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ABBREVIATIONS AND SYMBOLS

AERA	Aquatic Ecological Risk Assessment
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
ARD	Acid Rock Drainage
AWQC	Ambient Water Quality Criteria
bgs	Below ground surface
BMP	Best Management Practices
BMSG	Blackbird Mine Site Group
BRCP	Biological Restoration and Compensation Plan
CCC	Criteria Continuous Concentration (chronic criteria)
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CMC	Criteria Maximum Concentration (acute criteria)
COC	Chemical of Concern
COPEC	Chemical of Potential Ecological Concern
CRP	Community Relations Plan
CSM	Conceptual Site Model
CWA	Clean Water Act
cy	Cubic Yards
DEQ	Department of Environmental Quality
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ESA	Endangered Species Act
ESD	Explanation of Significant Difference
ESV	Ecological Screening Value
FS	Feasibility Study
gpm	gallons per minute
HEAST	Health Affects Assessment Summary Table
HI	Hazard Index
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
HR	Home range
IC	Institutional Controls
IDEQ	Idaho Department of Environmental Quality
IRIS	Integrated Risk Information System

ABBREVIATIONS AND SYMBOLS (continued)

IWQS	Idaho Water Quality Standard
LOAEL	Lowest observed adverse effect level
MCL	Maximum Contaminant Level
MBTA	Migratory Bird Treaty Act
NCEA	National Center for Environmental Assessment
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOEC	No observed effect concentration
NOAEL	No observed adverse effect level
NPDES	National Pollutant Discharge Elimination System
NRDA	Natural Resource Damage Assessment
O&M	Operation and Maintenance
PCI	Panther Creek Inn
PEC	Probable effects concentration
PRP	Potentially Responsible Party
PRG	Preliminary Remediation Goal or Preliminary Removal Goal
RA	Risk Assessment
RAO	Remedial Action Objective
RfD	Reference Dose
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RME	Reasonable Maximum Exposure
ROC	Receptor of Concern
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
SF	Slope Factor
SRB	Sulfate-reducing bacteria
TERA	Terrestrial Ecological Risk Assessment
TEC	Threshold Effects Concentration
TEL	Threshold Effects Level
TOC	Total organic carbon
TRV	Toxicity Reference Value
UAA	Use Attainability Analysis
UCL	Upper Confidence Limit
UTL	Upper Tolerance Level
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey

ABBREVIATIONS AND SYMBOLS (continued)

WQS	Water quality standard
WTP	Wastewater Treatment Plant
XRF	X-ray fluorescence

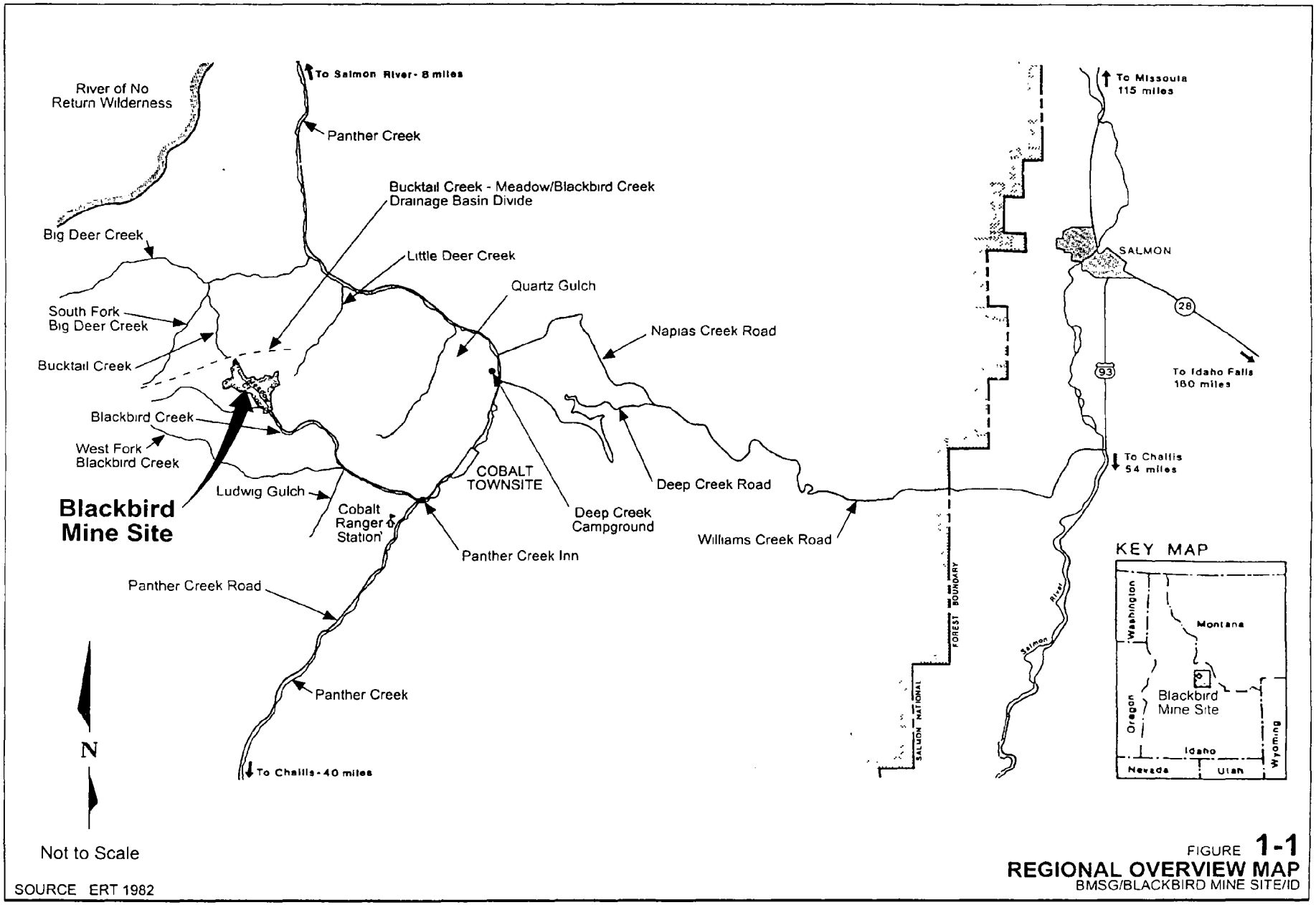

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FIGURE **1-1**

REGIONAL OVERVIEW MAP

BMSG/BLACKBIRD MINE SITE/ID

DRAWING NO 943159500405001g01 fh9 DATE 12/16/02 DRAWN BY EL

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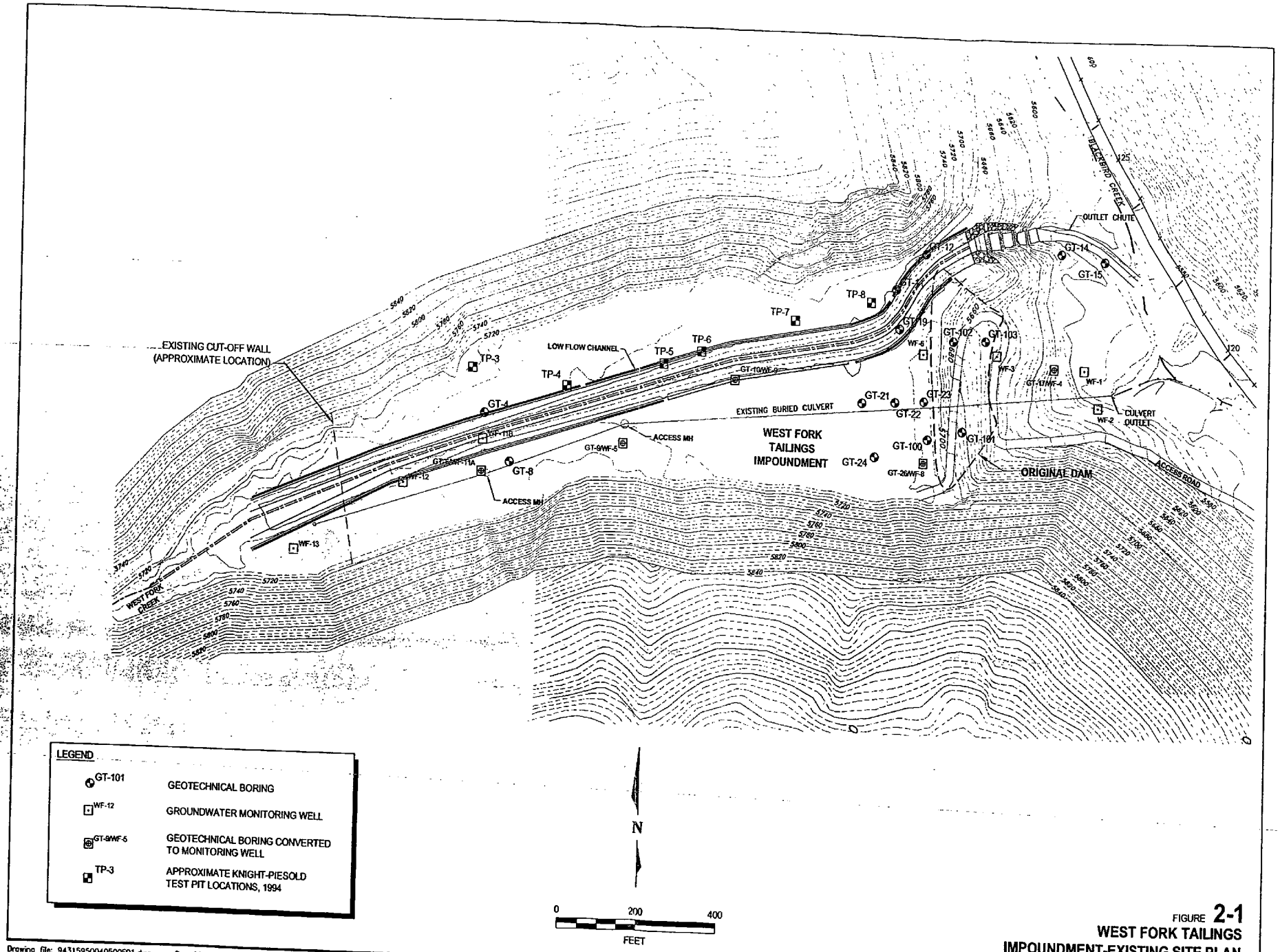

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FIGURE **2-1**
WEST FORK TAILINGS IMPOUNDMENT-EXISTING SITE PLAN
FEASIBILITY STUDY/BLACKBIRD MINE SITE/ID

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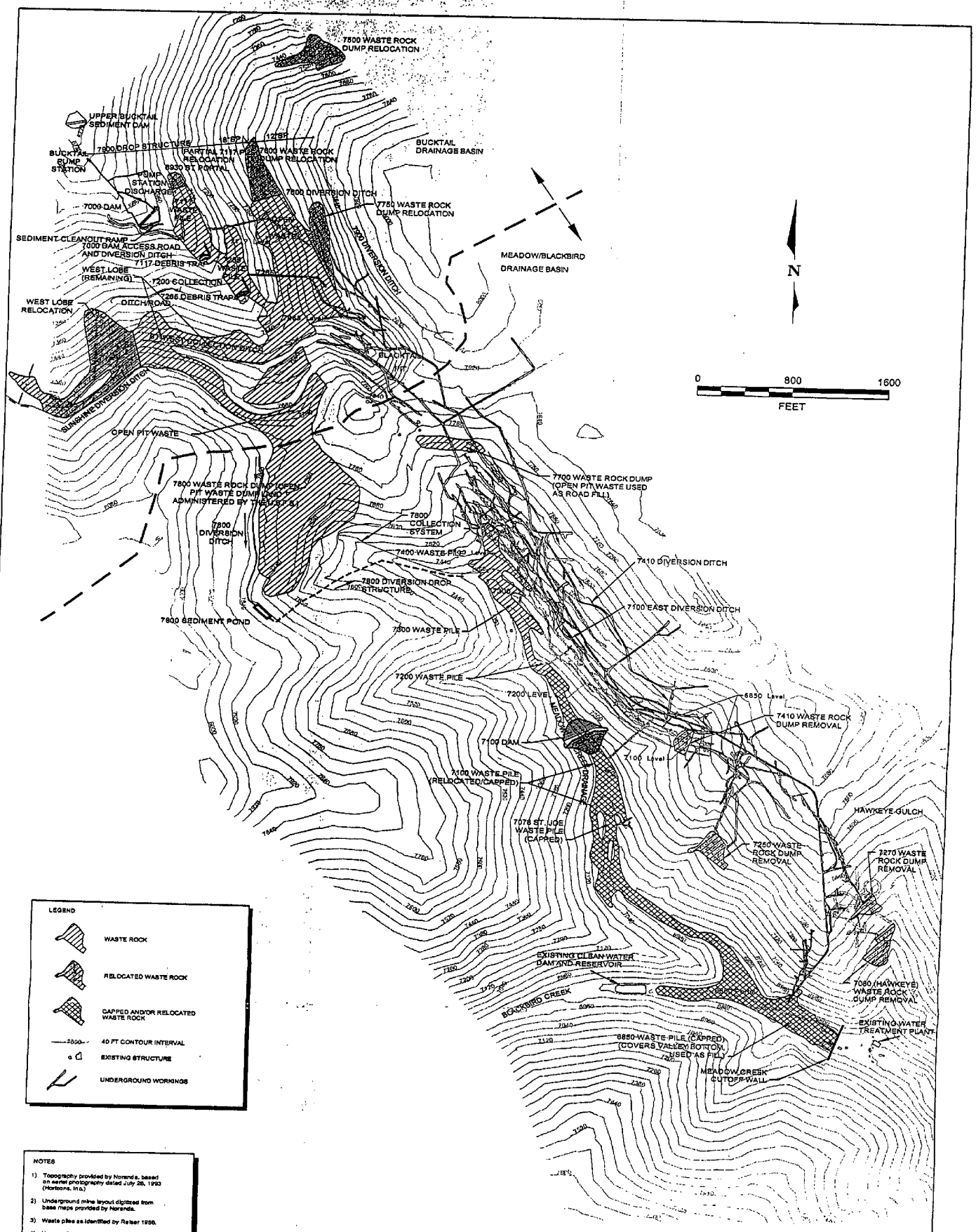

FIGURE **2-2**

MINE SITE WITH EARLY ACTIONS

FEASIBILITY STUDY/BLACKBIRD MINE SITE/ID

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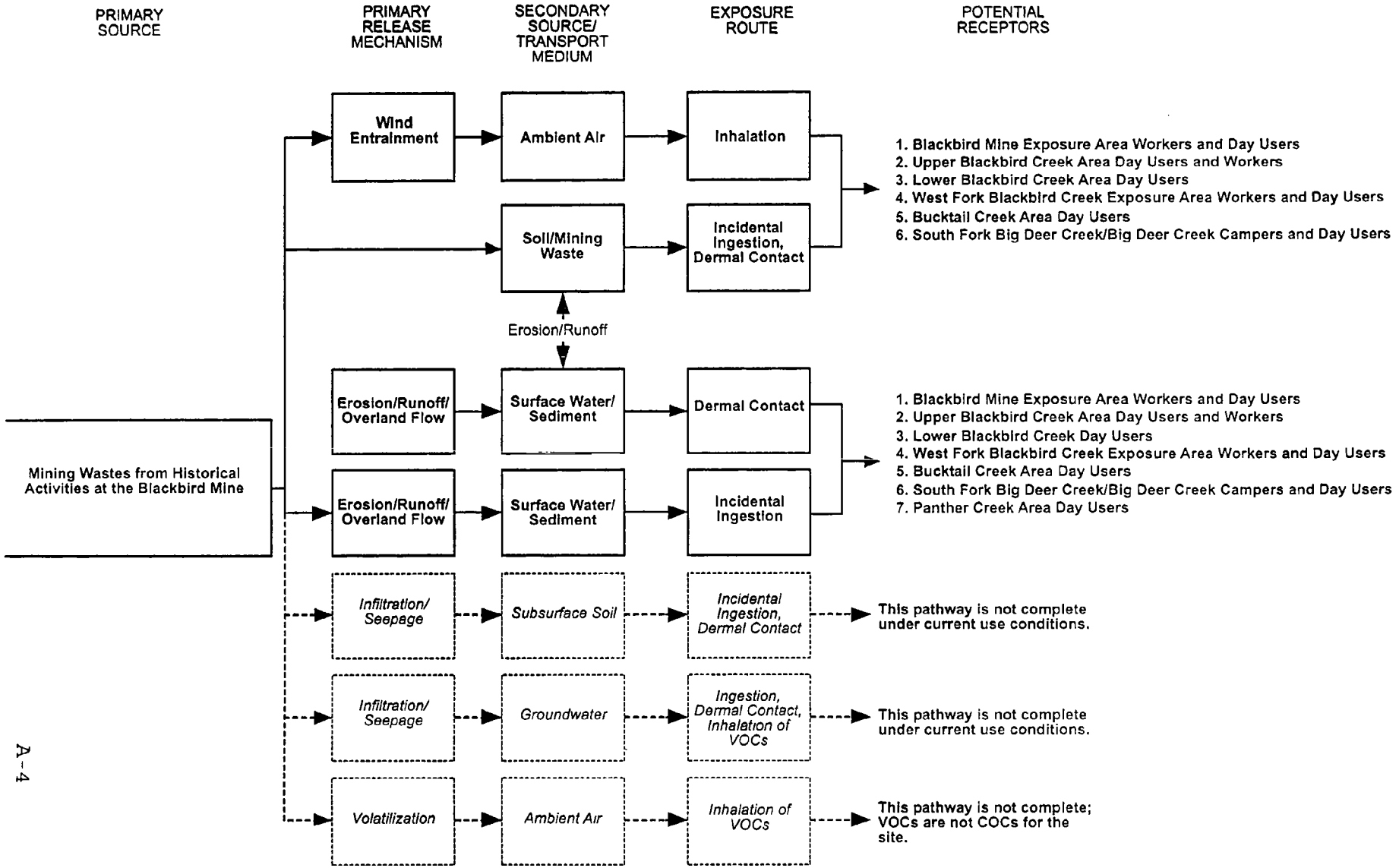


