*Final*

---

# CONTINGENCY PLAN FOR EXCEEDANCE OF DOWNSTREAM SURFACE WATER QUALITY STANDARDS/WARNING LIMITS

---

***Milltown Reservoir Sediments Site***

Prepared by:

ENVIROCON

**May 25, 2006**

## TABLE OF CONTENTS



## LIST OF TABLES



## LIST OF FIGURES

Figure 5 Reservoir Pool Elevation Versus Measured Dissolved Copper Concentrations at CFR Above Missoula Station During 2002, 2004 & 2005 Drawdowns

# 1.0 INTRODUCTION

This contingency plan develops the set of best management practices (BMPs), other controls and/or treatment options for water produced from/impacted by reservoir drawdown, storm water runoff or sediment dewatering to be considered if Remedial Action (RA) activities cause exceedance of temporary surface water quality standards and/or warning limits at the Milltown Project Surface Water Point of Compliance (POC) located at the United States Geologic Survey's (USGS) Clark Fork River (CFR) above Missoula Station (12340500). The plan includes a decision matrix as to the type of BMP, other control or treatment option, if any, to be employed based on the cause (i.e., contributing activity or source), nature, duration and extent of the exceedance. The evaluation considers the potential benefits (i.e., expected reduction in concentration of exceeding parameter) and the costs (e.g., budget, schedule and, if applicable, potential short-term adverse environmental or worker/public safety impacts) of implementing one or more mitigative measures.

While this contingency plan specifies detailed processes for determining whether the cause of increased arsenic or contaminant concentrations is RA activities, an effective plan to address such increases will require that actions be taken quickly. If EPA, in consultation with the State, determines that exceedances of a standard is threatened (i.e., warning limits are exceeded), and that additional mitigative measures can reduce that threat, EPA may require that additional mitigative measures be implemented while further evaluations under the contingency plan are being performed.

Numerous BMPs and other controls are already planned to be included in the basic design (see Section 2.0). Therefore, this contingency plan identifies the additional BMPs and other controls that would be considered in the event that, despite implementation of the basic BMPs, a surface water quality exceedance related to RA activity still occurs. The Settling Defendants (SDs) are responsible for implementing additional BMPs, other controls or treatment options to the extent that RA activities contribute to the exceedance.

During the RA, surface water quality at the Milltown Project POC could be impacted by:

1. Increased scour of reservoir sediment during drawdown of Milltown Reservoir;
2. Discharge of water generated during dewatering, excavation and/or stockpiling of Sediment Accumulation Area One (SAA I) or SAA III-c sediment;
3. Storm water runoff from areas disturbed by RA construction activities;
4. Construction and removal/breaching of in-stream structures (i.e., cofferdams, diversion dikes, bank armoring, etc.);
5. Restoration construction activities on the CFR or Blackfoot River (BFR) outside the RA project area;
6. Other upstream construction activities which may occur during the RA;
7. Ongoing (i.e., background) loading from other upstream sources not associated with Milltown Reservoir RA, Restoration or mitigation related activities;
8. Additional loading from other new, unanticipated upstream sources; and/or

9. Ongoing (i.e., background) net loading from Milltown Reservoir which is not associated with RA, Restoration or other mitigation construction activities.

This contingency plan directly addresses only those impacts related to the RA (i.e., items 1 through 4 above). This contingency plan identifies the decision basis for identifying if anticipated non-RA construction activities (i.e., items 5 and 6) are the likely cause of exceedances at the Milltown Project POC but references anticipated other contingency plans, to be developed by the entity responsible for the activity, for specifics on how these impacts might be addressed. Impacts associated with ongoing or new loading from other upstream sources (i.e., items 7 and 8) will typically be identifiable based on surface water sample results for the upstream CFR at Turah Bridge and BFR near Bonner monitoring stations. Ongoing net loading from Milltown Reservoir that is unrelated to RA or other construction activities will typically be identifiable based on conditions at the time (available historic data shows that, in the absence of reservoir drawdown or construction activity, Milltown Reservoir is typically a net loading source only during high flow or ice scour events) combined with review of what RA or other activities are ongoing at the time.

