guided tours are available throughout the hatchery facility. Each year the Iowa of Natural Resources welcomes between 40,000 and 60,000 visitors to the Spir Hatchery. Organized groups may contact the hatchery to view a narrated slide pertaining to a wide array of hatchery duties. Tours are available throughout th 8:00 a.m. to 4:00 p.m. on weekdays. Group tours can be arranged by calling t office. In addition, when walleye spawning is in full swing (Usually in early to hatchery is open to visitors 24 hours a day, seven days a week. **Spirit Lake Fi Duties**

The Spirit Lake Hatchery is a cool water station located in Dickinson County. Th collects, spawns, incubates, and raises walleye for use throughout the state. E between 60 and 70 million walleye fry are hatched at this facility. These fish m at two-day-old fry, transferred to other hatcheries, or stocked in natural lakes i Lake area where they are collected in June using large seines. At that point the usually five- to eight-inches long. The number of muskellunge produced is relat when compared to the sheer numbers of walleyes produced; however, this facil the sole source of Iowa's muskellunge. The fish are raised to nine- or ten-inche being stocked throughout the state.

Hatchery Address and Phone



State of Iowa Home | DNR Home
webmaster@dnr.state.ia.us © Iowa Department of Natur

Union Pacific
 Grain spur
 Estherville to
 Allendorf
 75-miles
 3-4 trains/day
 during harvest
 season
 10 mph

Spirit Lake Fish Hatchery



The first fish hatchery at Spirit Lake was established in 1915. Changes since that time include a replacement hatchery which was constructed in 1923 and was enlarged in 1927. This building was used until 1963 when it was replaced by the currently being used. The only major structural change in the construction of the new facility is the enlargement of the building for the intensive rearing of walleye and muskellunge. Se tours are available throughout the hatchery facility. Each year the Iowa Department of Natural Resources welcomes between 50,000 and 60,000 visitors to the Spirit Lake Hatchery. Organiz

may contact the hatchery to view a narrated slide series pertaining to a wide array of hatchery duties. Tours are available throughout the year from 8:00 a.m. to 4:00 p.m. on weekdays. Group tours can be arranged by calling the hatchery. In addition, when walleye spawning is in full swing (usually in early to mid April) the hatchery is open to visitors seven days a week. **Spirit Lake Fish Hatchery Duties**

The Spirit Lake Hatchery is a cool water station located in Dickinson County. The facility collects, spawns, incubates, and raises walleye for use throughout the state. Each year between 60 and 70 million walleye fry are hatched at this facility. These fish may be stocked at two-day-old fry, transferred to other hatcheries, or stocked in natural lakes in the area where they are collected in June using large seines. At that point these fish are usually five- to eight-inches long. The number of muskellunge produced is relatively minor when compared to the sheer numbers of walleyes produced. This facility serves as the sole source of Iowa's muskellunge. The fish are raised to nine- or ten-inches before being stocked throughout the state.

Search TerraServer

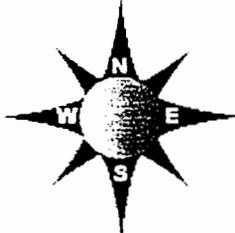
Home Image

Search input field with a GO button

Navigate

View: Aerial Photo

Orleans, Iowa, United States 12 Oct 1994



2 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Topo Map 1 Jul 1980

Partners:



Waterproof Map

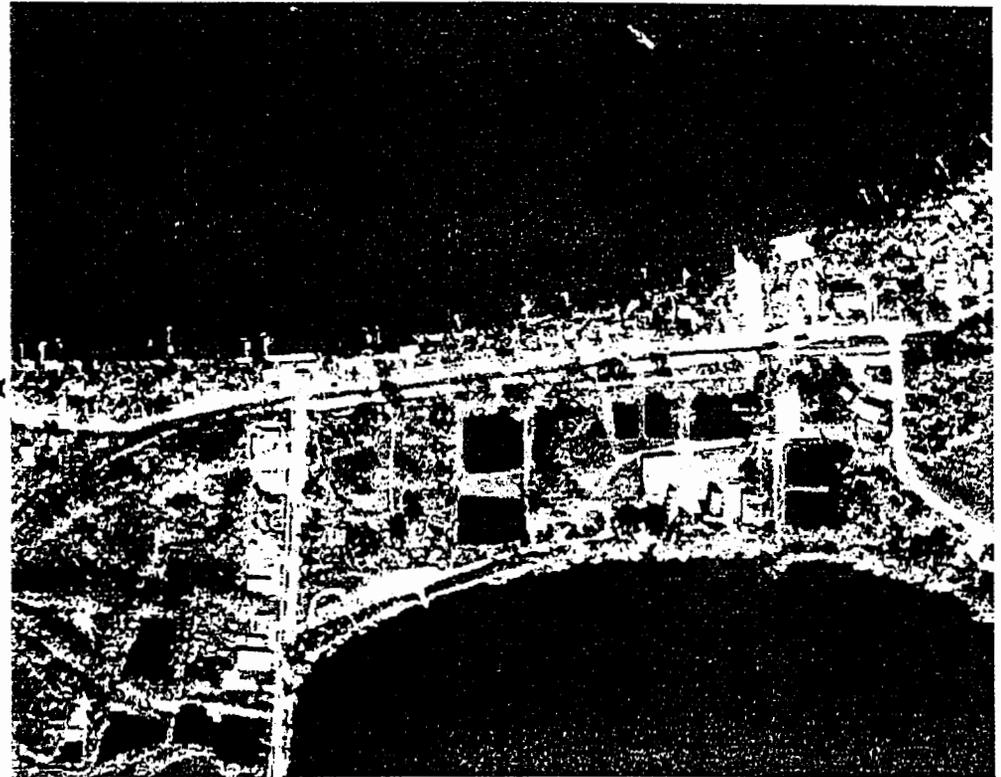
ClickWeather.com

Forecast for Tue. 23F 11F 43.4N 95.1W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

Schools, Crime and Demographics for 51360



0 200M

0 200yd

Image courtesy of the U.S. Geological Survey Source=4309540NW Center=(-95.0984,43.4435) 423ms Running Time

TerraServer-USA Sponsors



Microsoft



© 2003 Microsoft Corporation. Server=TK2TERRAWE11

Terms of Use Privacy Statement



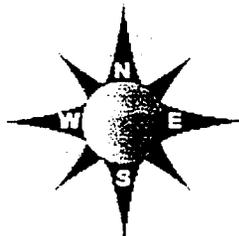
Advanced Find | Info | Download | Print | Waterproof M

Search TerraServer Home Image

GO

Navigate

View: Topo Map



2 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Aerial Photo 12 Oct 1994

Partners:



Waterproof Map

ClickWeather.com

Forecast for Tue. 23F 11F 43.4N 95.1W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

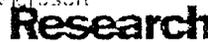
Schools, Crime and Demographics for 51360

TerraServer-USA Sponsors

© 2003 Microsoft Corporation. Server=TK2TERRAWE11

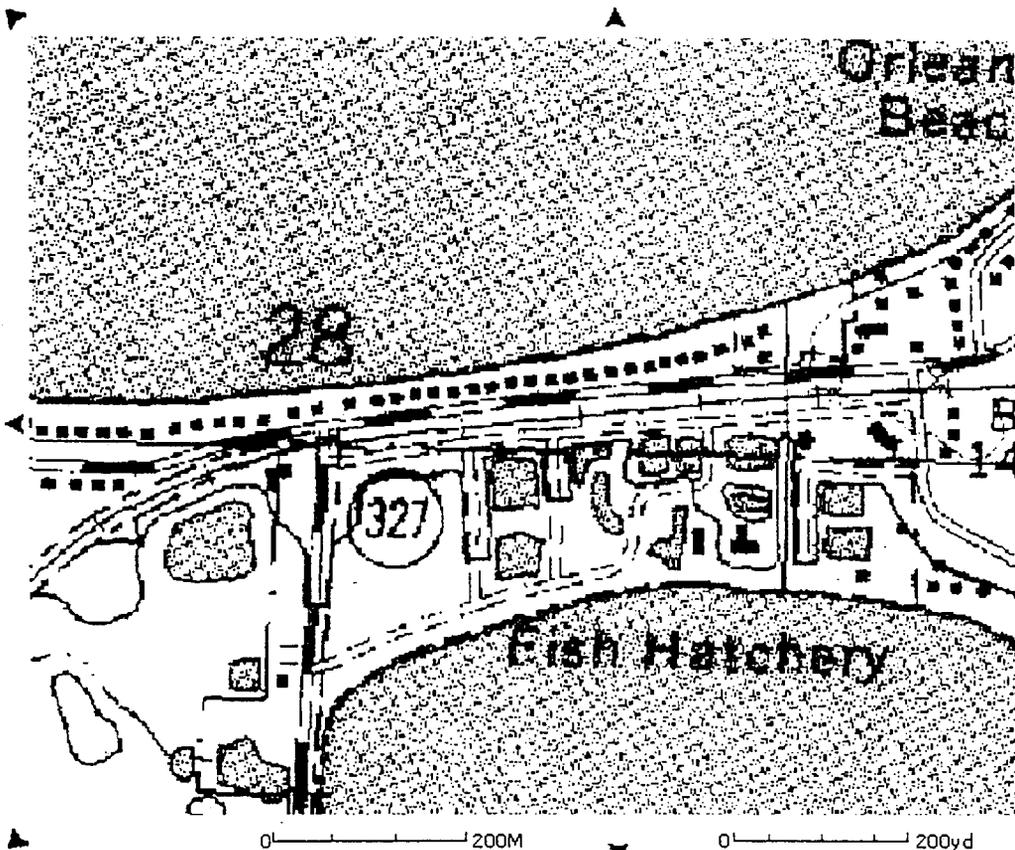


Microsoft



Terms of Use Privacy Statement

Orleans, Iowa, United States 01 Jul 1980 USGS



0 200M

0 200yd

Image courtesy of the U.S. Geological Survey Source=o43095d1 Center=(-95.0984,43.4435) 1736ms Running Time

Oxbow Oregon Fish Hatchery

HC 66 Box 750

Cascade Locks, OR 97014

(541) 374-8540

Hydrounit Basin: Middle Columbia - Hood

Operated by: Oregon Dept. of Fish and Wildlife

Hatchery Location: Oxbow Hatchery is located approximately 2 miles east of Cascade Locks, Oregon. Directions: Take I-84 to Cascade Locks (exit 44), drive through town. Cross the east bound I-84 on-ramp to Frontage Road. Proceed 1 mile to Oxbow Hatchery.