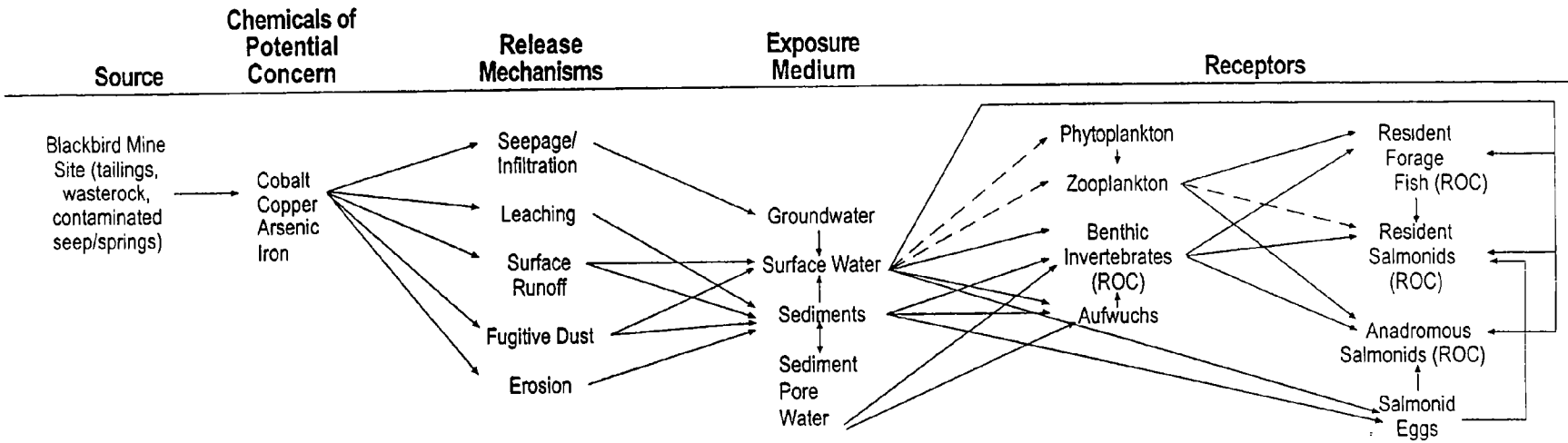
Notes

→ Potentially Complete Pathway

⇢ Potentially Incomplete Pathway

COCs . Contaminants of Concern

FIGURE **5-1**
HUMAN HEALTH
CONCEPTUAL SITE MODEL



- — — Minor Pathway

ROC = receptor of concern

FIGURE **5-2**
AQUATIC CONCEPTUAL SITE MODEL

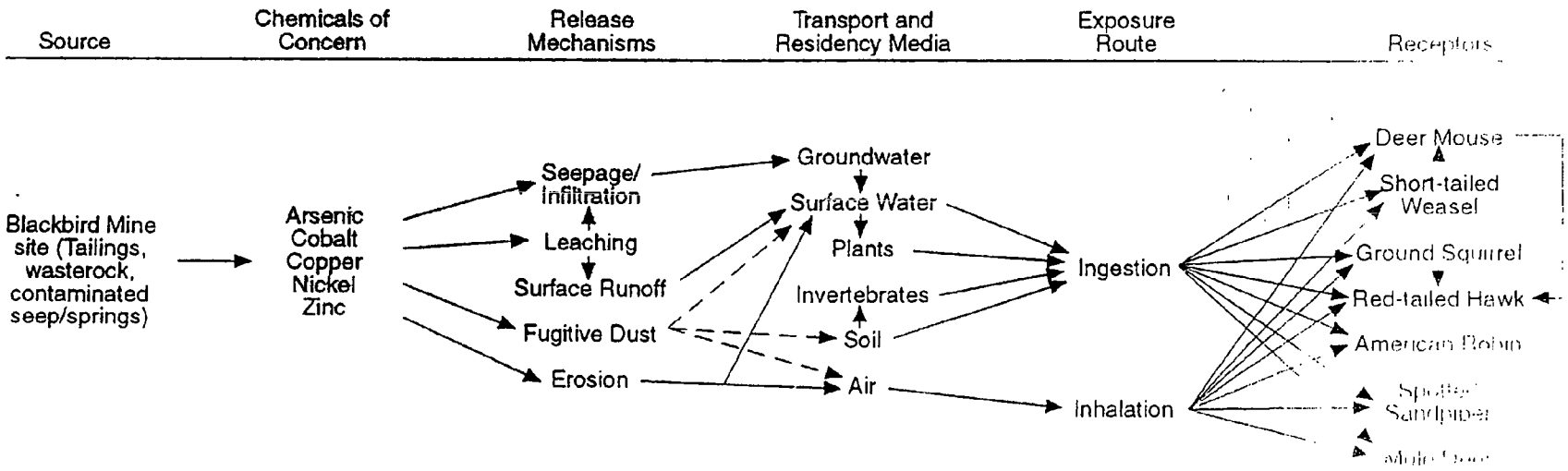


FIGURE **5-3**
TERRESTRIAL CONCEPTUAL MODEL
NORANDA/BLACKBIRD MINE/ID

DRAWING NO 9431595600fg02 fh9 DATE 12/16/02 DRAWN BY EL

Golder Associates

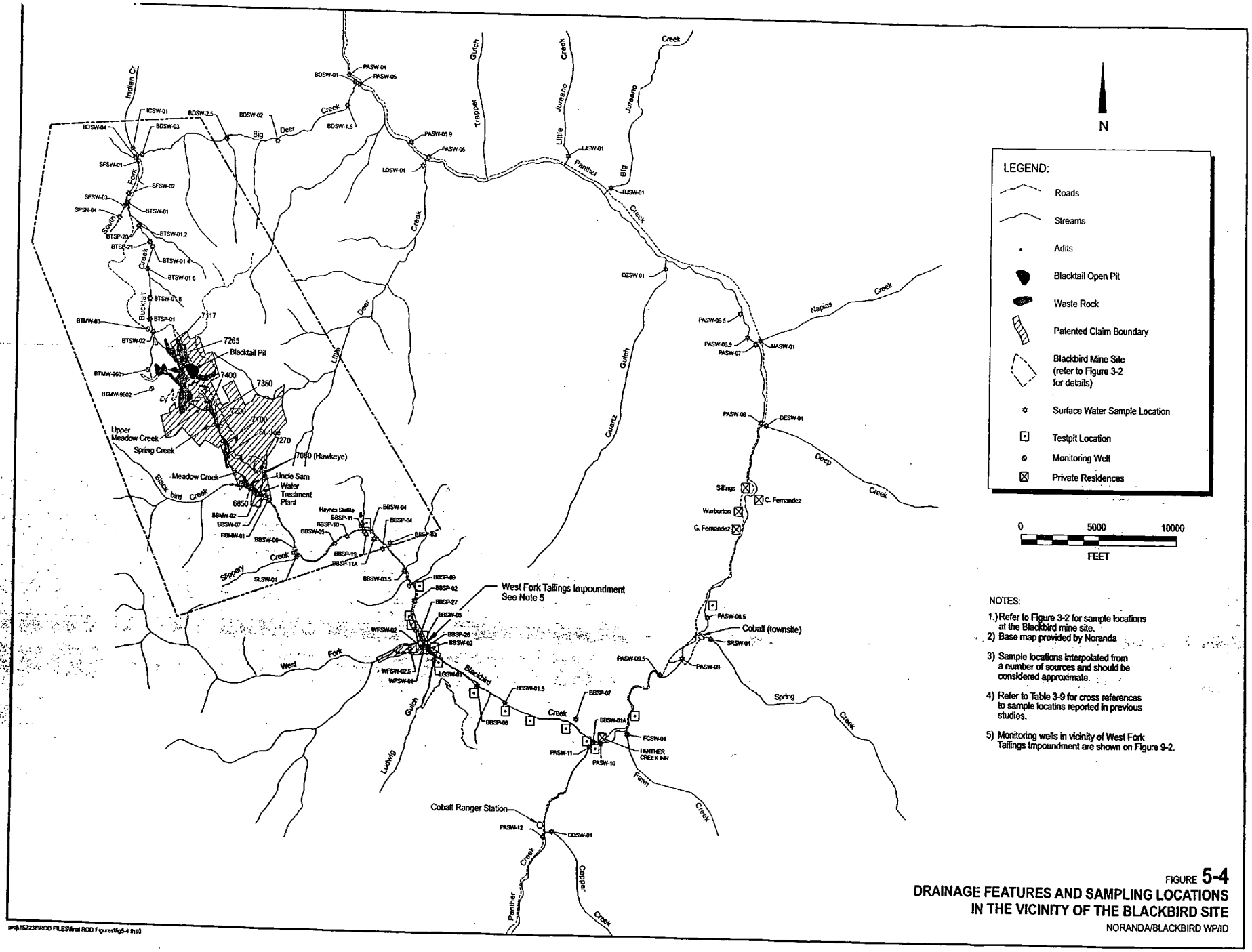
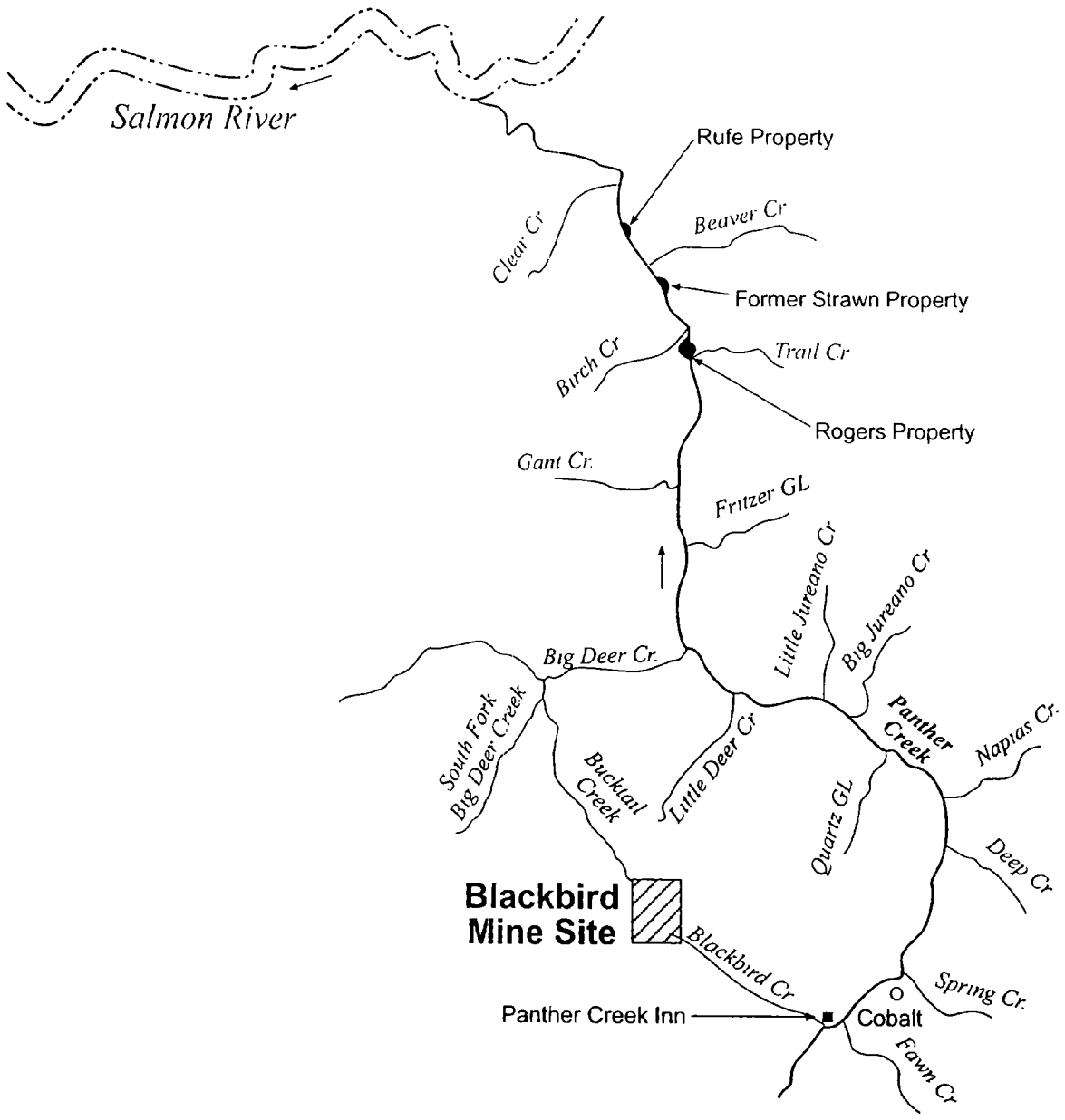
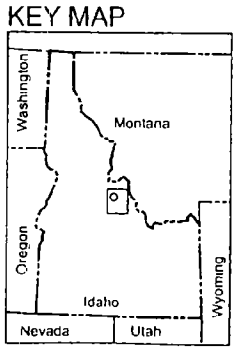


FIGURE **5-4**
DRAINAGE FEATURES AND SAMPLING LOCATIONS IN THE VICINITY OF THE BLACKBIRD SITE
NORANDA/BLACKBIRD WP/ID

After Golder Associates





N

Not to Scale

FIGURE **5-5**
PRIVATE PROPERTIES WITH FUTURE HUMAN HEALTH RISKS
BMSG/BLACKBIRD MINE SITE/ID

After Golder Associates

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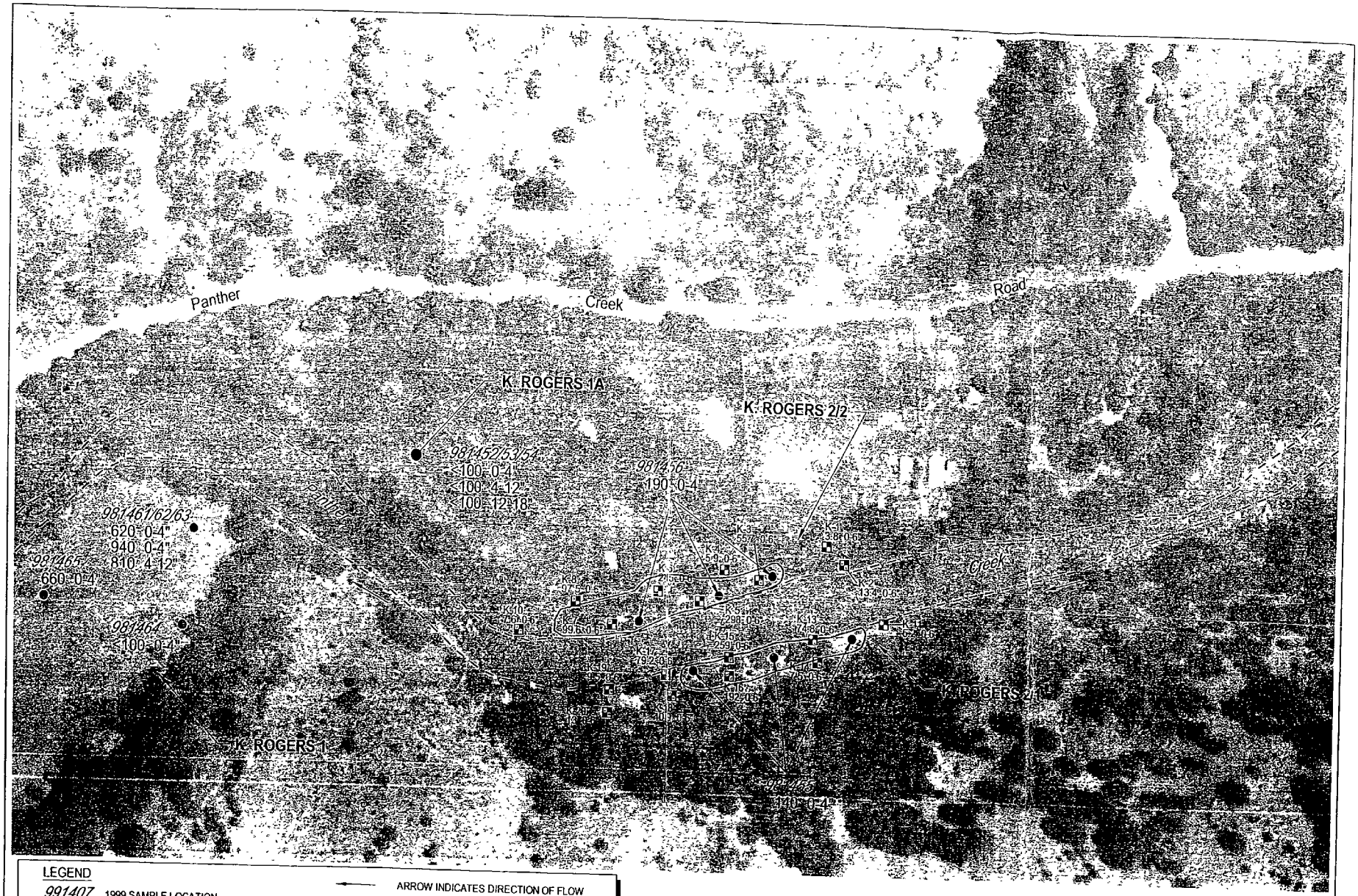

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FIGURE **5-6**
OVERBANK DEPOSIT SAMPLING LOCATIONS - K. ROGERS PROPERTY AREA 2/1 & 2/2
BMSG/BLACKBIRD MINE/ID

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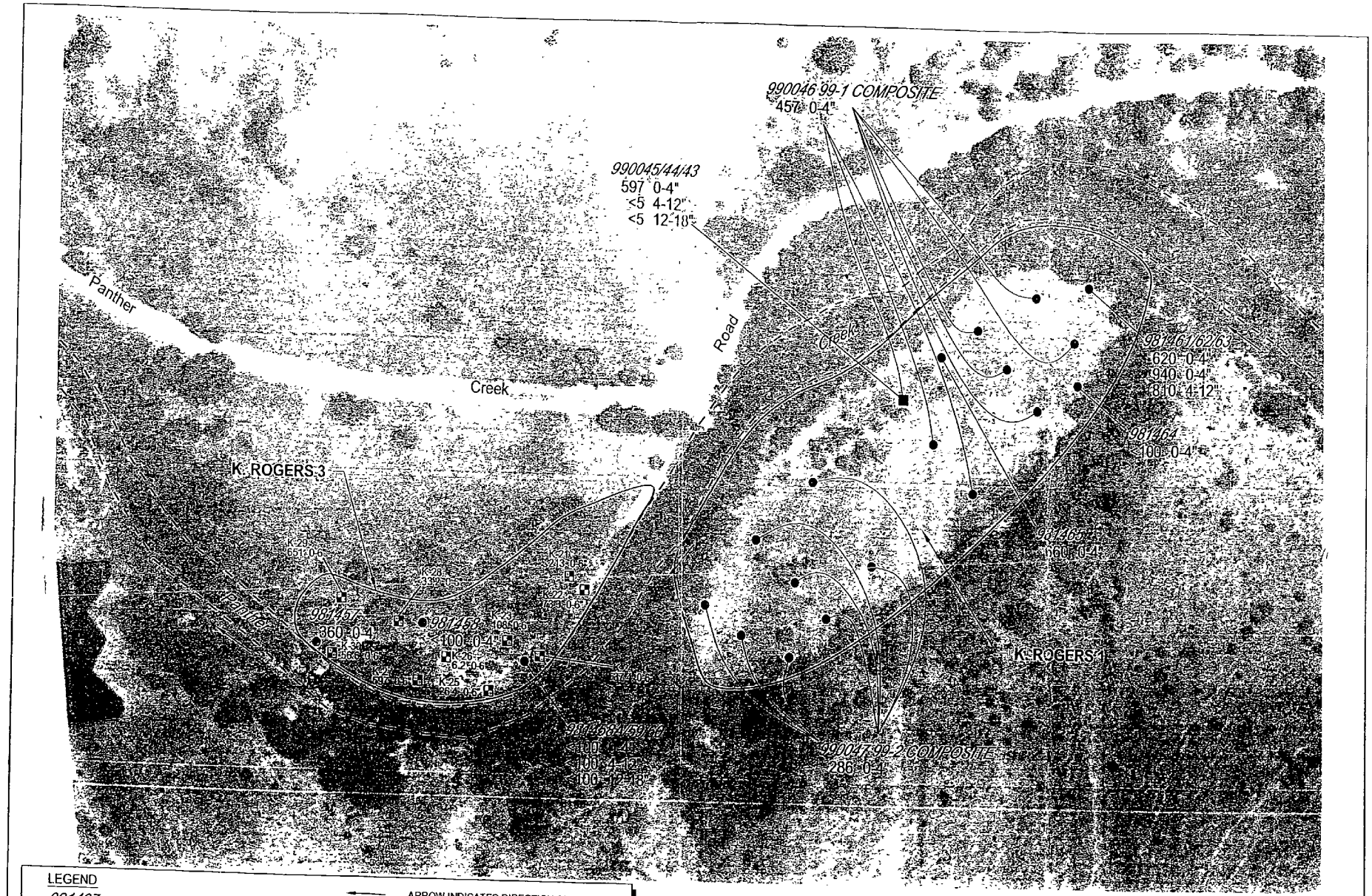

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FIGURE **5-7**

OVERBANK DEPOSIT SAMPLING LOCATIONS - K. ROGERS PROPERTY - AREA 3

BMSG/BLACKBIRD MINE/ID

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FIGURE **5-8**
OVERBANK DEPOSIT SAMPLING LOCATIONS - RUFE PROPERTY
BMSG/BLACKBIRD MINE/ID

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Golder Associates

FIGURE **5-9**

OVERBANK DEPOSIT SAMPLING LOCATIONS: STRAWN PROPERTY

BMSG/BLACKBIRD MINE/ID

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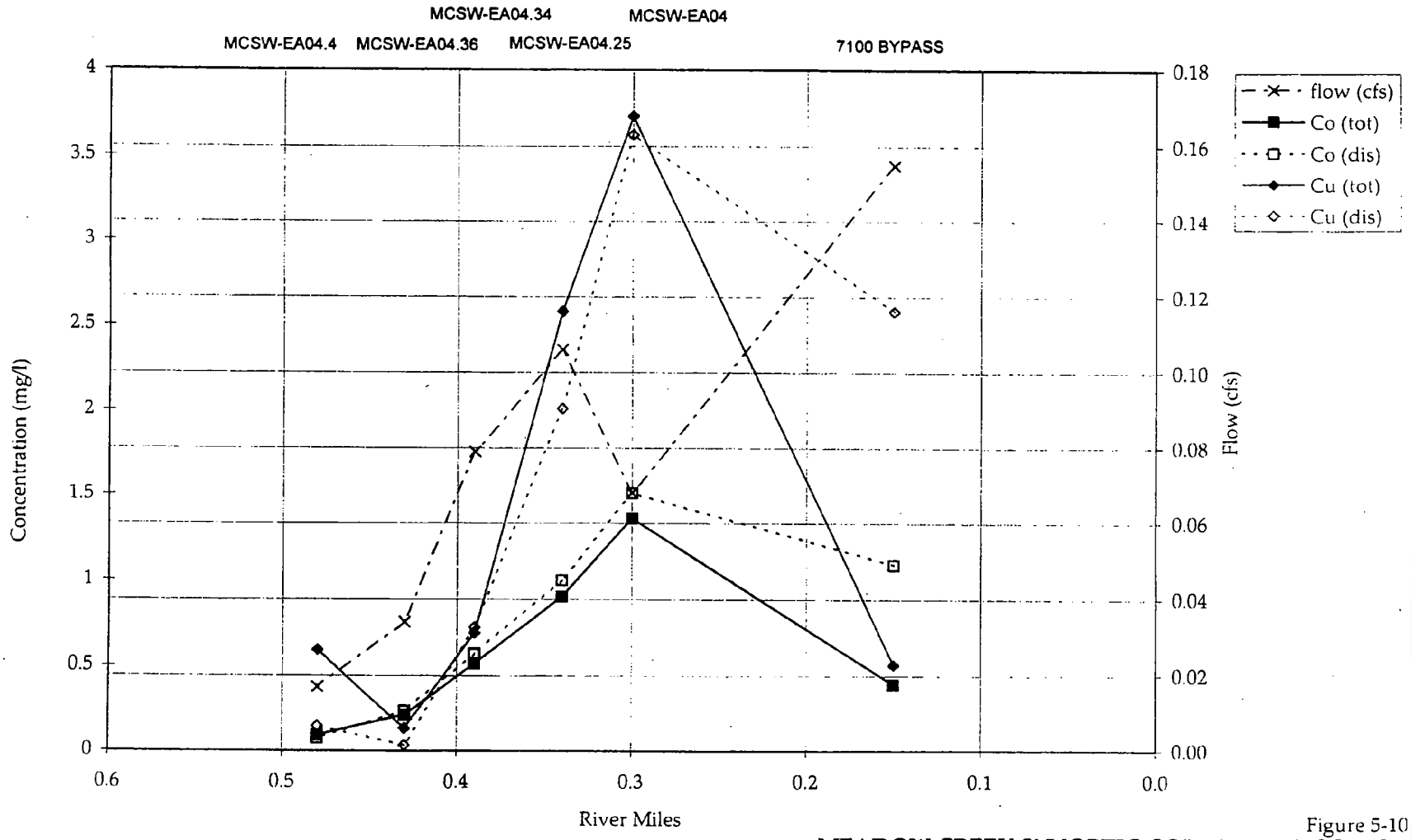