# 2.0 PLANNED BMPS AND OTHER CONTROLS

As previously noted, numerous BMPs and other controls to be routinely implemented during construction (i.e., to be employed even when exceedances are not threatened) are already planned to be included in the basic design. Some of the key planned BMPs and other controls are described here to provide background for the discussion of additional controls that may be considered in the event these planned controls are insufficient on their own to prevent RA-related exceedances of water quality warning limits. Additional BMPs and other controls for routine employment may also be identified and developed during the design process.

## 2.1 Reservoir Drawdown BMPs

As detailed below, planned BMPs for mitigating scour-related impacts to downstream water quality associated with removal of Milltown Dam can be divided into two general groups:

1. Implementing the drawdown in a series of steps staged over time; and
2. Isolating reservoir sediments from flowing surface water prior to dam removal.

<u>Stage reservoir drawdown over time</u>

Since it is impracticable to completely prevent natural erosion of reservoir sediment during the dam removal process the basic design uses a staged reservoir drawdown approach (i.e., incremental dam breaching) in order to meter out sediment release over time. To further protect downstream water quality the primary drawdown steps are timed to take advantage of dilution provided by seasonal high flows and coincide with times when downstream irrigators and recreational users are least effected. Under this approach, in Stage 1 the reservoir is drawn down a total of about 10 feet by opening the dam’s radial gate. In Stage 2, the reservoir is drawn down an additional approximately 7 feet by converting the powerhouse inlets to low level outlets. In Stage 3, the dam's spillway would be removed to lower the reservoir water level by a final drawdown of approximately 13 feet. During the first two stages of drawdown, the rate and degree of drawdown can be varied depending on water quality monitoring results but won't exceed a maximum drawdown rate of one foot per day when the reservoir level is above 3,258 feet NAVD 88 and 0.5 feet/day below 3,258 NAVD 88. By controlling the rate and timing of sediment release this baseline BMP is designed to meet concentration-based downstream water quality criteria to the greatest degree possible.

Isolate Reservoir Sediments from Flowing Surface Water

This planned BMP includes constructing an excavated channel to bypass CFR flows around reservoir sediments in the existing CFR channel along with using bank armoring, flood berms, dikes, cofferdams and channel bed grade controls to isolate higher metals concentration sediments from surface water flows prior to dam removal. Because the CFR flows are bypassed around the reservoir sediments, bank armoring and flood berm protection for the SAA I sediments is focused along the BFR channel.

### 2.2 Sediment Dewatering and Storm Water Runoff BMPs

The primary planned BMP for mitigating the potential for contaminant release from sediment dewatering and storm water runoff during construction will be to contain and collect runoff from sediment excavations/stockpiles and other disturbed areas and route it through constructed sedimentation ponds prior to discharge. Other planned BMPs include:

- preventing run-on to the work area (e.g., by installing flood control berms along the existing channels);
- placing silt fences, hay bails or other erosion controls around construction areas or at strategic runoff concentration locations;
- using raised roads and pads for accessing soft or wet ground areas; and
- minimizing the extent of disturbed area exposed at any one time via grading, cover placement and revegetation.

### 2.3 In-stream Structure Construction/Removal BMPs

Planned BMPs for mitigating the potential for contaminant release during installation and/or removal of in-stream structures include isolating work areas from flowing water via cofferdams or sheetpile walls, to the extent practicable, and installing silt curtain in the river around work areas where flows cannot practically be diverted. In addition, to the degree practicable, the work schedule will consider seasonal flow and river usage patterns in the timing of in-stream work.

