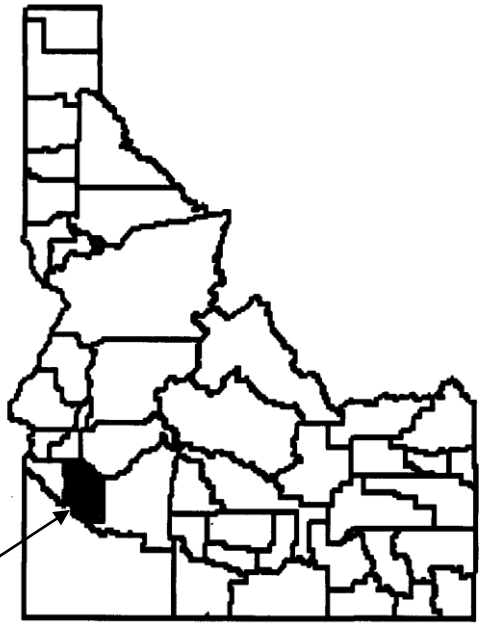
FLOOD INSURANCE STUDY

VOLUME 1 OF 2

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

Community Name	*Community Number*
ADA COUNTY (UNINCORPORATED AREAS)	160001
BOISE, CITY OF	160002
EAGLE, CITY OF	160003
GARDEN CITY, CITY OF	160004
KUNA, CITY OF	160174
MERIDIAN, CITY OF	160180
STAR, CITY OF	160236



Ada County

Notice
This revised preliminary FIS report includes only revised Flood Profiles and Floodway Data tables. See "Notice to Flood Insurance Study Users" page for additional details.

Preliminary: September 23, 2016

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
16001CV001C

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

ATTENTION: On some Flood Insurance Rate Map (FIRM) panels located along the Boise River, levees have not been demonstrated by the community or levee owner(s) to meet requirements of Section 65.10 of the National Flood Insurance Program regulations in 44 CFR as it relates to the levee's capacity to provide 1% annual chance flood protection. The subject areas are identified on FIRM panels (with notes and bounding lines) and in the FIS report as potential areas of flood hazard data changes based on further review.

FEMA has updated levee analysis and mapping protocols. Until such time as FEMA is able to initiate a new flood risk project to apply the new protocols, the flood hazard information on the aforementioned FIRM panels that are affected by the levees are being added as a snapshot of the prior effective information presented on the FIRMs and FIS dated October 2, 2003. As indicated above, it is expected that affected flood hazard data within the subject area could be significantly revised. This may result in floodplain boundary changes, and/or changes to flood hazard zone designations.

This FIS report was revised on _____. Users should refer to Section 10.0, Revisions Description, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of this FIS report.

Initial Countywide FIS Effective Date: September 22, 1999

Revised Countywide Date(s): February 19, 2003
October 2, 2003
To Be Determined

This preliminary FIS report does not include unrevised Floodway Data Tables or unrevised Flood Profiles. These Floodway Data Tables and Flood Profiles will appear in the final FIS report.

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FLOOD INSURANCE STUDY
ADA COUNTY, IDAHO AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of Ada County, including the Cities of Boise, Eagle, Garden City, Kuna, Meridian, and Star and the unincorporated areas of Ada County (referred to collectively herein as Ada County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the original studies for the Cities of Boise, Eagle, and Garden City and for the unincorporated areas of Ada County were performed by the U.S. Army Corps of Engineers (USACE), Walla Walla District, for the Federal Emergency Management Agency (FEMA) under Interagency Agreement No. IAA-H-7-76, Project Order No. 24. This work was completed in September and October 1978.

The hydrologic and hydraulic analyses for the Boise and South Fork Boise Rivers, which affect the Cities of Garden City and Eagle and the unincorporated areas of Ada County, were revised by the USACE, Walla Walla District, for FEMA, under Interagency Agreement No. IAA-H-10-77, Project Order No. 24. This work was completed in December 1981.

The hydrologic and hydraulic analyses for the original study for the City of Meridian, which also updated the study for the unincorporated areas of Ada County, were performed by Toothman-Orton Engineering Company, for FEMA, under Contract No. EMW-88-C-2602. This work was completed in August 1989.

The study for the City of Garden City was revised to show the effects of a levee located along the right-hand side (looking downstream) of the Boise River from its confluence with the South Fork Boise River to approximately 3,200 feet upstream, based on data prepared by CH2M Hill, Inc. The study was submitted by the City of Garden City (Reference 1). The study was also revised to incorporate a revision to the floodway along a reach of the Boise River between East 47th and 49th Streets, and was based on the revised hydraulic analysis prepared by CH2M Hill, Inc. (Reference 2).

1.3 Coordination

Community base map selection and the identification of streams requiring detailed study took place at the initial Consultation Coordination Officer (CCO) meetings in January 1976 for the original studies for the Cities of Boise, Eagle, and Garden City and the unincorporated areas of Ada County. Representatives of the USACE, FEMA, and the communities were present at each of the meetings.

An intermediate CCO meeting, attended by representatives of the USACE, FEMA, and the City of Boise, was held on September 13, 1978, to review the progress made on the study.

Final CCO meetings were held for the Cities of Garden City (January 30, 1979), Boise (January 31, 1979), and Eagle (February 1, 1979), and for the unincorporated areas of Ada County (March 15, 1983). Representatives of the USACE, FEMA, and the communities attended the meetings. Any problems raised at the meetings were addressed in the study.

The studies for the Cities of Eagle and Garden City were revised in 1985 to add the detailed-study information along the Boise and South Fork Boise Rivers. No community coordination information regarding this revision is available.

The initial CCO meetings were held in June 1987 for the original study for the City of Meridian, which also affected the unincorporated areas of Ada County, to identify portions of Fivemile, Eightmile, Ninemile, and Tenmile Creeks to be studied by detailed methods. Representatives of Toothman-Orton Engineering Company, FEMA, and the communities were present at each of the meetings.

An intermediate CCO meeting, attended by representatives of Toothman-Orton Engineering Company, FEMA, and the communities, was held on December 14, 1989, to review the progress made on the study.

The results of the study were reviewed at the final CCO meeting held on February 13, 1991, and attended by representatives of Toothman-Orton Engineering Company, FEMA, and the communities. Any problems raised at the meeting were addressed in the study.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of Ada County, Idaho, including the incorporated communities listed in Section 1.1.

The streams studied by detailed methods, along with their study reaches, are shown in Table 1, "Streams Studied by Detailed Methods."

The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through 1983 for the Cities of Boise and Garden City, through 1986 for the City of Eagle and the unincorporated areas of Ada County, and through 1989 for the City of Meridian and the revised portions of the unincorporated areas of Ada County.

Table 1. Streams Studied by Detailed Methods

Stream	Location
Boise River	From the Ada-Canyon County line to Barber Dam, southeast of the City of Boise
Boise River Side Channel	From its convergence with to its divergence from the Boise River
South Channel Boise River Eagle Island	From its convergence with to its divergence from the Boise River
South Channel Boise River Right Overbank	From its confluence with the Boise River to just downstream of Trout Road
Cottonwood Gulch	From 600 feet downstream of Mountain Cove Road to approximately 2,300 feet upstream of Shaw Mountain Road
Crane Gulch	From Hill Road to Curling Drive
Dry Creek	From its confluence with the Boise River to upstream of Cartwright Road
Dry Creek Side Channel	From its confluence with Dry Creek to 4,200 feet upstream of North McFarland Creek Road
Eightmile Creek	From its confluence with Fivemile Creek to Victory Road
Fivemile Creek	From just below its confluence with Ninemile Creek to New York Canal, a reach of approximately 13 miles
Highland Gulch	From approximately 160 feet upstream of State Highway 21 upstream for a reach of 2,330 feet
Hulls Gulch	From just upstream of the intersection of 9th and Heron Streets to approximately 2,350 feet upstream of McCord Lane
Maynard Gulch	From approximately 60 feet upstream of State Highway 21 upstream for a reach of 765 feet
Ninemile Creek	From its confluence with Fivemile Creek to Locust Road

Table 1. Streams Studied by Detailed Methods (Cont'd)

Stream	Location
Pierce Gulch	From approximately 100 feet upstream of Hill Road upstream for a reach of 1,885 feet
Polecat Gulch	From Castle Road to approximately 400 feet upstream of Outlook Avenue
Seaman Gulch	From approximately 100 feet upstream of Hill Road upstream for a reach of 1,100 feet
Stuart Gulch	From approximately 200 feet upstream of intersection of Hill Road and Stuart Gulch Road to approximately 500 feet downstream of Cartwright Road
Stuart Gulch Split Flow Channel	From its convergence with to its divergence from Stuart Gulch
Tenmile Creek	From Interstate 84 to Locust Grove Road
Tenmile Creek Overbank	From Columbia Road to its divergence from Tenmile Creek
Warm Springs Creek	From approximately 700 feet upstream of Warm Springs Avenue to approximately 1,830 feet upstream of Barber Road

The streams studied by approximate methods are as follows: Big Gulch and Little Gulch in the vicinity of the City of Star; Ninemile, Fivemile, and Tenmile Creeks in the vicinity of the City of Meridian; Fivemile Creek in the southern part of the City of Boise; Dry Creek, Spring Valley Creek, and Currant Creek, located northeast of the City of Eagle; Seaman Gulch, Pierce Gulch, Crane Gulch, and Freestone Creek in the vicinity of the City of Boise; Blacks Creek and Bryans Run, located southeast of the City of Boise; Mason Creek, located southwest of the City of Boise; and Indian Creek, in the vicinity of the City of Kuna.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and the communities.

2.2 Community Description

Ada County comprises a 1,042-square-mile area in southwestern Idaho. In 1980, the population of the County was 173,036 (Reference 3). According to the U.S. Bureau of the Census, the 1990 population of Ada County was 205,775 (Reference 4). This represents an increase of 18 percent over 1980. A steady growth is expected for the County in the foreseeable future.

Incorporated communities within Ada County consist of the Cities of Boise, Eagle, Garden City, Kuna, Meridian, and Star. Ada County is bordered by Gem County to the north, Boise County to the northeast, Elmore County to the east and south, Owyhee County to the southwest, and Canyon County to the west.

The City of Boise is located in the northern part of Ada County. It is the largest city in the State of Idaho and serves as the State Capital. The population of the City was 102,154 in 1980 (Reference 5). According to the U.S. Bureau of the Census, the 1990 population of the City of Boise was 125,738 (Reference 4).

The City of Eagle, located in northwestern Ada County, was incorporated in the early 1900s. The City is located approximately 10 miles northwest of the City of Boise and 7 miles east of the City of Star. The Boise River flows westerly through the southern half of the City of Eagle, while the South Fork Boise River flows westerly just south of the City. Dry Creek flows southerly along the western corporate limits. Ballentine Canal is a shallow ditch that crosses the floodplains of both the Boise River and Dry Creek, but has no effect on flooding. According to the U.S. Bureau of the Census, the 1990 population of the City of Eagle was 3,327 (Reference 4). This represents an increase of 26 percent over 1980.

The City of Garden City, located in north-central Ada County, was incorporated in May 1949. The City is located immediately adjacent to and in the northwestern suburb of the City of Boise. The City of Garden City is adjoined by the City of Boise to the west, south, and east and by Ada County to the north. According to the U.S. Bureau of the Census, the 1990 population of the City of Garden City was 6,369 (Reference 4). This represents a 7-percent increase over 1980.

The City of Meridian is located in northwestern Ada County, off Interstate Highway 84, Exit 44, on U.S. Highway 30. According to the U.S. Bureau of the Census, the 1990

population of the City of Meridian was 9,596 (Reference 4). This represents an increase of 10 percent over 1980.

The City of Kuna is located in western Ada County, southwest of the City of Boise.

The City of Star is located in northwestern Ada County, due west of the City of Eagle, along State Route 44, and northwest of the City of Meridian. It was incorporated in 1977.

The topography in Ada County varies from steep slopes and narrow canyons in the northern mountainous uplands, to a gentle sloping plateau of the Snake River plain to the south. Elevations range from more than 6,000 feet along the crest of the Boise Front northeast of the City of Boise to 2,300 feet along the Snake River rim to the southwest (Reference 5).

The drainage area for the Boise River is 2,650 square miles at Lucky Peak Dam, located a short distance upstream from the study area. The topography above Lucky Peak Dam is characterized by highly dissected deep V-shaped valleys, steep slopes, and narrow, sharp-topped ridges. The upper basin ranges in elevation from 3,000 to 10,600 feet.

The remaining watershed area (approximately 1,484 square miles downstream of Lucky Peak Dam) is composed of river bottoms, terraces, and low-rolling to steep hills, with few distinct mountains. Adjoining the main stream is bottomland, varying from 1 to 3 miles in width (Reference 6).

The soils are moderately coarse to very-fine textured on alluvial bottoms and lowlands, with level to nearly level slopes (Reference 5). The soils are suitable for cropland cultivation in the northern portion of the County near the population centers of the Cities of Boise, Garden City, Meridian, Kuna, Eagle, and Star. Rangelands and undeveloped arid lands constitute the largest portion of Ada County. Most rangeland is located in the southern portion of the County. A further use of these rangelands in the southern portion of the County is for the National Guard Maneuver and Firing Area (Reference 7).

The climate of the Boise River basin, which is the chief drainage basin in the County, is characterized by moderate precipitation and a large temperature range. The area has a mean annual temperature of 52°F. Temperatures of 0°F and 100°F represent approximate average annual extremes. Normal annual precipitation varies from 13 inches at the City of Boise to approximately 22 inches at the higher elevations of the foothills. Most precipitation occurs in the cooler months. General orographic rainstorms may last for several days, but precipitation intensities are not great. The maximum observed 24-hour rainfall at the City of Boise was 2.7 inches. Summer thunderstorms occasionally produce intense rainfall over parts of the drainage area (Reference 8). Major floods in the Boise River basin result from rainfall or a combination of rainfall and snowmelt (Reference 7).

The City of Meridian is 2,606 feet above sea level. The average daily temperature varies from 74.8°F in the summer to 29.3°F in the winter. Average annual precipitation is 11.48 inches. Average summer humidity at noon is 41 percent. Nights are cool. The growing season is approximately 175 days long (Reference 9).

The City of Meridian was incorporated as a village in 1903, with a population of 200. Today, it is a thriving, growing community, with several hundred retail merchants, manufacturers, and professional services. Located only 8 miles from the State capital, it is within easy access of colleges, vocational/technical schools, and a State university. The airport, hospitals, museums, and theaters, as well as corporate headquarters and local,

State, and Federal government offices, are only a 15-minute drive away. Skiing, hunting, fishing, boating, and camping are also easily accessible. The City of Meridian is a friendly, community-spirited City that welcomes new residents, business, and industry (Reference 9).