Figure 5-10

MEADOW CREEK SYNOPTIC COBALT AND COPPER CONCENTRATION SPRING 2000

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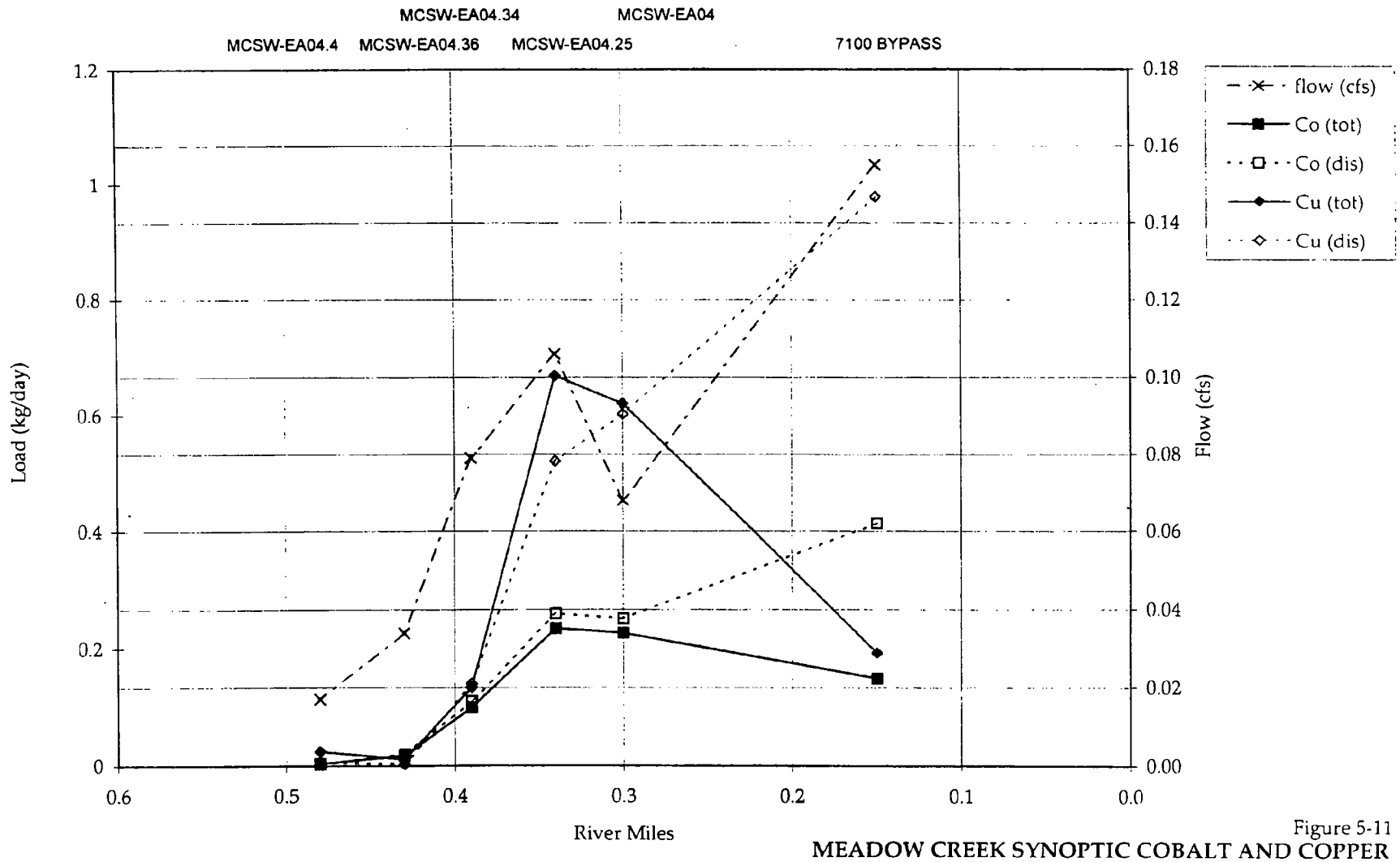

Figure 5-11
MEADOW CREEK SYNOPTIC COBALT AND COPPER LOADING SPRING 2000
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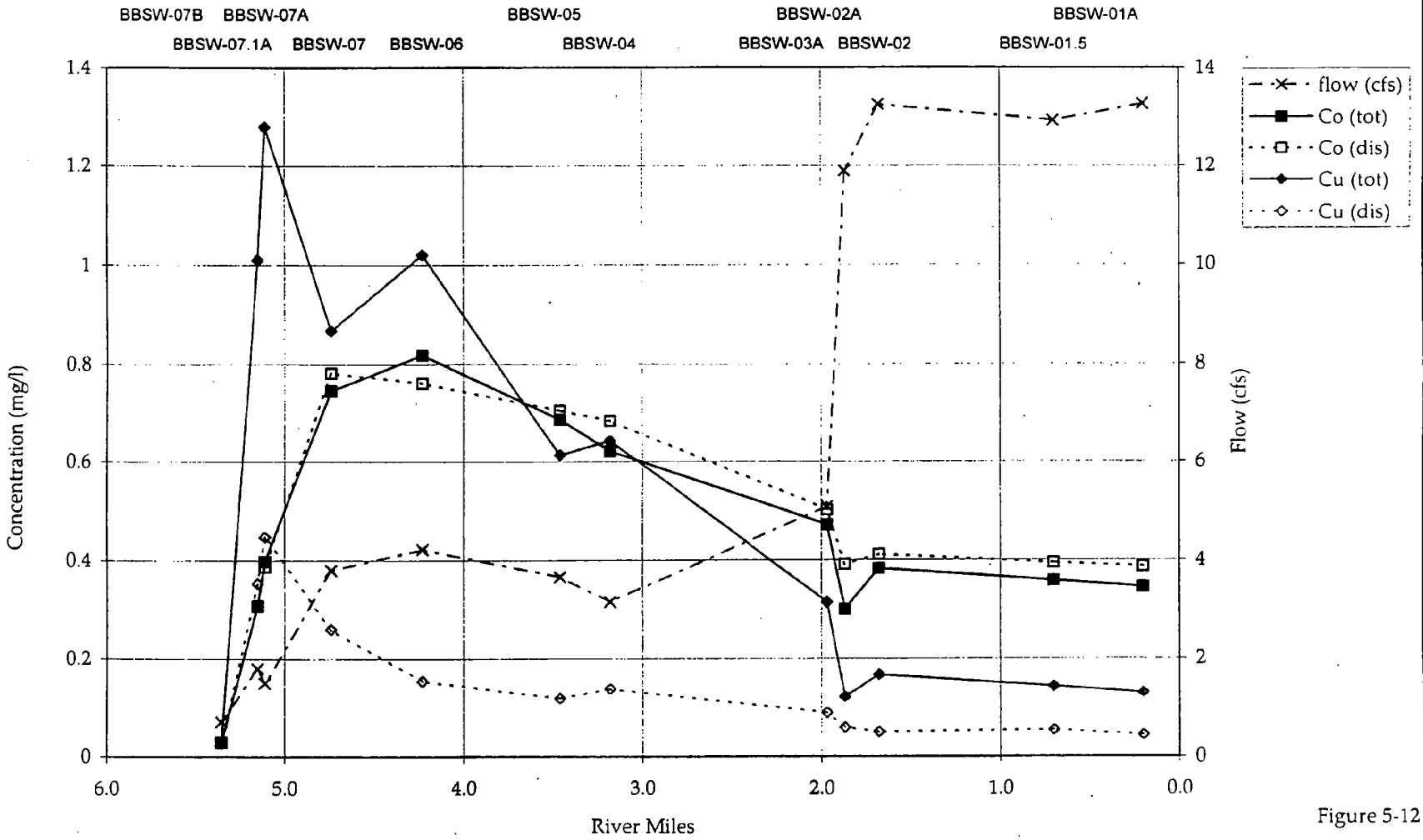

Figure 5-12

BLACKBIRD CREEK SYNOPTIC COBALT AND COPPER CONCENTRATION SPRING 2000

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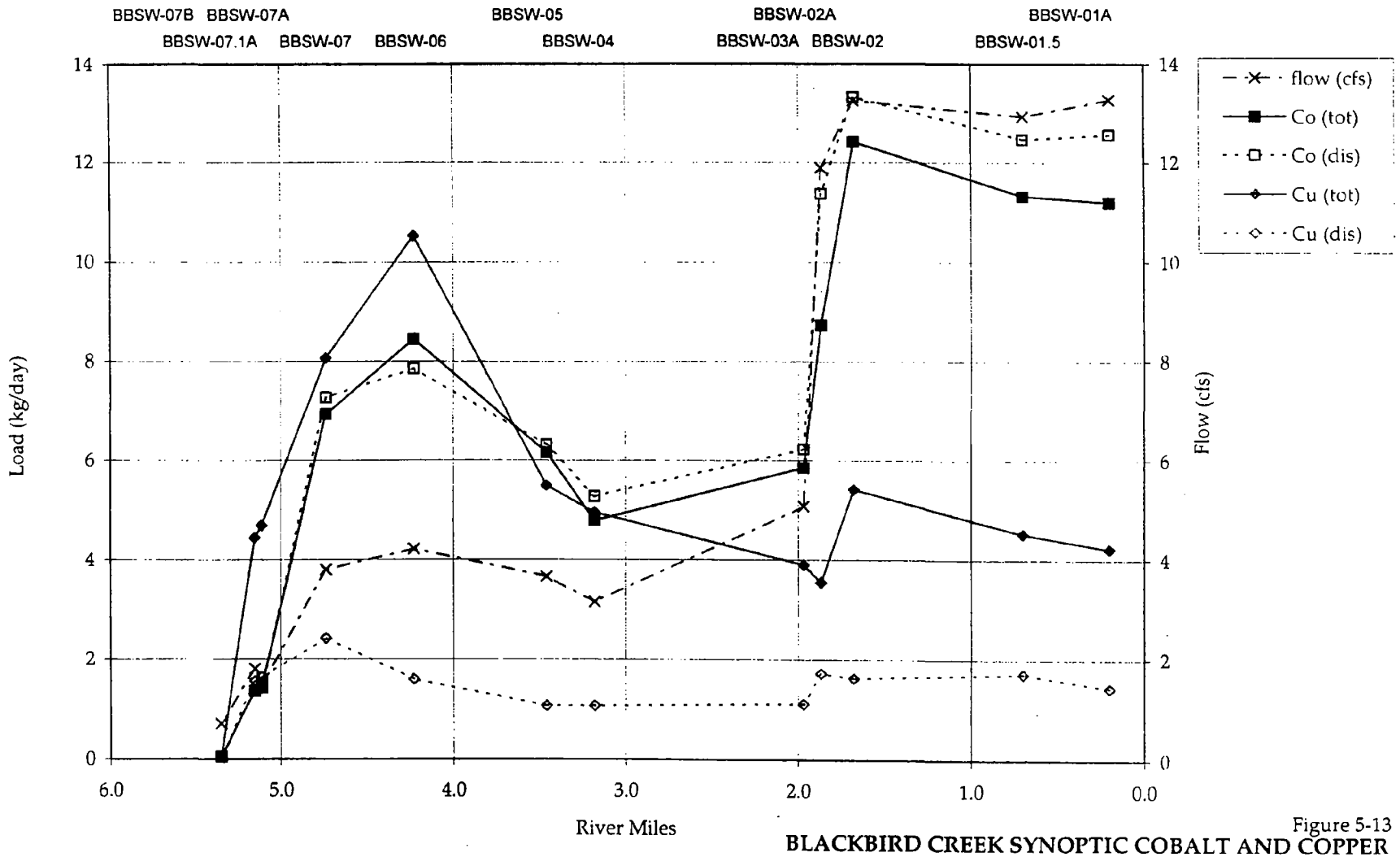

Figure 5-13
BLACKBIRD CREEK SYNOPTIC COBALT AND COPPER LOADING SPRING 2000
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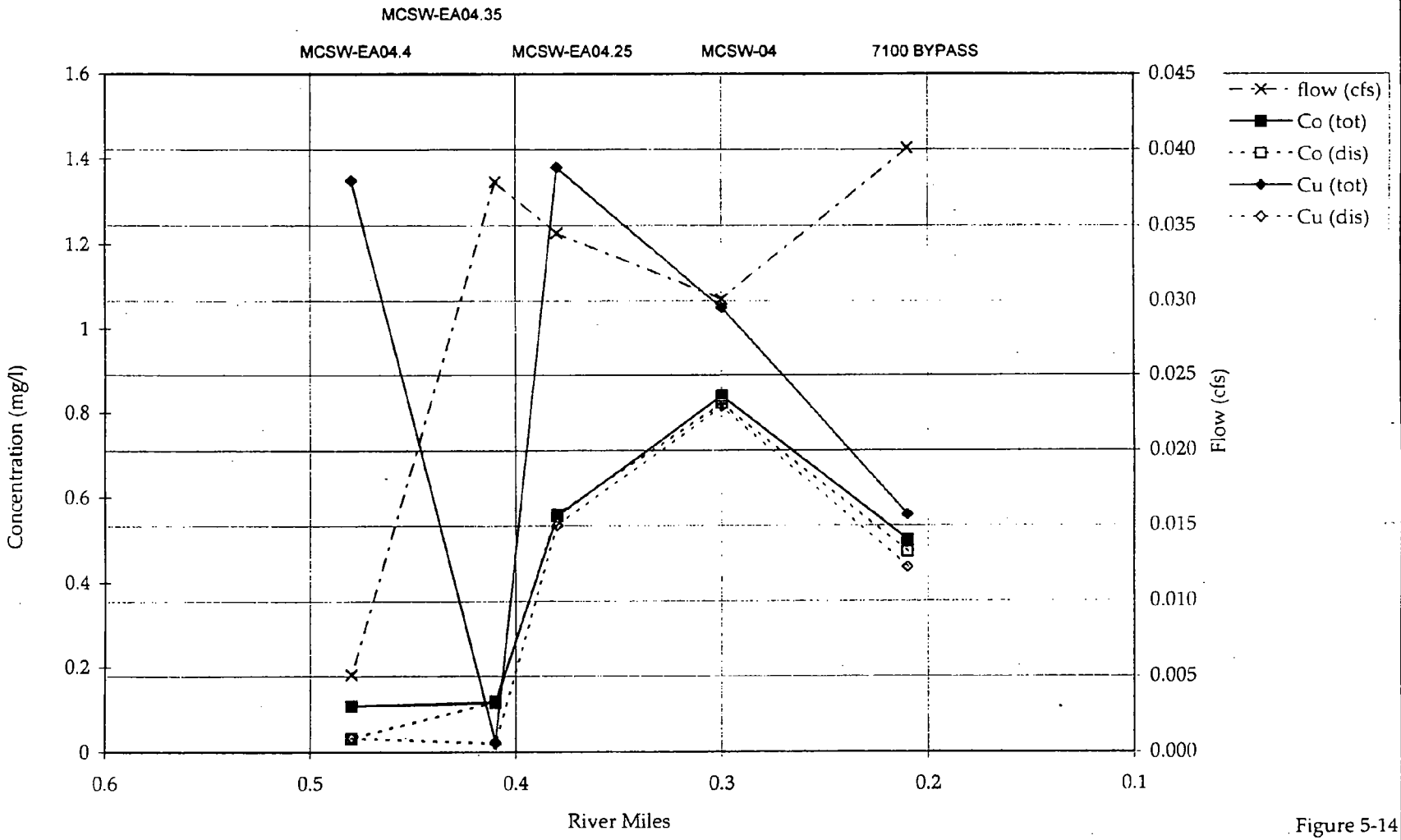

Figure 5-14
MEADOW CREEK SYNOPTIC COBALT AND COPPER CONCENTRATION FALL 2000
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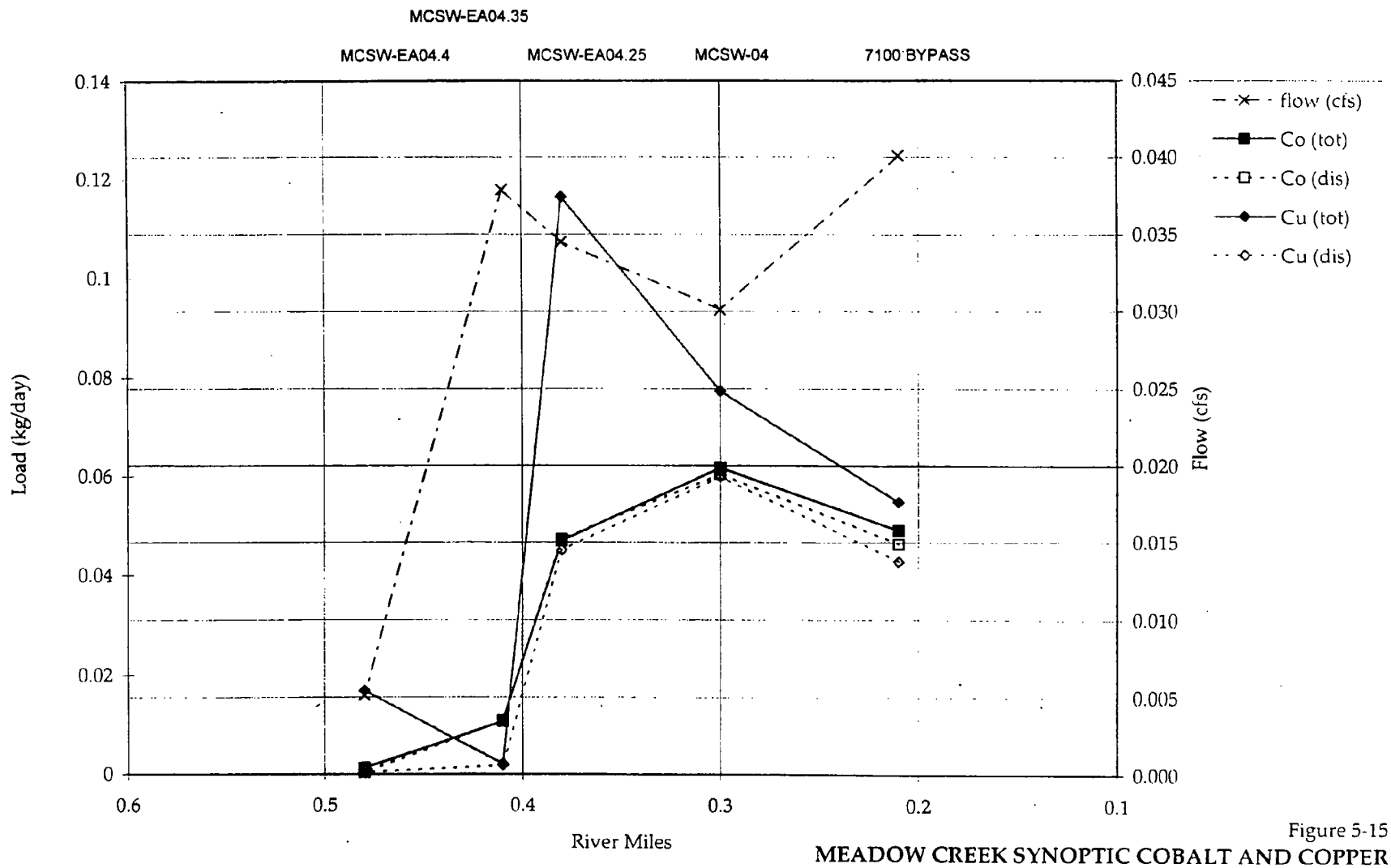