## 3.0 SURFACE WATER MONITORING FEEDBACK SYSTEM

A comprehensive surface water monitoring program will be implemented during the RA to provide the information needed to:

1. Measure the overall and cumulative effects of the RA activities on downstream surface water quality; and

2. Provide the analytical feedback system to trigger consideration of additional BMPs, other controls or treatment as contingency measures.

The analytical feedback system includes identifying when water quality exceeds temporary surface water quality standards and/or warning limits and, assuming there is an exceedance, evaluating concurrent sampling data for other monitoring stations to determine the likely cause of the exceedance. These temporary standards were established by the US Environmental Protection Agency (EPA) and the Montana Department of Environmental Quality (DEQ) in the Record of Decision (ROD) to protect human health and prevent acute impacts to the downstream fishery and bull trout with the point of compliance set 2.8 miles downstream of Milltown Dam at the Milltown Project POC. The primary standards of concern are for TSS and dissolved arsenic and copper but dissolved cadmium, iron, zinc and lead are also included (see Table 1).

**Table 1 Temporary Construction Related Water Quality Standards* (Envirocon, 2005)**

| Constituent | Concentration Standard | Duration |
|---|---|---|
| Cadmium-Acute AWQC | 2 ug/L | Short-term (1 hour) |
| Copper-80% of the TRV (dissolved) (at hardness of 100 mg/L) | 25 ug/L | Short-term (1 hour) |
| Zinc-Acute AWQC (dissolved) | 117 ug/L | Short-term (1 hour) |
| Lead-Acute AWQC (dissolved) | 65 ug/L | Short-term (1 hour) |
| DWS (dissolved) | 15 ug/L | Long-term (30-day average) |
| Arsenic-Acute AWQC (dissolved) | 340 ug/L | Short-term (1 hour) |
| DWS (dissolved) | 10 ug/L | Long-term (30-day average) |
| Iron-AWQC (dissolved) | 1,000 ug/L | Short-term (1 hour) |
| Total Suspended Solids (TSS) | 550 mg/L | Short-term (day) |
| | 170 mg/L | Mid-term (week) |
| | 86 mg/L | Long-term (season) |

*All hardness related AWQC values assume a hardness of 100 mg/L.
TRV = Toxicity Reference Value, used in proposed plan for the Clark Fork River Operable Unit.
AWQC = Federal Ambient Water Quality Criteria.
DWS = Federal Drinking Water Standard.

To provide added protectiveness EPA and DEQ also identified an early warning limit set at 80% of the standards where implementation of mitigative measures may be considered. The table on Figure 1 lists the applicable warning limits.

Surface water sampling requirements specific to the RA are detailed in the Remedial Action Monitoring Plan (RAMP, Envirocon 2006) and briefly summarized below. Requirements for additional surface water monitoring anticipated to be completed as part of Restoration, bridge mitigation and other non-RA construction activities are still to be developed but are anticipated to include sampling, while the activity is ongoing, of additional temporary surface water monitoring stations.

The RAMP requires weekly surface water quality sampling and continuous discharge monitoring at three United States Geological Survey (USGS) stations (CFR at Turah, BFR near Bonner and the Milltown Project POC; see Figure 1 of the RAMP for station locations) with the potential for increasing to daily sampling if the downstream station sample exceeds warning limit concentrations or levels. The RAMP also requires 3 times a day sampling for turbidity at the downstream Milltown Project POC with the potential to reduce frequency to daily if 3 consecutive days of monitoring shows turbidity to be less than 6 NTU (i.e., half the warning limit) at the downstream station. The warning limits (for total suspended solids [TSS], metals and arsenic) or criterion (for turbidity) that determine whether weekly or daily surface water sampling is required are defined in Figures 3, 4 and 5 of the RAMP.