Urban developments subject to flooding in the City of Eagle are located on the northern bank of the Boise River and on the southern bank of Dry Creek. Natural obstructions to floodflows include trees, brush, and other vegetation along the streambanks in the floodplain area.

Urban developments subject to flooding in the City of Garden City are located on both banks of the Boise River within the lower or downstream portion of the City of Garden City and on the left bank (looking downstream) within the upper part of the City of Garden City.

There are commercial, industrial, and residential areas and public utilities in and around the floodplain throughout the County. Economic development is expected to continue, accompanied by continuous pressure to intensify floodplain uses within the study area.

2.3 Principal Flood Problems

The main flooding season on the Boise River is normally during April, May, or June and is caused primarily by snowmelt.

The Boise River tributaries are small streams, with intermittent and infrequent flow, but substantial runoff from these areas is experienced occasionally from summer thunderstorms. There is also a potential for floods during the winter from rain on frozen ground.

Basic floodflow information is available from the U.S. Geological Survey (USGS) stream gage near the Capitol Boulevard Bridge in the City of Boise.

The greatest flood of known magnitude on the Boise River occurred on June 14, 1896. Peak flow was estimated at 35,500 cubic feet per second (cfs). The largest recent flood occurred in April 1943. Peak flow was estimated at 21,000 cfs (frequency not known). The floods of June 14, 1896, and April 1943 occurred prior to upstream flood controls on the Boise River. Since the installation of upstream flood-control structures, the highest recorded discharge was 7,240 cfs, occurring May 1965. The source of these discharge figures is a USGS gaging station on the Boise River 1 mile upstream of the City of Garden City

(Reference 10). The greatest known floods estimated on the ungaged Boise River tributaries studied had peak discharges estimated as follows (Reference 6):

Stream	Date	Discharge (cfs)	Recurrence Interval
Cottonwood Creek	August 1959	1,580	16 Years
	June 1909	6,000	80 Years
Hulls Gulch	July 1913	5,000	100 Years
Crane Gulch	July 1891	1,350	25 Years
Stuart Gulch	June 1884	3,000	80 Years

These are the only floods for which field data were collected. Other floods have occurred on which no estimates of peak discharges were made.

Figures 1 and 2 show examples of flooding on the Boise River. Figure 3 shows flooding on Cottonwood Gulch.

Natural obstructions to floodflows include trees, brush, and other vegetation growing along the streambanks. Manmade encroachments on or over the streams, such as bridges, create more extensive flooding than would otherwise occur.

The study areas added in 1989 are predominantly subject to winter flooding events accompanied by warm rain and rapidly melting snow on frozen ground.

The greatest known floods estimated on the ungaged Boise River tributary of Fivemile Creek and the gaged site on Bryans Run had peak discharges estimated as follows (Reference 6):

Stream	Date	Discharge (cfs)	Recurrence Interval
Fivemile Creek At Five Mile Road	January 1979	220	< 10 Years
Bryans Run At gage, tributary of Fivemile Creek	January 1971	420	45 Years

The Boise River tributaries and their floodplains that affect the City of Boise are Cottonwood Creek and Stuart, Hulls, Polecat, and Crane Gulches. These are small streams with intermittent and infrequent flows.

Floods in the areas of the Cities of Eagle and Garden City have two primary causes: 1) high-intensity thunderstorm rainfall, usually during the warmer months, and 2) combinations of general storm rainfall and snowmelt, with frozen ground conditions in the winter and early spring.

The study areas in the City of Meridian are predominantly subject to winter flooding events accompanied by warm rain and rapidly melting snow on frozen ground.

2.4 Flood Protection Measures

Three dams provide flood-control storage for floods from 64 percent of the drainage area of the Boise River. Anderson Ranch and Arrowrock Dams are U.S. Bureau of Reclamation reservoirs, and Lucky Peak Reservoir is a USACE project. Lucky Peak Reservoir is located approximately 10 miles upstream of the City of Boise on the Boise River. Arrowrock Reservoir is located approximately 30 miles upstream of the City of Boise on the Boise River. Anderson Ranch Reservoir is located approximately 70 miles upstream of the City of Boise on the South Fork Boise River. Joint-use flood-control storage is available, based on flood forecasts. Although effective regulation has been afforded by flood-control storage, the potential for flooding still exists.

Flood-damage-prevention measures include small detention lagoons on Cottonwood Creek and contour terracing in the upper Cottonwood Creek watershed. These lagoons were built as emergency measures and cannot be relied on for permanent flood protection.

Flood-prevention measures along the Boise River include a levee built by B&A Engineers, Inc., and located along the right-hand side (looking downstream) of the Boise River from the divergence of the South Channel Boise River to approximately 3,200 feet upstream (Reference 1). The levee provides protection for the Riverside Village Subdivision in the City of Garden City from the 100-year flood. A permanent committee appointed by the City of Garden City provides maintenance and operation of the levee and flood-control works. The levee affects the 100-year flood boundaries in the City of Garden City and the unincorporated areas of Ada County.

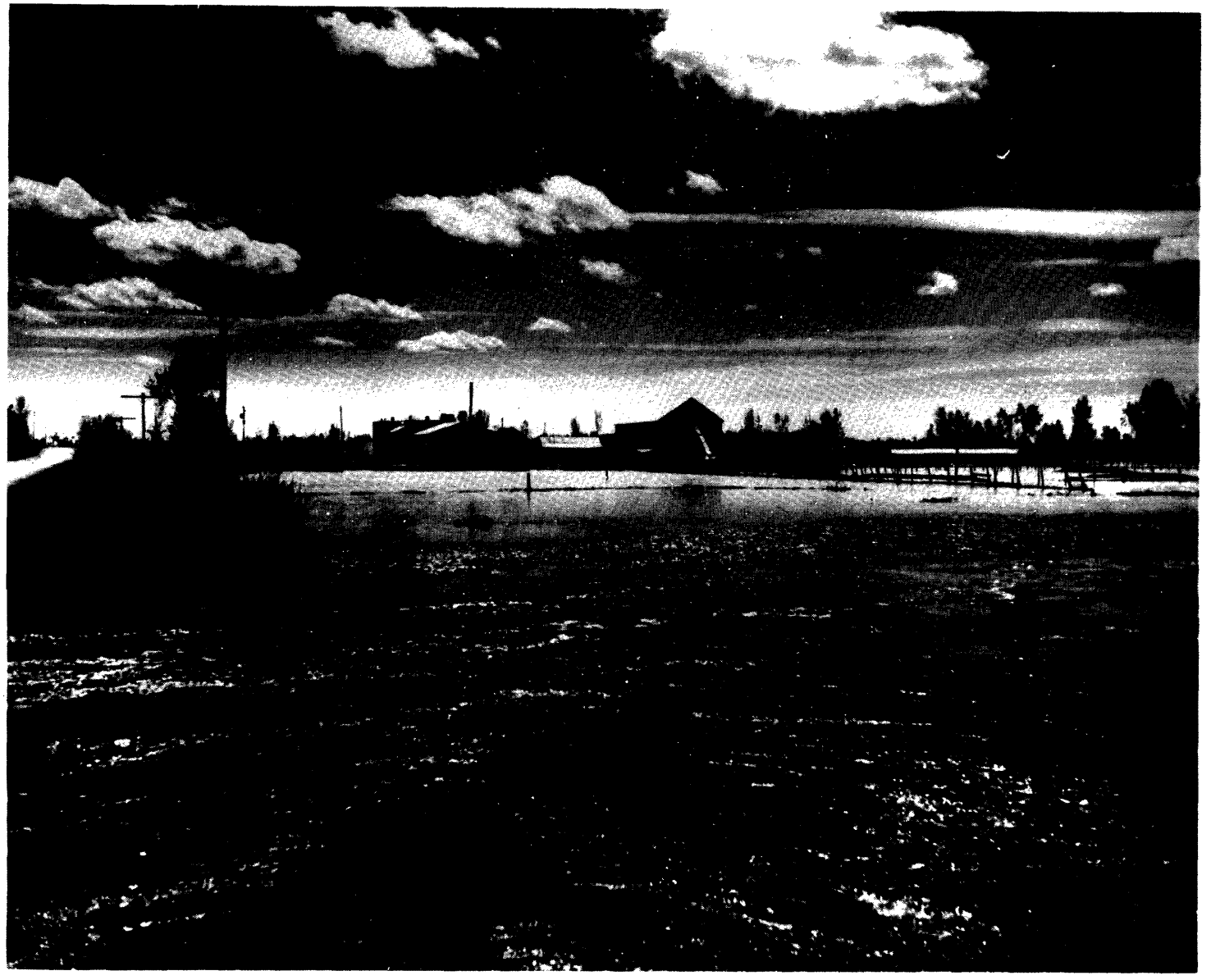


Figure 1. Boise River Flooding Near Eagle on April 22, 1943

Figure 2. Boise River Flooding Near Strawberry Glen Bridge on April 22, 1943

Figure 3. Flooding From Cottonwood Creek in Boise at 10th and Ressequie Streets (August 20, 1959)

No significant flood-prevention measures have been taken on any other streams in Ada County.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

A gaging station on the Boise River, located near the Capitol Boulevard Bridge in the City of Boise and approximately 1 mile upstream from the City of Garden City, was the principal source of data for defining discharge-frequency relationships for the river and for the side channel. The gage has been operated intermittently for 50 years, from 1895 to 1977. Values of the10-, 50-, 100-, and 500-year peak discharges were obtained from a log-Pearson Type III distribution of annual peak-flow data (Reference 11). Adjustments were made to the analyses in the City of Boise to account for reservoir storage.

The principal method used to define discharge-frequency data for all study reaches on ungaged streams and those study reaches remote from gaging stations was a regional relationship of basin characteristics to streamflow characteristics (Reference 11).

Discharge-frequency data for all of the creeks added in the Meridian Area study were influenced by major irrigation canal crossings with either the New York Canal or the Ridenbaugh Canal, or both. Natural peak discharges were reduced primarily due to significant ponding, limited culvert sizes under the New York Canal, and flow intercepted by the New York and Ridenbaugh Canals. Historically, the Ridenbaugh Canal has intercepted winter floodflows from Fivemile Creek just east of Cloverdale Road where the creek and the canal intersect at grade. Peak discharges were developed for basins studied using general rainfall and snowmelt on frozen ground. The peak discharges were computed by 1) deriving Snyder 30-minute unit hydrographs for each basin (Reference 12); 2) deriving the 6-hour, 100-year precipitation amount (Reference 13); and 3) inputting derived data into the HEC-1 computer program using a constant loss rate of 0.3 inch per hour (Reference 14). Resultant discharges were checked using USGS Regional Regression Equations (Reference 15). Soils in the City of Meridian studied drainage areas have high

loss rates. Maximum observed 24-hour rainfall for the City of Meridian gaging station is 1.65 inches (Reference 16).

The analysis of Fivemile Creek includes the use of the USACE HEC-1 computer program (Reference 14) and USGS Open-File Report 81-909, "A Method of Estimating Flood-Frequency Parameters for Streams in Idaho" (Reference 15).

Flows on the South Fork Boise River are controlled by the Boise River; therefore, peak discharge-frequency relationships were not developed for this stream.

Peak discharge-drainage area relationships for the streams studied by detailed methods are shown in Table 2, "Summary of Discharges."

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Cross-section data for streams in the unincorporated areas of Ada County were obtained from aerial photographs and topographic maps (References 17 through 20). The below-water sections were obtained by field measurements. All bridges and culverts were surveyed to obtain elevation data and structural geometry.

Water-surface profiles were developed using a USACE HEC-2 computer model (Reference 21). On the Boise River near Eagle Island and on Tenmile Creek, overbank areas were modeled as separate flows using the USACE HEC-2 computer model.

Starting water-surface elevations (WSELs) were determined using normal-depth calculations for most of the streams studied in detail. For the study areas added in 1989 in the Meridian area, starting water-surface elevations were determined using the slope-area method for Fivemile and Tenmile Creeks and the calculated WSEL of Fivemile Creek, at the confluence point, for Ninemile and Tenmile Creeks.

Roughness coefficients (Manning's "n" values) for computations in Ada County were estimated by field inspections of the floodplains. The roughness values for the initial study varied according to the roughness of the streambeds and overbank areas. Roughness values ranged from 0.020 to 0.080 for the channels and overbank areas, respectively. For the 1989 study, the roughness values ranged from 0.016 to 0.085 in the channels and from 0.020 to 0.100 in the overbank areas.

Updated cross sections were used in the HEC-2 computer model revised by CH2M Hill, Inc., to include channel modifications that have occurred since the original floodplain was established. The revised model was run using Manning's "n" values, flow rates, and starting WSELs from the initial study.