Figure 5-15
MEADOW CREEK SYNOPTIC COBALT AND COPPER LOADING FALL 2000
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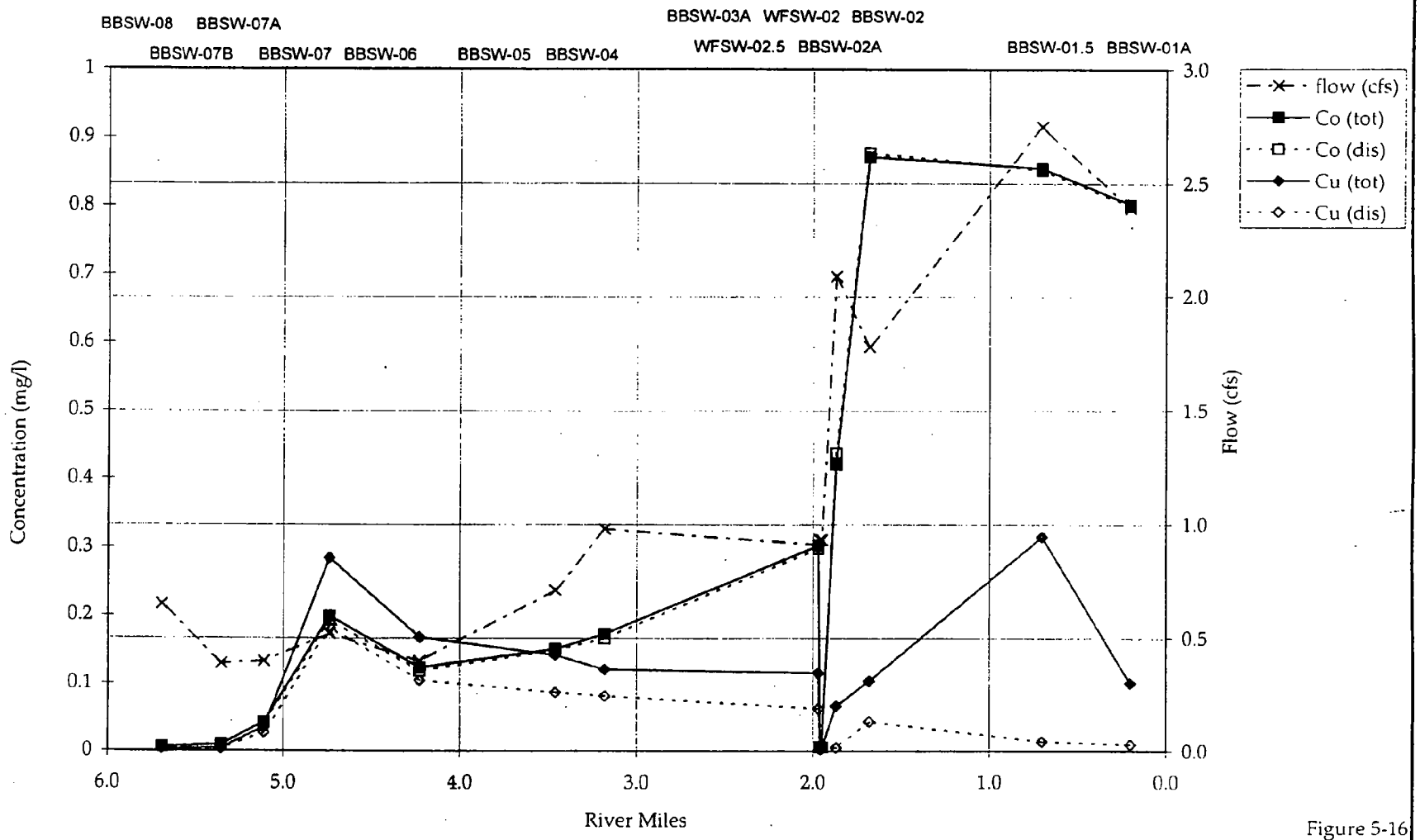

Figure 5-16

BLACKBIRD CREEK SYNOPTIC COBALT AND COPPER CONCENTRATION FALL 2000

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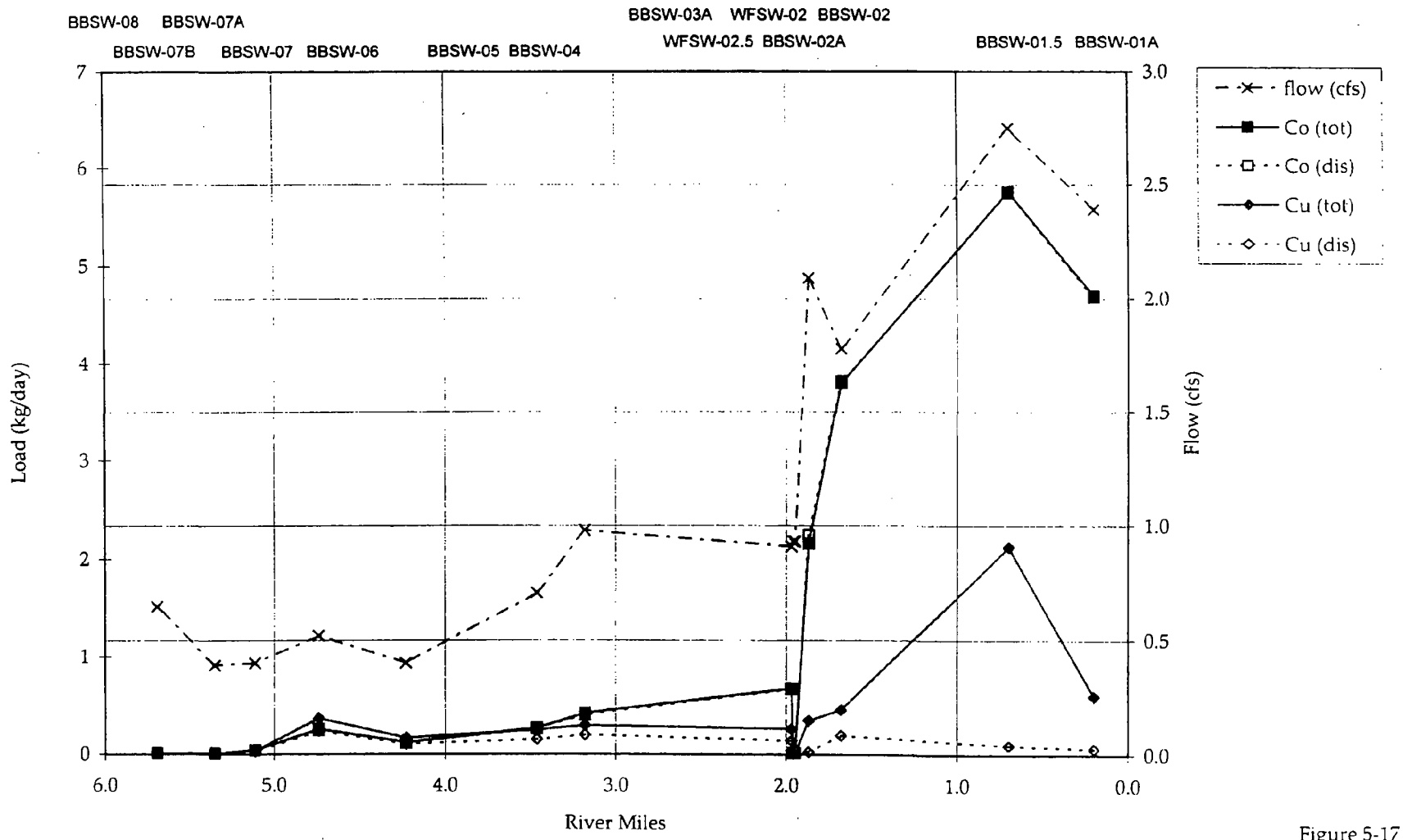

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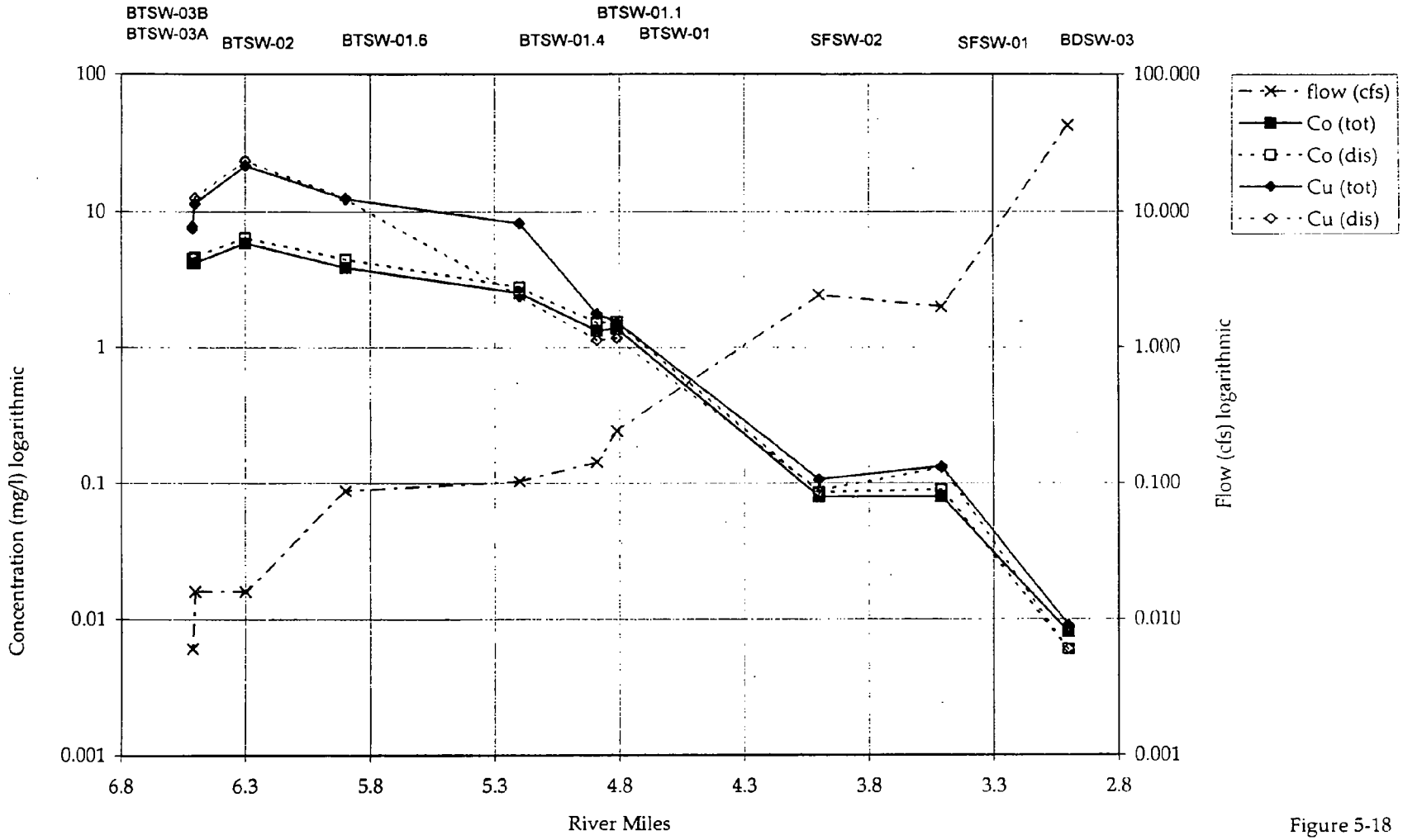

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BUCKTAIL CREEK SYNOPTIC COBALT AND COPPER CONCENTRATION SPRING 2000
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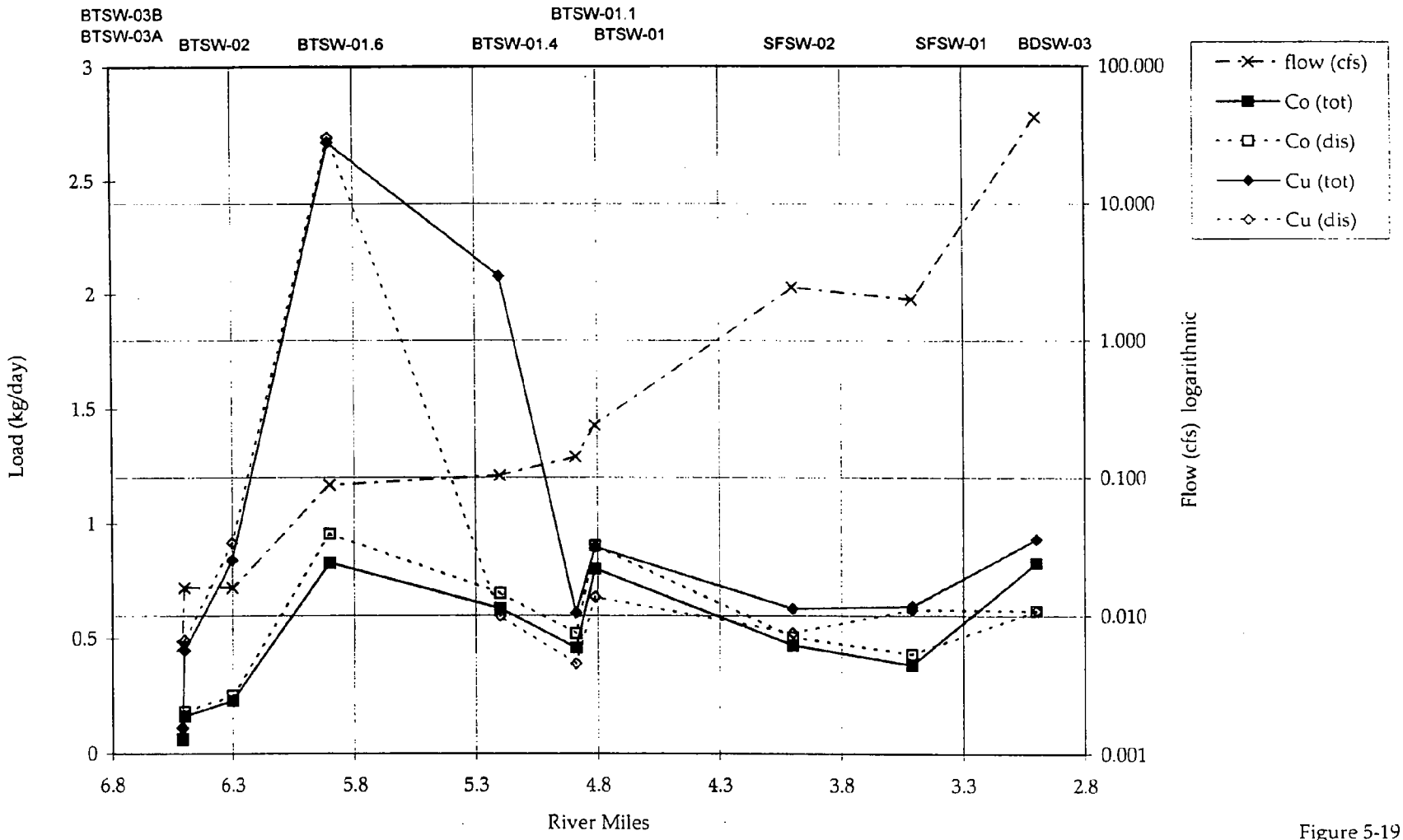

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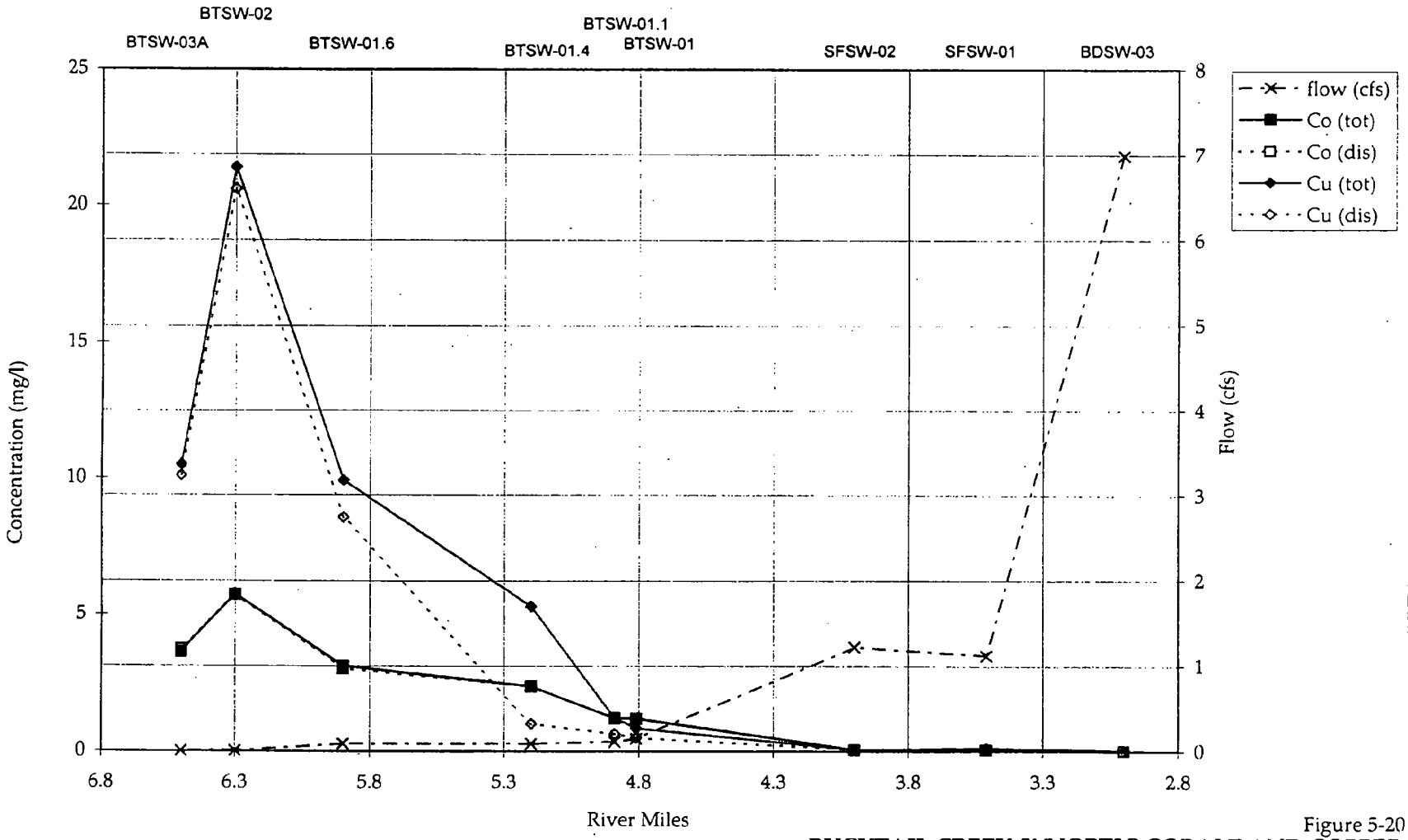

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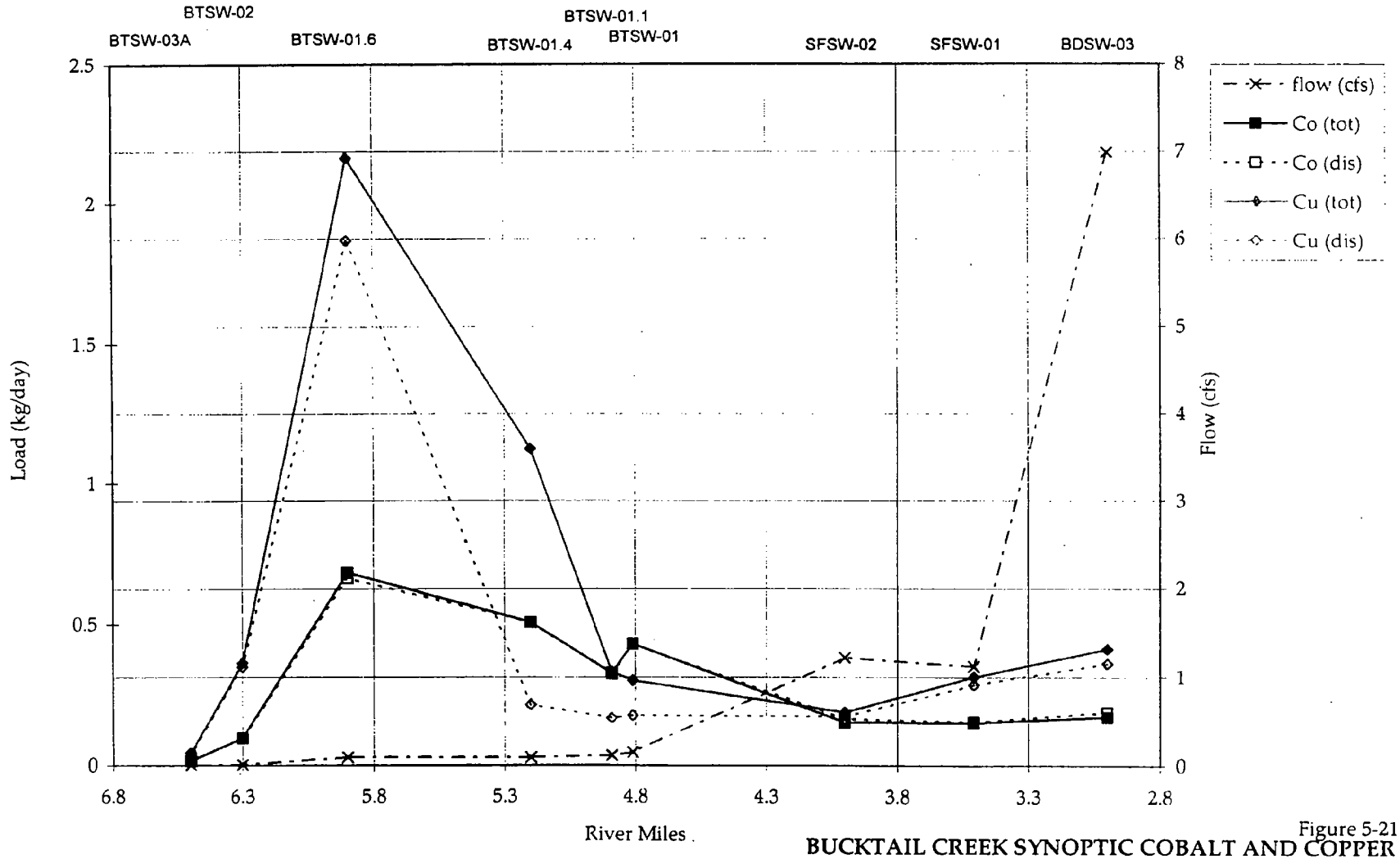