# 4.0 SURFACE WATER EXCEEDANCE CAUSE DETERMINATION

## 4.1 Assessing if RA Activities are Adding Contaminants to Surface Water

Implementation of additional BMPs, other controls, and/or water treatment as part of the RA will be considered necessary if an exceedance of temporary construction water quality standards or warning limits is threatened downstream at the Milltown Project POC. Therefore, as shown graphically on Figure 1, assuming sampling confirms exceedance of standards or warning limits at the Milltown Project POC, the first action under this contingency plan will be to assess the degree to which RA activities are causing or contributing to the exceedance. To support this assessment, two spreadsheets were developed (see Tables B-1 and B-2 in Appendix B of the RAMP) to quantitatively assess whether RA construction activities were adding turbidity (Table B-1) or TSS, dissolved arsenic or dissolved metals (Table B-2). The spreadsheets make this assessment as follows:

> Constituents will be deemed to have been added by RA construction activities if the measured TSS or any of the dissolved metals or arsenic at the Milltown Project POC (or potentially CFR near Milltown Dam if restoration construction or other activities/impacts are ongoing along the CFR between the RA project area and the Milltown Project POC) are higher (outside the error margin) than the sum of the calculated flow-weighted constituent levels sampled the same day at the CFR at Turah (or potentially CFR near Duck Bridge if restoration construction or other activities/impacts are ongoing along the CFR upstream of the RA project area) and BFR near Bonner (or potentially BFR near I-90 if restoration construction or other activities/impacts are ongoing along the BFR upstream of the RA project area) stations. The upstream concentration will be flow-weighted by multiplying the applicable constituent concentration by discharge for each of the CFR at Turah and BFR near Bonner stations, adding the two products together, and dividing by the discharge at the Milltown Project POC. To determine error propagation of the data sets, the measurement error and lab precision for each constituent must be considered. For discharge, an error of 5% is typical for stable channels (ref: 6-2-05 email from John Lambing, USGS). Based on the 2003 USGS data, the standard deviation of field replicates is 2.2 mg/L, 0.15 ug/L, 0.01 ug/L, 0.13 ug/L, 1.3 ug/L, 0.38 ug/L and 0.02 ug/L for TSS

and dissolved arsenic, cadmium, copper, iron, zinc, and lead respectively (see: USGS report "Water-Quality, Bed-Sediment, and Biological Data [October 2002 through September 2003] and Statistical Summaries of Data for Streams in the Upper Clark Fork Basin, Montana", Open-File Report 2004-1340, Table 9). The standard deviation of lab replicates is 0.16 ug/L, 0.00 ug/L, 0.08 ug/l, 1.6 ug/L, 0.24 ug/L and 0.02 ug/L for dissolved arsenic, cadmium, copper, iron, zinc and lead, respectively. Combining the standard errors of the discharge and constituents, the downstream measured constituent concentration would be deemed higher, if it is greater than the sum of the upstream flow-weighted concentration and the calculated total standard deviation.

The above methodology assumes that RA construction activities are responsible if concentrations downstream of the RA project work area are significantly above flow-weighted upstream concentrations. However, as discussed in Section 1.0, there are conditions, such as high flow or ice scour events, that have historically caused net loading to downstream surface water from the RA project work area even when no drawdown or construction activities were ongoing. Therefore, assuming Tables B-1 or B-2 predict that the RA project area is causing or contributing to a downstream exceedance, an additional check may be done to assess whether unusual water or ice flow conditions, rather than RA activities, are the likely cause. If natural flow or ice scour conditions are determined to be a significant contributing cause of the exceedance, then it may be difficult to control the impact. However, so long as the dam is operational, evaluation of additional BMPs or other actions to reduce RA-related loading that are similar to what has been required in the past would still need to be done to determine if there was any practicable way to mitigate impacts to downstream resources. In addition, the typical contaminant signatures for RA activities shown in Table 2 may help identify which RA activities are contributing to an exceedance of surface water quality standards or trigger levels.