The shallow-flooding analysis for the original study for the unincorporated areas of Ada County was performed using normal-depth calculations. Statistical analyses were used to compute flood depths and velocities for those areas that are subject to alluvial fan

Table 2. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Boise River					
At Lucky Peak Dam	2,650[1]	7,200[2]	11,000[2]	16,600[2]	34,800[2]
Boise River Side Channel					
At Park Center	N/A	N/A	N/A	675[3]	N/A
Cottonwood Gulch					
At mouth	16.5	242	1,450	3,650	25,500
Above Freestone Creek	11.7	192	1,016	2,688	19,282
Crane Gulch					
At mouth	7.8	154	376	1,030	8,428
Dry Creek					
At City of Eagle	67.0	610	2,700	4,000	13,200
Below Confluence with Spring Valley Creek	35.1	--[4]	--[4]	3,650	--[4]
Below Confluence with Dry Creek Side Channel	--[4]	--[4]	--[4]	2,473	--[4]
Above split flow to Dry Creek Side Channel	--[4]	--[4]	--[4]	1,641	--[4]
5,700 feet downstream of Cartwright Road	--[4]	--[4]	--[4]	2,230	--[4]
Dry Creek Side Channel					
At split flow from Dry Creek	--[4]	--[4]	--[4]	350	--[4]
3,300 feet upsream of Cartwright Road	--[4]	--[4]	--[4]	890	--[4]
1,110 feet upstream of Confluence with Dry Creek	--[4]	--[4]	--[4]	1,231	--[4]
Eightmile Creek					
At confluence with Fivemile Creek	16.7	330	525	590	850
At Cloverdale Road	--[4]	325	510	575	820
At Victory Road	13.4	275	390	425	580
Above New York Canal	9.9	300	700	950	1,800

[1]Drainage area above Lucky Peak Dam
[2]Regulated discharges
[3]Breakout flow from Boise River
[4]Data not available

Table 2. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Fivemile Creek					
Below Ninemile Creek	63.0	650	1,000	1,200	1,875
At Linder Road	--[3]	565	850	1,000	1,575
Below Eightmile Creek	52.5	530	780	900	1,375
Below Ridenbaugh Canal	--[3]	200	250	300	525
Above Ridenbaugh Canal	--[3]	345	440	525	815
Below Five Mile Road	--[3]	325	400	470	725
Below Three Mile Creek	33.0	300	390	440	650
At Victory Road	--[3]	265	320	350	580
Below New York Canal	30.2	250	280	300	500
Above New York Canal	30.2	725	1,450	1,850	3,000
Highland Valley Gulch	2.5	150	940	1,250	2,100
Hulls Gulch					
At mouth	4.3	108	263	360	2,200
Maynard Gulch	2.3	150	830	1,100	1,850
Ninemile Creek					
At Ten Mile Road	5.6	70	135	175	290
Above Linder Road	--[4]	50	95	120	200
At Meridian Road	--[4]	55	120	145	235
At Locust Grove Road	2.9	40	80	95	150
Pierce Gulch	2.0	140	760	1,100	1,700
Polecat Gulch	1.2	110	580	780	1,300
Seaman Gulch	1.8	140	760	1,100	1,700

[1]Drainage area above Lucky Peak Dam [2]Regulated discharges
[3]Data not available [4]Data not applicable

Table 2. Summary of Discharges (Cont=d)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
South Channel Boise River Eagle Island	--[3]	--[4]	--[4]	4,900	14,000
Stuart Gulch					
At mouth	9.1	169	538	1,494	11,794
Tenmile Creek					
At Roosevelt Road	10.0	215	415	510	820
At Tenmile Community Church	1.8	83	160	200	320
At Interstate 84	6.5	185	350	440	680
At Locust Grove Road	--[4]	170	320	400	620
At Amity Road	5.0	--[3]	--[3]	350	--[3]
Warm Springs Creek	5.0	230	1,860	2,500	4,300

[1]Drainage area above Lucky Peak Dam [2]Regulated discharges
[3]Data not available [4]Data not applicable

flooding. Channel systems on alluvial fans are unstable, and flow may occur on separate parts of an alluvial fan during sequent flood events. The depths of flooding on alluvial fans presented in this study were computed according to guidelines issued by FEMA (Reference 22).

Several reaches within the 1989 study areas on Fivemile and Ninemile Creeks included computations of split flow, where floodwaters will separate from the main channel area and generally return to the channel area farther downstream. On Fivemile Creek, for the 100-year flood, these areas include upstream of Targee Street east of Maple Grove Road, at Southerland Drive east of Five Mile Road, at Franklin Road, and between Pine Street and Fairview Avenue. For Ninemile Creek, split flows occur at Franklin Road continuing over Meridian Road, at the crossing with the Rutledge Canal just north of the railroad, and at Leann Way north of Cherry Lane. In addition, split flows were computed where irrigation canals intercept floodwaters or where the flows will not return to the creeks. On Fivemile Creek, those areas are at the Farmers Lateral, Ridenbaugh Canal, and upstream of the railroad crossing. On Ninemile Creek, these areas are just upstream of the railroad crossing and at Rutledge Canal. The spilt-flow areas where the depth of flooding was less than 1 foot were shown as Zone X (shaded).

Cross-section data for streams in the City of Boise were obtained from aerial photographs and topographic maps (References 18, 23, and 24, respectively). The below-water sections were obtained by field measurements.

When the computed WSEL is near the critical depth, unstable flow conditions can be expected. For cross sections at which unstable flow is expected, the elevations, as presented on the Flood Profiles (Exhibit 1), are the computed elevations at critical depth, plus 40 percent of the velocity head at critical depth. The resulting depth is equal to 1.1 times critical depth for triangular channels and, therefore, is a conservatively high approximation for other channel shapes (Reference 25).

Roughness coefficients (Manning's "n" values) for computations in the City of Boise were estimated by field inspections of the floodplains. The roughness values varied according to the roughness of the streambeds and overbank areas. In the City of Boise, roughness coefficients ranged from 0.035 to 0.080.

At Cross Section CI on the Boise River, the 100- and 500-year flows overtop the levee. This causes a divided flow between the Boise River and the Boise River Side Channel.

Cross-section data for streams in the City of Eagle were obtained from aerial photographs (Reference 26). The below-water sections were obtained by field measurements.

Roughness coefficients (Manning's "n" values) for computations in the City of Eagle were estimated by field inspections of the floodplains. Roughness values were 0.040 for the channels and ranged from 0.050 to 0.080 for the overbanks of the Boise and South Fork Boise Rivers and Dry Creek.

Cross-section data for the Boise River in the City of Garden City were obtained from aerial photographs (Reference 27). The below-water sections were obtained by field measurements.

Roughness coefficients (Manning's "n" values) for computations in the City of Garden City were estimated by field inspections of the floodplain areas. The roughness coefficients ranged from 0.035 in the channel to 0.080 in the overbank areas.

The WSELs computed for the Boise River in the City of Garden City were started from normal depth, computed by using the slope-area method.

Cross-section data for the study of the City of Meridian were obtained from aerial photogrammetry (Reference 20). The below-water sections were obtained by field measurements.

Roughness coefficients (Manning's "n" values) for the studied streams in the City of Meridian were determined by field inspections and varied from 0.020 to 0.100 in the overbanks and from 0.016 to 0.085 in the channel.

All flood profiles were drawn showing computed WSELs to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the FIRM (Exhibit 2).

For streams studied by approximate methods, the 100-year flood boundaries were delineated using aerial photographs at a scale of 1:12,000, using a stereoscope (Reference 19). Normal-depth hydraulic computations were computed to determine flood elevations at various locations.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the North American Vertical Datum of 1988 (NAVD). Elevation reference marks (ERMs) and their descriptions are shown on the maps. ERMs shown on the FIRM represent those used during the preparation of this and previous FISs. The elevations associated with each ERM were obtained and/or developed during FIS production to establish vertical control for determination of flood elevations and floodplain boundaries shown on the FIRM. Users should be aware that these ERM elevations may have changed since the publication of this FIS. To obtain up-to-date elevation information on National Geodetic Survey (NGS) ERMs shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov. Map users should seek verification of non-NGS ERM monument elevations when using these elevations for construction or floodplain management purposes.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 100-year floodplain data, which may include a combination of the following: 10-, 50-, 100-, and 500-year flood elevations; delineations of the 100-year and 500-year floodplains; and 100-year floodway. This information is presented on the FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000, with contour intervals of 10, 20, and 40 feet (References 28, 24, and 17); 1:1,200, with a contour interval of 2 feet (References 18 and 29); and 1:12,000, with a contour interval of 4 feet (References 30 and 20) and aerial photographs at a scale of 1:12,000 (Reference 26); 1:1,200 with a contour interval of 2 feet (Reference 18); and 1:6,000 (Reference 30).

For the Boise River, flood boundaries were developed photogrammetrically using aerial photographs at a scale of 1:12,000 (References 19 and 30). For the 1989 study for Ada County, the boundaries were interpolated using topographic maps at a scale of 1:12,000, with a contour interval of 4 feet (References 30 and 20).

The 100- and 500-year floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, and AO), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

Along the levee located between the divergence of the South Channel Boise River from the Boise River and approximately 3,200 feet upstream, the 100-year flood boundaries between cross sections were interpolated using a topographic map at a scale of 1:6,000, with a contour interval of 2 feet (Reference 31).

Polecat Gulch is an alluvial fan. Because floodways are not applicable to alluvial fans, no floodway was computed for this stream. The scope of the original study in Ada County did not include the computation of floodways for Tenmile Creek Overbank and Maynard Gulch. The 1989 study did not include floodway computations for Eightmile, Ninemile, and Tenmile Creeks.

CH2M Hill, Inc., set the 100-year floodway boundaries on the north side of the Boise River, from the divergence of the South Channel Boise River to approximately 3,200 feet upstream, at the limits of the levee in both the original study and the revised analysis.

Shallow flooding boundaries of the alluvial fans in the City of Boise were plotted on topographic maps at a scale of 1:24,000, enlarged to 1:6,000, with contour intervals of 40, 20, and 10 feet (References 23 and 24).

For Fivemile Creek, which was studied by approximate methods, the 100-year flood boundaries were delineated with a stereoscope using aerial photographs at a scale of 1:12,000 (Reference 19).

The study contractor determined that some areas in the City of Boise, shown on the Flood Hazard Boundary Map (Reference 32), are areas of minimal flooding; therefore, they were not delineated on the maps.

In the City of Garden City, the boundaries between cross sections for the floodway revision based on the levee located along the right-hand side (looking downstream) of the Boise River, from its confluence with the South Fork Boise River to approximately 3,200 feet upstream, were interpolated using a topographic map at a scale of 1"=1,000', with a contour interval of 2 feet (Reference 1).

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the FIRM (Exhibit 2).

Approximate 100-year floodplain boundaries in some portions of the study area were taken directly from the Flood Hazard Boundary Map for Ada County, Idaho, dated June 1977 (Reference 33).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 3, "Floodway Data"). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The revised floodway in the vicinity of the Riverside Village Subdivision in the City of Garden City due to the effects of a levee located along the right-hand side (looking downstream) of the Boise River, from its confluence with the South Fork Boise River to approximately 3,200 feet upstream, was based on data prepared by CH2M Hill, Inc.

The equal-conveyance reduction method was not used to compute the revised floodway boundaries for the levee in the vicinity of the Riverside Village Subdivision because it was not used in the original study for the City of Garden City. The original study established the floodway boundary on the right-hand side (looking downstream) of the river at the levee. To be consistent with the original study, the floodway boundary on the right-hand side (looking downstream) was established at the levee along the revised reach.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOISE RIVER								
B[2]	194,399	2,405	6,910	2.4	2,461.3	2,461.3	2,462.1	0.8
C[2]	196,272	1,936	3,861	4.3	2,465.1	2,465.1	2,465.7	0.6
D[2]	197,868	442	2,995	5.6	2,468.7	2,468.7	2,469.6	0.9
E[2]	199,050	2,107	5,202	3.2	2,471.4	2,471.4	2,472.3	0.9
F[2]	201,821	1,200	3,448	4.8	2,477.2	2,477.2	2,478.1	0.9
G[2]	204,218	1,895	5,711	2.9	2,481.5	2,481.5	2,482.4	0.9
H	206,963	2,095	3,674	8.0	2,487.0	2,487.0	2,487.7	0.7
I	208,522	2,254	6,254	2.7	2,490.2	2,490.2	2,490.5	0.3
J	210,943	1,685	4,978	3.3	2,494.0	2,494.0	2,494.4	0.4
K	213,355	2,340	7,272	2.3	2,498.4	2,498.4	2,498.7	0.3
L	214,514	2,040	3,424	4.9	2,500.0	2,500.0	2,500.2	0.2
M	216,258	1,075	3,341	5.0	2,503.8	2,503.8	2,504.5	0.7
N	217,105	845	4,260	3.9	2,505.8	2,505.8	2,506.7	0.9
O[2]	218,743	1,330	6,353	2.6	2,509.4	2,509.4	2,510.1	0.7
P[2]	222,273	2,050	6,067	2.7	2,512.3	2,512.3	2,512.3	0.0
Q[2]	223,954	1,615	5,228	4.5	2,513.3	2,513.3	2,513.3	0.0
R[2]	225,811	488	1,887	3.5	2,520.8	2,520.8	2,521.2	0.4
S[2]	228,324	532	1,513	4.4	2,524.0	2,524.0	2,524.9	0.9
T[2]	230,810	351	2,210	3.0	2,528.9	2,528.9	2,529.9	1.0
U[2]	235,052	1,289	2,013	3.3	2,536.4	2,536.4	2,537.1	0.7
V[2]	236,403	1,038	2,357	2.8	2,541.0	2,541.0	2,541.7	0.7

[1]Feet above confluence with Snake River

[2]This cross section lies within an area that has not been updated on the FIRM at this time due to the presence of levees that have not been demonstrated to meet the requirements of NFIP Regulation Section 65.10. Please refer to Section 4.4 of this FIS for more information.

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

BOISE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOISE RIVER (CONTINUED)								
W[2]	237,776	1,186	3,073	2.6	2,543.1	2,543.1	2,543.5	0.4
X[2]	240,301	852	3,026	4.1	2,549.3	2,549.3	2,550.0	0.7
Y[2]	242,608	612	2,598	4.8	2,553.8	2,553.8	2,554.3	0.5
Z[2]	244,194	238	1,505	8.2	2,557.1	2,557.1	2,557.5	0.4
AA[2]	246,291	1,168	4,860	2.6	2,562.9	2,562.9	2,563.9	1.0
AB[2]	247,534	1,336	3,662	3.4	2,565.5	2,565.5	2,566.0	0.5
AC[2]	248,935	1,283	3,825	3.2	2,567.9	2,567.9	2,568.4	0.5
AD[2]	249,468	1,113	3,020	4.1	2,569.8	2,569.8	2,570.1	0.3
AE[2]	250,345	1,110	3,829	3.2	2,572.0	2,572.0	2,572.6	0.6
AF[2]	251,245	895	2,545	4.9	2,573.6	2,573.6	2,574.0	0.4
AG[2]	251,681	870	2,589	4.8	2,574.3	2,574.3	2,575.0	0.7
AH[2]	252,442	1,050	3,258	3.8	2,576.5	2,576.5	2,577.3	0.8
AI[2]	253,862	1,045	3,821	3.1	2,580.8	2,580.8	2,581.8	1.0
AJ[2]	254,210	1,010	3,082	3.8	2,581.7	2,581.7	2,582.3	0.6
AK[2]	254,583	954	2,802	4.2	2,582.5	2,582.5	2,583.1	0.6
AL[2]	255,857	893	2,569	4.6	2,585.8	2,585.8	2,586.3	0.5
AM[2]	258,013	1,205	4,776	3.5	2,591.0	2,591.0	2,591.6	0.6
AN[2]	260,524	853	3,875	4.3	2,596.9	2,596.9	2,597.0	0.1
AO[2]	262,439	1,325	3,457	4.8	2,601.5	2,601.5	2,601.7	0.2
AP[2]	264,548	167	1,596	10.4	2,607.7	2,607.7	2,608.0	0.3
AQ[2]	267,481	412	2,959	5.6	2,614.6	2,614.6	2,615.2	0.6

[1]Feet above confluence with Snake River

[2]This cross section lies within an area that has not been updated on the FIRM at this time due to the presence of levees that have not been demonstrated to meet the requirements of NFIP Regulation Section 65.10. Please refer to Section 4.4 of this FIS for more information.