Lat/Long: 45.675621 / -121.852966

Fish Species: Coho - Tanner Creek Stock (Umatilla Releases), Coho - Tanner Creek Stock (CEDC Releases), Coho - Mixed Tanner Creek/Sandy River Stock (CEDC Releases), Coho - Tanner Creek Stock (Bonneville Releases), and Spring Chinook (Clackamas Stock)

Oxbow Hatchery was originally constructed in 1913 to provide additional rearing facilities for Bonneville Hatchery. It was relocated to its present site in 1937 following construction of Bonneville Dam. Oxbow was operated as part of the Columbia River Fisheries Development Program (Mitchell Act). The goal of the hatchery is to produce coho and spring chinook that will contribute to the Northeast Pacific and Columbia River commercial, tribal, and sports fisheries. Oxbow is a coho salmon hatchery. Fingerlings can be viewed year-round. Though there is no adult fish collection at Oxbow, adult salmon can be seen spawning in Herman Creek (Oxbow's water source) September through November.

Union Pacific mainline
Hinkle to Portland
25 to 30 trains/day
Train speed 40 mph
I-84 2002 ave.
20,000 vehicles/day



Advanced Find

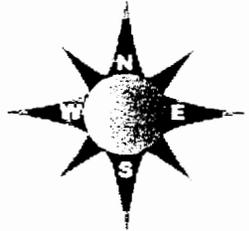
Search TerraServer Home Image

(GO)

Navigate

View: Aerial Photo

2 km E of Cascade Locks, Oregon, United States 31 J



Map Size: Large

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

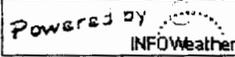
Partners:



Waterproof Map

ClickWeather.com

Click to get: Weather Forecast Maps for this point:



House and Home:

- Schools, Crime and Demographics for 97014
- Schools, Crime and Demographics for 97031
- Schools, Crime and Demographics for 98648



Image courtesy of the U.S. Geological Survey
Source=211610 Center=(-121.8611,45.6752) 46ms Running Time



Search TerraServer Home Image

Search input field with GO button

Navigate

View: Aerial Photo

2 km E of Cascade Locks, Oregon, United States 31 J



1 meter resolution



Map Size: Large

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

Partners:



Waterproof Map

ClickWeather.com Forecast for 11th. 8ZF 56F 45.7N 121.9W Details

CLICK HERE and get Weather and Map Forecast for any point on the Planet!

House and Home:

- Schools, Crime and Demographics for 97014
Schools, Crime and Demographics for 97031
Schools, Crime and Demographics for 98648



Scale bar showing 0 to 100M

Image courtesy of the U.S. Geological Survey
Source=211610 Center=(-121.8585,45.6761) 63ms Running Time

Search TerraServer

Home Image

Search input field with a magnifying glass icon and a 'GO' button.

Navigate

View: Topo Map

2 km E of Cascade Locks, Oregon, United States 01 Jul 1979 USGS



4 meter resolution



Map Size: Medium

Advanced Find

Famous Places

Web Services

About

Related Links:

Other Imagery:

USGS Aerial Photo 31 Jul 1993

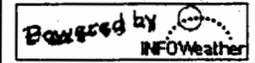
Partners:



Waterproof Map

ClickWeather.com

Click to get Weather Forecast Maps for this point



House and Home:

- Schools, Crime and Demographics for 97014
- Schools, Crime and Demographics for 97031
- Schools, Crime and Demographics for 98648

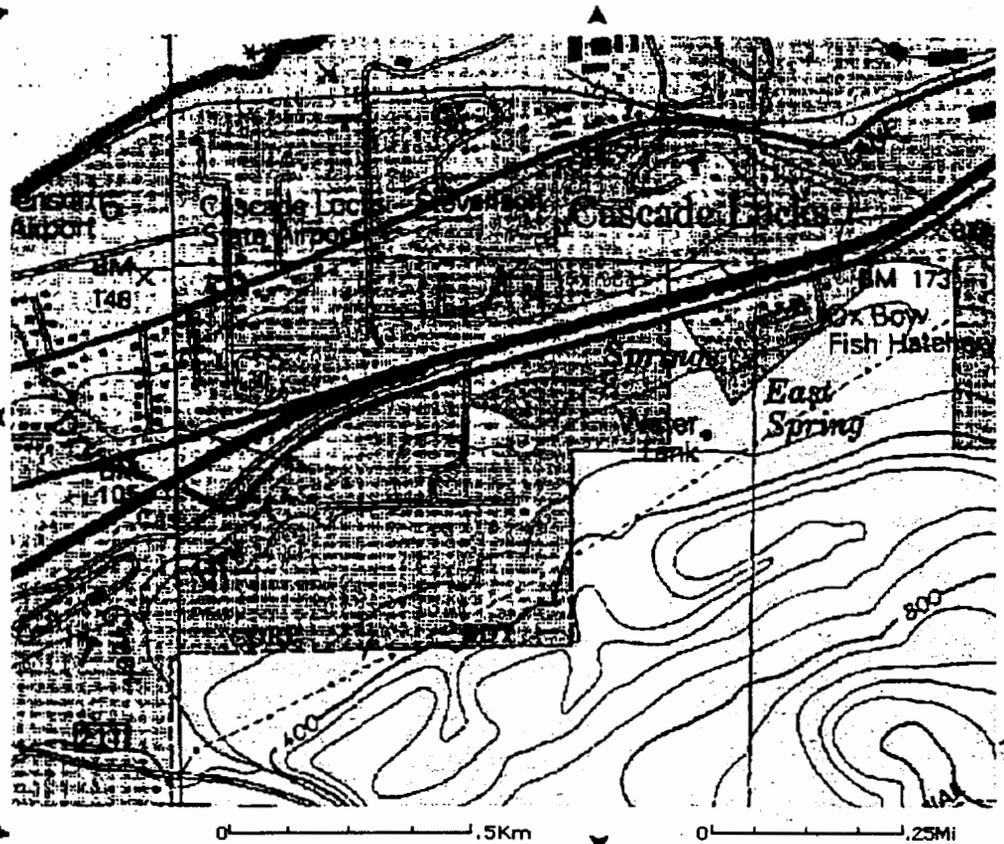


Image courtesy of the U.S. Geological Survey
Source=o45121f7 Center=(-121.8651,45.6699) 423ms Running Time

TerraServer-USA Sponsors



© 2003 Microsoft Corporation. Server=TK2TERRAWE23

Terms of Use Privacy Statement



Beard Environmental and Technical Assistance, LLC

Telephone: (406) 492-6590 • Fax: (406) 492-6592 • P.O. Box 85 • Elliston, Montana 59728

MEMORANDUM

To: Gary Bertellotti, Hatcheries Program Manager, Montana Fish, Wildlife & Parks

From: Alden G. Beard, P.E. 

Date: February 3, 2004

Re: *Miles City Fish Hatchery - Program Level Cost Projection for Monitoring Program for Impact Assessment for Proposed Railroad*

Based on our recent discussions and material provided by Montana Fish, Wildlife & Parks, I understand there is may be need for a long-term monitoring program to assess potential impacts from the proposed Tongue River Railroad across the Miles City Fish Hatchery site. FWP's primary concerns relate to potential vibration and noise from coal train traffic adversely impacting fish rearing, spawning, and egg hatching. I researched possible resources for such an evaluation, concentrating on noise and vibration propagation relative to geotechnical conditions, similar to a 1999 study conducted for the City of Mankato, Minnesota, by David Braslau Associates, Inc.

It appears that a long-term evaluation would likely require three phases:

1. Baseline (pre-project) data measurements and impact prediction – Geotechnical investigation, noise/vibration measurements, baseline hatchery production data evaluation, impact prediction, and mitigation alternatives (two years).
2. Monitoring during railroad construction – Noise/vibration measurements, hatchery production monitoring, geotechnical "truthing," and construction oversight of mitigation (two years).
3. Post-construction monitoring – Noise/vibration measurements, hatchery production monitoring, evaluation of mitigation effectiveness, and revised mitigation proposals if required (five years).

I contacted Mr. David Braslau, Principal (ph: 612/331-4571), and Professor Curtis Link, Geophysicist, at the Montana Tech division of the Montana University System (ph: 406/496-4165) to assess costs of a such a long-term monitoring program. Montana Tech appears well qualified to assist with geotechnical and seismology testing and evaluations for the program, having both faculty and suitable equipment resources to use in conjunction with its graduate student research program.

Page 1 of

Post-It® Fax Note	7671	Date	2/3/04	# of pages	2
To	Gary Bertellotti		From	Alden Beard	
Co./Dept.	FWP - Fisheries		Co.	BETA	

I consider the inclusion of a transportation engineering consultant with a specialty in acoustics to be necessary to address the more sophisticated noise/vibration modeling, data evaluation, and impact integration elements of the project. Obviously the evaluation would also require a significant aquaculture element, which potentially could be handled by a qualified university graduate program specializing in fisheries.

The following cost projection summarizes the likely components and "program level" estimated costs for the overall effort. This projection is based on analogous efforts for related projects, without the benefit of specific cost quotations from the entities involved. Personnel time is only approximated, based on discussions with Montana Tech.

	Evaluation Component	Phase I (2 years)	Phase II (2 years)	Phase III (5 years)
I.	Noise/Vibration Study and Predictive Analysis - Transportation/acoustic Engineering Consultant (based on 1999 cost of Mankato, MN study)*	\$80,000		
II.	University <u>Geophysics</u> Graduate Program - Faculty Assisted Student Research			
	Graduate Research Assistant @ \$20,000/yr	\$40,000	\$40,000	\$100,000
	Faculty Assistance, 120 hr/yr**	\$19,017	\$19,017	\$47,542
	Geotechnical Equipment Use & Lab Charges	\$36,000	\$12,000	\$30,000
	Travel & Per Diem (12 trips/yr)	\$10,800	\$10,800	\$27,000
III.	University <u>Fisheries</u> Graduate Program - Faculty Assisted Student Research			
	Graduate Research Assistant @ \$20,000/yr	\$40,000	\$40,000	\$100,000
	Faculty Assistance, 120 hr/yr**	\$19,017	\$19,017	\$47,542
	Aquaculture Equipment Use & Lab Charges	\$12,000	\$7,200	\$18,000
	Travel & Per Diem (12 trips/yr)	\$10,800	\$10,800	\$27,000
Total by Phase:		\$267,634	\$158,834	\$397,084
Total Program:		\$823,551		

* Mankato study cost adjusted for 3% annual inflation and estimated additional travel and per diem.