**Table 2 – Typical Contaminant Signatures for RA Activities**

| Activity | Expected Type of Contaminant | Expected Form of Contaminant | Expected Timing of Contaminant Release |
|---|---|---|---|
| Sediment Scour Associated with Reservoir Drawdown | Primarily turbidity and TSS (particularly during Stages 2 and 3 when scour is mainly from the BFR channel) | Primarily total concentrations | Varies with rate and degree of drawdown. Slow reduction with time after maximum drawdown level for each stage reached. May also vary with flow conditions. |
| Sediment Dewatering via Pumping from Wells (direct discharge) | Primarily arsenic | Dissolved concentrations | When discharging to surface water. Identifiable when surface water concentrations, after accounting for dilution by river flows, correspond to well discharge sample concentrations and flow rates. |
| Sediment Dewatering via Pumping from Excavations (discharged after sediment pond treatment) | Primarily arsenic and metals | Primarily dissolved concentrations | When discharging from sediment pond. Identifiable when surface water concentrations, after accounting for dilution by river flows, correspond to sediment pond discharge sample concentrations and flow rates. |
| Passive Sediment Dewatering during Handling and from Stockpile Drainage (discharged after sediment pond treatment) | Primarily arsenic and metals | Primarily dissolved concentrations | When discharging from sediment pond. Identifiable when surface water concentrations, after accounting for dilution by river flows, correspond to sediment pond discharge sample concentrations and flow rates. |

| | | | |
|---|---|---|---|
| Storm Water Runoff from disturbed areas (discharged after sediment pond treatment) | Primarily turbidity and TSS from clean disturbed areas (e.g., borrow area), mix of turbidity, TSS, arsenic and/or metals depending on level of contamination for other areas | Primarily total concentrations | During, and immediately following, a precipitation or snow melt event that causes runoff and when discharging from sediment pond. Identifiable when surface water concentrations, after accounting for dilution by river flows, correspond to sediment pond discharge sample concentrations and flow rates. |
| Construction and/ or Removal of In-stream Structures | Primarily turbidity and TSS from imported fill with potential for arsenic and/or metals from disturbance of underlying sediment | Primarily total concentrations | When installing or removing structure or performing other in-stream construction activities. |

Note: The above activities represent what are likely to be the more significant potential sources of additional contaminant loading to the surface water but the project also has other activities that could potentially affect surface water quality, many of which will be more thoroughly evaluated in the design process.

## 5.0 EVALUATION OF ADDITIONAL BMPS, OTHER CONTROLS OR TREATMENT

As discussed in Section 2, cost-effective and non-schedule impacting BMPs and other controls will be routinely employed, even when exceedances are not threatened, to reduce potential impacts to resources. Additional BMPs, other controls or treatment options will be evaluated for possible implementation if a surface water quality standard or warning limit exceedance is: 1) observed at the Milltown Project POC, 2) confirmed with additional sampling/analyses (if it is a marginal exceedance or the data is otherwise suspect), and 3) determined to be caused by RA activities. Analyses completed as part of preliminary design work have predicted that, with the possible exception of turbidity and TSS concentrations during, and immediately following, drawdowns, the RA is not expected to result in surface water exceedances. In addition, given the numerous BMPs already planned as part of the baseline design, the opportunity for significantly reducing downstream concentrations through implementation of additional BMPs, other controls or treatment of discharge water may be limited. Nonetheless, the sections below describe the process that will be used to identify and evaluate additional mitigative measures to be considered in the event RA activities cause or contribute to exceedance of surface water quality standards or warning limits at the Milltown Project POC.

## 5.1 Evaluation Process

Since time will be of the essence, the process for evaluating what, if any, additional contingency measures should be taken to mitigate exceedance of surface water warning limits due to RA activities needs to be streamlined. This evaluation process will compare the expected effectiveness (in reducing downstream concentrations of the exceeding constituent to below warning limit levels in a timely manner) provided by the various potential options available is compared to their cost and implementability. Impacts to the project schedule and the potential for adverse effects on the environment, workers or the community associated with implementing a mitigation measure will also be considered as balancing factors. The results of the evaluation and recommendations for proposed action will be provided to the agencies for final approval in the form of a brief memo or email. To focus the evaluation process, the general measures that will likely be included in the contingency analysis and their expected applicability are summarized for each of the primary RA activities that could impact surface water quality in the following sections.