TABLE

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

BOISE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOISE RIVER (CONTINUED)								
AR[2]	268,581	295	2,167	7.7	2,616.9	2,616.9	2,617.6	0.7
AS[2]	269,961	560	2,101	7.9	2,620.4	2,620.4	2,620.8	0.4
AT[2]	271,535	900	2,633	6.3	2,625.0	2,625.0	2,626.0	1.0
AU[2]	274,375	625	3,907	4.3	2,633.2	2,633.2	2,633.7	0.5
AV[2]	276,842	890	3,766	4.4	2,638.4	2,638.4	2,639.1	0.7
AW[2]	278,591	776	2,015	8.2	2,645.3	2,645.3	2,645.3	0.0
AX[2]	281,228	315	2,592	6.4	2,652.8	2,652.8	2,653.4	0.6
AY[2]	282,599	206	1,653	10.0	2,655.4	2,655.4	2,655.7	0.3
AZ[2]	284,799	473	2,303	7.2	2,662.4	2,662.4	2,662.9	0.5
BA[2]	286,974	805	3,757	4.4	2,667.4	2,667.4	2,668.3	0.9
BB[2]	288,055	300	3,565	4.7	2,670.6	2,670.6	2,671.0	0.4
BC[2]	288,546	310	2,220	7.5	2,671.9	2,671.9	2,672.2	0.3
BD	288,943	575	4,943	3.4	2,675.2	2,675.2	2,675.9	0.7
BE	290,751	312	2,559	6.5	2,677.9	2,677.9	2,678.7	0.8
BF	293,461	270	2,298	7.2	2,685.9	2,685.9	2,686.3	0.4
BG	294,764	293	2,638	6.3	2,689.1	2,689.1	2,689.4	0.3
BH	298,342	296	2,728	6.1	2,698.1	2,698.1	2,698.2	0.1
BI	299,334	305	2,689	6.2	2,700.2	2,700.2	2,700.2	0.0
BJ	300,264	328	2,652	6.3	2,701.9	2,701.9	2,701.9	0.0
BK	300,816	340	2,371	7.0	2,702.7	2,702.7	2,702.7	0.0

[1]Feet above confluence with Snake River [2]This cross section lies within an area that has not been updated on the FIRM at this time due to the presence of levees that have not been demonstrated to meet the requirements of NFIP Regulation Section 65.10. Please refer to Section 4.4 of this FIS for more information.

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

BOISE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BOISE RIVER (CONTINUED)								
BL	301,503	370	2,179	7.6	2,704.3	2,704.3	2,704.4	0.1
BM	303,700	292	1,803	8.3	2,711.8	2,711.8	2,711.8	0.0
BN	306,569	442	2,924	5.1	2,718.6	2,718.6	2,719.0	0.4
BO	308,090	785	2,125	7.8	2,720.3	2,720.3	2,720.8	0.5
BP	310,053	970	4,143	4.0	2,726.2	2,726.2	2,726.4	0.2
BQ	312,041	361	2,409	6.9	2,731.3	2,731.3	2,731.4	0.1
BR	313,519	730	4,732	3.5	2,735.6	2,735.6	2,736.1	0.5
BS	315,447	369	2,133	7.8	2,738.1	2,738.1	2,738.6	0.5
BT	319,032	885	3,563	4.7	2,744.7	2,744.7	2,745.4	0.7
BU	319,992	921	4,278	3.9	2,747.6	2,747.6	2,748.1	0.5
BV	322,551	775	2,974	5.6	2,752.4	2,752.4	2,752.8	0.4
BW	324,840	316	2,498	6.7	2,758.1	2,758.1	2,758.9	0.8
BX	326,293	415	2,840	5.8	2,761.9	2,761.9	2,762.5	0.6
BY	328,037	449	4,444	3.7	2,764.1	2,764.1	2,764.9	0.8
BZ	329,882	2,592	7,964	2.1	2,784.6	2,784.6	2,784.8	0.2
CA	332,031	3,090	6,016	2.8	2,785.3	2,785.3	2,785.5	0.2
CB	334,327	2,424	5,247	3.2	2,786.5	2,786.5	2,786.6	0.1
CC	336,951	1,559	5,438	3.1	2,789.0	2,789.0	2,789.0	0.0
CD	338,830	782	3,165	5.2	2,790.0	2,790.0	2,790.0	0.0
CE	341,441	258	2,618	6.3	2,793.5	2,793.5	2,793.5	0.0

[1]Feet above confluence with Snake River

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

BOISE RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FIVEMILE CREEK								
A	-690	55	306	3.9	2,544.1	2,544.1	2,545.1	1.0
B	-340	79	320	3.7	2,544.8	2,544.8	2,545.8	1.0
C	0	178	429	2.8	2,545.7	2,545.7	2,546.7	1.0
D	120	61	330	3.1	2,545.9	2,545.9	2,546.9	1.0
E	490	66	335	3.0	2,547.6	2,547.6	2,548.1	0.5
F	1,360	58	321	3.2	2,549.0	2,549.0	2,549.3	0.3
G	1,820	51	262	3.9	2,549.8	2,549.8	2,550.0	0.2
H	2,010	46	283	3.6	2,551.2	2,551.2	2,551.3	0.1
I	2,510	66	382	2.7	2,551.9	2,551.9	2,552.0	0.1
J	3,360	56	256	4.0	2,553.1	2,553.1	2,553.3	0.2
K	4,380	53	253	4.0	2,555.1	2,555.1	2,555.1	0.0
L	4,720	53	226	4.5	2,556.9	2,556.9	2,556.9	0.0
M	4,870	51	279	3.6	2,558.7	2,558.7	2,558.7	0.0
N	5,670	58	281	3.6	2,560.3	2,560.3	2,560.3	0.0
O	6,840	72	269	3.7	2,562.8	2,562.8	2,562.8	0.0
P	7,269	45	232	4.3	2,565.8	2,565.8	2,565.8	0.0
Q	7,719	40	250	4.0	2,566.9	2,566.9	2,567.3	0.4
R	7,879	258	954	1.0	2,570.9	2,570.9	2,571.3	0.4
S	8,479	201	811	1.2	2,571.0	2,571.0	2,571.5	0.5
T	9,109	200	712	1.4	2,571.1	2,571.1	2,571.6	0.5
U	9,859	54	228	4.4	2,571.1	2,571.1	2,572.1	1.0
V	11,129	103	326	3.1	2,575.4	2,575.4	2,576.0	0.6
W	11,824	102	308	3.2	2,576.5	2,576.5	2,577.1	0.6
X	12,498	98	280	3.5	2,578.4	2,578.4	2,579.1	0.7
Y	13,299	75	343	2.8	2,579.7	2,579.7	2,580.7	1.0
Z	14,119	49	182	5.4	2,582.7	2,582.7	2,582.7	0.0

[1]Feet above confluence of Ninemile Creek

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

FIVEMILE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FIVEMILE CREEK (CON'T)								
AA	14,763	63	317	3.1	2,586.8	2,586.8	2,586.8	0.0
AB	14,939	51	328	3.0	2,587.1	2,587.1	2,587.6	0.5
AC	15,679	61	274	3.6	2,588.0	2,588.0	2,588.5	0.5
AD	16,479	49	212	4.6	2,590.2	2,590.2	2,590.3	0.1
AE	17,139	49	248	3.9	2,592.6	2,592.6	2,592.9	0.3
AF	17,589	14	110	8.2	2,594.8	2,594.8	2,594.9	0.1
AG	18,339	40	224	4.0	2,597.1	2,597.1	2,597.4	0.3
AH	18,859	115	521	2.3	2,598.8	2,598.8	2,599.4	0.6
AI	19,919	39	244	3.7	2,600.7	2,600.7	2,601.1	0.4
AJ	20,329	47	298	3.0	2,601.5	2,601.5	2,601.8	0.3
AK	21,608	274	767	1.5	2,604.4	2,604.4	2,605.1	0.7
AL	22,218	40	179	5.0	2,605.0	2,605.0	2,605.6	0.6
AM	22,558	83	317	3.0	2,606.5	2,606.5	2,607.1	0.6
AN	22,860	503	585	1.6	2,606.8	2,606.8	2,607.8	1.0
AO	23,238	250	1,686	0.6	2,614.3	2,614.3	2,614.5	0.2
AP	23,858	65	403	2.4	2,614.3	2,614.3	2,614.4	0.1
AQ	24,368	68	363	2.6	2,614.4	2,614.4	2,614.7	0.3
AR	24,863	32	221	4.6	2,617.2	2,617.2	2,617.2	0.0
AS	24,893	35	229	4.2	2,617.9	2,617.9	2,617.9	0.0
AT	25,313	136	551	1.7	2,618.3	2,618.3	2,618.3	0.0
AU	25,873	189	415	2.2	2,618.5	2,618.5	2,618.9	0.4
AV	26,493	46	202	4.6	2,619.4	2,619.4	2,620.0	0.6
AW	26,959	165	430	2.2	2,621.0	2,621.0	2,621.8	0.8
AX	27,759	51	205	4.4	2,622.1	2,622.1	2,623.0	0.9
AY	28,599	64	185	4.9	2,626.7	2,626.7	2,626.9	0.2
AZ	29,469	104	276	3.3	2,629.7	2,629.7	2,630.7	1.0

[1]Feet above confluence of Ninemile Creek

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

FIVEMILE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FIVEMILE CREEK (CON'T)								
BA	30,074	206	895	1.0	2,633.5	2,633.5	2,634.3	0.8
BB	30,554	59	301	3.0	2,633.6	2,633.6	2,634.4	0.8
BC	31,054	41	163	5.5	2,634.3	2,634.3	2,635.3	1.0
BD	32,004	100	965	1.0	2,647.7	2,647.7	2,647.7	0.0
BE	32,824	100	1,000	1.2	2,647.7	2,647.7	2,647.8	0.1
BF	33,209	233	749	1.8	2,647.7	2,647.7	2,647.9	0.2
BG	33,314	189	978	1.4	2,647.7	2,647.7	2,647.9	0.2
BH	33,454	46	246	1.6	2,647.7	2,647.7	2,647.9	0.2
BI	33,934	38	165	2.1	2,647.7	2,647.7	2,648.1	0.4
BJ	34,314	66	189	2.0	2,647.7	2,647.7	2,648.3	0.6
BK	34,604	33	91	3.5	2,649.6	2,649.6	2,650.2	0.6
BL	35,064	129	294	1.2	2,651.4	2,651.4	2,652.1	0.7
BM	35,554	64	153	2.0	2,652.6	2,652.6	2,653.6	1.0
BN	35,844	353	1,413	0.2	2,656.7	2,656.7	2,657.7	1.0
BO	36,214	252	608	0.5	2,656.7	2,656.7	2,657.7	1.0
BP	36,424	38	97	3.1	2,659.5	2,659.5	2,659.6	0.1
BQ	36,974	49	186	1.6	2,659.4	2,659.4	2,660.3	0.9
BR	37,244	29	117	2.6	2,659.8	2,659.8	2,660.8	1.0
BS	37,704	20	65	4.6	2,664.7	2,664.7	2,664.7	0.0
BT	38,094	22	82	3.7	2,667.1	2,667.1	2,667.1	0.0
BU	39,035	32	140	2.1	2,674.1	2,674.1	2,674.9	0.8
BV	39,271	81	486	1.1	2,674.7	2,674.7	2,675.3	0.6
BW	39,511	132	498	1.1	2,674.7	2,674.7	2,675.3	0.6
BX	39,831	68	139	3.8	2,674.8	2,674.8	2,675.4	0.6
BY	40,323	77	147	3.6	2,677.0	2,677.0	2,677.8	0.8
BZ	40,659	56	136	3.9	2,680.6	2,680.6	2,680.9	0.3

[1]Feet above confluence of Ninemile Creek

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

FIVEMILE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
FIVEMILE CREEK (CON'T)								
CA	40,899	57	216	2.4	2,681.0	2,681.0	2,681.3	0.3
CB	41,240	73	221	2.4	2,681.2	2,681.2	2,682.1	0.9
CC	41,533	30	105	6.9	2,683.5	2,683.5	2,683.5	0.0
CD	41,895	90	324	1.5	2,685.3	2,685.3	2,685.9	0.6
CE	42,381	78	168	4.5	2,685.5	2,685.5	2,686.2	0.7
CF	43,092	81	193	4.3	2,687.8	2,687.8	2,688.7	0.9
CG	43,504	82	125	6.7	2,689.2	2,689.2	2,689.8	0.6
CH	43,881	37	126	4.3	2,691.5	2,691.5	2,692.3	0.8
CI	44,420	30	136	3.7	2,693.6	2,693.6	2,694.0	0.4
CJ	44,912	38	181	2.4	2,697.2	2,697.2	2,698.0	0.8
CK	45,232	38	186	2.4	2,697.5	2,697.5	2,698.3	0.8
CL	45,721	41	192	2.3	2,698.7	2,698.7	2,699.6	0.9
CM	47,087	40	134	3.3	2,703.6	2,703.6	2,704.4	0.8
CN	47,227	50	298	1.5	2,704.0	2,704.0	2,704.7	0.7
CO	47,667	42	151	2.9	2,705.2	2,705.2	2,705.5	0.3
CP	48,227	84	215	2.0	2,706.4	2,706.4	2,707.0	0.6
CQ	48,847	106	192	2.3	2,707.7	2,707.7	2,708.4	0.7
CR	49,567	64	97	4.5	2,712.4	2,712.4	2,712.7	0.3
CS	50,577	117	262	1.7	2,715.1	2,715.1	2,716.1	1.0
CT	51,127	55	101	4.3	2,716.7	2,716.7	2,717.5	0.8
CU	51,603	71	188	2.1	2,719.1	2,719.1	2,719.8	0.7
CV	51,903	95	255	1.6	2,720.5	2,720.5	2,721.5	1.0
CW	52,215	123	369	1.1	2,722.0	2,722.0	2,722.7	0.7
CX	52,485	35	112	3.6	2,722.0	2,722.0	2,722.8	0.8
CY	52,755	43	179	2.5	2,722.6	2,722.6	2,723.6	1.0
CZ	53,079	166	180	2.4	2,724.2	2,724.2	2,725.2	1.0

[1]Feet above confluence of Ninemile Creek

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

FIVEMILE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MAYNARD GULCH								
A	79	25	36	6.9	2,838.4	2,838.4	2,838.4	0.0
B	266	27	37	6.7	2,846.8	2,846.8	2,846.8	0.0
C	554	44	43	5.7	2,862.7	2,862.7	2,862.7	0.0
D	836	37	41	6.0	2,879.0	2,879.0	2,879.0	0.0