** Based on a \$90,000 university salary with 25% indirect costs and 46.5% overhead.

This cost estimate excludes the cost of FWP staff and facilities used on the project. Other consultants and specialists not contemplated above may also be necessary for the work. To further refine costs, the next step would logically be solicit proposals from prospective consultants and universities, after developing a detailed scope of work.

Feel free to respond with any questions or discussion.

MEMORANDUM

To: Gary Bertellotti, Hatcheries Program Manager, Montana Fish, Wildlife & Parks

From: Alden G. Beard, P.E.

Date: February 3, 2004

Re: *Miles City Fish Hatchery - Program Level Cost Projection for Monitoring Program for Impact Assessment for Proposed Railroad*

Based on our recent discussions and material provided by Montana Fish, Wildlife & Parks, I understand there is may be need for a long-term monitoring program to assess potential impacts from the proposed Tongue River Railroad across the Miles City Fish Hatchery site. FWP's primary concerns relate to potential vibration and noise from coal train traffic adversely impacting fish rearing, spawning, and egg hatching. I researched possible resources for such an evaluation, concentrating on noise and vibration propagation relative to geotechnical conditions, similar to a 1999 study conducted for the City of Mankato, Minnesota, by David Braslau Associates, Inc.

It appears that a long-term evaluation would likely require three phases:

1. Baseline (pre-project) data measurements and impact prediction - Geotechnical investigation, noise/vibration measurements, baseline hatchery production data evaluation, impact prediction, and mitigation alternatives (two years).
2. Monitoring during railroad construction - Noise/vibration measurements, hatchery production monitoring, geotechnical "truthing," and construction oversight of mitigation (two years).
3. Post-construction monitoring - Noise/vibration measurements, hatchery production monitoring, evaluation of mitigation effectiveness, and revised mitigation proposals if required (five years).

I contacted Mr. David Braslau, Principal (ph: 612/331-4571), and Professor Curtis Link, Geophysicist, at the Montana Tech division of the Montana University System (ph: 406/496-4165) to assess costs of a such a long-term monitoring program. Montana Tech appears well qualified to assist with geotechnical and seismology testing and evaluations for the program, having both faculty and suitable equipment resources to use in conjunction with its graduate

student research program.

I consider the inclusion of a transportation engineering consultant with a specialty in acoustics to be necessary to address the more sophisticated noise/vibration modeling, data evaluation, and impact integration elements of the project. Obviously the evaluation would also require a significant aquaculture element, which potentially could be handled by a qualified university graduate program specializing in fisheries.

The following cost projection summarizes the likely components and "program level" estimated costs for the overall effort. This projection is based on analogous efforts for related projects, without the benefit of specific cost quotations from the entities involved. Personnel time is only approximated, based on discussions with Montana Tech.

	Evaluation Component	Phase I (1 year)	Phase II (2 years)	Phase III (3 years)
I.	Noise/Vibration Study and Predictive Analysis - Transportation/acoustic Engineering Consultant (based on 1999 cost of Mankato, MN study)*	\$80,000		
II.	University Geophysics Graduate Program - Faculty Assisted Student Research			
	Graduate Research Assistant @ \$20,000/yr	\$40,000	\$40,000	\$100,000
	Faculty Assistance, 120 hr/yr**	\$19,017	\$19,017	\$47,542
	Geotechnical Equipment Use & Lab Charges	\$36,000	\$12,000	\$30,000
	Travel & Per Diem (12 trips/yr)	\$10,800	\$10,800	\$27,000
III.	University Fisheries Graduate Program - Faculty Assisted Student Research			
	Graduate Research Assistant @ \$20,000/yr	\$40,000	\$40,000	\$100,000
	Faculty Assistance, 120 hr/yr**	\$19,017	\$19,017	\$47,542
	Aquaculture Equipment Use & Lab Charges	\$12,000	\$7,200	\$18,000
	Travel & Per Diem (12 trips/yr)	\$10,800	\$10,800	\$27,000
Total by Phase:		\$267,634	\$158,834	\$397,084
Total Program:		\$823,551		

* Mankato study cost adjusted for 3% annual inflation and estimated additional travel and per diem.

** Based on a \$90,000 university salary with 25% indirect costs and 46.5% overhead.

This cost estimate excludes the cost of FWP staff and facilities used on the project. Other consultants and specialists not contemplated above may also be necessary for the work. To further refine costs, the next step would logically be solicit proposals from prospective consultants and universities, after developing a detailed scope of work.

Feel free to respond with any questions or discussion.

May 13, 2004

Mr. Gary Bertellotti
Hatchery Bureau Chief
Montana Department of Fish,
Wildlife & Parks
1420 East 6th Avenue
P. O. Box 200701
Helena, MT 59620

Dear Mr. Bertellotti:

Enclosed please find a report prepared by Womack & Associates, Inc. presenting supplemental geotechnical, slope stability and vibration analyses and information. The report supplements the Womack & Associates report dated March 15, 1999 and responds to the comments submitted by the Montana DNRC. I apologize for the delay in getting this information to you. Mr. Womack was overseas this early spring and has just recently completed the analyses.

The enclosed report also incorporates the findings of vibration analyses conducted for the proposed DM&E rail line in Minnesota, South Dakota and Wyoming. The Beard Environmental and Technical Assistance, LLC memorandum dated February 3, 2004 and provided to us at the February 6th meeting referenced a study completed for the City of Mankato, Minnesota by David Braslau Associates, Inc. The City of Mankato study was submitted to the Surface Transportation Board (STB) in October 1999 and requested that the STB conduct a careful review of the noise and vibration assessment contained in the DM&E Draft EIS to ensure the document adequately addressed potential noise and vibration issues. Subsequently, the STB commissioned Wilson, Ihrig & Associates, Inc. to conduct further vibration analyses as reported in the DM&E Draft EIS published in September 2000.

The supplemental analyses and the DM&E vibration assessment validates the geotechnical and vibration investigations conducted by Womack in 1999 and will be useful and beneficial to developing an appropriate program to monitor the construction and operation of the TRR project. We are continuing to research available data related to fish rearing, spawning and egg hatching and will report any available findings to you.

Mr. Gary Bertellotti
May 13, 2004
Page two of two

Should you have any questions, please do not hesitate to call.

Sincerely,

Douglas A. Day

Enclosure

cc. Jeff Hagener
Larry Peterman
Chris Hunter
Dan Walker

Womack & Associates, Inc.
Geology and Geotechnical Engineering

May 7, 2004

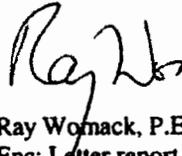
Doug Day
Tongue River Railroad Company
P.O. Box 1181
Billings, MT 59103-1181

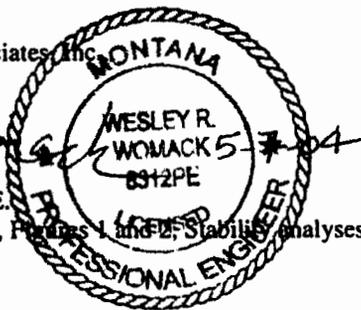
RE: MILES CITY FISH HATCHERY SUPPLEMENTAL GEOTECHNICAL
AND VIBRATION ANALYSIS

Dear Doug:

The attached report presents results of supplemental geotechnical and vibration analyses associated with the Miles City Fish Hatchery (MCFH). These analyses are a follow up to our report dated March 15, 1999, and include two elements: review of vibration recordings at MCFH in 1998 in light of vibration recordings associated with trains at other sites reported in 1999 and 2000; and supplemental slope stability analyses.

Womack & Associates, Inc.


Ray Womack, P.E.
Enc: Letter report, Figures 1 and 2, Stability analyses



Miles City Fish Hatchery Supplemental Geotechnical and Vibration Analysis

Introduction

In 1999, Womack & Associates conducted studies and prepared a report for the TRRC, i.e., "Miles City Fish Hatchery Investigation to Assess Potential Effects of the Tongue River Railroad". The scope of the 1999 study included: 1) a geotechnical analysis of the rock and soil types within and adjacent to the fish hatchery; 2) measurement and analysis of vibration from existing unit train and interstate traffic adjacent to the fish hatchery; 3) evaluation of potential effects on the hatchery and fish reproduction from the construction and operation of the TRR; and, 4) soil chemistry analysis to evaluate corrosive effects on buried fish hatchery piping. Another concern addressed in the 1999 report is the effect of coal dust and herbicides on the fish hatchery.

The purpose of this supplemental report is to respond to comments made by the Montana DNRC to the 1999 report related to vibration analysis, geotechnical investigations, and slope stability. In addition, the findings of vibration analyses conducted for the proposed DM&E rail line in Minnesota, South Dakota, and Wyoming which substantiate the findings in Womack & Associates 1999 report are incorporated herein.

Vibration Investigation

The purpose of the vibration study performed in 1998 as part of the Miles City Fish Hatchery Investigation (Womack & Associates, 1999) was to measure train vibration levels from the existing BNSF rail line and to evaluate potential future vibration levels from the proposed rail line. Soil attenuation characteristics were used in conjunction with measured peak particle velocities from existing unit train traffic to model expected peak particle velocities from construction and operation of the TRR at critical sites around the fish hatchery. The peak particle velocities predicted from the proposed TRR alignment are equal to or less than those currently experienced at the hatchery from the existing unit train traffic along the BNSF line. Therefore, it is reasonable to assume that since the fish hatchery produces fish under existing conditions (i.e., very low levels of vibration from the existing rail line), operation of a new rail line constructed at an equal or greater distance away from the hatchery than the existing rail line will have no detrimental effects on the fish hatchery.

The vibration monitoring conducted at the MCFH in 1998 used two instruments; an SSU 3000 L/C Seismograph and an SSU 2000 D Seismograph with detection limits of 0.01 and 0.02 inches per second (peak particle velocity), respectively. These instruments were deemed adequate to measure the vibration levels from the existing BNSF rail line and to develop attenuation relationships that are sufficient to evaluate vibration levels within the fish hatchery and predict future vibration levels from operation of the TRR.