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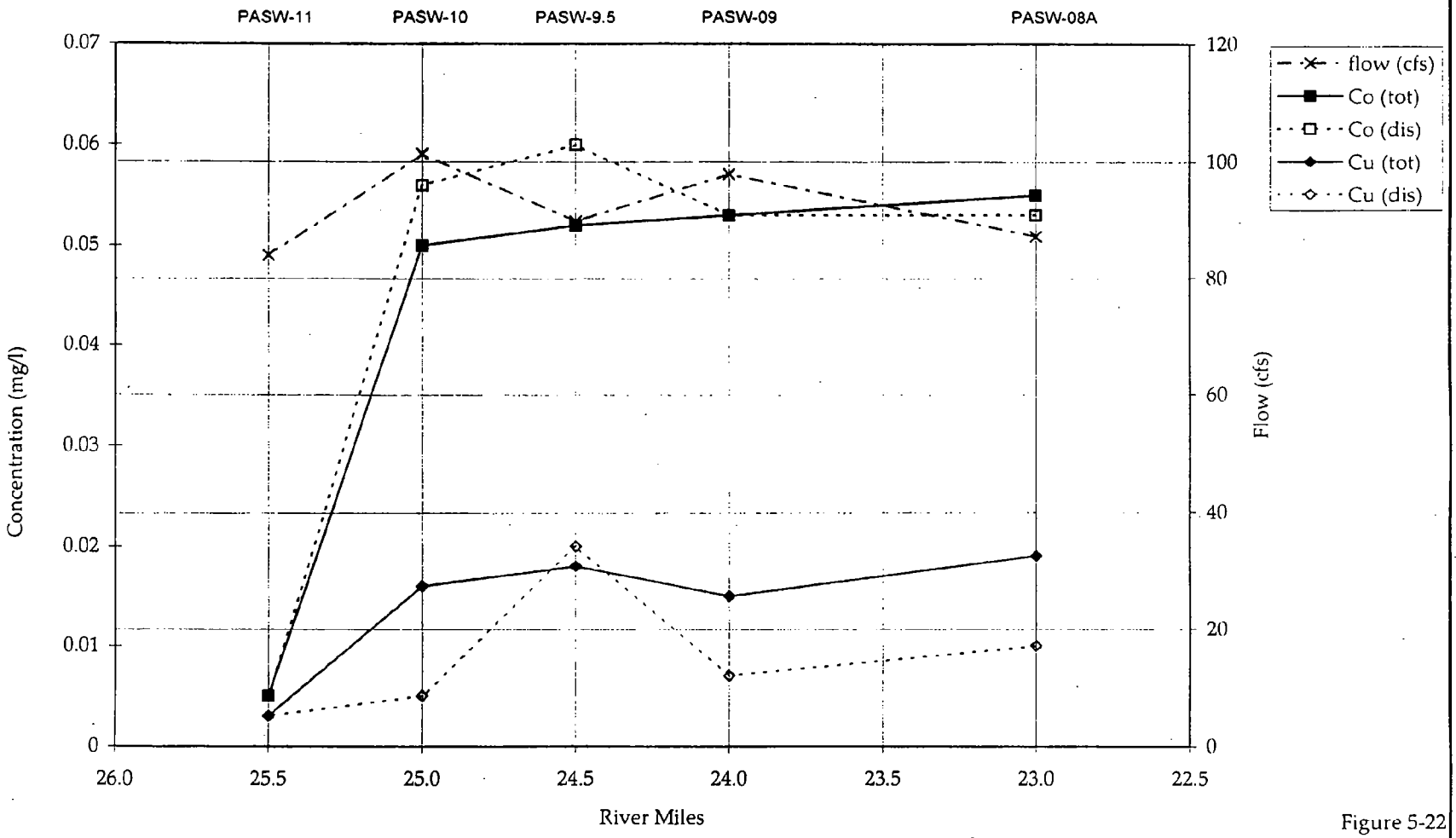

Figure 5-22

PANTHER CREEK SYNOPTIC COBALT AND COPPER CONCENTRATION SPRING 2000

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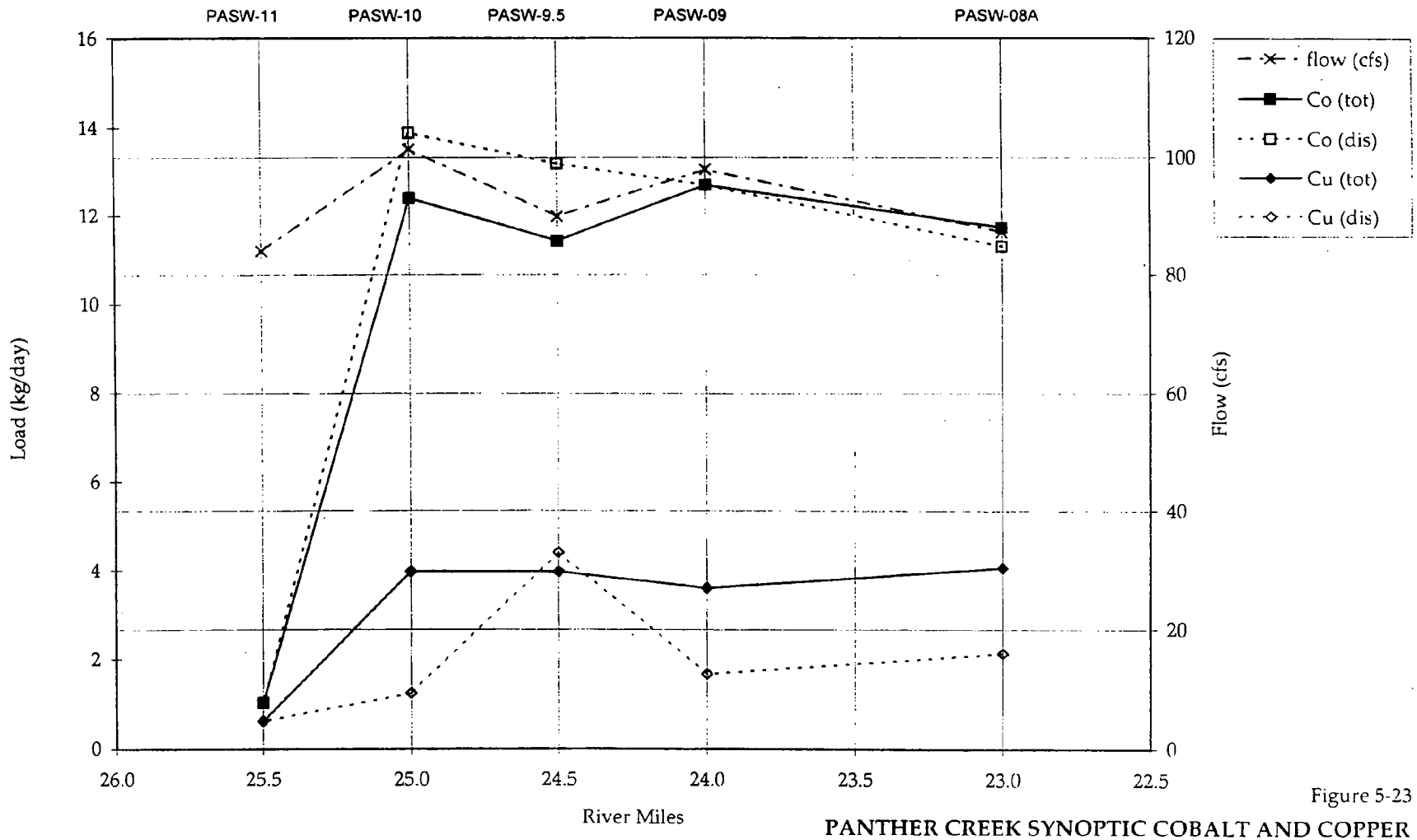

Figure 5-23

PANTHER CREEK SYNOPTIC COBALT AND COPPER LOADING SPRING 2000

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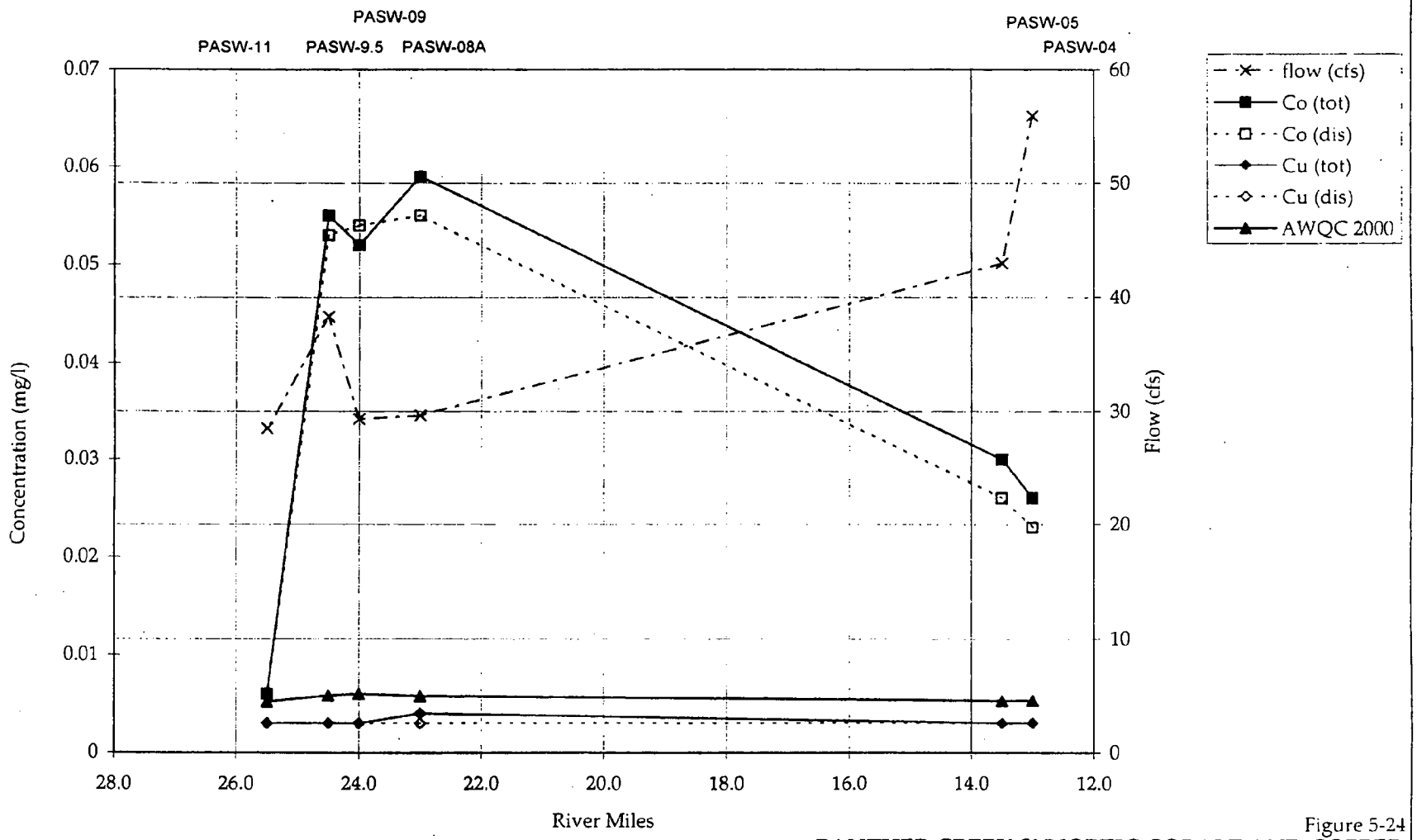

Figure 5-24
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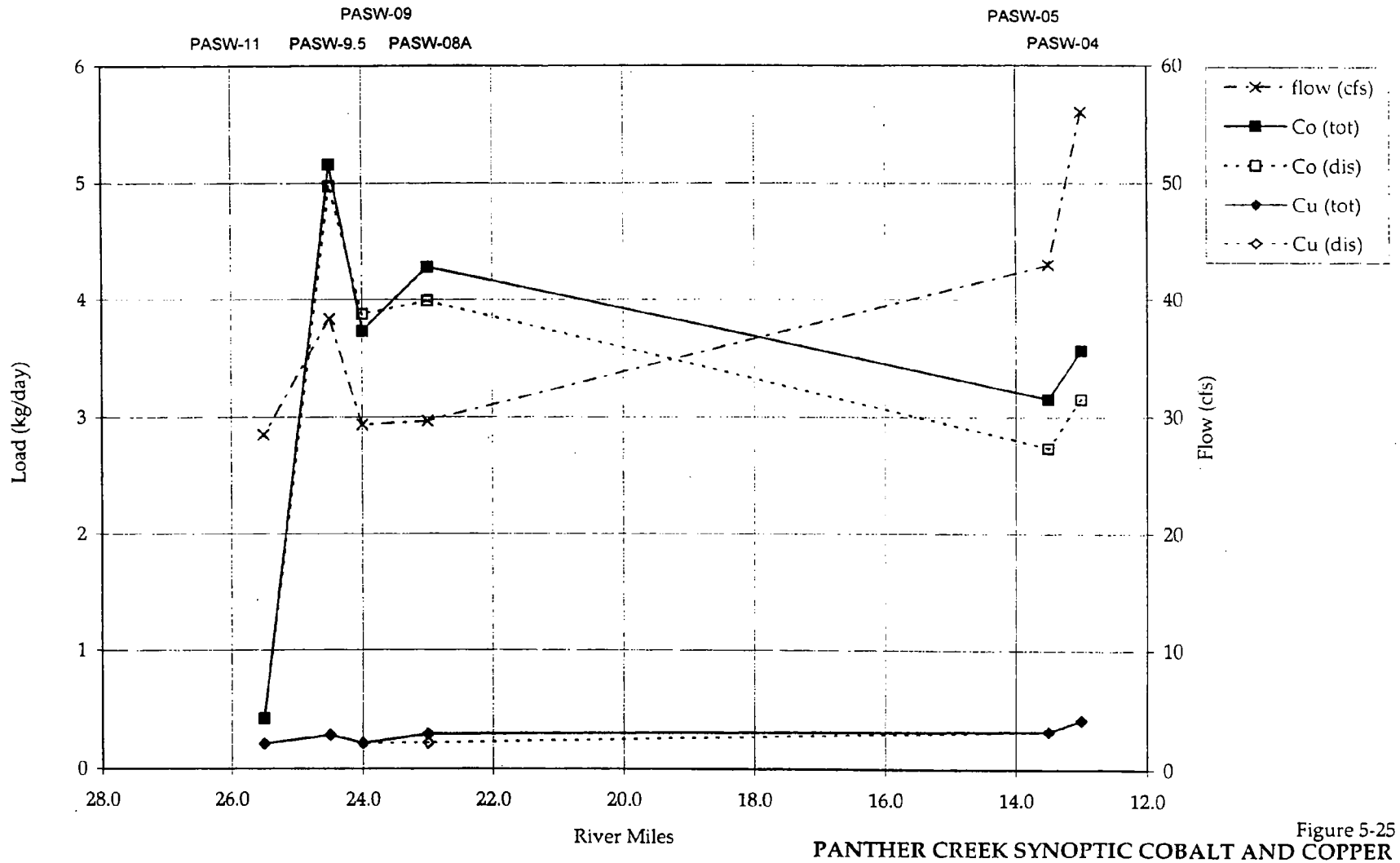

Figure 5-25
PANTHER CREEK SYNOPTIC COBALT AND COPPER LOADING FALL 2000
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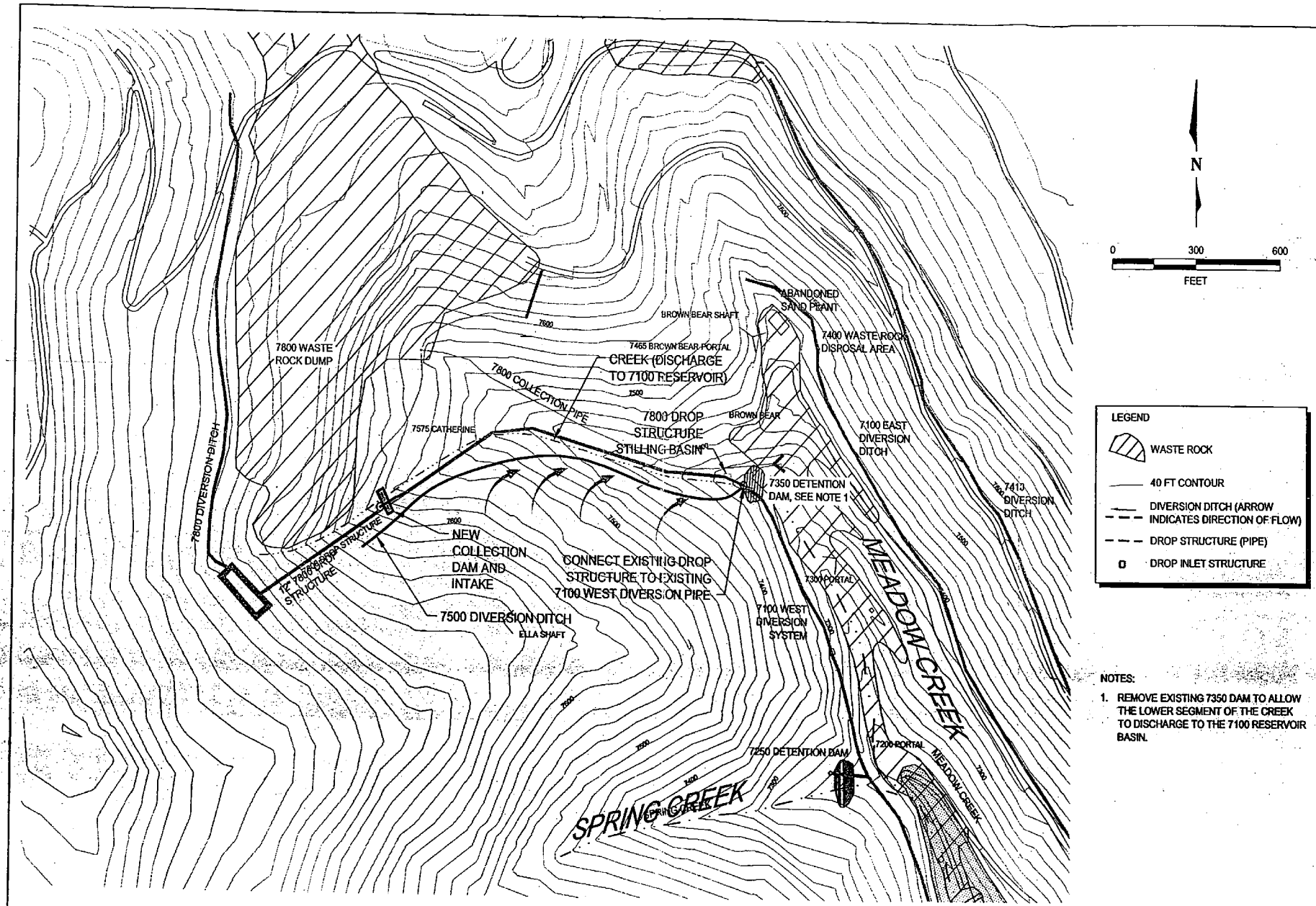