[1]Feet above Warm Springs Avenue/State Highway 21

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

MAYNARD GULCH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NINEMILE CREEK								
A	656	*	*	*	2,545.8	2,545.8	*	*
B	1,305	*	*	*	2,546.3	2,546.3	*	*
C	1,871	*	*	*	2,553.8	2,553.8	*	*
D	2,198	*	*	*	2,553.9	2,553.9	*	*
E	2,724	*	*	*	2,554.0	2,554.0	*	*
F	3,409	*	*	*	2,555.2	2,555.2	*	*
G	4,063	*	*	*	2,555.4	2,555.4	*	*
H	4,470	*	*	*	2,555.5	2,555.5	*	*
I	5,068	*	*	*	2,555.8	2,555.8	*	*
J	5,873	*	*	*	2,556.4	2,556.4	*	*
K	6,408	*	*	*	2,557.3	2,557.3	*	*
L	6,693	*	*	*	2,562.7	2,562.7	*	*
M	7,108	*	*	*	2,562.7	2,562.7	*	*
N	7,390	*	*	*	2,566.2	2,566.2	*	*
O	7,815	*	*	*	2,566.2	2,566.2	*	*
P	8,057	*	*	*	2,566.7	2,566.7	*	*
Q	8,840	*	*	*	2,566.7	2,566.7	*	*
R	9,095	*	*	*	2,571.1	2,571.1	*	*
S	9,620	*	*	*	2,571.1	2,571.1	*	*
T	10,518	*	*	*	2,571.2	2,571.2	*	*
U	11,359	*	*	*	2,571.5	2,571.5	*	*

[1]Above confluence with Fivemile Creek

*No floodway computed

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

NINEMILE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NINEMILE CREEK (CONTINUED)								
V	12,171	*	*	*	2,572.4	2,572.4	*	*
W	12,454	*	*	*	2,572.9	2,572.9	*	*
X	12,764	*	*	*	2,576.2	2,576.2	*	*
Y	13,060	*	*	*	2,579.5	2,579.5	*	*
Z	14,322	*	*	*	2,582.5	2,582.5	*	*
AA	14,718	*	*	*	2,584.8	2,584.8	*	*
AB	15,036	*	*	*	2,585.1	2,585.1	*	*
AC	15,331	*	*	*	2,585.1	2,585.1	*	*
AD	15,581	*	*	*	2,585.3	2,585.3	*	*
AE	15,785	*	*	*	2,585.3	2,585.3	*	*
AF	15,980	*	*	*	2,586.5	2,586.5	*	*
AG	16,197	*	*	*	2,586.5	2,586.5	*	*
AH	16,702	*	*	*	2,588.5	2,588.5	*	*
AI	16,954	*	*	*	2,589.6	2,589.6	*	*
AJ	18,311	*	*	*	2,591.0	2,591.0	*	*
AK	18,541	*	*	*	2,600.3	2,600.3	*	*
AL	19,073	*	*	*	2,601.1	2,601.1	*	*
AM	19,385	*	*	*	2,601.2	2,601.2	*	*
AN	19,676	*	*	*	2,601.3	2,601.3	*	*
AO	20,058	*	*	*	2,603.9	2,603.9	*	*
AP	20,300	*	*	*	2,604.2	2,604.2	*	*

[1]Above confluence with Fivemile Creek

*No floodway computed

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

NINEMILE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
NINEMILE CREEK (CONTINUED)								
AQ	20,929	*	*	*	2,605.6	2,605.6	*	*
AR	21,516	*	*	*	2,609.9	2,609.9	*	*
AS	22,304	*	*	*	2,612.9	2,612.9	*	*
AT	22,863	*	*	*	2,614.9	2,614.9	*	*
AU	23,515	*	*	*	2,617.3	2,617.3	*	*
AV	24,383	*	*	*	2,617.5	2,617.5	*	*
AW	24,835	*	*	*	2,620.5	2,620.5	*	*
AX	25,752	*	*	*	2,620.6	2,620.6	*	*
AY	26,582	*	*	*	2,621.3	2,621.3	*	*
AZ	26,981	*	*	*	2,624.5	2,624.5	*	*
BA	27,342	*	*	*	2,624.7	2,624.7	*	*
BB	28,547	*	*	*	2,630.1	2,630.1	*	*
BC	29,150	*	*	*	2,630.7	2,630.7	*	*
BD	29,587	*	*	*	2,631.7	2,631.7	*	*
BE	30,117	*	*	*	2,637.4	2,637.4	*	*
BF	30,276	*	*	*	2,640.8	2,640.8	*	*
BG	30,667	*	*	*	2,640.8	2,640.8	*	*
BH	31,496	*	*	*	2,640.9	2,640.9	*	*

[1]Above confluence with Fivemile Creek

*No floodway computed

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

NINEMILE CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
PARK CENTER OVERFLOW								
A	1,424	66	302	5.9	2,706.5	2,706.5	2,706.5	0.0
B	2,843	334	821	2.2	2,709.1	2,709.1	2,709.1	0.0
C	3,383	464	514	3.5	2,709.6	2,709.6	2,709.6	0.0
D	4,040	198	267	6.7	2,712.0	2,712.0	2,712.0	0.0
E	4,382	184	742	2.2	2,714.4	2,714.4	2,714.6	0.2
F	4,974	236	553	3.0	2,715.7	2,715.7	2,715.8	0.1

[1]Stream distance above confluence with Boise River

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

PARK CENTER OVERFLOW

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SOUTH CHANNEL BOISE RIVER EAGLE ISLAND								
A	1,190	1,405	3,862	3.3	2,512.3	2,512.3	2,512.6	0.3
B	1,900	800	2,256	3.8	2,512.7	2,512.7	2,513.0	0.3
C	3,530	590	1,759	3.3	2,516.6	2,516.5	2,517.2	0.7
D	4,700	135	768	6.8	2,519.8	2,519.8	2,520.4	0.6
E	6,602	1,122	2,755	3.6	2,521.6	2,521.6	2,522.5	0.9
F	7,807	1,360	2,581	3.9	2,524.1	2,524.1	2,525.1	1.0
G	9,722	1,152	3,003	5.1	2,528.2	2,528.2	2,529.0	0.8
H	12,457	1,686	3,134	3.2	2,533.8	2,533.8	2,534.2	0.4
I	14,937	1,619	3,582	2.8	2,540.8	2,540.8	2,541.6	0.8
J	16,347	1,600	2,694	3.6	2,541.9	2,541.9	2,542.8	0.9
K	17,362	1,009	1,617	3.8	2,544.9	2,544.9	2,545.3	0.4
L	19,302	156	634	6.7	2,548.6	2,548.6	2,549.3	0.7
M	21,822	437	1,078	3.9	2,554.4	2,554.4	2,555.3	0.9
N	23,247	116	483	8.8	2,558.1	2,558.1	2,558.2	0.1
O	24,905	400	925	4.6	2,562.4	2,562.4	2,563.2	0.8
P	26,965	1,000	2,366	1.8	2,567.7	2,567.7	2,568.7	1.0
Q	29,255	815	1,459	2.9	2,574.0	2,574.0	2,574.4	0.4
R	30,605	335	915	4.6	2,577.6	2,577.6	2,578.1	0.5
S	31,962	326	1,104	3.8	2,581.7	2,581.7	2,582.4	0.7
T	34,707	143	753	6.5	2,587.0	2,587.0	2,587.6	0.6

[1]Feet above confluence with Boise River

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH CHANNEL BOISE RIVER EAGLE ISLAND

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SOUTH CHANNEL BOISE RIVER RIGHT OVERBANK								
A	1,365	190	384	8.5	2,513.1	2,513.1	2,513.1	0.0
B	1,740	145	608	5.4	2,515.8	2,515.8	2,515.9	0.1
C	2,680	385	2,870	1.1	2,519.7	2,519.7	2,519.8	0.1

[1]Feet above confluence with South Channel Boise River Eagle Island

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

SOUTH CHANNEL BOISE RIVER RIGHT OVERBANK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
WARM SPRINGS CREEK								
A	0	25	49	7.7	2,778.4	2,778.4	2,778.4	0.0
B	347	21	47	8.1	2,785.5	2,785.5	2,786.1	0.6
C	680	20	46	8.3	2,789.8	2,789.8	2,790.4	0.6
D	1,027	43	63	6.0	2,796.5	2,796.5	2,797.2	0.7
E	1,464	24	48	7.9	2,804.1	2,804.1	2,804.7	0.6
F	1,726	20	45	8.5	2,810.9	2,810.9	2,811.1	0.2
G	2,159	22	48	7.9	2,817.4	2,817.4	2,818.0	0.6
H	2,429	18	45	8.5	2,824.0	2,824.0	2,824.8	0.8
I	2,555	25	48	7.9	2,827.8	2,827.8	2,827.8	0.0
J	2,755	32	53	7.2	2,835.1	2,835.1	2,835.2	0.1
K	2,860	18	43	8.8	2,838.7	2,838.7	2,839.4	0.7
L	2,969	19	44	8.6	2,842.8	2,842.8	2,843.7	0.9
M	3,164	21	45	8.4	2,849.4	2,849.4	2,849.6	0.2
N	3,296	42	57	6.6	2,855.3	2,855.3	2,856.0	0.7
O	3,454	15	43	8.8	2,862.0	2,862.0	2,862.3	0.3
P	3,560	39	57	6.7	2,865.7	2,865.7	2,865.7	0.0
Q	3,737	14	40	9.5	2,873.2	2,873.2	2,873.6	0.4
R	3,867	9	36	10.7	2,879.0	2,879.0	2,879.5	0.5
S	3,986	22	46	8.3	2,884.8	2,884.8	2,885.2	0.4
T	4,149	35	54	7.1	2,894.7	2,894.7	2,894.7	0.0
U	4,290	16	44	8.7	2,906.0	2,906.0	2,906.3	0.3
V	4,438	18	43	8.8	2,908.5	2,908.5	2,909.1	0.6

[1]Feet above Cross Section A

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, IDAHO
AND INCORPORATED AREAS

FLOODWAY DATA

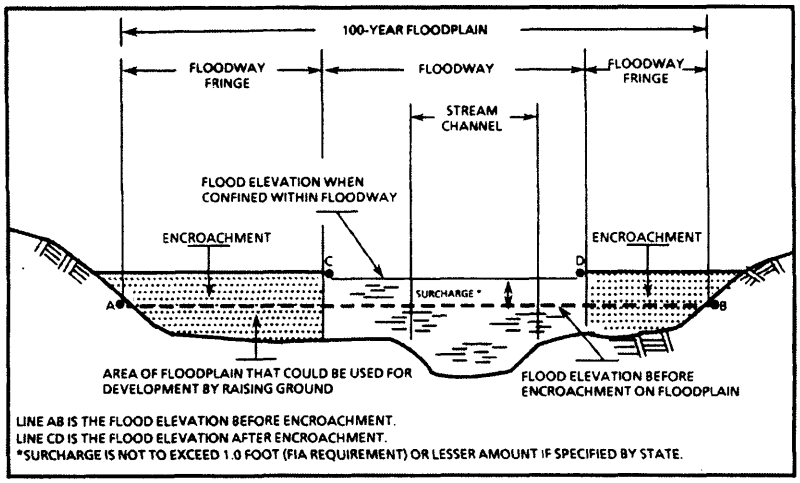
WARM SPRINGS CREEK

Upstream and downstream of the study area, the equal-conveyance reduction method was used to compute the floodway boundaries.

The revised floodway in the vicinity of the Herron Village Subdivision in the City of Garden City is along a reach of the Boise River located between East 47th and 49th Streets. A HEC-2 hydraulic analysis was developed by CH2M Hill, Inc., based on the equal-conveyance method. The boundaries for the floodway revision were taken from a topographic work map at a scale of 1"=100', with a contour interval of 2 feet (Reference 2).

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the WSEL of the 100-year flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

Figure 4. Floodway Schematic



5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (100-year) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the FIS by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No BFEs or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide FIRM presents flooding information for the entire geographic area of Ada County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as floodprone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 4, "Community Map History."

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Boise, City of	June 21, 1974	September 12, 1975 September 10, 1976	April 17, 1984	April 16, 1993 August 2, 1996
Eagle, City of	December 7, 1973	July 23, 1976	March 4, 1980	October 15, 1985
Garden City, City of	December 17, 1973	November 14, 1975	May 5, 1980	January 17, 1985 October 16, 1987 May 6, 1991
Kuna, City of[1]				
Meridian, City of	September 27, 1991	None	September 27, 1991	None
Star, City of	June 28, 1977 (Ada County)		December 18, 1984 (Ada County)	December 17, 1991 August 2, 1996 (Ada County)
Unincorporated Areas	June 28, 1977	None	December 18, 1984	December 17, 1991 August 2, 1996

[1]This community did not have map history prior to first countywide FIRM for Ada County

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

ADA COUNTY, ID
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

The USACE, Walla Walla District, prepared a report entitled "Flood Plain Information, Boise, Idaho and Vicinity, Boise River and Northside Tributaries (Reference 6). The USACE also prepared Design Memorandum No. 1, "Hydrology, Cottonwood Creek Dam and Reservoir and Stuart Gulch Dam and Reservoir, Boise, Idaho," dated July 1969 (Reference 8).

The original FISs published for the Cities of Eagle, Boise, and Garden City (References 34, 35, and 36) did not match the original study for Ada County because of revised work on the Boise River. The studies for the Cities of Eagle, Boise, and Garden City were subsequently revised to include the new Boise River data and to account for corporate limit changes.

CH2M Hill, Inc., prepared a report for the City of Garden City entitled "Flood Study-Riverside Village, Garden City, Idaho," dated January 1989 (Reference 1), which included new Boise River data based on the construction of a levee located along the right-hand side (looking downstream) of the Boise River from the divergence of the South Channel Boise River to approximately 3,200 feet upstream.

Previous FISs were published for the unincorporated areas of Ada County (Reference 37) and the City of Meridian (Reference 38).

A Flood Hazard Boundary Map for the City of Boise (Reference 32) has been published. Due to a more detailed analysis, the present FIS supersedes the previously published map.

No previous studies have been prepared for the Cities of Kuna and Star.

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Mitigation Division, Federal Regional Center, 130 228th Street, SW, Bothell, Washington 98021-9796.

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10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original FIS was printed. Future revisions may be made that do not result in the republishing of the FIS report. To assure that any user is aware of all revisions, it is advisable to contact the community repositories of flood-hazard data.