In addition to the data obtained from the Miles City Fish Hatchery Investigation (Womack & Associates, Inc., 1999), the EIS document prepared by the Surface Transportation Board for the DM&E proposed railroad extension provides additional information and data. In

October 1999, David Braslau Associates, Inc., with assistance from ESI Engineering, Inc. and Schoell & Madson, Inc., prepared a report for the City of Mankato that evaluated the potential noise and vibration impacts that could result from the DM&E's expanded rail activity through the City of Mankato. The City of Mankato submitted the Braslau report to the Surface Transportation Board and requested that the DM&E Draft EIS consider potential noise and vibration assessment issues raised in the Braslau report. Subsequently, the DM&E Draft EIS included a ground vibration assessment, i.e., Ground Vibration Impacts Associated with Unit Coal Trains on the DM&E Railroad (Wilson, Ihrig & Associates, Inc., 2000). Comparison of the vibration data collected for the MCFH study with data from other investigations validates the use of the SSU 2000/3000 Seismographs to measure ground vibration levels.

The attached Figure 1 summarizes vibration levels caused by trains measured at several locations around the country, including the MCFH. Vibration levels on Figure 1 are expressed as peak particle velocity, illustrating the attenuation relationship between ground vibration and distance from the source. As indicated on the graph, the vibration data from the MCFH study are consistent with data reported from other studies measuring train vibration and generally follow the FTA Baseline Attenuation Curve for trains traveling at 50 miles per hour. Note that few of the studies reported vibration levels with peak particle velocities below 0.01 inches per second.

Slope Stability and Geotechnical Investigation

The following discussion addresses comments provided by the State of Montana regarding geotechnical investigations and analyses performed in 1999 to evaluate the potential for slope instability of the Camelsback resulting from construction and operation of the Tongue River Railroad (TRR). The specific concerns raised by the State of Montana about the slope stability evaluation are summarized below:

- Location and depth of fill from construction of an I-94 rail line overpass and potential impact to pore pressures and water table fluctuations.
- Bedding plane orientations within the Camelsback.
- Lower soil strength parameters for weathered material on the flanks of the Camelsback.
- Basis for the assumed coal strength parameters used in the stability analyses.
- Justification for groundwater elevations used in the slope stability models.

Current plans for the TRR alignment and grade indicate that the rail line will pass under Interstate 94 on the east side of the Camelsback. There will be no railroad overpass and no fill placement along the east side of the Camelsback. The current rail alignment passes approximately 200 feet east of the east flank of the Camelsback, about 500 feet east of the ponds on the east edge of the fish hatchery. Railroad grades along this portion of the alignment will require about 5 to 10 feet of cut into the existing ground surface. No potential increases in pore water pressure or groundwater levels are anticipated from construction and operation of the TRR east of the Camelsback.

In October 1998, drill hole VCO-1 was cored into the Camelsback. Interbedded claystone, siltstone, sandstone, and thin coal beds were recovered in the core samples. Horizontal bedding plane orientations were observed and recorded in the cores. Some secondary cross-bedding was noted in the sandstone that appeared to be inclined at about 20 degrees. Cross-beds are not continuous or critically weak and were not used in the models. A regional bedrock geology map compiled by Stagle and others (1983) shows structural contours (elevations) for the top of the Bearpaw Shale in the Tongue River Drainage basin. The structural contours indicate the top of Bearpaw Shale is essentially flat-lying in the vicinity of Miles City. The Bearpaw shale is a Cretaceous aged formation that underlies the Tertiary aged Fort Union formation (Tullock shale).

It is reasonable to assume that if the bedding orientation of the underlying Bearpaw Shale is near horizontal, then the bedding orientation of the overlying Fort Union formation is essentially horizontal.

In response to comments from the State of Montana, the slope stability analyses were revisited. In our opinion, the original analyses represent a reasonable and conservative approach based on observation, testing and literature review. However, supplemental analyses were prepared using the following highly conservative assumptions:

- Dipping bedding planes
- Thick weathered zone
- Much lower coal strength
- Higher piezometric surface

Although published geologic maps and observations of core samples indicate that bedding plane orientations are horizontal in the Camelsback, the slope stability models presented below assume a conservative 5-degree westward tilt to the beds (i.e., inclined toward the fish hatchery). Figure 2 represents the stability cross-section with a 5-degree dip imposed.

The core samples from drill hole VCO-1 in the central-portion of the Camelsback indicate that the bedrock is relatively fresh and unweathered. The slope stability analyses presented below conservatively assume that a 15-foot thick zone of lower strength weathered material occurs on the Camelsback. Soil strength parameters, rather than bedrock strengths, are assigned to the potential weathered zone. For stability modeling, we have assumed that the claystone bedrock has weathered to medium stiff, high plastic clay, a CH soil in the Unified Soil Classification System. Soil strength parameters for the undrained and drained conditions were estimated from published values and are referenced below.

Coal strength values used in the original slope stability analyses performed in 1999 were derived from the unconfined compressive strength and shear strength tests performed on core samples recovered from drill hole VCO-1. Although individual coal seams were too thin to test, weak high-plastic claystone intervals adjacent to the coal seams were tested for unconfined compressive strength. The assumed coal strength values used in the 1999

analyses are lower than the lowest claystone strengths. Published values for coal strength were reviewed to verify that the strength values used in the original analyses are consistent with measured coal strength parameters.

The stability results tabulated below use the original value of 3,330 psf for the undrained coal strength and the low range of published values for cohesion and internal friction angle for the drained coal strength.

Groundwater was not encountered in drill hole VCO-1 drilled to a depth of 59 feet, or an elevation of about 2,375 feet. Groundwater was encountered in three auger holes drilled in the alluvium on the east, west, and north sides of the Camelsback. Groundwater levels measured at the time of drilling varied from about 10 to 15 feet below the existing ground surface, corresponding to groundwater elevations of about 2,370 to 2,375 feet. The original slope stability analyses performed in 1999 used a phreatic surface in the alluvium and bedrock at an elevation of 2,375 feet. The revisited slope stability models presented below are modeled with a phreatic surface at an elevation of 2,380 feet.

In response to the comments submitted by the State of Montana in May 1999, the slope stability models for the Camelsback were re-run using the conservative assumptions noted above. Figure 2 represents geologic cross section used as the basis for the conservative slope stability models. The line of section is approximately 600 feet long and runs roughly in an east-west direction across the Camelsback. The cross section was developed using a 2-foot contour interval Digital Terrain Model (DTM) base map provided by Tongue River Railroad. The Camelsback is approximately 120 feet high with side slopes that vary from 3:1 to 1:1. Additional descriptions of the field investigation, site conditions, laboratory testing, and geotechnical engineering analyses are provided in the Miles City State Fish Hatchery Investigation to Assess Potential Effects of the Construction and Operation of the Tongue River Railroad (Womack & Associates, Inc, 1999).

Stability of the Camelsback was evaluated for varied slope conditions, assuming potential slope failures on the west side of Camelsback; i.e., toward the fish hatchery. Analyses were performed using two sets of soil and bedrock strength parameters under both static and pseudo-static (induced ground acceleration) forces and using circular and block failure modes. Short-term (Su) or End-of-Construction cases were evaluated using undrained shear strength values obtained from Unconfined Compression Tests. This is a conservative approach that assumes construction might create a short-term load, and that the soil pore pressures may increase if the soils cannot drain quickly enough to maintain equilibrium, possibly leading to development of undrained loading conditions. This type of analysis is very conservative because no construction (cut or fill) is planned on or near the flanks of the Camelsback, so loading and soil pore pressures are highly unlikely to change. The second case evaluated was a Long-Term or Consolidated-Drained case using drained shear strength values from the Direct Shear Tests. Stability of the existing slope conditions is evaluated in this case assuming no change in soil surcharge and that pore pressures will maintain equilibrium. Soil and bedrock strength parameters used in the analyses are summarized on Figure 2 and in the following tables:

Table 1 – Soil Parameter Summary**Short Term Conditions (Su)**

SS Model Soil Number	Soil Type	Moist Weight (pcf)	Saturated Weight (pcf)	Cohesion Intercept (psf)	Friction Angle (degrees)
S1	Alluvium*	110	115	300	0
S2	Claystone	83.7	109.6	3900	0
S3	Sandstone	103.9	117.7	3300	0
S4	Coal*	80	90	3300	0
S5	Shale	114.8	132.3	9000	0
S6	Weathered Zone*	110	115	2000	0

Long Term Conditions (CD)

SS Model Soil Number	Soil Type	Moist Weight (pcf)	Saturated Weight (pcf)	Cohesion Intercept (psf)	Friction Angle (degrees)
S1	Alluvium*	110	115	100	30
S2	Clay/Siltstone	83.7	109.6	1924	35
S3	Sandstone	103.9	117.7	1000	35
S4	Coal*	80	90	500	15
S5	Shale	114.8	132.3	600	38
S6	Weathered Zone*	110	115	280	15

*Strength parameters estimated from laboratory data and published values.

Static and pseudo-static analyses were performed using the above soil strength parameters. Vibration monitoring conducted during the 1998 field investigation measured peak particle velocities as well as peak ground accelerations from the existing BNSF rail line. A maximum horizontal ground acceleration of 0.02g measured at a distance of 25 feet from the trains was applied to the slope to simulate forces that may potentially affect the Camelsback. This assumption is extremely conservative because the proposed tracks will be at least 400 feet from the west side (fish hatchery side) of the Camelsback and vibrations from the rail line will be insignificant. In fact, the effects of such vibrations are so small that it is not standard practice in the geotechnical engineering profession to consider vibrations generated by rail and highway traffic in slope stability assessments of this type.

Results from a slope stability analysis are expressed as a factor of safety (FOS) against slope failure. The FOS is a ratio of the forces resisting slope movement divided by the forces driving slope failure. When the resisting forces are larger than the driving forces the ratio is greater than 1 and indicates slope stability. When the driving forces are larger than the resisting forces the ratio is less than 1 and indicates potential slope instability. The higher the ratio, the more stable the slope.

The calculated factors of safety against a slope failure indicate that the Camelsback is stable under existing (static) conditions and assuming vibration accelerations in the slope (pseudo-static) far in excess of those expected to result from coal-train operations. The FOS are summarized in the table below. Individual slope stability models/cross sections and data files are attached. Under short-term (undrained) static conditions the calculated FOS are 1.70 and 1.77 for circular and block failures, respectively. The FOS are reduced to 1.64 and

1.71 with an applied horizontal acceleration of 0.02g. Under existing or long-term (drained) conditions the FOS are 1.39 and 1.81 for circular and block failures, respectively. With a horizontal acceleration of 0.02g applied the FOS decrease to 1.34 and 1.73. These factors of safety values indicate stable slope conditions. As shown in Table 2, the reduction in the factor of safety attributable to an acceleration of 0.02g is on the order of 3 to 4 percent. Actual reduction in factor of safety due to railroad operations is insignificant.