FIGURE **9-1**

MEADOW CREEK SEEP COLLECTION-CLEANWATER DIVERSION OPTION

FEASIBILITY STUDY/BLACKBIRD MINE SITE/ID

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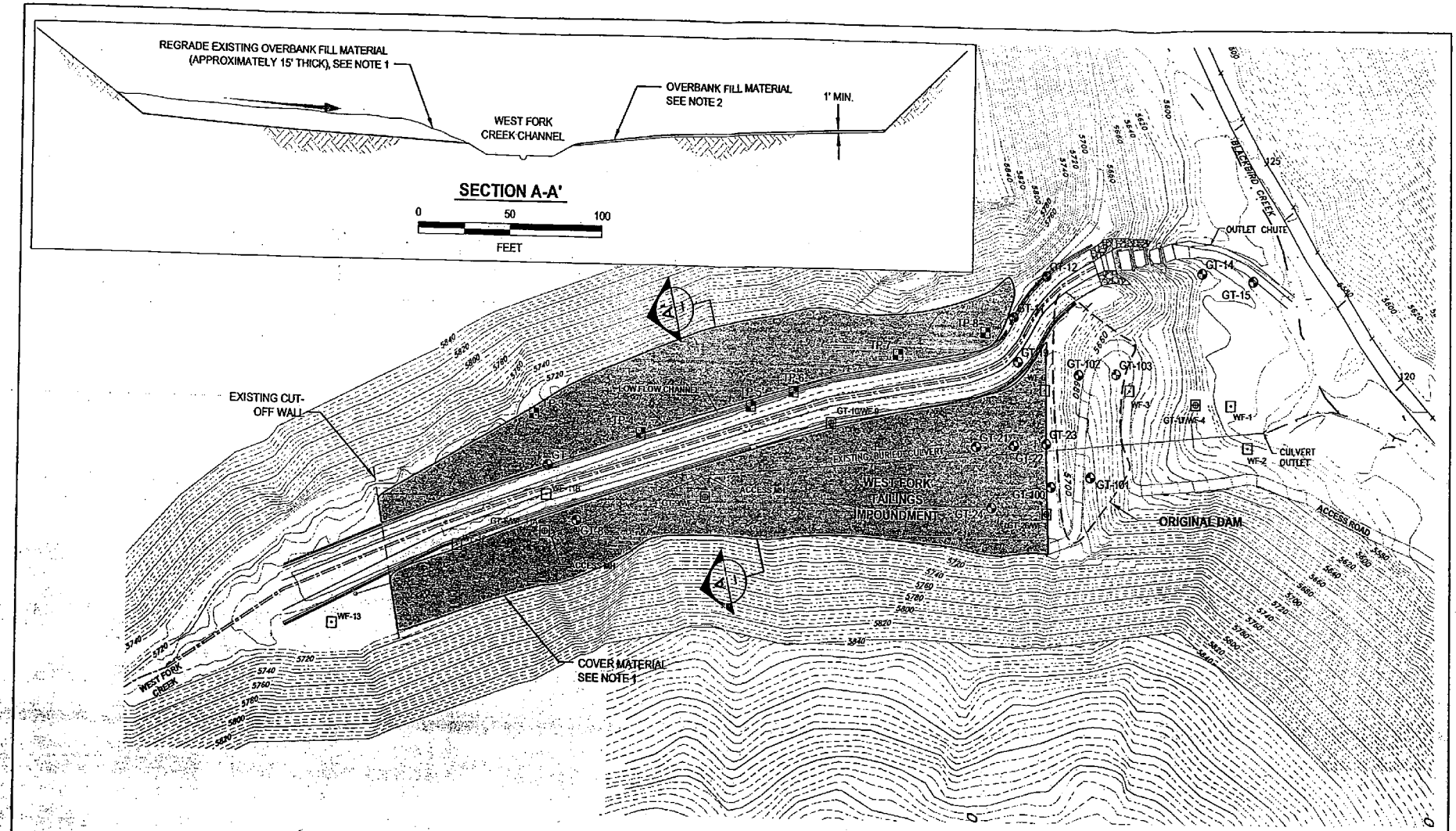

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FIGURE **9-2**

TAILINGS IMPOUNDMENT SOIL COVER

FEASIBILITY STUDY/BLACKBIRD MINE SITE/ID

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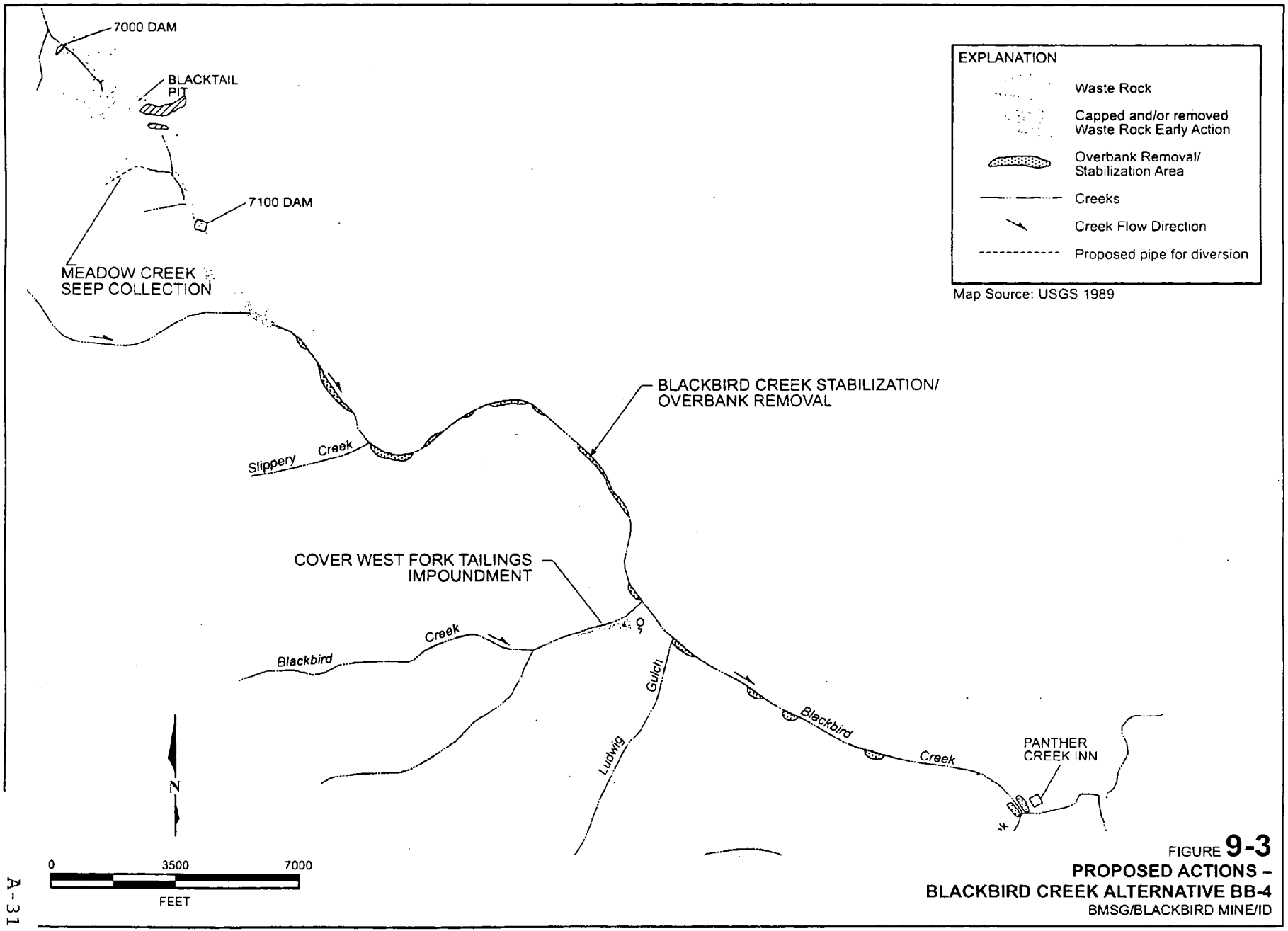