10.1 First Revision

City of Boise

This study was revised on April 16, 1993, to provide flood-hazard information based on new hydrologic analyses of Crane, Hulls, and Stuart, and Cottonwood Gulches. Those analyses were performed by Michael Baker Jr., Inc., under Contract No. EMW-92-C-3845.
Each of the flood-frequency curves resulting from the new analyses consists of two parts, both of which are lognormal. The upper part of each curve was estimated using historic data and accounts for infrequent but very severe storms. The lower part of each curve was estimated using gage-record data and accounts for the more frequent floods. Discharges for selected recurrence interval floods are presented in Table 2, "Summary of Discharges."

Flood depths and velocities presented in this revision were determined using FEMA methodology for analyzing flood risks in areas subject to alluvial fan flooding. This methodology assigns relative flood hazards associated with runoff from the watersheds above the alluvial fan apexes only. Therefore, it should be noted that runoff resulting from rain falling directly on the alluvial fan surface has not been considered. Flood hazard areas where the 100-year flood depth is, on the average, less than 1 foot are labeled Zone X (shaded). It should be noted that when realized, the hazards associated with alluvial fan flooding are just as severe in areas designated Zone X (shaded) as those in areas designated Zone AO. The distinction between the zones should be regarded as a distinction between flooding potentials and not a distinction between the severity of damages to be expected in the event of a flood.

10.2 Second Revision

City of Boise and Unincorporated Areas of Ada County

This study was revised on August 2, 1996, to incorporate the revised hydraulic analyses of Cottonwood, Crane, Hulls, and Stuart Gulches. The hydraulic analyses for this revision were performed by Northwest Hydraulic Consultants, Inc., under Contract No. EMW-93-C-4152. This work was computed in January 1994.

During the preparation of this study, Northwest Hydraulic Consultants, Inc., conducted discussions with the City of Boise Public Works Department; Ada County Highway Maintenance District; Kunz Engineering; J.U.B. Engineers; Kevin McKee Associates; Quail Hollow Golf Course; and Valley Air Photo.

This study examines riverine flooding on Cottonwood, Crane, Hulls, and Stuart Gulches, which are four streams that are tributaries to the Boise River. These gulches empty onto alluvial fans within the Boise River Valley. The study reach for each gulch begins approximately at the apex of these fans and extends upstream 1 to 2 miles away from the City. Land use within the study area ranges from residential and light industrial to recreational (golf courses) and agricultural.

An approximately 1,500-foot-long levee exists along the left bank of Stuart Gulch, near the downstream end of the study reach. This levee is not certified for protection against a 100-year flood event. Various other structures exist at the downstream ends of all of the gulches, near the apexes of the alluvial fans. These include grated pipe-inlet structures, diversion works, embankments, and basins used for sedimentation, flood retention, or energy dissipation. However, these facilities would generally only affect areas downstream of the gulches. No significant measures currently exist that would offer flood protection upstream of the study gulches. The City of Boise intends to install flood-control measures such as detention basins in these areas when sufficient funds are obtained.

The hydrologic analyses used to establish the discharges used in this study are described in Section 10.1, "First Revision," and are shown in Table 2, "Summary of Discharges."

A hydraulic analysis of each study reach was carried out to predict WSELs for floods of the selected recurrence intervals. Elevations were established using the USACE HEC-2 computer program (Reference 39). Data necessary for the model to describe the study reaches included existing data from the previous FIS (Reference 40) and new data collected by Northwest Hydraulic Consultants, Inc. Vertical control for the Northwest Hydraulic Consultants, Inc., field surveys was established based on contour lines from the Ada County Development Council topographic maps, due to a general lack of available benchmarks in or near the gulches. There were no new ERMs established for this study.

Roughness coefficients (Manning's "n" values) used in the hydraulic analyses were generally unchanged from the previous FIS. Any new values were assigned on the basis of field inspections and engineering judgment. Roughness coefficients for the gulches studied in detail ranged from 0.035 to 0.080.

A split-flow analysis was done for Stuart Gulch because of the existence of a secondary channel that runs parallel to Stuart Gulch at the Quail Hollow Golf Course.

The two channels diverge at the upstream end of the golf course near the City of Boise City limits and converge just above the downstream end of the golf course, approximately 0.25 mile upstream of Hillside Junior High School. The split-flow channel typically lies north of Stuart Gulch. An access road and fill effectively blocks off the split-flow channel at the point of divergence for all but the largest of flows.

For the 10-, 50-, and 100-year floods, the two channels were than simulated within the same model using the tributary stream method in HEC-2. The natural stream was considered the primary channel in the model throughout the study reach, while the new excavated channel in the golf course was considered a secondary tributary. The cross sections were split at the high points between the channels to account for the separate channels. Appropriate discharge values based on the flow-distribution analysis described above were imposed accordingly. The 10- and 50-year floods, however, were entirely confined to the primary natural channel. For the 500-year flood, water levels inundate much more of the valley floor, including the floodplain area between the two channels. A separate non-split-flow model was, therefore, run for the 500-year flood, in which the stream corridor was considered a single channel with the fully extended cross sections to account for both channels and their adjacent floodplain.

Water-surface profiles for floods of the selected recurrence intervals are shown in Exhibit 1, "Flood Profiles." The profiles reflect the rather steep slopes of the gulches, as indicated by numerous critical-flow messages in the HEC-2 modeling results. Initial test runs were done assuming supercritical flow by reversing the input sequence, resulting in numerous critical-flow messages. Adding interpolated cross sections also did not significantly suppress the critical-flow messages. All profiles were, therefore, produced assuming the more conservative subcritical flow input sequence, with the understanding that the steepness of the gulches is probably very near critical.

The 100-year regulatory profiles for Stuart Gulch assume the levee near Hillside Junior High School at the downstream end of the gulch has been removed. For FEMA to recognize a levee as capable of providing protection, the levee typically must provide a minimum of 3 feet of freeboard during a 100-year flood event. The levee on Stuart Gulch does not meet this requirement. Levees that do not meet the freeboard requirements are considered ineffective and the 100-year profile must be computed with the assumption that the levees do not exist.

The floodplain boundaries are delineated on the FIRM (Exhibit 2). Information used to delineate the floodplain included the model cross sections; Ada County Development Council topographic maps (Reference 18); USGS quadrangle maps (Reference 23); Northwest Hydraulic Consultants, Inc., survey data; aerial photographs; and the Quail Hollow Golf Course plans (Reference 41).

The floodway boundaries developed were computed on the basis of equal-conveyance reduction from each side of the floodplain. The secondary channels within Quail Hollow Golf Course and Stuart Gulch were analyzed using split-flow techniques. The results of the floodway computations are shown in Table 3, "Floodway Data."

Letters of Map Revision (LOMRs) dated November 3, 1994, for Case No. 94-10-064A, and July 31, 1995, for Case No. 95-10-055A, were incorporated into this study. These revisions along the Boise River reflect the elevation, by the placement of fill, of portions of Lots 37 through 40, Natures Wood Duck Island No. 5 Subdivision.

10.3 Third Revision

This study was revised on September 22, 1999, to convert the FIRMs and FIS reports for Ada County and Incorporated Areas into the countywide format. In addition, the mapping for the new countywide FIRM was converted to digital format.

Countywide Update

This update combined the FIRMs and FIS reports for Ada County and Incorporated Areas into the countywide format. Under the countywide format, FIRM panels have been produced using a single-layout format for the entire area within the County instead of separate layout formats for each community. The single-layout format facilitates the matching of adjacent panels and depicts the flood hazard area within the entire panel border, even in areas beyond a community's corporate boundary line. In addition, under the countywide format, this single FIS report provides all FIS information and data for the entire County area.

As part of this revision, the format of the map panels has changed. Previously, flood-hazard information was shown on both the FIRM and Flood Boundary and Floodway Map (FBFM). In the new format, all BFE, cross sections, zone designations, and floodplain and floodway boundary delineations are shown on the FIRM and the FBFM has been eliminated. Some of the flood insurance zone designations were changed to reflect the new format Areas previously shown as numbered Zone A were changed to Zone AE. Areas previously shown as Zone B were changed to Zone X (shaded). Areas previously shown as Zone C were changed to Zone X (unshaded). In addition, all Flood Insurance Zone Data Tables were removed from the FIS report and all zone designations and reach determinations were removed from the profile panels.

Digital Conversion

The mapping for Ada County and Incorporated Areas has been prepared using digital data. Previously published FIRM and FBFM data produced manually have been converted to vector digital data by a digitizing process. These vector data were fit to raster digital images of the USGS quadrangle maps of the County area to provide horizontal positioning.

The Ada County Assessor's Office has provided road and highway name and centerline data. The centerline data were computer plotted with the digitized floodplain data to produce the countywide FIRM.

As part of this digital conversion, the panel layout of the FIRM has been revised. The new layout for the FIRM was based on the layout of the USGS quadrangle maps of Ada County. Individual map panel scales were determined so that the flood data represented were at similar scale to that shown on the previously effective FIRM.

In addition, Table 4, "Community Map History," was added to the FIS report as part of this update, and all ERMs were removed from the FIS reports. All ERMs and their descriptions are shown on the FIRM.

Letters of Map Change (LOMCs)

This update also incorporates the determinations of mappable LOMCs (i.e., Letters of Map Amendment and LOMRs) issued by FEMA for the projects listed in Table 5, "Letters of Map Change." Table 3, "Floodway Data," and Exhibit 1, "Flood Profiles," were revised to reflect changes as a result of incorporating this flood hazard information.

10.4 Fourth Revision

Boise River

This study was revised on February 19, 2003, to incorporate the revised hydraulic analyses of Boise River from the Ada/Canyon County corporate boundary to Barber Dam. Analyses for Boise River Side Channel and South Channel Boise River Eagle Island were also included. This study was also revised to incorporate the revised hydraulic analysis for Dry Creek along a 6.2 mile reach from upstream of Cartwright Road to State Route 55.

Boise River, Boise River Side Channel and South Channel Boise River Eagle Island

The hydraulic analyses for this revision were performed by the USGS, Idaho District, Water Resources Division, under Contract No. EMW-97-IA-0141. The work was completed in March 2000.

Because the relation between frequency and magnitude has not changed since the previous analysis, the peak discharge values from the effective study for Boise River are used in the current study area. The discharges for Boise River and for split flows on Boise River Side Channel and South Channel Boise River Eagle Island are shown in Table 2, "Summary of Discharges."

A hydraulic analysis of the study reach was carried out by using the USACE HEC-RAS model (Reference 42) to predict WSELs for selected recurrence interval floods (i.e., 100- and 500-year floods). Cross-section data for the HEC-RAS model are obtained from a topographic map with a 2-foot contour interval (Reference 43). The below-water points were obtained by field measurements. Manning's roughness coefficients range from 0.030 to 0.045 for the main channel and from 0.035 to 0.09 for the overbank area. The starting water-surface elevation was determined by using the normal depth method with a channel bottom slope of 0.0019 ft/ft.

Split flows were analyzed between Boise River and South Channel Boise River Eagle Island. The Boise River and South Channel Boise River Eagle Island diverge upstream of Horse Bend Road and converge downstream of Linder Road. The discharge distribution was obtained by balancing the energy grade at the section of divergence.

In response to scientific and technical data submitted during the 90-day appeal period, two revised HEC-RAS hydraulic analyses for the Boise River extending from Eagle Road to the upstream end of Eagle Island prepared by Toothman-Orton Engineering Company and Kunz Engineering, Inc.; a revised HEC-RAS hydraulic analysis along South Channel Boise River Eagle Island extending from approximately 3,000 feet downstream to just downstream of Eagle Road prepared by MTC, Inc. and Michael Baker Jr., Inc.; and a revised hydraulic analysis along the Boise River extending from just downstream to approximately 9,000 feet downstream of South Eckert Road prepared by Resource Systems, Inc., were incorporated into this restudy. This work was completed in December 2000, July 2002, and August 2002, respectively. The revisions were performed in order to incorporate additional topographic information, to more accurately define the floodway delineation in these areas, to more precisely define the division of flood flows at the head of Eagle Island, and to incorporate a split flow analysis just downstream of South Eckert Road, now shown as Walling Ditch. The revised BFEs and floodplain and floodway boundaries in these areas were re-delineated using 1"=200', 1"=300', 1"=400', and 1"=500 feet topographic maps

(References 44, 45, 46, and 47). Also, minor revisions and corrections were made to the hydraulic analysis just upstream of Eagle Road, and in the vicinity of Island Woods Subdivision, River Pointe Apartments and the Bilbao Property. These revisions, prepared by Michael Baker Jr., Inc., were completed in April 2001. Revisions were also made to incorporate more detailed topographic information along South Channel Boise River Eagle Island in the vicinity of Artesian Road (Reference 48) and along the Boise River in the vicinity of Star Road (Reference 49) and the Cottonwood Apartments (Reference 50).

In the vicinity of Parkcenter Boulevard, the breakout flow into Boise River Side Channel was remodeled using updated topographic information. The width of the floodway was maintained as much as possible along the flooding source.

The levee system along the Boise River is not certified for 100-year flood protection. Therefore, for 100- and 500-year floods, the analysis assumes the levee does not exist. In places where natural high ground exists along the edge of the bank, that ground was used to contain the flow for all frequencies.

Dry Creek

The hydraulic analysis for this revision was performed by the USACE, Walla Walla District. The work was completed in August 1997. In addition to the information provided by the USACE, a LOMR was submitted by EnviroSearch International and incorporated into this study. The EnviroSearch information extends from below Broken Horn Road to Dry Creek Road, a total distance of approximately 3 miles. The work was completed in September 1999.

No new hydrology was developed for the study. A curve of discharge vs. drainage area was created from the discharge vs. drainage area relationships in the previous FIS for Spring Valley Creek, Currant Creek and Dry Creek at and near Eagle, Idaho. The EnviroSearch information included revised hydrology which lowered the discharges used by USACE by as much as 30 percent. The revised discharges were calculated using the Soil Conservation Service rainfall-runoff methods (Reference 51), a regional flood frequency analysis for Idaho Streams developed by the USGS (Reference 52) and the USACE HEC-1 model (Reference 53). The discharges for Dry Creek and for Dry Creek Side Channel are shown in Table 2, "Summary of Discharges."

The hydraulic analysis for the study was performed using the USACE HEC-2 model (Reference 54) to compute the water-surface profiles. Twenty-seven cross sections were surveyed by the USACE in August and September of 1995. Additional cross sections were added to the model from the previous hydraulic model and based on interpolation from the surveyed data. The hydraulic analysis for the LOMR was performed using the USACE HEC-RAS model (Reference 42). The HEC-RAS model incorporated updated topographic information based on 2-foot contour interval maps (Reference 55) and a revision to the base flood discharge. The final HEC-RAS model used to map the revised floodplain boundary delineations for Dry Creek includes the HEC-2 information supplied by the USACE.