Table 2 – Calculated Factors of Safety

Case Evaluated	Failure Type	Static FOS	Pseudo-Static FOS
Short-Term (Su)	Circular (Bishop)	1.70	1.64
	Block (Rankine)	1.77	1.71
Long-Term (CD)	Circular (Bishop)	1.39	1.34
	Block (Rankine)	1.81	1.73

Over a prolonged period of time the slopes will likely continue to weather, and through natural slope processes, it is possible that localized shallow slumps, erosion, or raveling of weathered material may occur. However, given that it is unlikely that soil loading will change or that pore water pressures will increase within the Camelsback, the probability is extremely small that deep-seated rotational or translational slope failures will occur. In addition, the measured ground accelerations from passing trains are extremely small (0.01 to 0.02g, at or near minimum detection levels) within 25 feet of the rail line, and the proposed rail line will be about 400 feet or more from the west side of the Camelsback. Any ground acceleration produced by the trains will attenuate over this distance resulting in no significant influence on slope stability.

The stability of the embankments around fish hatchery ponds was not evaluated for this investigation because construction of the TRR will not alter the configuration of the embankments, increase the pore-water pressures, nor influence the groundwater levels. Branum Lake was constructed approximately 300 feet from the pre-existing BNSF rail line and the raceways along the north side of the fish hatchery were constructed within about 700 to 800 feet of the pre-existing rail line. Based on the attenuation curve presented in Figure 1, peak particle velocity vibration levels experienced at Branum Lake and the north edge of the raceways is on the order of about 0.01 and 0.002 inches per second, respectively. This is considerably lower than the published vibration thresholds for damage to buildings of about 0.5 to 2.0 inches per second (ESI Engineering, Inc., 1999). The proposed TRR alignment is about 400 to 500 feet east of the ponds on the east side of the hatchery and about 1,000 feet or more away from the eastern most raceways, corresponding to attenuated peak particle velocity vibration levels of less than 0.01 inches per second. Therefore, the predicted ground vibration levels at the Miles City Fish Hatchery from construction and operation of the TRR are extremely low and potential damage to the ponds and raceway from train vibration is not indicated by the models conducted for the TRR and analysis conducted for other rail projects, including the DM&E.

References

ESI, Engineering, Inc., 1999, City of Mankato – DM&E Vibration Assessment; Vibration Impact Expected Through Mankato, Minnesota, ESI Project 1105.

Hoek, E, 2000, Practical Rock Engineering, Chapter 4 – Shear Strength of Discontinuities, Web Publication-www.rocscience.com/hoek/practicalrockengineering.asp

Huang, Y. H., 1983, Stability Analysis of Earth Slopes, Van Nostrand Reinhold Company, New York.

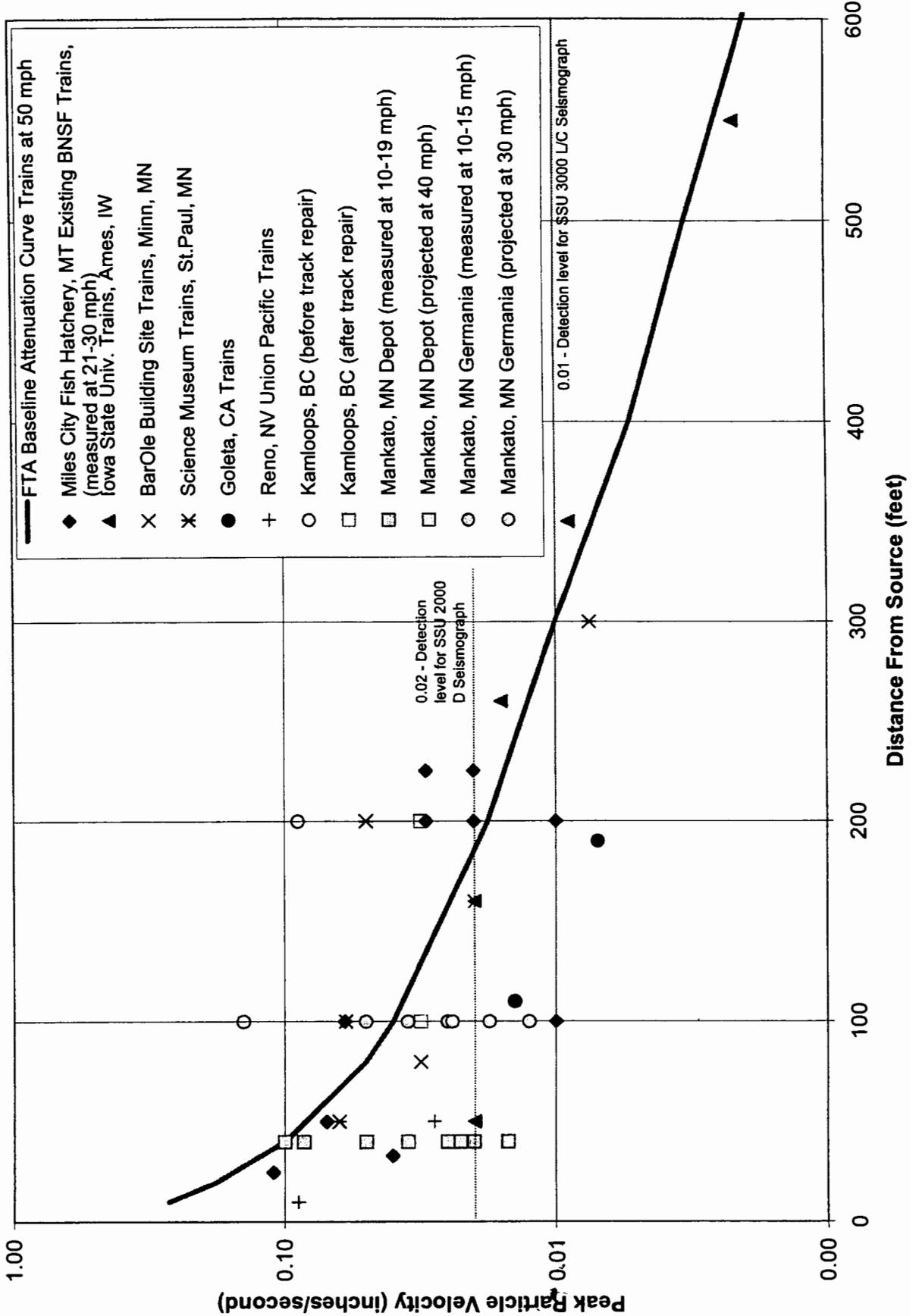
Pit Slope Manuel, 1977, Chapter 9 – Waste Embankments; Canada Centre for Mineral and Energy Technology, Minerals Research and Mining Research Laboratories, CANMET Report 77-01.

Shen, B and Duncan-Fama, M.E., 1996, Span Stability Prediction for Highwall Mining – Analytical and Numerical Studies; CSIRO Exploration and Mining Report 316F.

Stagle E. and others, 1983, Hydrology of Area 49, Northern Great Plains and Rocky Mountain Coal Provinces, Montana and Wyoming; U. S. Geologic Survey Water-Resources Investigations Open-File Report 82-682, Figure 3.2-1, pg 11.

Wilson, Ihrig & Associates Inc., 2000, Ground Vibration Impacts Associated With Unit Coal Trains on the DM&E Railroad, Appendix F – Noise and Vibration.

FIGURE 1: Miles City Fish Hatchery Train Vibration Investigation
Peak Particle Velocity versus Distance From Vibration Source
(Comparison of Measured Train Vibration at MCFH and Published Train Vibration Values)

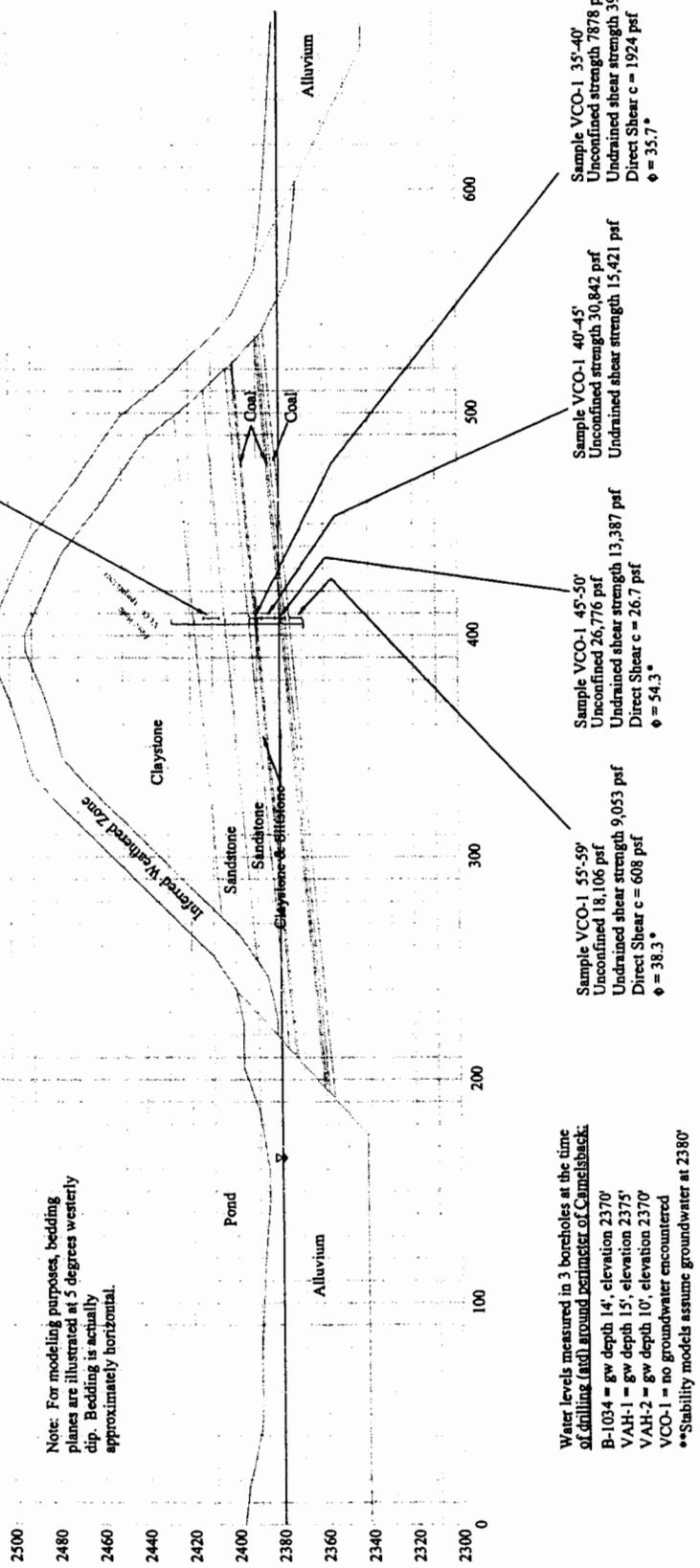


Cross Section B-B'

SCALE: 1" = 50'

B' (East)

B (West)



Note: For modeling purposes, bedding planes are illustrated at 5 degrees westerly dip. Bedding is actually approximately horizontal.