FIGURE **9-3**
PROPOSED ACTIONS – BLACKBIRD CREEK ALTERNATIVE BB-4
BMSG/BLACKBIRD MINE/ID

After Golder Associates

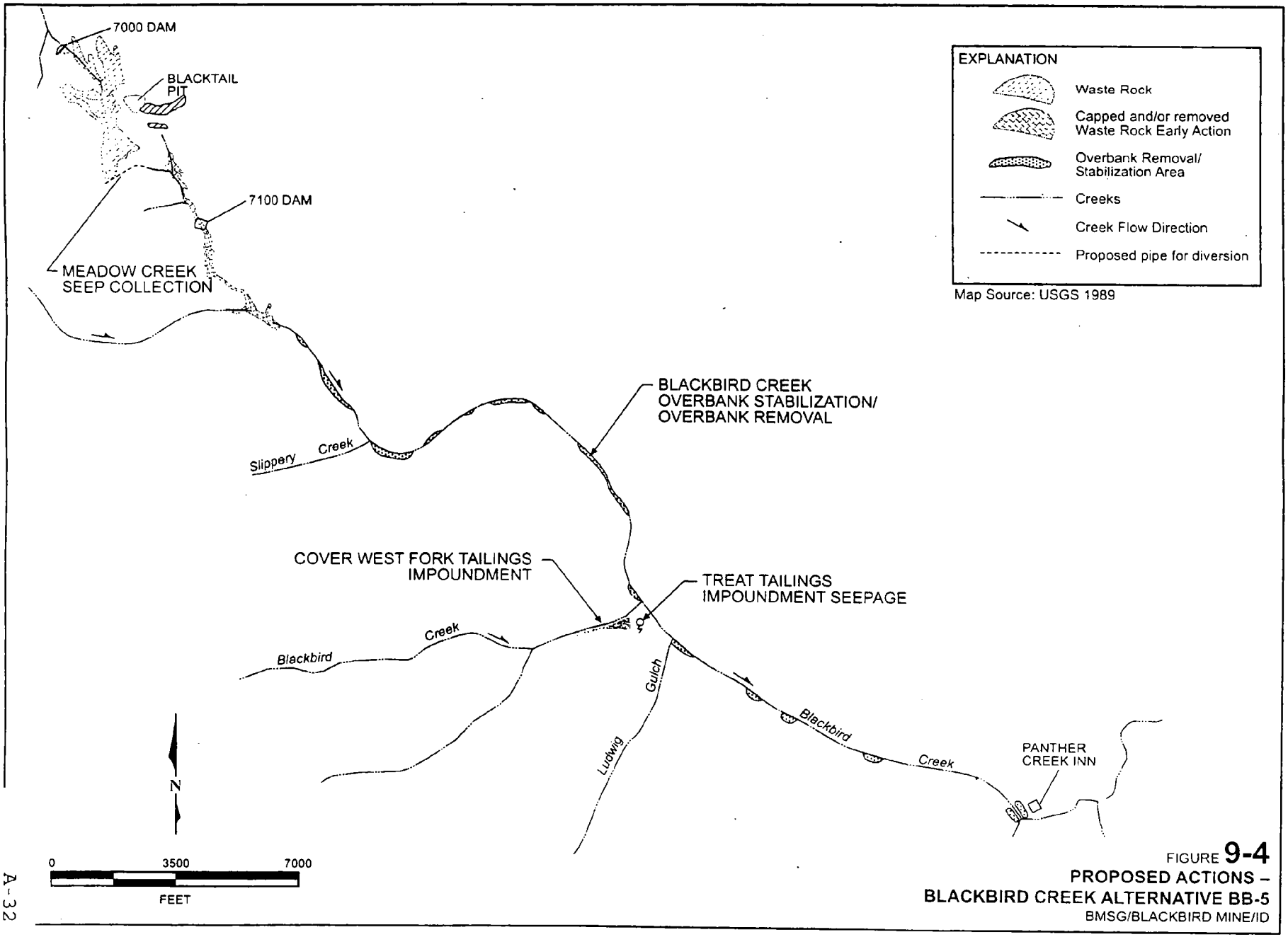


FIGURE **9-4**
PROPOSED ACTIONS – BLACKBIRD CREEK ALTERNATIVE BB-5
BMSG/BLACKBIRD MINE/ID

After Golder Associates

Proj\152238\ROD FILES\FINAL ROD FIGURES\FIG9-5 FH10 21-JAN-2003

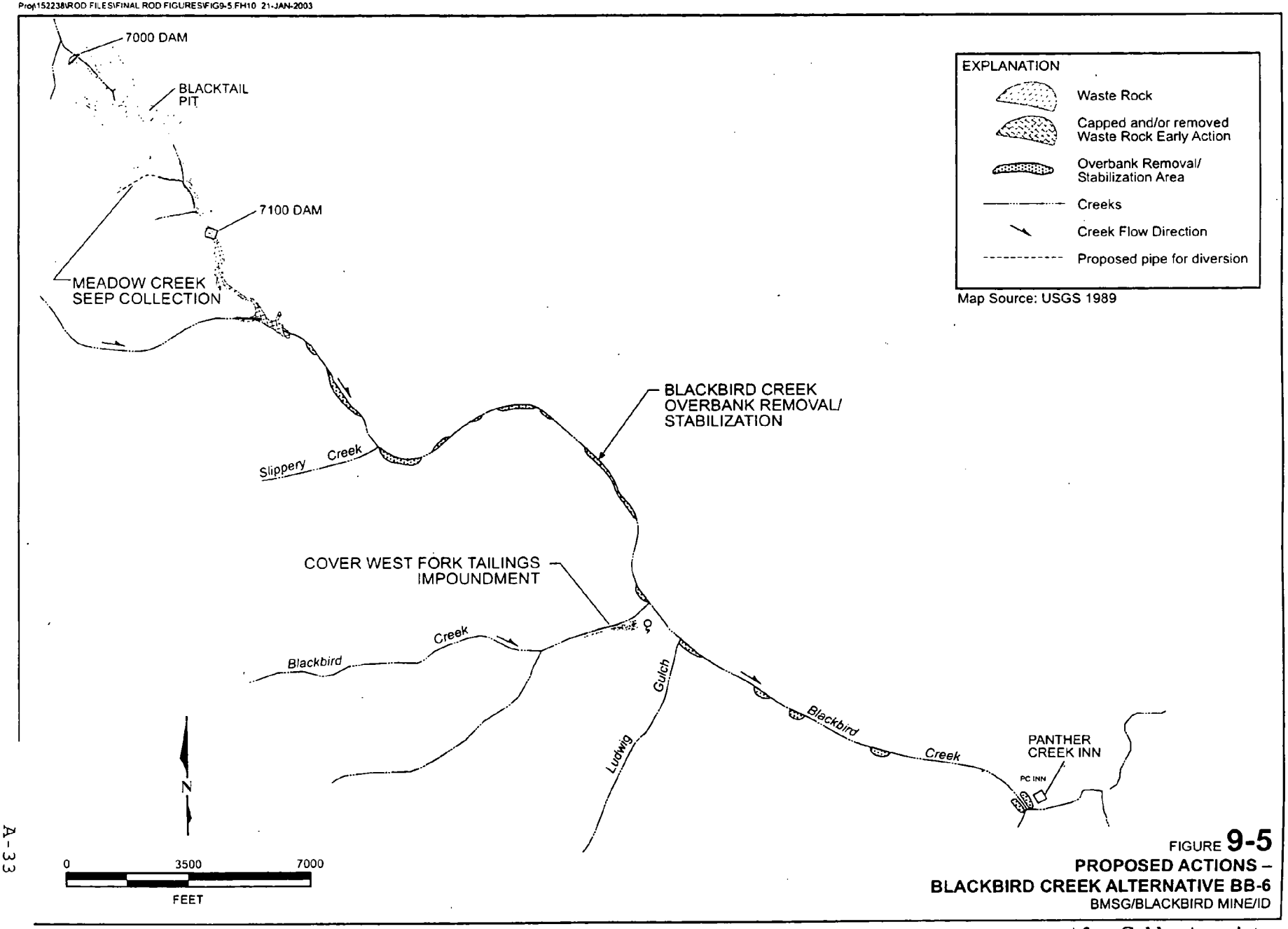


FIGURE **9-5**

PROPOSED ACTIONS – BLACKBIRD CREEK ALTERNATIVE BB-6

BMSG/BLACKBIRD MINE/ID

After Golder Associates

Proj\152238\ROD FILES\FINAL ROD FIGURES\FIG9-6 FH10 21-JAN-2003

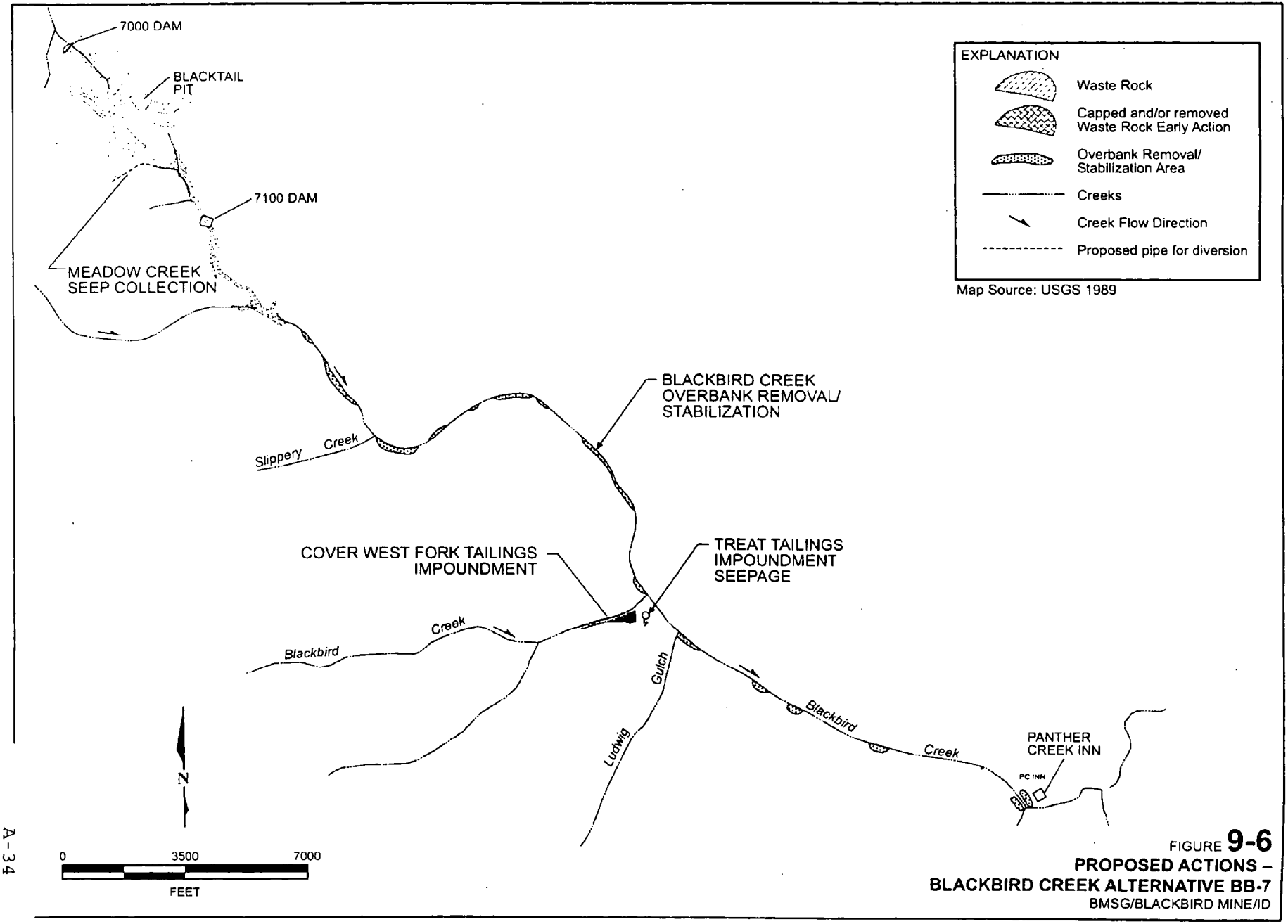


FIGURE **9-6**

PROPOSED ACTIONS – BLACKBIRD CREEK ALTERNATIVE BB-7

BMSG/BLACKBIRD MINE/ID

After Golder Associates

Proj\152238\ROD FILES\FINAL ROD FIGURES\FIG9-7.FH10 21-JAN-2003

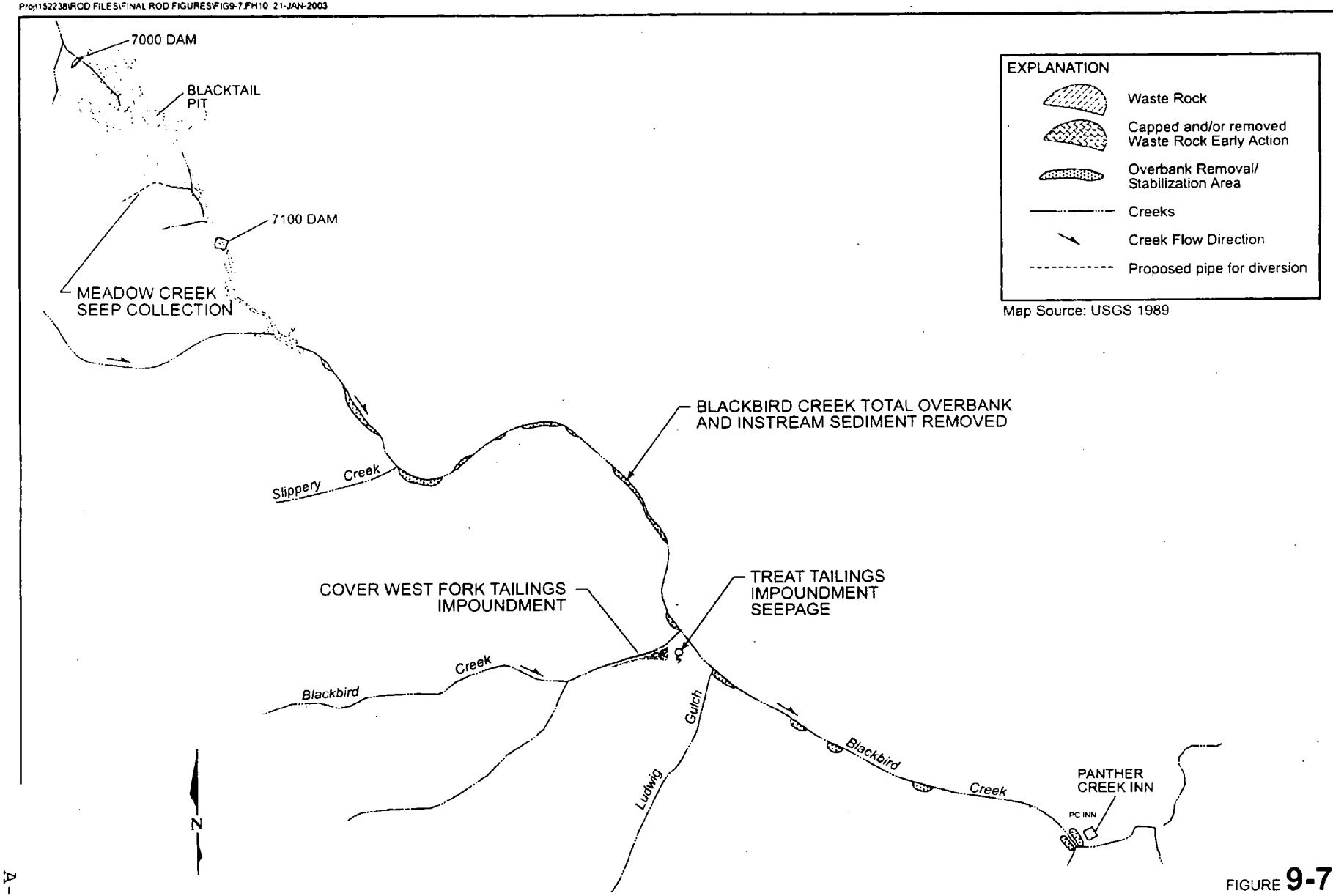


FIGURE **9-7**

PROPOSED ACTIONS – BLACKBIRD CREEK ALTERNATIVE BB-8

BMSG/BLACKBIRD MINE/ID

After Golder Associates

Proj\152236\ROD FILES\FINAL ROD FIGURES\FIG9-8.FH10 21-JAN-2003

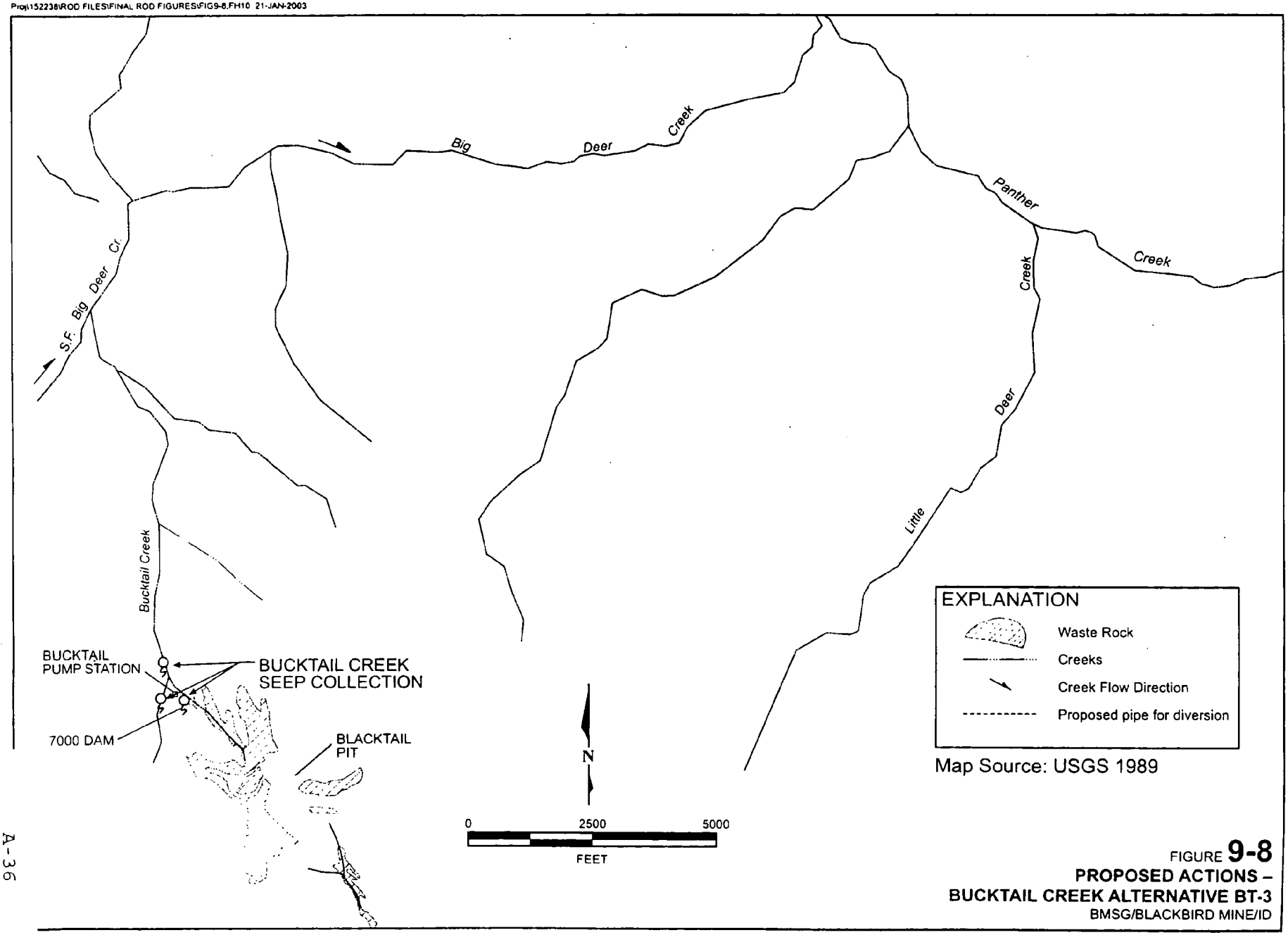
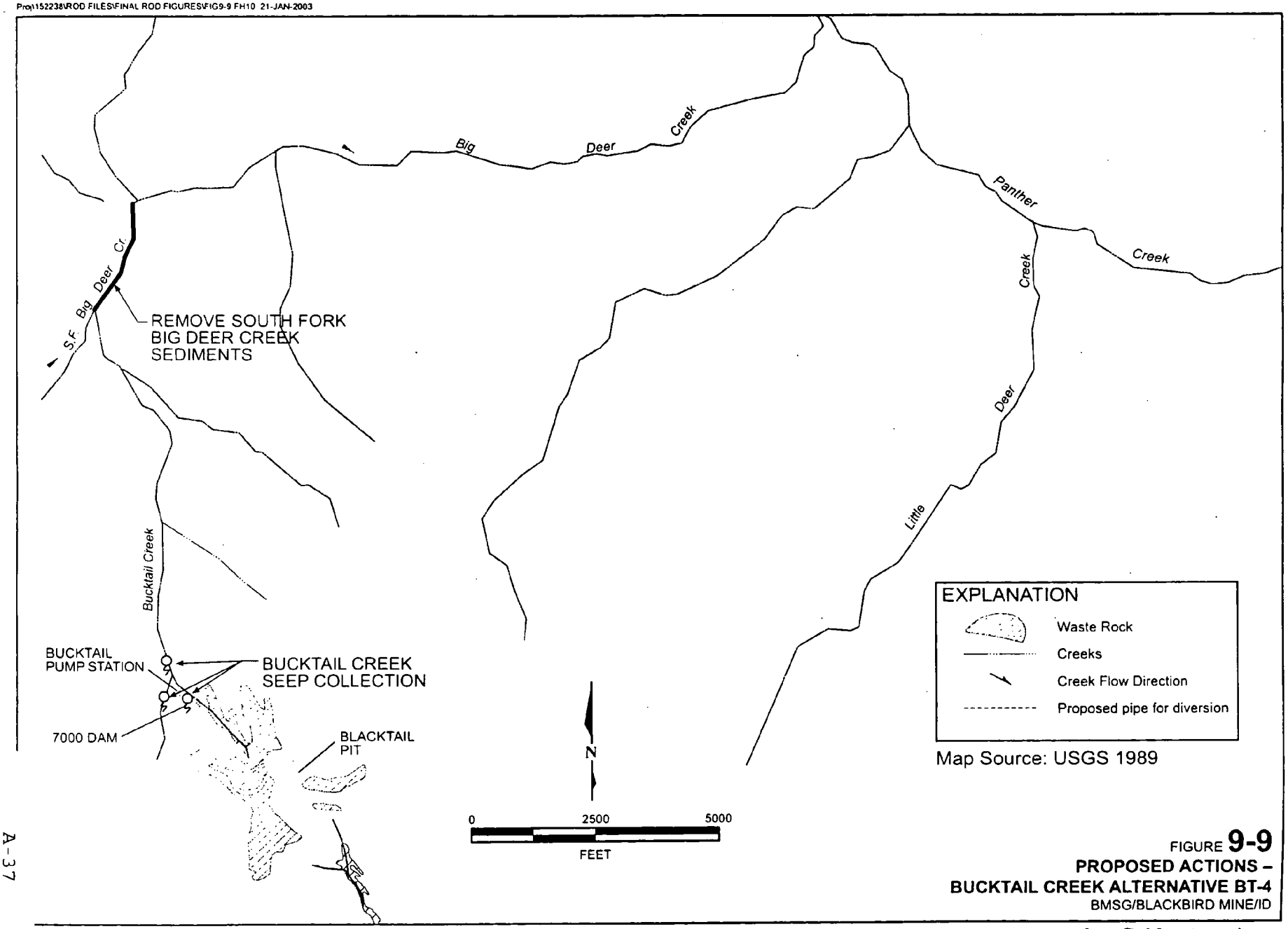


FIGURE **9-8**
PROPOSED ACTIONS –
BUCKTAIL CREEK ALTERNATIVE BT-3
BMSG/BLACKBIRD MINE/ID

After Golder Associates

Proj\152238\ROD FILES\FINAL ROD FIGURES\FIG9-9 FH10 21-JAN-2003



Map Source: USGS 1989

FIGURE **9-9**
PROPOSED ACTIONS –
BUCKTAIL CREEK ALTERNATIVE BT-4
BMSG/BLACKBIRD MINE/ID

After Golder Associates

Proj\152238\ROD FILES\FINAL ROD FIGURES\FIG9-10 FH10 21-JAN-2003

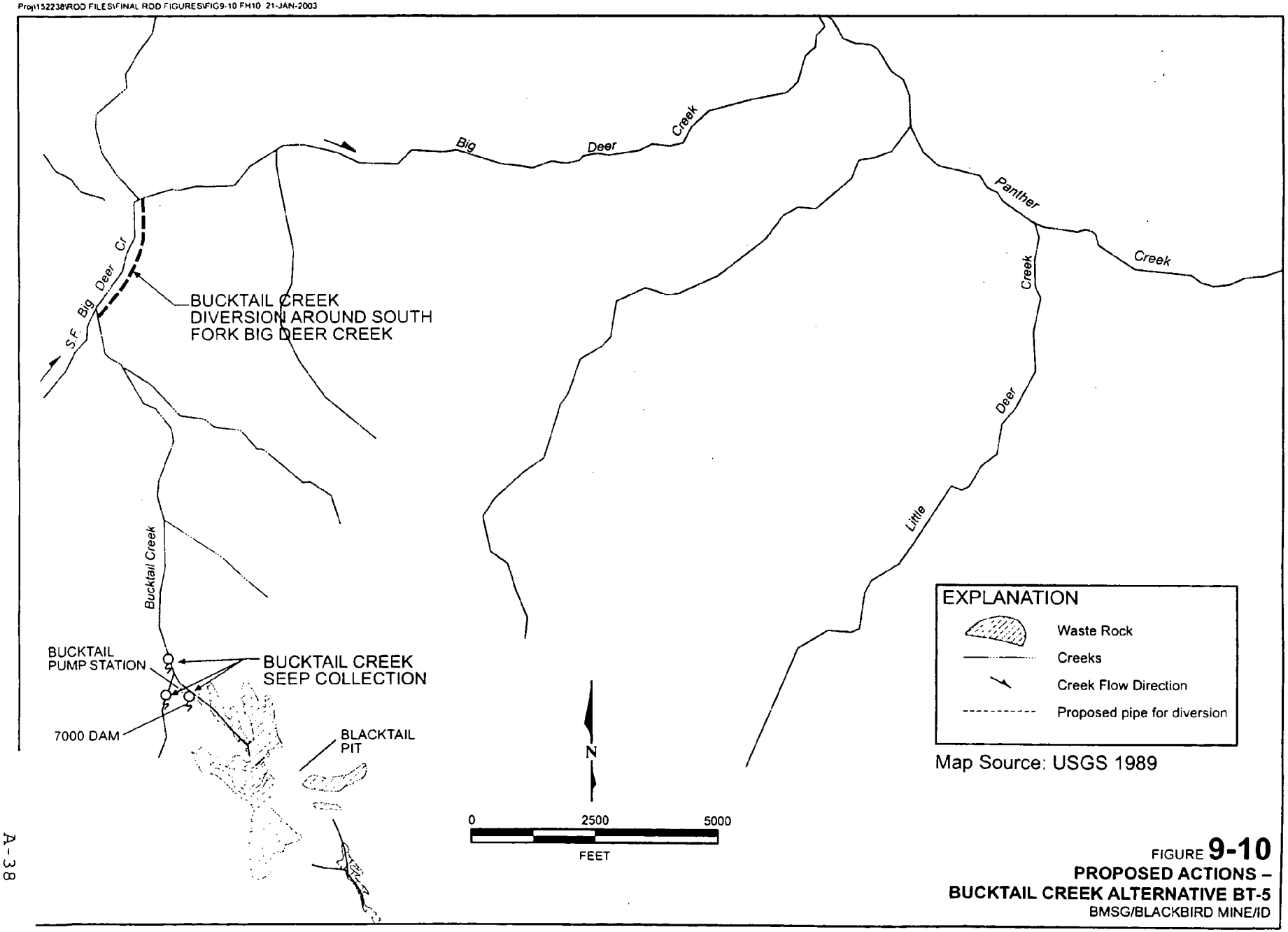
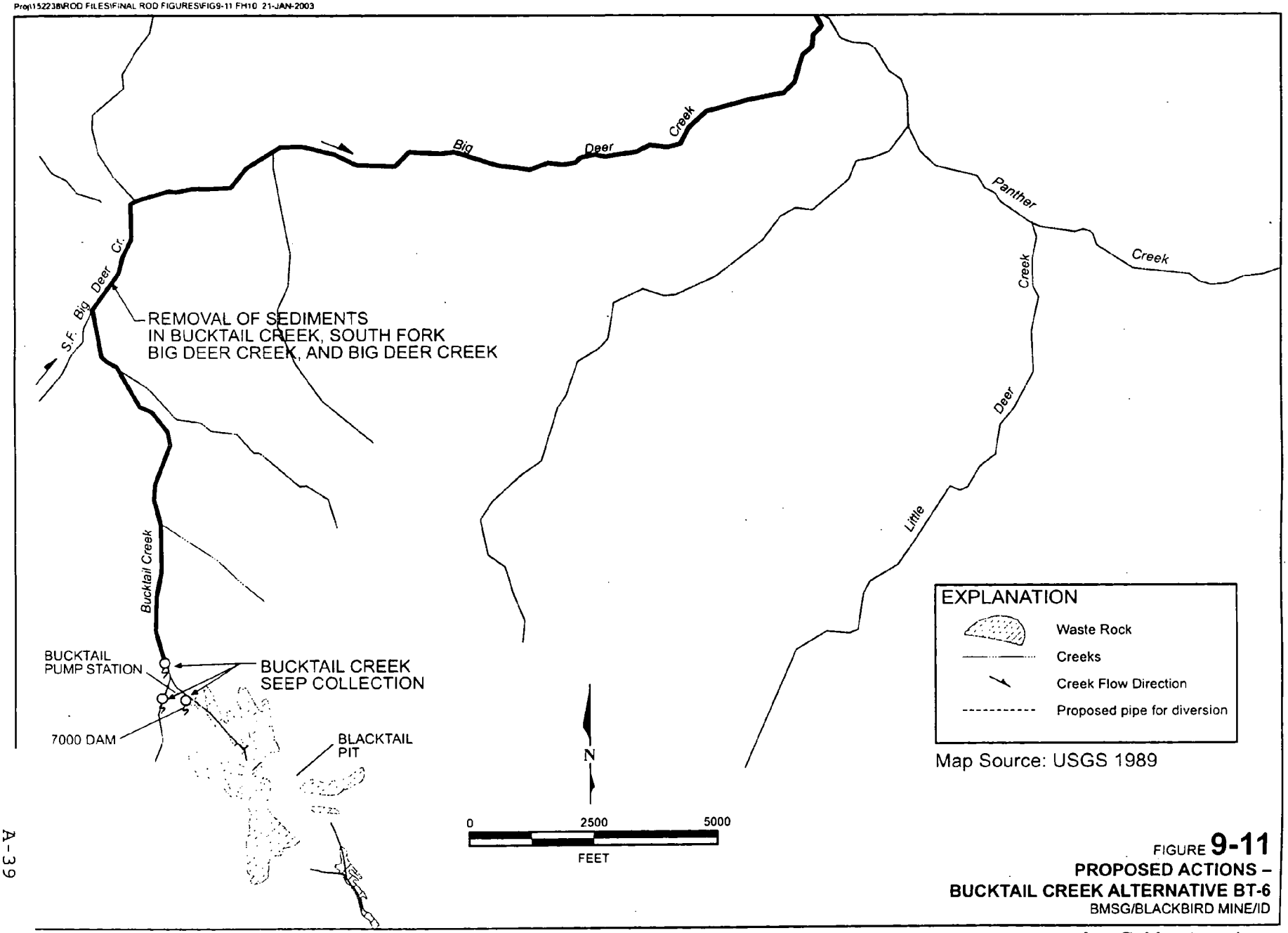