Through much of the studied reach, the 100-year flood is contained within the channel. Out-of-bank flooding occurs upstream of State Route 55 near the bridges, particularly near Dry Creek Road. Due to the steepness of the valley overflow areas are confined to a width of approximately 300 feet on either side of the bridges. At Dry Creek Road approximately 80 percent of the flow spills out of the main channel and in to the Dry Creek Side Channel. The split-flow channel has been modeled separately from the main channel. The split-flow returns to the main channel downstream of McFarland Creek Road.

The floodplain and floodway boundaries for the study have been mapped using the computed WSELs at each cross section. Between cross sections, the boundaries were interpolated using a USGS topographic quadrangle map at a scale of 1:24,000 with a contour interval of 20 feet (Reference 56). In the area of Dry Creek Road, the USGS quadrangle map was supplemented with 5-foot contour interval mapping. For the LOMR area, the updated topographic information based on 2-foot contour interval maps (Reference 48) was used for mapping the floodplain and floodway boundaries.

A floodway has been delineated along the entire studied reach. The encroachments have been set so that the surcharges are less than 1.0 foot. In addition, no encroachments were allowed inside the channel banks.

Table 1, "Streams Studied by Detailed Methods"; Table 2, "Summary of Discharges"; and Table 3, "Floodway Data," were revised to reflect revised information and the results of the study and LOMR.

This update also incorporates the determination of mappable LOMCs issued by FEMA for projects listed in Table 5, "Letters of Map Change." Note that previously issued LOMCs may have been superseded by this new revision; for up-to-date information, please see the Final Summary of Map Actions.

10.5 Fifth Revision

City of Kuna

This study was revised on October 2, 2003, to incorporate Special Flood Hazard Areas (SFHAs) along Indian Creek within the City of Kuna. Analyses for Indian Creek were based on approximate study methods. On November 18, 2002, representatives of FEMA visited the City of Kuna and identified SFHAs along Indian Creek. With the addition of these SFHAs, the City of Kuna is now a floodprone community.

Table 5. Letters of Map Change

Community	Case No.	Project	Flooding Source	Letter Date
Ada County	93-10-020P	Sportsman Pointe Subdivision	Ninemile Creek	April 23, 1993
	93-10-044P	Arch Culvert at Tenmile Road	Ninemile Creek	August 11, 1993
	93-10-048A	Waterbury Park Subdivision	South Slough	July 1, 1993
	94-10-047P	Danbury Fair Subdivision	Fivemile Creek	September 15, 1994
	96-10-166A	Waterbury Park Subdivision	Fivemile Drain	August 19,1996
	97-10-334A	Englewood Creek Estates	Ninemile Creek	December 10, 1997
	98-10-170A	Odiaga's Rosecreek Subdivision	Fivemile Creek	April 29, 1998
	00-10-062A	Leo's Rosecreek Subdivision	Fivemile Creek	December 8, 1999
	00-10-072P	Wintry Rivers and Brookwood Subdivisions	Dry Creek	February 23, 2000
	00-10-210A	Muir Woods Subdivision	Eightmile Creek	April 25, 2000
	00-10-289P	Wintry Rivers and Brookwood Subdivisions	Dry Creek	June 9, 2000
	02-10-246A	Odiaga's Rosecreek Subdivision	Fivemile Creek	March 6, 2002
City of Boise	93-10-046A	Parkcenter Pointe Subdivision	Boise River Side Channel	June 11, 1993

Table 5. Letters of Map Change (Cont'd)

Community	Case No.	Project	Flooding Source	Letter Date
City of Eagle	93-10-040A	Island Woods Subdivision	Boise River South Channel	July 9, 1993
	95-10-056A	Government Lots 1,2,3	Boise River South Channel	July 5, 1995
	98-10-234A	Channel Center Subdivision	Boise River	June 8, 1998
	00-10-072P	Wintry Rivers and Brookwood Subdivisions	Dry Creek	February 23, 2000
	00-10-289P	Wintry Rivers and Brookwood Subdivisions	Dry Creek	June 9, 2000
	00-10-203A	Island Woods Subdivision	South Channel Boise River	August 2, 2000
	00-10-503P	Streamside Subdivision	Boise River	January 3, 2001
	01-10-176A	Brookwood Subdivision	Dry Creek	April 11, 2001
City of Meridian	93-10-044P	Arch Culvert at Tenmile Road	Ninemile Creek	August 11, 1993
	93-10-020P	Sportsman Pointe Subdivision	Ninemile Creek	April 23, 1993
	94-10-029P	Vineyards Subdivision	Ninemile Creek	July 20, 1994
	94-10-047P	Danbury Fair Subdivision	Fivemile Creek	September 15, 1994
	95-10-008A	TWP 3 N, RA 1 E Boise Meridian	Fivemile Creek	April 19, 1995
	97-10-222A	Waterbury Park Subdivision	Fivemile Creek	June 10, 1997
	97-10-007P	Waterbury No 5.	Fivemile Creek	March 11, 1997

10.6 Sixth Revision

a. Authority and Acknowledgments

This Physical Map Revision (PMR) was prepared to incorporate revised hydrology and hydraulics along the Boise River and Ninemile Creek in the Cities of Boise, Eagle, Garden City, Meridian, and Star, and in Ada County (Unincorporated Areas). The engineering for this project was completed in 2014 by the U.S. Army Corps of Engineers (USACE) under contract HSFE10-09-X- 00091.
The revision was completed by Strategic Alliance for Risk Reduction (STARR) under contract HSFEHQ-09-D-0370.

b. Coordination

The results of the Lower Boise PMR were reviewed at a meeting held on _____, and attended by representatives of _____. All problems raised at that meeting have been addressed.

c. Scope of Study

For this PMR, Boise River and Ninemile Creek were restudied using detailed methods by the USACE. The limits of detailed study are presented in Table 6.

Table 6 – Limits of Detailed Study for the Sixth Revision

Stream	Limit of Detailed Study
Boise River	From approximately 38.9 miles upstream of the confluence with the Snake River to approximately 41.4 miles upstream of the confluence with the Snake River
	From the I-184 connector bridge to approximately 0.5 miles upstream of the Highway 21 Bridge
Ninemile Creek	From approximately 0.27 miles downstream of the West Ustick Road to approximately 0.25 miles upstream of Locust Grove Road

An additional portion of the Ninemile Creek watershed was restudied using approximate methods by the USACE. The approximately 1.2-mile-long reach is located south of West Broadway Avenue and west of North Meridian Road within the Unincorporated Areas of Ada County.

d. Considerations for using this Flood Insurance Study Report

The National Flood Insurance Program (NFIP) encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each Flood Insurance Study (FIS) Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1% annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

This section presents important considerations for using the information contained in this FIS Report and the FIRM, including changes in format and content. Figures 5, 6, and 7 present information that applies to using the FIRM with the FIS Report.

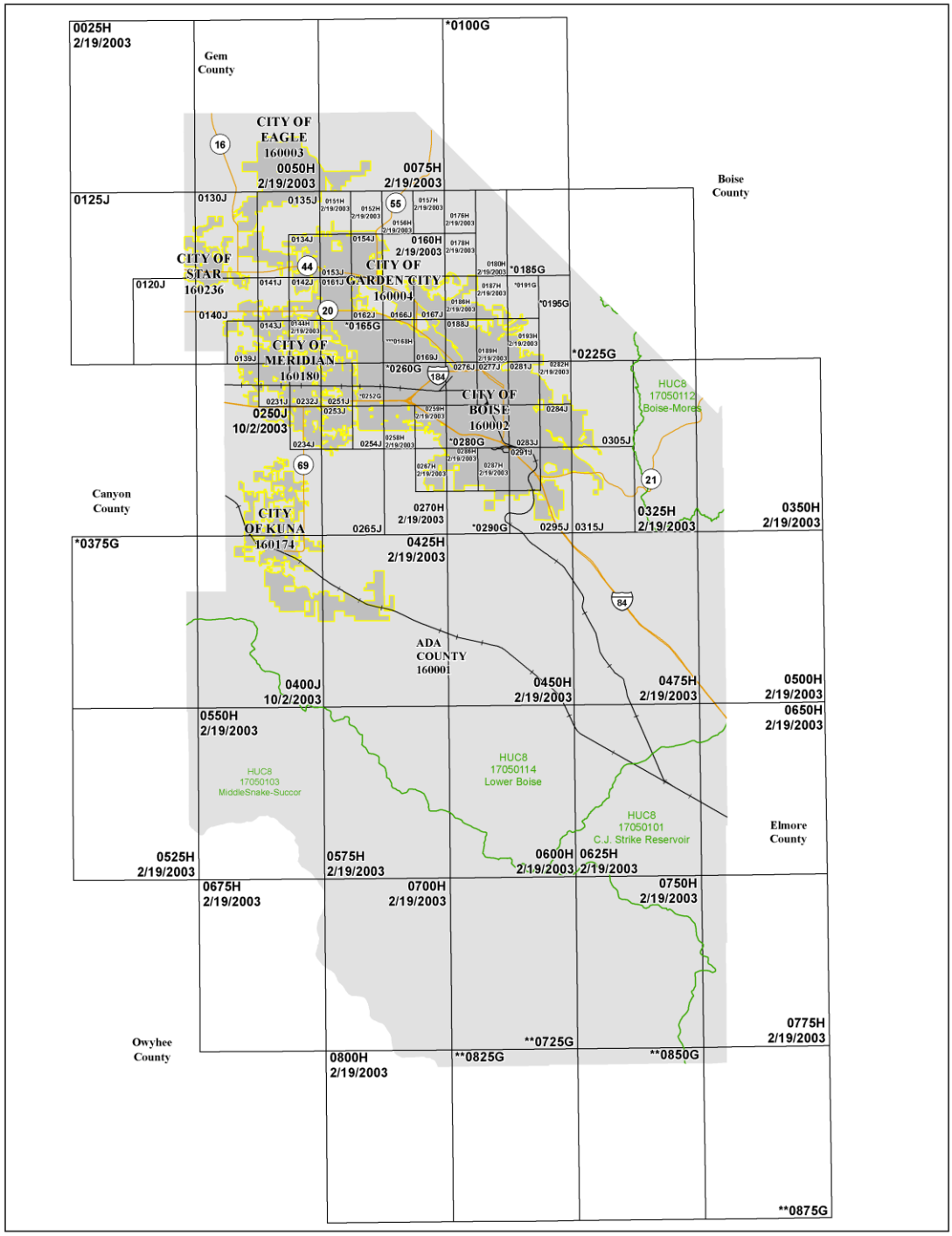
Part or all of this FIS Report may be revised and republished at any time. In addition, part of this FIS Report may be revised by a Letter of Map Revision (LOMR), which does not involve republication or redistribution of the FIS Report.

It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 9, "Map Repositories," within this FIS Report.

New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

Figures 5, 6 and 7 present important considerations for using the information contained in this revised FIS report and the FIRM and is provided in response to changes in format and content.

Figure 6 – FIRM Notes to Users



1 inch = 5 miles 1:300,000

Miles 0 2.5 5 10

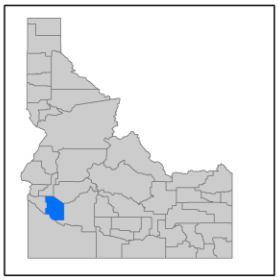
Map Projection:
Universal Transverse Mercator Zone 11N;
North American Datum 1983;
Western Hemisphere; Vertical Datum: NAVD 88

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

SEE FIS REPORT FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS
** PANEL NOT PRINTED - AREA IN ZONE D
*** PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS; ALL AREAS WITHIN 0.2% ANNUAL CHANCE FLOODPLAIN



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

ADA COUNTY, IDAHO and Incorporated Areas

PANELS PRINTED:

0025, 0050, 0075, 0120, 0125, 0130, 0134, 0135, 0139, 0140, 0141, 0142, 0143, 0144, 0151, 0152, 0153, 0154, 0156, 0157, 0160, 0161, 0162, 0166, 0167, 0169, 0176, 0178, 0180, 0186, 0187, 0188, 0189, 0193, 0231, 0232, 0234, 0250, 0251, 0253, 0254, 0258, 0259, 0265, 0267, 0270, 0276, 0277, 0281, 0282, 0283, 0284, 0286, 0287, 0291, 0295, 0305, 0315, 0325, 0350, 0400, 0425, 0450, 0475, 0500, 0525, 0550, 0575, 0600, 0625, 0650, 0675, 0700, 0750, 0775, 0800

FEMA

PRELIMINARY

MAP NUMBER
16001CIND0B

MAP REVISED

Figure 6 – FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 4 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 10.6 (d) of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was Universal Transverse Mercator. The horizontal datum was North American Datum 1983. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/, or contact the National Geodetic Survey at the following address:

Figure 6 – FIRM Notes to Users

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community.

BASE MAP INFORMATION: Base map information shown on the FIRM was provided by U.S. Census Bureau TIGER files, dated 2014 and digital data provided by Ada County GIS, dated 2015. For information about base maps, refer to the FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Ada County, Idaho and Incorporated Areas, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 4 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

SPECIAL NOTES FOR SPECIFIC FIRM PANELS

This Notes to Users section was created specifically for Ada County, Idaho and Incorporated Areas, effective date to be determined.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Figure 7 – FIRM Legend

SPECIAL FLOOD HAZARD AREAS: *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*

	Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone, either at cross section locations or as static whole-foot elevations that apply throughout the zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.

Figure 7 – FIRM Legend (Continued)

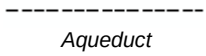
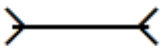
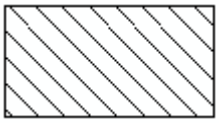
OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.
	Zone X Protected by Accredited Levee: Areas protected by an accredited levee, dike or other flood control structures. See Notes to Users for important information.
OTHER AREAS	
	Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible
	Unshaded Zone X: Areas determined to be outside the 0.2% annual chance floodplain
FLOOD HAZARD AND OTHER BOUNDARY LINES	
	Flood Zone Boundary (white line)
	Limit of Study
	Jurisdiction Boundary
	Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet
GENERAL STRUCTURES	
 *Aqueduct* *Channel* *Culvert* *Storm Sewer*	Channel, Culvert, Aqueduct, or Storm Sewer
Dam *Jetty* *Weir*	Dam, Jetty, Weir
	Levee, Dike or Floodwall
 *Bridge*	Bridge

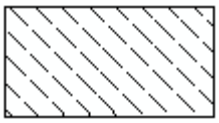
Figure 7 – FIRM Legend (Continued)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): *CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas. See Notes to Users for important information.*



CBRS AREA
09/30/2009

Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.