Water levels measured in 3 boreholes at the time of drilling (and around perimeter of CAMELSBACK):
 B-1034 = gw depth 14', elevation 2370'
 VAH-1 = gw depth 15', elevation 2375'
 VAH-2 = gw depth 10', elevation 2370'
 VCO-1 = no groundwater encountered
 **Stability models assume groundwater at 2380'

Published Strength Values for Coal:
 Unconfined strength 33,000 psf (weak coal mass; Shen and Duncan Fama, 1996)
 Undrained shear strength 16,500 psf
 Direct Shear $c = 280$ to 660 psf (Hoek, 2000)
 $\phi = 15^\circ$ to 17.5° (Hoek, 2000)
 **Stability models assume undrained strength of 3,300 psf; $c = 280$ psf and $\phi = 15$ degrees

Published Strength Values for Medium Stiff Clay (i.e., weathered claystone):
 Unconfined strength 4,000 to 8,000 psf (Huang, 1983)
 Undrained shear strength 2,000 to 4,000 psf (1/2 of the unconfined strength; Huang, 1983)
 Cohesion: $c = 500$ to 1,000 psf (Huang, 1983; Pit Slope Manual, 1977)
 $\phi = 15^\circ$ to 30° (Huang, 1983; Pit Slope Manual, 1977)
 **Stability models assume undrained strength of 2,000 psf; $c = 500$ psf and $\phi = 15$ degrees

Miles City Fish Hatchery Cameleback Slope Stability Evaluation Tongue River Railroad Company	CAMELSBACK STABILITY ANALYSIS CROSS SECTION	FIGURE 2
--	--	-------------



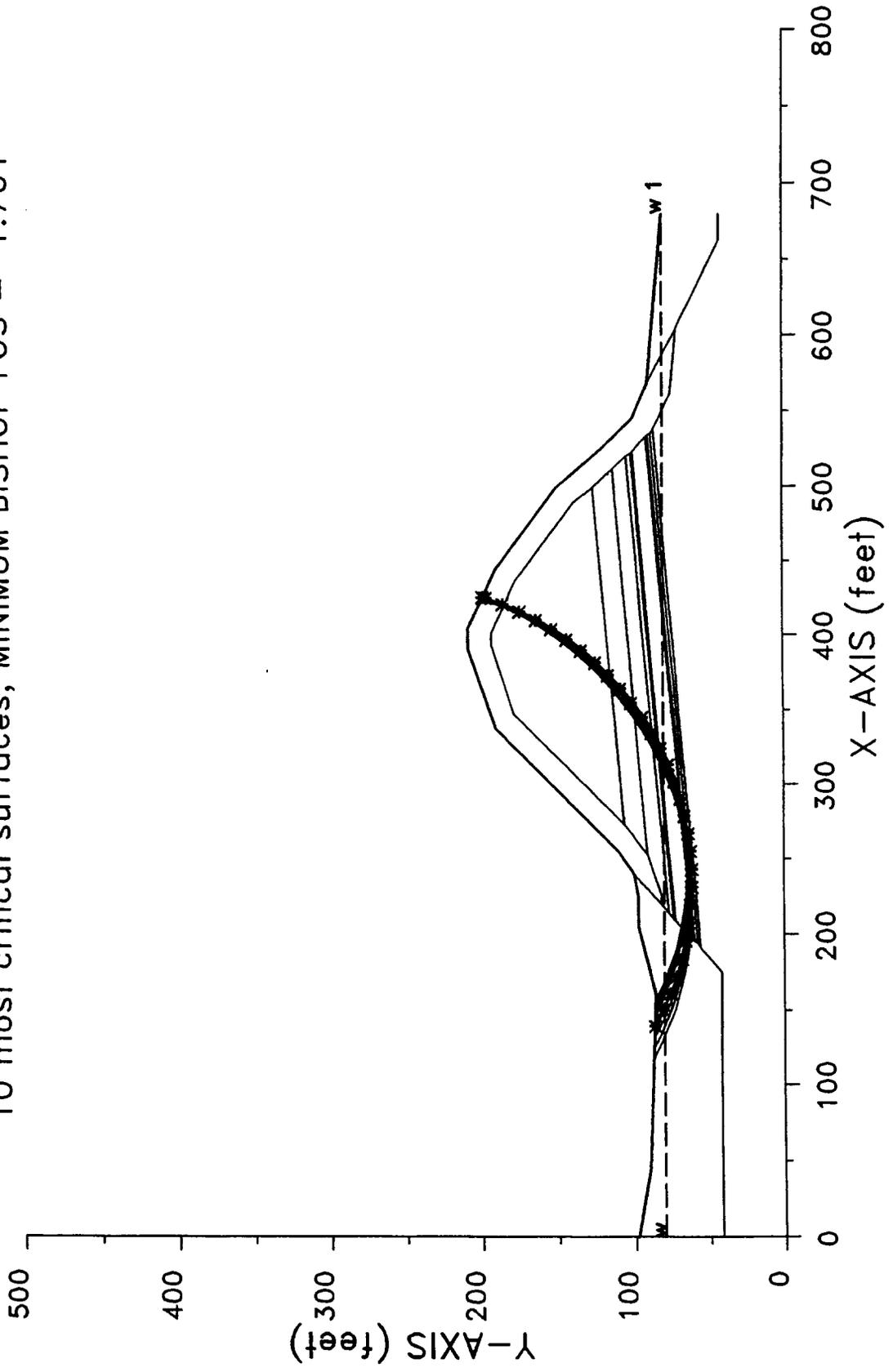
APPENDIX A:

**SLOPE STABILITY ANALYSES
CAMELSBACK RIDGE AT MCFH**

**WOMACK & ASSOCIATES, INC.
May 7, 2004**

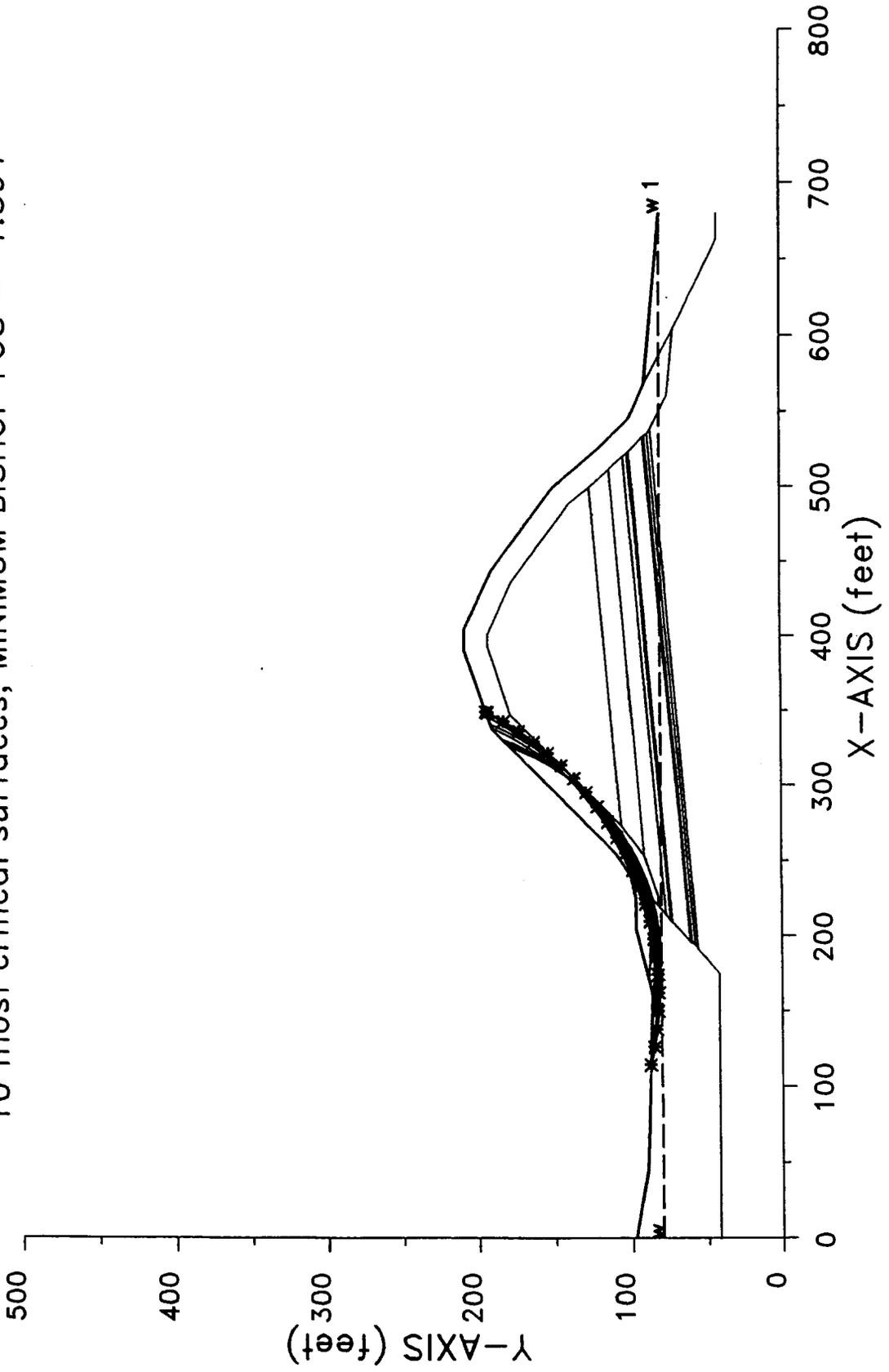
MCFH03C 4-28-04 11:50

Camel Su Circular 5 deg c=3300 p=0
10 most critical surfaces, MINIMUM BISHOP FOS = 1.701