FIGURE **9-10**
PROPOSED ACTIONS –
BUCKTAIL CREEK ALTERNATIVE BT-5
BMSG/BLACKBIRD MINE/ID

After Golder Associates

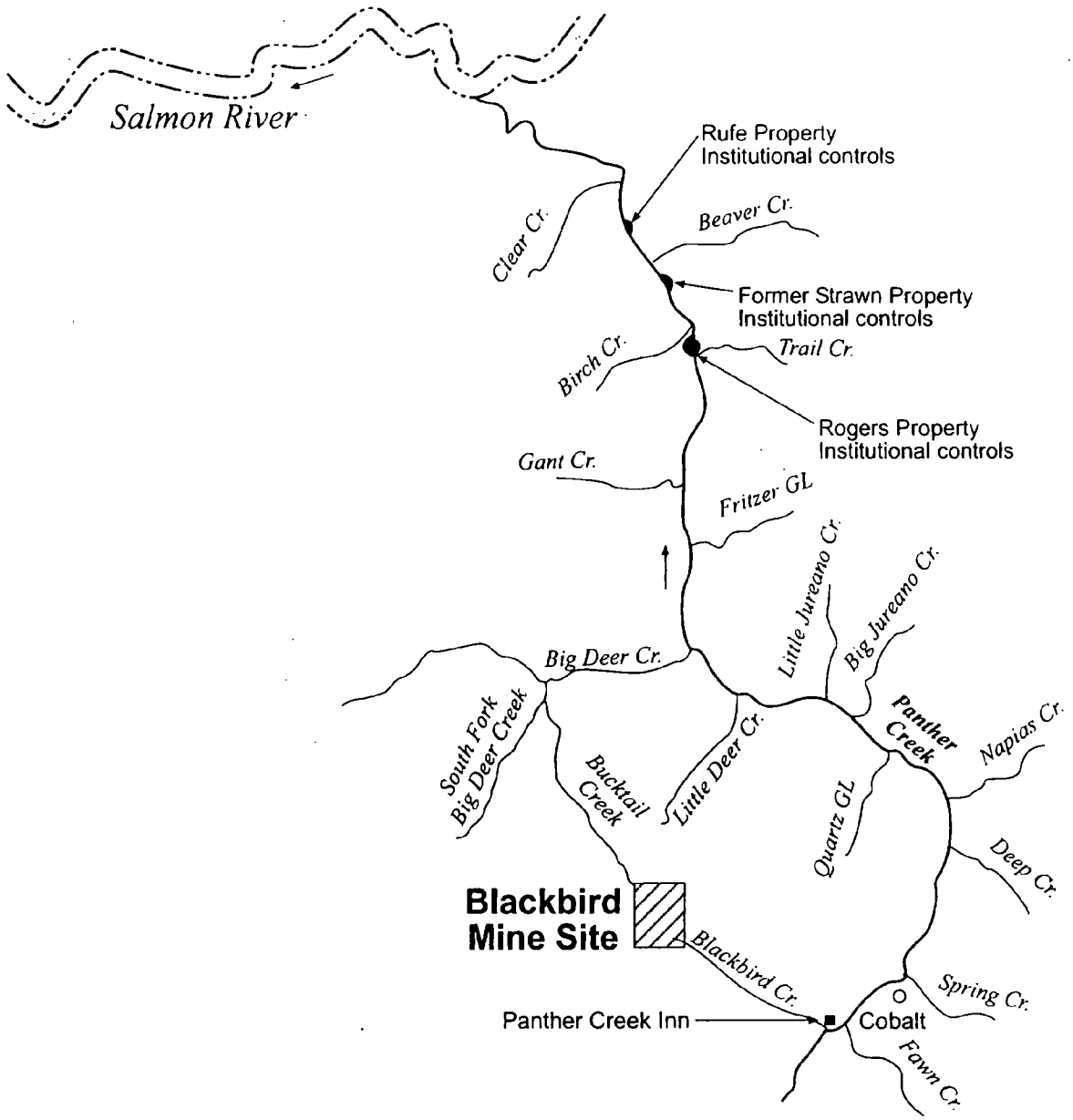
Proj\152238\ROD FILES\FINAL ROD FIGURES\FIG9-11 FH10 21-JAN-2003

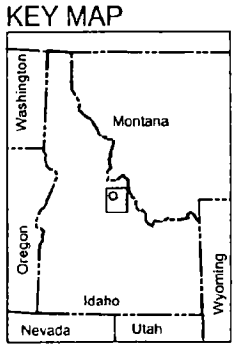


Map Source: USGS 1989

FIGURE **9-11**
PROPOSED ACTIONS –
BUCKTAIL CREEK ALTERNATIVE BT-6
BMSG/BLACKBIRD MINE/ID

After Golder Associates





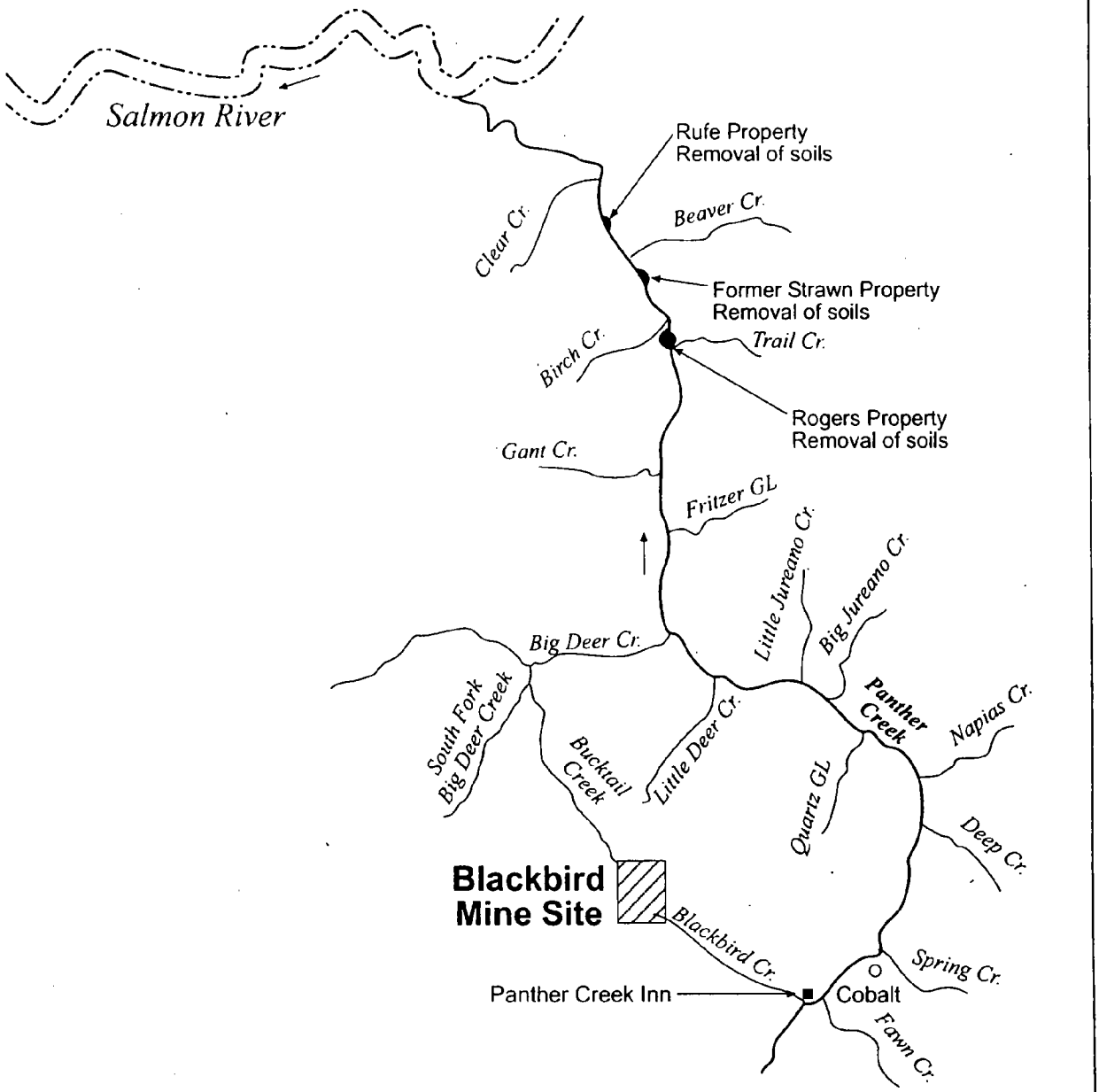
N

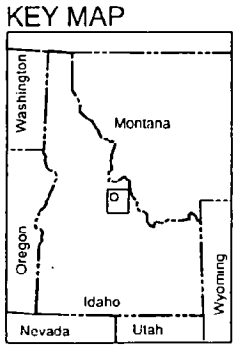
Not to Scale

FIGURE **9-12**
PROPOSED ACTIONS
PANTHER CREEK ALTERNATIVE P-2
BMSG/BLACKBIRD MINE SITE/ID

After Golder Associates

proj\152236\ROD FILES\FINAL ROD FIGURES\FIG9-12.FH10 21-JAN-2003



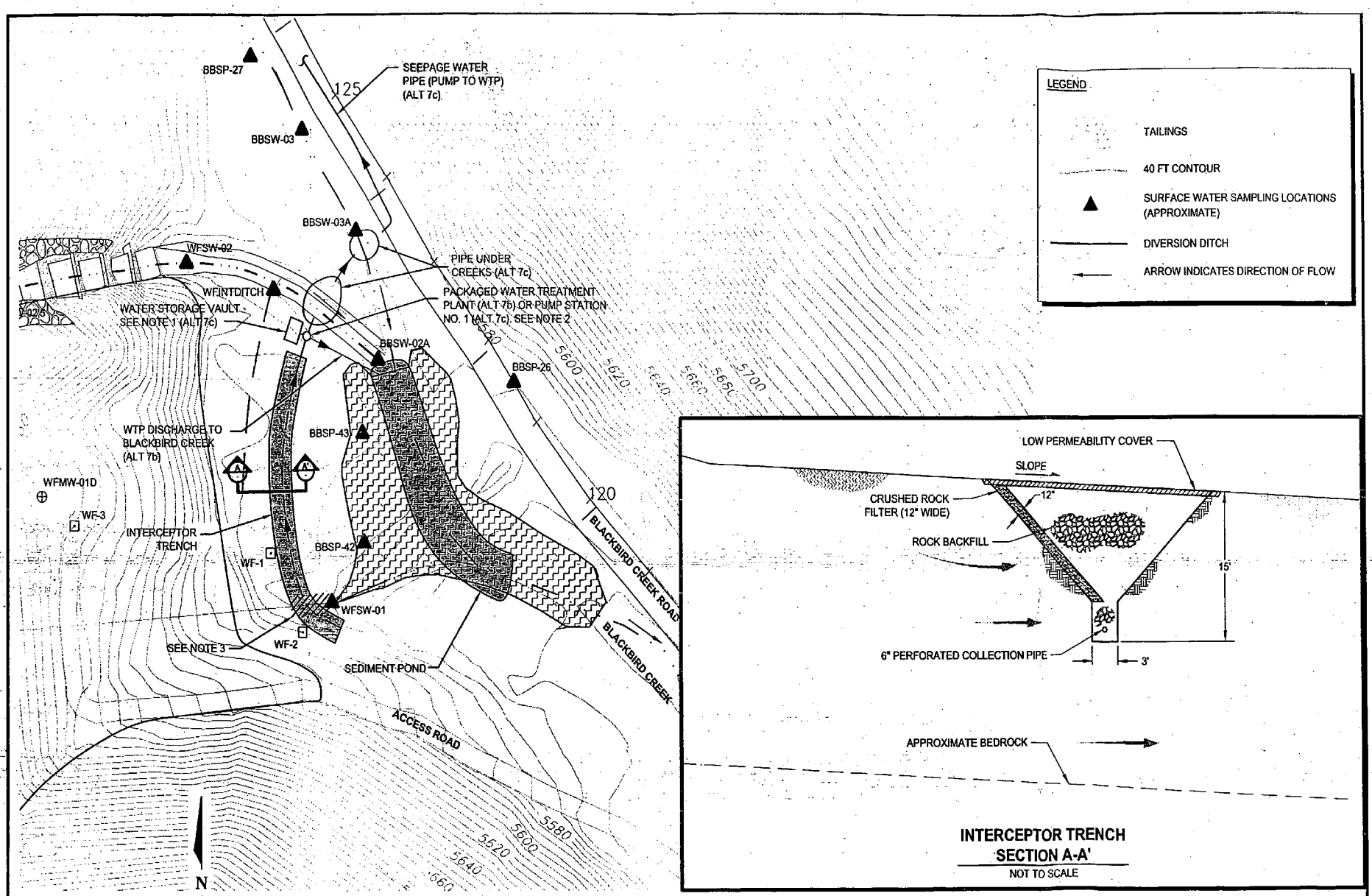


Not to Scale

FIGURE **9-13**
PROPOSED ACTIONS
PANTHER CREEK ALTERNATIVE P-3
BMSG/BLACKBIRD MINE SITE/ID

After Golder Associates

proj\15223\ROD FILES\FINAL ROD FIGURES\FIG9-13 FH10 21-JAN-2003



NOTES:

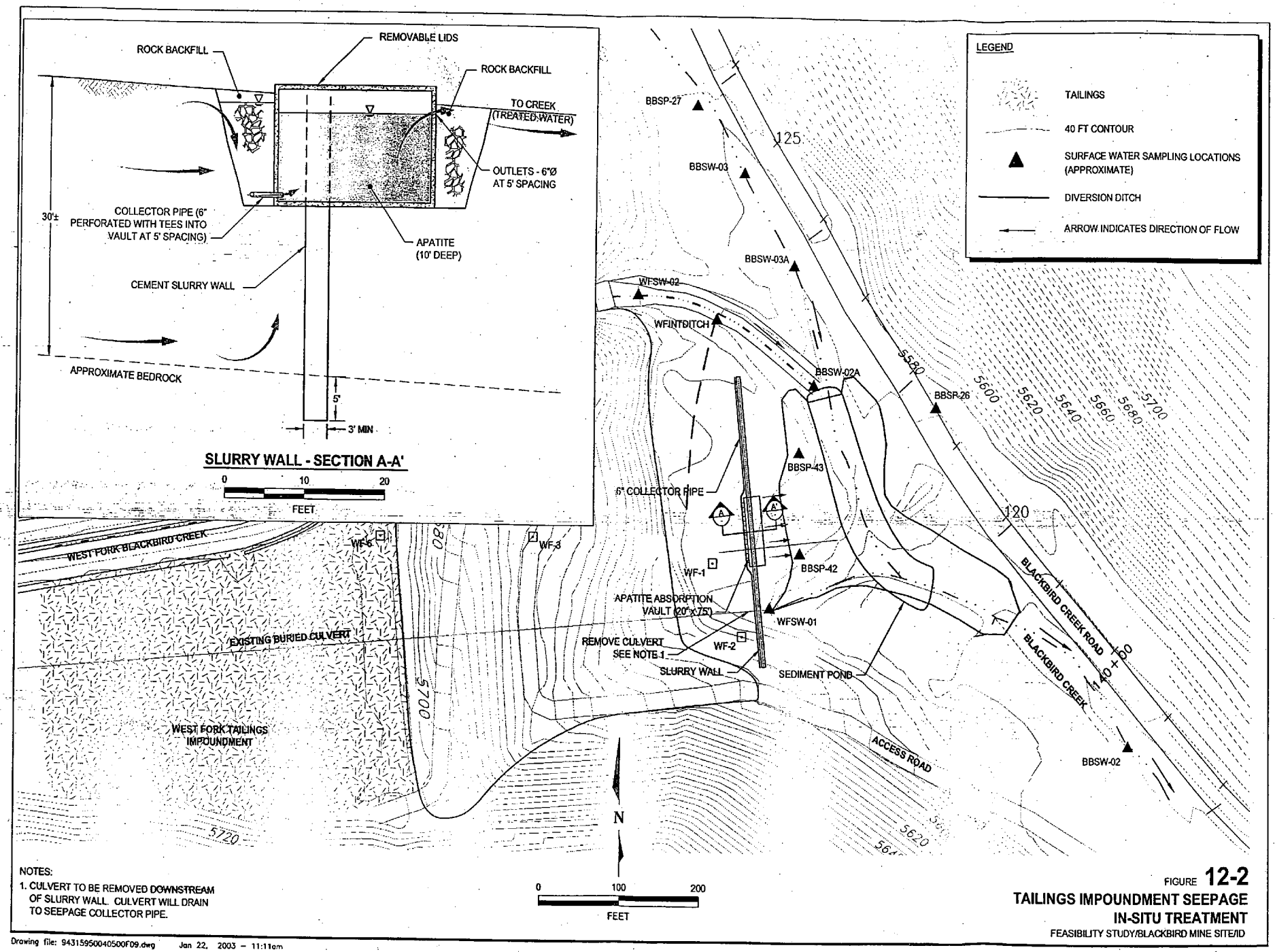
1. 5000 GALLON STORAGE VAULT. NORMALLY EMPTY. VAULT AVAILABLE FOR DRAIN DOWN OF PUMP LINE IF NECESSARY.
2. A TOTAL OF 4 PUMP STATIONS WILL BE UTILIZED TO PUMP SEEPAGE WATER TO THE 7100 DAM, OR 3 IF PUMPING DIRECTLY TO THE WTP.
3. REMOVE CULVERT DOWNSTREAM OF INTERCEPTOR TRENCH.

FIGURE **12-1**

TAILINGS IMPOUNDMENT SEEPAGE IN-SITU ACTIVE TREATMENT OR COLLECTION-PUMP BACK

FEASIBILITY STUDY/BLACKBIRD MINE SITE/ID

After Golder Associates

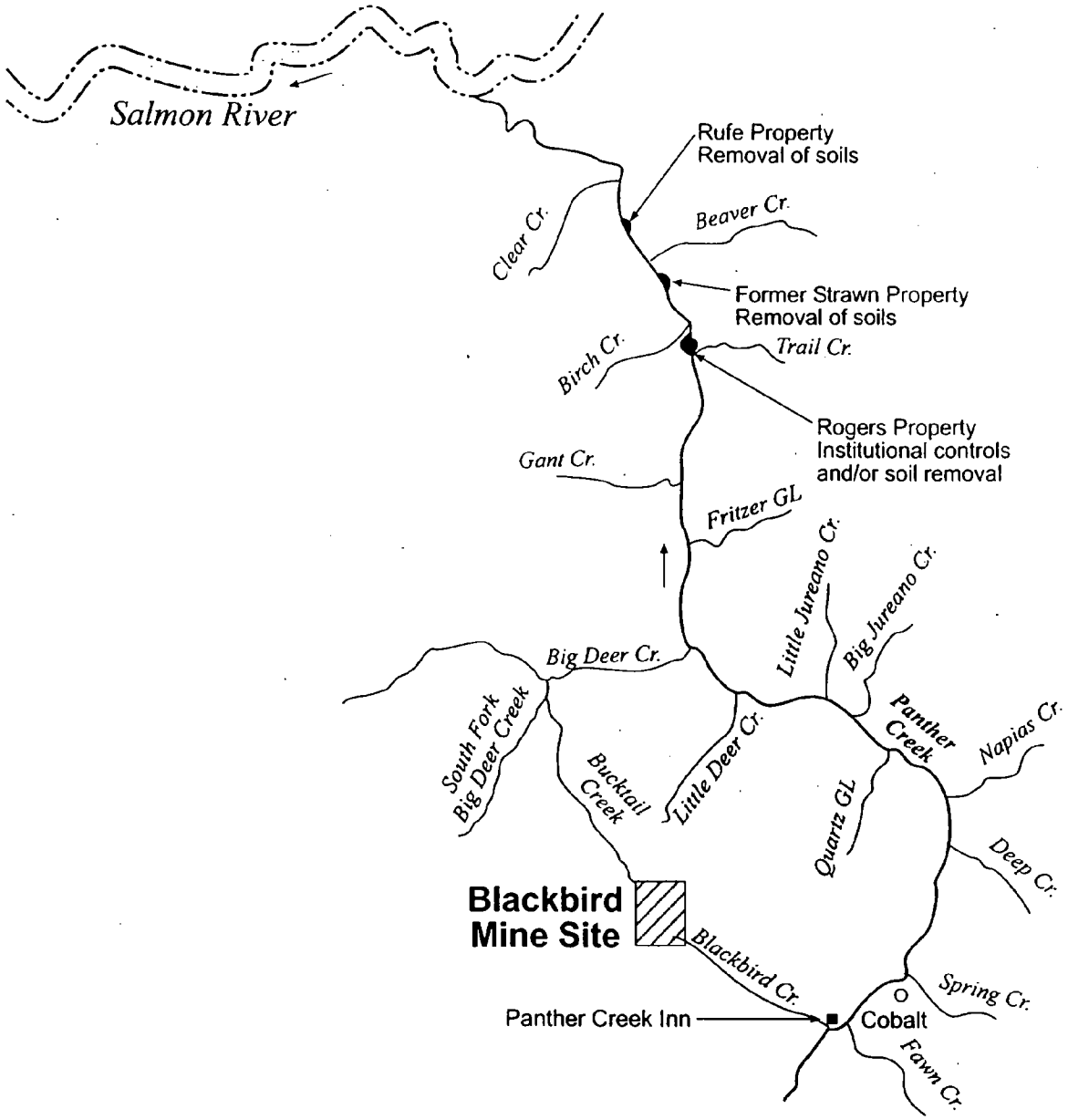


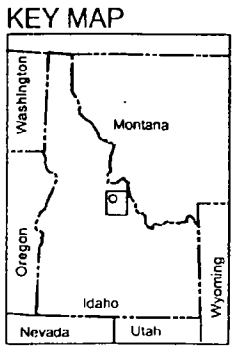
NOTES:
1. CULVERT TO BE REMOVED DOWNSTREAM OF SLURRY WALL. CULVERT WILL DRAIN TO SEEPAGE COLLECTOR PIPE.

FIGURE **12-2**
TAILINGS IMPOUNDMENT SEEPAGE IN-SITU TREATMENT
FEASIBILITY STUDY/BLACKBIRD MINE SITE/ID

Drawing file: 9431595004050OF09.dwg Jan 22, 2003 - 11:11am

Golder Associates





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Not to Scale

FIGURE 12-3
PROPOSED ACTIONS
PANTHER CREEK COMBINED
ALTERNATIVES P-2 AND P-3
BMSG/BLACKBIRD MINE SITE/ID

After Golder Associates

proj\15223A\ROD FILES\FINAL ROD FIGURES\FIG12-3.PH10 22-JAN-2003