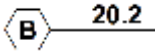
O
THERWISE PROTECTED AREA
09/30/2009

Otherwise Protected Area

REFERENCE MARKERS

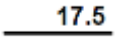
River mile Markers

CROSS SECTION & TRANSECT INFORMATION

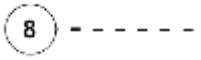


Lettered Cross Section with Regulatory Water Surface Elevation (BFE)

Numbered Cross Section with Regulatory Water Surface Elevation (BFE)



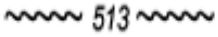
Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)



Coastal Transect

Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.

Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.



Base Flood Elevation Line (shown for flooding sources for which no cross sections or profile are available)

ZONE AE
(EL 16)

Static Base Flood Elevation value (shown under zone label)

ZONE AO
(DEPTH 2)

Zone designation with Depth

ZONE AO
(DEPTH 2)
(VEL 15 FPS)

Zone designation with Depth and Velocity

Figure 7 – FIRM Legend (Continued)

BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway
234	U.S. Highway
234	State Highway
234	County Highway
MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}$E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16' 52.5"	Corner Coordinates (Latitude, Longitude)

e. Flood Protection Measures

According to the National Levee Database, there are currently 3 levees along the Boise River in Ada County totaling 1.6 miles in length providing minimally acceptable protection to the surrounding areas. These levees are operated and maintained by Flood Control District #10 of Idaho. The Fairgrounds Levee is 0.23 miles long and located within the City of Boise, along the south side of the Boise River. The 0.48 mile-long Mink Farm Levee is located on the north side of the river west of the City of Eagle, while the Strunk-Stillwell Levee is 0.89 miles long and located south of the river near the City of Star.

Within this jurisdiction, there are one or more levees that have not been demonstrated by the community or levee owner(s) to meet the requirements of 44 CFR Part 65.10 of the NFIP regulations as it relates to the levee's capacity to provide 1% annual chance flood protection. Please refer to the Notice to Flood Insurance Study Users page at the front of this FIS report for more information.

While other levees may exist within Ada County, levees not identified in this section are not known to have the necessary features to provide protection from the regulatory flood.

f. Hydrologic Analyses

Flood peaks for Nine Mile Creek were derived from U.S. Geological Survey (USGS) Open File Report 93-419 (Reference 1). The 0.2 percent chance flood was developed by a Log Pearson Type III extension of the flood peaks available in the report. The natural Nine Mile Creek basin is divided by the Ridenbaugh Canal which effectively limits the extents of the basin to roughly half of the natural drainage to the study area. To the south, the drainage basin is bounded by the Eightmile Lateral and to the North by the Hunter Lateral.

A flood frequency curve for the Lower Boise River basin, developed in 2012 by the USACE, Walla Walla District, was utilized in this restudy. Since 1955, when storage in Lucky Peak Lake began, the lower part of the frequency curve has been defined by regulated flood flows measured at the USGS gaging stations at Boise, Idaho. The upper part of the regulated frequency curve was developed by routing specific frequency hydrographs through the upstream reservoirs.

Peak discharge-drainage area relationships for the 10-,2-, 1- and 0.2-percent-annual chance flood for each stream studied by detailed methods are presented in Table 7, Summary of Discharges.

Table 7 - Summary of Discharges						
		Peak Discharges (cubic feet per second)				
Flooding Source and Location	Drainage Area (square miles)	10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Boise River At Lucky Peak Dam	2,650[1]	7,500[2]	7,900[2]	11,000[2]	16,600[2]	34,800[2]
Ninemile Creek At confluence with Fivemile Creek	3.3	95	135	170	209	319
Downstream Ten Mile Road	3.0	89	126	158	194	295
Downstream Linder Road	1.9	63	88	111	136	209

[1]Drainage area above Lucky Peak Dam [2]Regulated discharges

Table 7 - Summary of Discharges (continued)						
		Peak Discharges (cubic feet per second)				
Flooding Source and Location	Drainage Area (square miles)	10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Ninemile Creek (continued) Downstream Central Drive	0.9	38	53	66	80	119
Downstream Locust Grove Road	0.5	22	31	38	46	66

[1]Drainage area above Lucky Peak Dam [2]Regulated discharge

g. Hydraulic Analyses

Boise River

Starting water surface elevations for Nine Mile Creek were taken from the water surface profiles at the confluence with Five Mile Creek from the previous FIS study. Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.1 foot for floods for the selected recurrence intervals. The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do no

Water surface elevations for floods of the selected recurrence intervals on the Boise River are computed by the USACE using the USACE computer program, HEC- RAS, version 4.1.0. Cross Sections were developed using 2006 Green LiDAR. Also, new bridge cross sections were obtained in 2012 and 2013 for those bridges without previous data. Roughness coefficient factors (Manning's "n"), used in the hydraulic computations are chosen by engineering judgment based on field observation of the river and floodplain areas, and aerial imagery. Channel values are predominately 0.032, however vary slightly due to local disparities. Overbank values predominately range from 0.03 to 0.08; the median value is 0.045 as much of the floodplain is agricultural land. The large range in overbank values resulted from having a mixture of agricultural, urbanized, residential, and impervious areas. Starting water surface elevations for the Boise River are established using normal depth. Flood profiles are drawn showing computed water-surface elevations to an accuracy of 0.1 foot for floods for the selected recurrence intervals. The hydraulic analyses for this study are based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Ninemile Creek

Water surface elevations for floods of the selected recurrence intervals on Nine Mile Creek were computed by the USACE using the USACE computer program, HEC- RAS, version 4.1.0. Cross Sections were developed as a combination of LiDAR data merged with 2012 below-water field surveys. Roughness coefficient factors (Manning's "n"), used in the hydraulic computations were chosen by engineering judgment based on field observation of the stream and floodplain areas, and aerial imagery. Channel values ranged from 0.04 to 0.048, and overbank values ranged from 0.04 to 0.08. The range in overbank values resulted from having a mixture of residential areas and farm fields.

Two areas within the study area on Nine Mile Creek included computations of split flow, where floodwaters separate from the main channel area and generally return to channel area further downstream. Split Flows occur along Todd Way north of Cherry Lane and at the crossing with Rutledge Canal just north of the railroad. In addition, a split flow was computed where the flows do not return to Nine Mile Creek. This area is just upstream of the railroad crossing and flows east toward Eight Mile Lateral. One area within the study area was modeled as overland flow because Nine Mile Creek is directed underground through a series of pipes. Overland flow was computed for the area downstream of Central Drive to Ada Street in downtown Meridian.

h. Additional Information

The jurisdictions that are included in this project area, along with the Community Identification Number (CID) for each community and the 8-digit Hydrologic Unit Codes (HUC-8) sub-basins affecting each, are shown in Table 8. The Flood Insurance Rate Map (FIRM) panel numbers that affect each community are listed. If the flood hazard data for the community is not included in this FIS Report, the location of that data is identified.

The location of flood hazard data for any participating communities in multiple jurisdictions is also indicated in Table 8.

Jurisdictions that have no identified SFHAs as of the effective date of this study are indicated in the table. Changed conditions in these communities (such as urbanization or annexation) or the availability of new scientific or technical data about flood hazards could make it necessary to determine SFHAs in these jurisdictions in the future.

Table 8 - Listing of NFIP Jurisdictions			
Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)
Ada County (Unincorporated Areas)	160001	17050101 17050103 17050112 17050114	*16001C0025H, *16001C0150H, 16001C0075H,* *16001C0100G, 16001C0120J, 16001C0125J, 16001C0130J, 16001C0134J, 16001C0135J, 16001C0139J, 16001C0140J, 16001C0141J, 16001C0142J, 16001C0143J, *16001C0144H, *16001C0151H, *16001C0152H, 16001C0153J, 16001C0154J, *16001C0156H, *16001C0157H, *16001C0160H, 16001C0161J, 16001C0162J, *16001C0165G, 16001C0166J, 16001C0167J, *16001C0168H, 16001C0169J, *16001C0176H, *16001C0178H, *16001C0180H, *16001C0185G, *16001C0186H,*16001C0187H, 16001C0188J, *16001C0189H, *16001C0191H, *16001C0193H, *16001C0195G, *16001C0225G, 16001C0231J, 16001C0232J, 16001C0234J, 16001C0251J, *16001C0252G, 16001C0253J, 16001C0254J, *16001C0258H, *16001C0259H, *16001C0260G, 16001C0265J, *16001C0267H, *16001C0270H, 16001C0277J, 16001C0281J, *16001C0282H, 16001C0283J, 16001C0284J, *16001C0286H, *16001C0287H, *16001C0290G, 16001C0291J, 16001C0295J, 16001C0305J, 16001C0315J, *16001C0325H, *16001C0350H, *16001C0350H, *16001C0375G, 16001C0400J, *16001C0425H, *16001C0450H, *16001C0475H, *16001C0500H, *16001C0525H, *16001C0550H, *16001C0575H, *16001C0600H, *16001C0625H, *16001C0650H, *16001C0675H, *16001C0700H, *16001C0725G, *16001C0750H, *16001C0775H, *16001C0800H, *16001C0825G, *16001C0850G, *16001C0875G
City of Boise	160002	17050114	*16001C0160H, 16001C0161J, 16001C0162J, *16001C0165G, 16001C0166J, 16001C0167J, *16001C0168H, 16001C0169J,*16001C0178H, *16001C0180H, *16001C0186H,*16001C0187H, 16001C0188J, *16001C0189H, *16001C0193H, *16001C0195G, *16001C0252G, 16001C0254J, *16001C0258H, *16001C0259H, *16001C0260G, *16001C0267H, 16001C0276J, 16001C0277J, *16001C0280G, 16001C0281J, *16001C0282H, 16001C0283J, 16001C0284J, *16001C0286H, *16001C0287H, *16001C0290G,*16001C0291H, 16001C0295J, 16001C0305J, 16001C0315J

Table 8 - Listing of NFIP Jurisdictions (continued)			
Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)
City of Eagle	160003	17050114	*16001C0050H, *16001C0075H, 16001C0130J, 16001C0134J, 16001C0135J, 16001C0141J, 16001C0142J, *16001C0151H, *16001C0152H, 16001C0153J, 16001C0154J, *16001C0160H, 16001C0161J, 16001C0162J
City of Garden City	160004	17050114	16001C0162J, 16001C0166J, 16001C0167J, 16001C0169J, 16001C0188J, *16001C0198H, 16001C0276J
City of Kuna	160174	17050114	16001C0250J, 16001C0400J, *16001C0425H
City of Meridian	160180	17050114	16001C0139J, 16001C0140J, 16001C0141J, 16001C0142J, 16001C0143J, *16001C0144H, 16001C0161J, *16001C0165G, 16001C0231J, 16001C0232J, 16001C0234J, 16001C0250J, 16001C0251J, 16001C0252G, 16001C0253J, 16001C0254J,
City of Star	160236	17050114	16001C0120J, 16001C0125J, 16001C0130J, 16001C0140J

*Panel not printed

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see http://www.fema.gov.

The additional data that was used for this project includes the FIS Report and FIRM that were previously prepared for Ada County and Incorporated Areas (FEMA2003).

Table 9 is a list of the locations where FIRMs for Ada County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 9 – Map Repositories

Community	Address	City	State	Zip Code
Ada County (Unincorporated Areas)	Ada County Courthouse 200 West Front Street	Boise	ID	83702
City of Boise	City Hall 150 North Capitol Boulevard	Boise	ID	83701
City of Eagle	City Hall 310 East State Street	Eagle	ID	83616
City of Garden City	City Hall 6015 Glenwood Street	Garden City	ID	83714
City of Kuna	City Hall 329 West Third Street	Kuna	ID	83634
City of Meridian	Public Works Department 660 East Water Tower Lane	Meridian	ID	83642
City of Star	City Hall 10769 West State Street	Star	ID	83669

i. Letters of Map Revision

Letters of Map Change (LOMCs) were also incorporated during this PMR, and are listed in Table 10.

Table 10 – Letters of Map Change Incorporated in the Sixth Revision

LOMC	Case Number	Date Issued	Project Identifier
LOMR	03-10-0316P	03/27/2003	Floodway Data Table Revision
LOMR	03-10-0614P	11/03/2003	Idaho Auto Auction Property
LOMR	04-10-0735P	10/25/2004	Robnett Property
LOMR	05-10-0184P	04/15/2005	Shoreline – Boise LOMR
LOMR	05-10-0584P	09/27/2005	Robnett LOMR
LOMR	07-10-0624P	07/07/2008	Tuscany Lakes
LOMR	07-10-0641P	08/11/2008	Kowallis and Mackey Property
LOMR	07-10-0642P	09/17/2010	Johnson LOMR
LOMR	08-10-0528P	04/28/2009	Mace Property Area
LOMR	08-10-0658P	06/15/2009	Bellingham Park
LOMR	10-10-0128P	03/01/2011	Creekside Arbour
LOMR	10-10-0170P	09/01/2010	Jayo, Boise River, South Channel
LOMR	11-10-0941P	02/15/2013	Combined Fivemile and Eightmile Creek
LOMR	11-10-1081P	06/15/2012	Maynard Gulch
LOMR	12-10-0639P	01/25/2013	Tenmile Creek, AV-CB
LOMR	13-10-0446P	04/05/2013	Combined Fivemile and Eightmile Creek
LOMR	13-10-1349P	02/18/2014	Messina Meadows

Table 10 – Letters of Map Change Incorporated in the Sixth Revision			
LOMC	Case Number	Date Issued	Project Identifier
LOMR	13-10-1539P	09/05/2014	Fivemile Creek, BY-CD
LOMR	14-10-0845P	12/24/2014	Warm Springs Creek and Council Spring
LOMR	14-10-2112P	08/03/2015	Fivemile Creek, CB-CI
LOMR	15-10-0917P	11/05/2015	Boise River, at Eagle, Idaho

j. Bibliography for the Sixth Revision

Federal Emergency Management Agency, Flood Insurance Study, Ada County, Idaho, and Incorporated Areas, Flood Insurance Study Number 16001CV000B, Revised October 2, 2003.

U.S. Army Corps of Engineers, Walla Walla District, Water Control Manual for Boise River Reservoirs, Boise River, Idaho, 1984.

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U.S. Geological Survey, Guidelines for Determining Flood Flow Frequency, Bulletin #17B of the Hydrology Subcommittee, 1982.

U.S. Geological Survey, Open File Report 93-419, Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States, Blakemore E. Thomas, H.W. Hjalmarson, and S.D. Waltemeyer, 1994

U.S. Geological Survey, Water Resources Investigation 02-4170, Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Streams in Idaho, C. Berenbock, 2002.

U.S. Geological Survey, StreamStats Application for Idaho, http://water.usgs.gov/osw/streamstats/idaho.html, 2007.