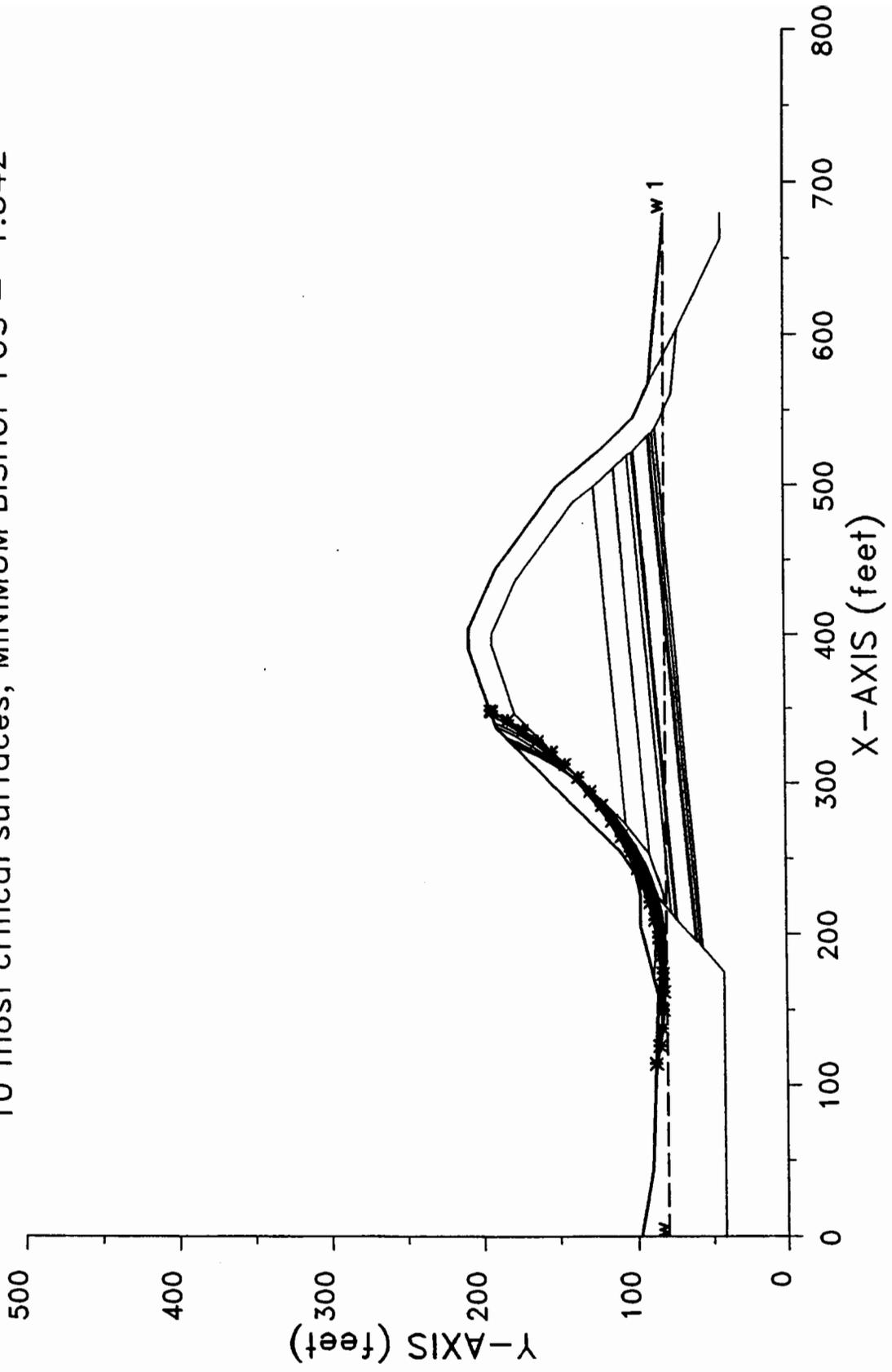
MCFH13C 4-28-04 12:14

Camel CD Circular 5 deg c=280 p=15
10 most critical surfaces, MINIMUM BISHOP FOS = 1.391



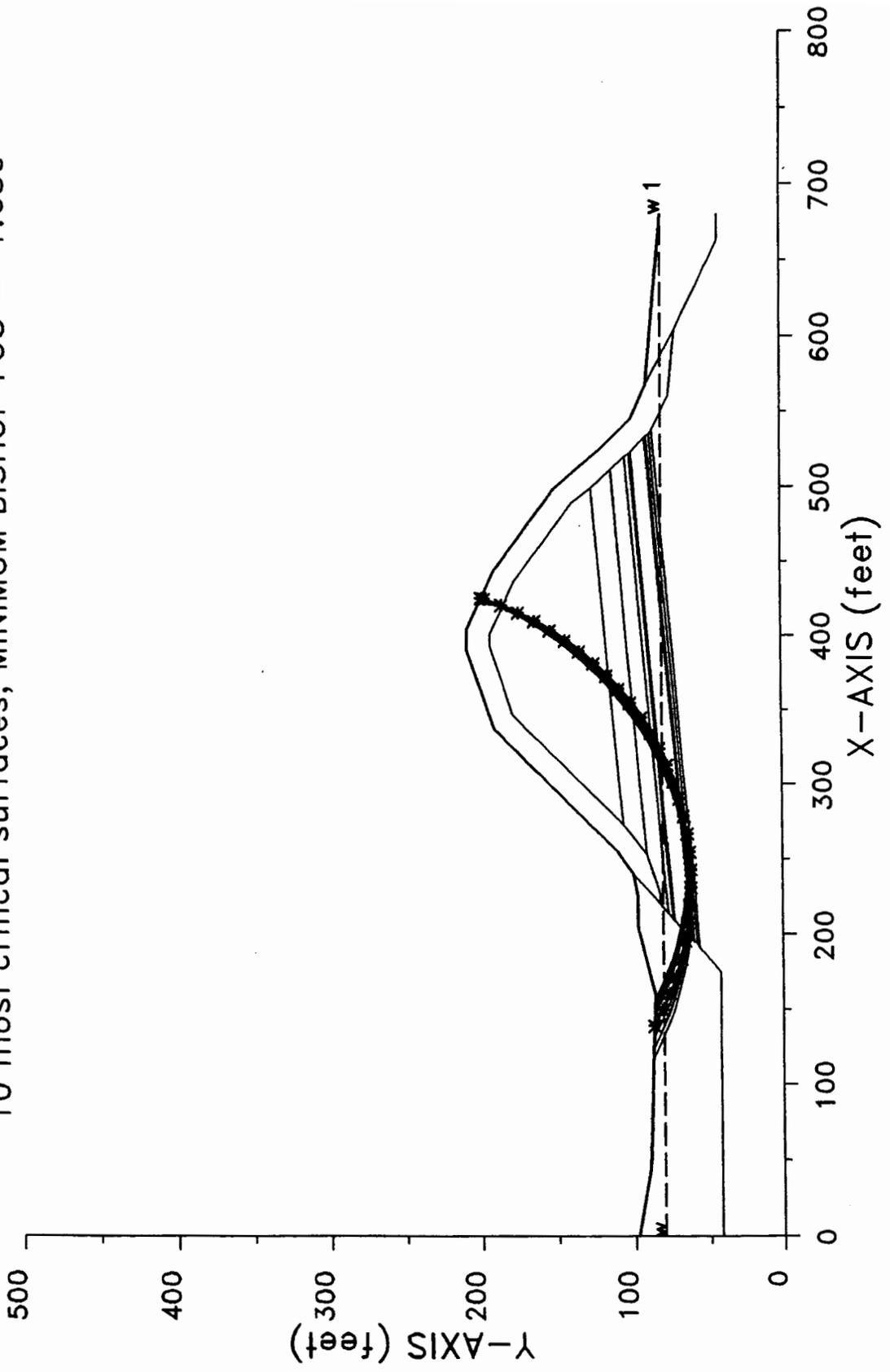
MCFH13CS 4-28-04 14:22

Camel CD Circ 5deg c=280 p=15 0.02g
10 most critical surfaces, MINIMUM BISHOP FOS = 1.342



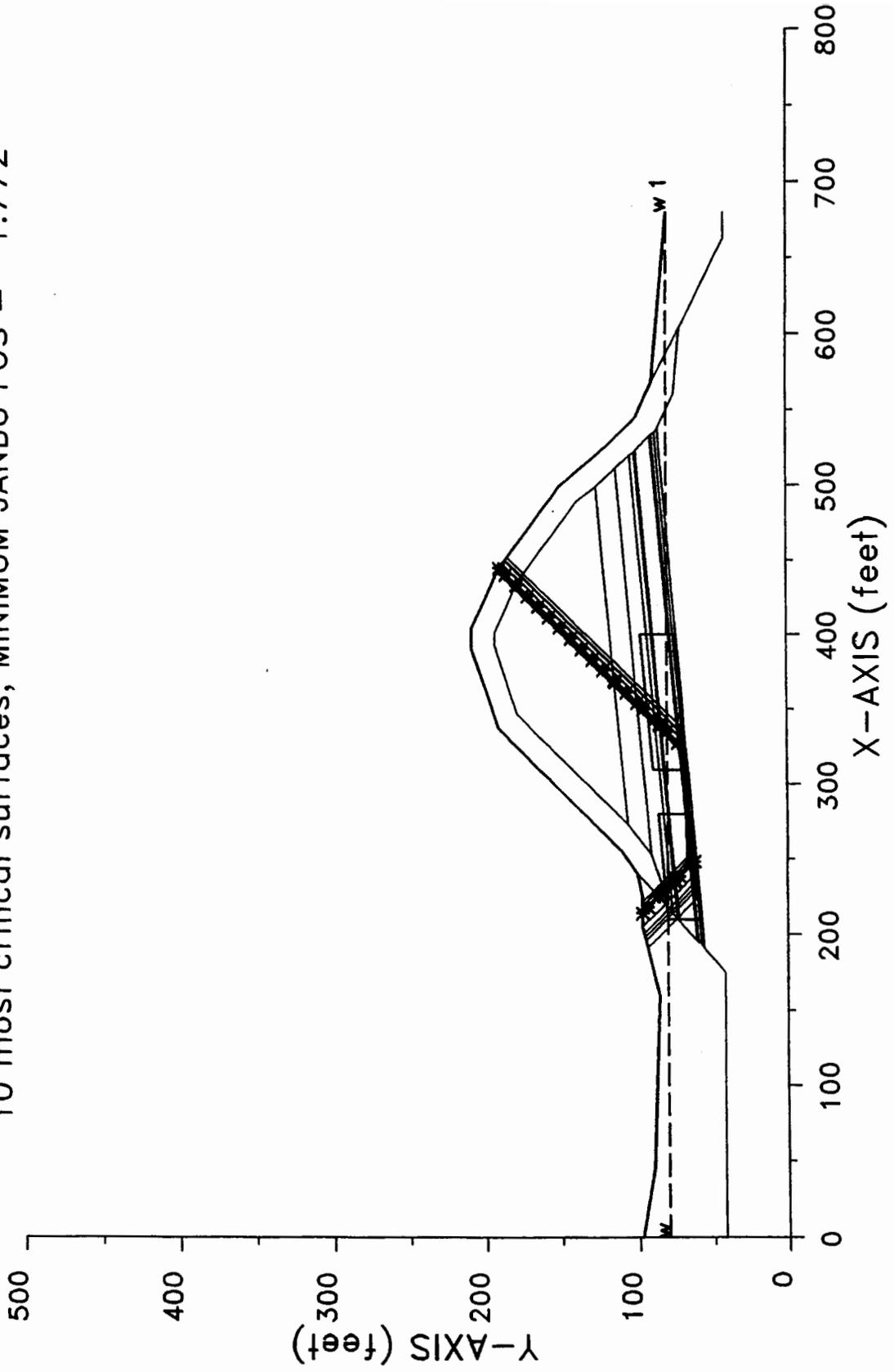
MCFH03CS 4-28-04 14:24

Camel Su Circ 5deg c=3300 p=0 0.02g
10 most critical surfaces, MINIMUM BISHOP FOS = 1.639



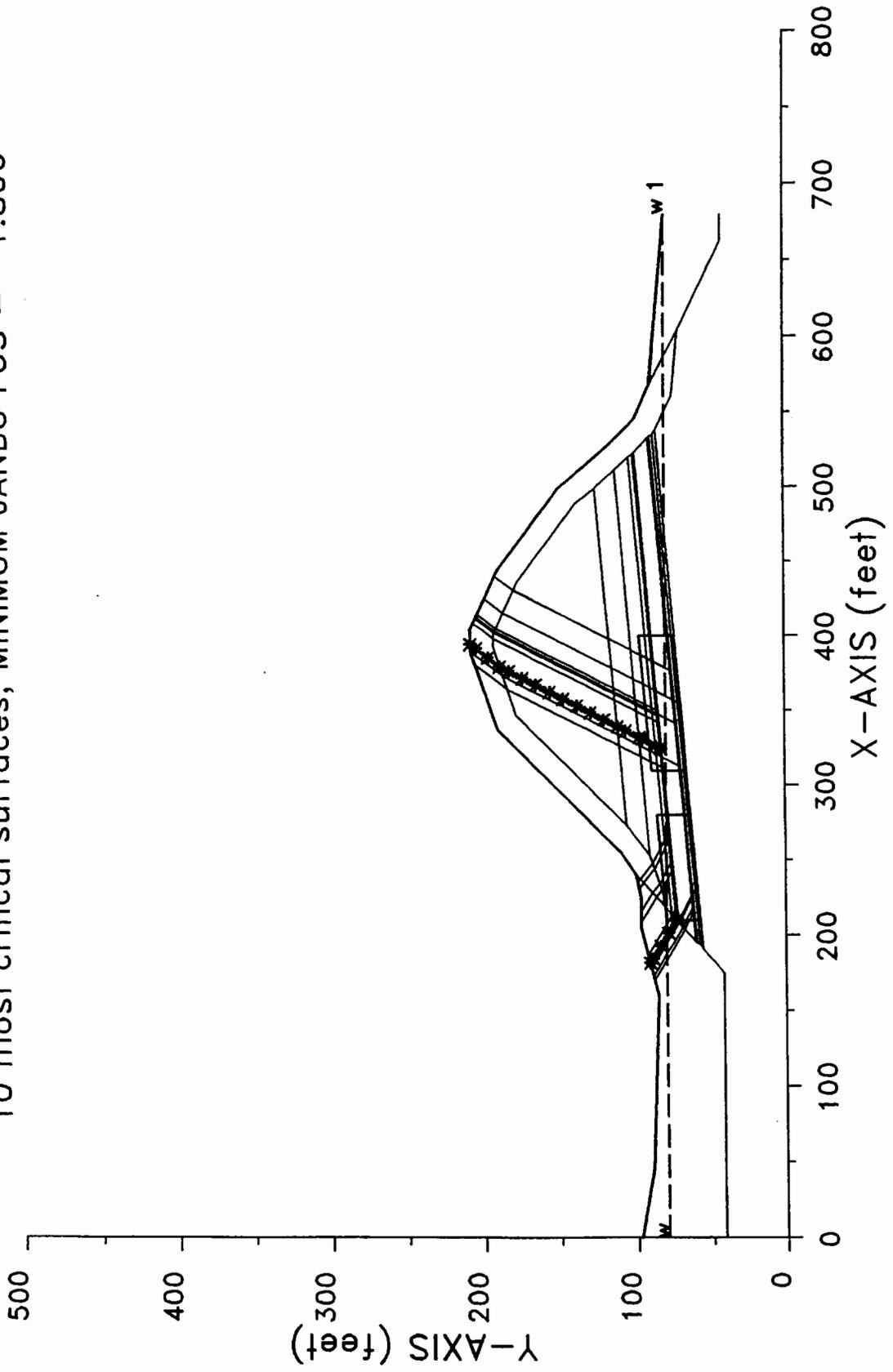
MCFH03B 4-28-04 14:48

Camel Su Block 5 deg c=3300 p=0
10 most critical surfaces, MINIMUM JANBU FOS = 1.772



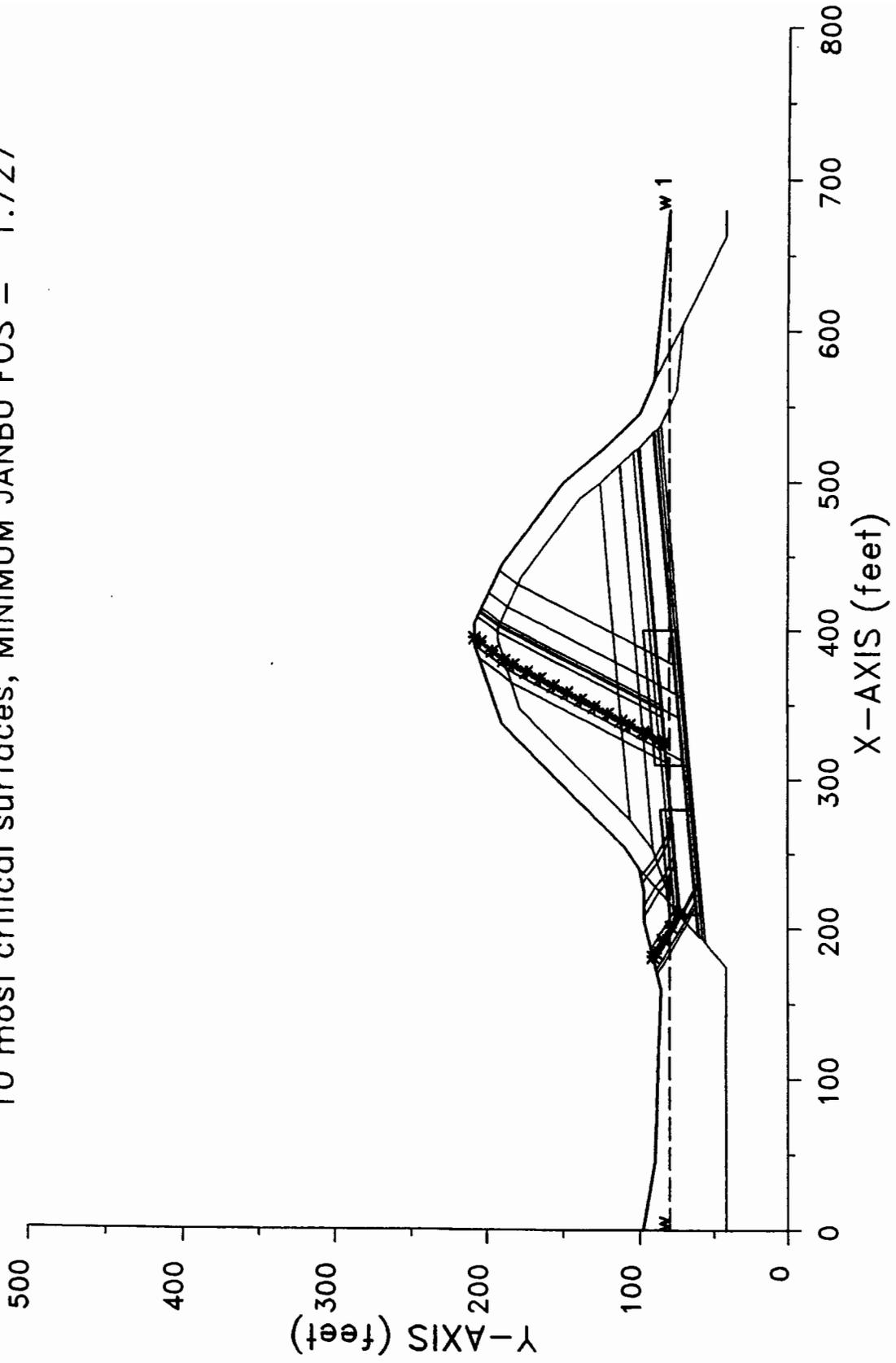
MCFH13B 4-28-04 14:50

Camel CD Block 5 deg c=280 p=15
10 most critical surfaces, MINIMUM JANBU FOS = 1.806



MCFH13BS 4-28-04 14:51

Camel CD Block 5deg c=280 p=15 0.02g
10 most critical surfaces, MINIMUM JANBU FOS = 1.727



MCFH03BS 4-28-04 14:53

Camel Su Block 5deg c=3300 p=0 0.02g
10 most critical surfaces, MINIMUM JANBU FOS = 1.706