## 5.2 Contingency Plan for Surface Water Exceedance Related to Reservoir Drawdown

The metered release of sediment over time as the reservoir is drawn down and the dam is removed is a necessary part of the Milltown Reservoir dry removal cleanup plan. The drawdown will be conducted to minimize the potential for exceedance of downstream water quality criteria including, as discussed below, allowing for modifications based on observed impacts to downstream water quality. However, consideration must also be given to the potential schedule and production rate impacts of drawdown modifications since extending the construction timeframe delays the timeframe for achieving site cleanup environmental and human health objectives and delays may pose additional risks to downstream resources. EPA, in consultation with the State, will determine how much consideration such potential impacts should be given in this evaluation process on a case by case basis.

A reservoir-drawdown-related exceedance is likely to be identifiable based on increased downstream turbidity and TSS concentrations (compared to what would be expected given flow and upstream loading conditions) occurring during, or in the immediate months after, each stage of drawdown. The only practical additional measure that could be taken to mitigate drawdown-related water quality impacts is to further reduce the rate, or total amount, of drawdown. This will likely only be practical during Stages 1 and 2 drawdowns since the Stage 3 drawdown will be achieved by breaching cofferdams.

During Stage 1 drawdown, reservoir water levels can be modified by partially or entirely opening and closing the radial gate and/or removing and replacing panels on the spillway. Figure 2 shows the reservoir water level control available at different flow conditions during the Stage 1. If the decision is made to modify the Stage 1 drawdown in response to exceedance of downstream water quality warning limits then the rate of reservoir drawdown could be slowed or halted or the reservoir water levels could be progressively raised until downstream concentrations are again below warning limits. Once downstream concentrations drop sufficiently to provide a buffer between observed concentrations and warning limit levels then the reservoir water levels will begin to be progressively lowered using the procedures identified for the initial drawdown (i.e., a maximum rate of 1 foot/day until elevation 3,258 feet NAVD88 and 0.5 foot/day below 3,258 feet) until either full Stage 1 drawdown is reached or a subsequent exceedance of downstream water quality warning limits associated with reservoir drawdown is observed.

Some water quality data is available from previous radial gate drawdowns performed in 2002, 2003, 2004 and 2005 that can be used to assess the effect of a reduction in the amount of Stage 1 drawdown on downstream water quality, at least during the lower flow conditions occurring during these drawdowns. Data from these previous drawdowns show that under these low flow conditions, exceedance of the TSS level that approximately equates to the turbidity warning limit at the Milltown Project POC was limited to times when the reservoir water surface was below 3,254 feet NAVD88 (see Figure 3). Note that all the exceedances of this TSS level occurred during the 2002 drawdown and subsequent drawdowns that extended slightly below 3,254 feet did not exceed the TSS level that approximately equates to the turbidity warning limit. No exceedances of dissolved arsenic or metals warning levels were observed in any of the historic drawdowns at up to almost 11 feet of drawdown (see Figures 4 and 5). Based on this data it is anticipated that raising reservoir water levels to approximately 3,254 feet at low flow conditions, or potentially higher at high flow conditions, will be effective for addressing a Stage 1-drawdown-related TSS or turbidity exceedance.

During Stage 2 drawdown, reservoir water levels can be raised by modifying the powerhouse penstock intakes. A water level control curve for the Stage 2 drawdown has not yet been developed but it is anticipated that significant control will be available during the low flow conditions typical of the period of the year (i.e., October through March) when Stage 2 is scheduled to occur. Less control may be possible under the infrequent high water and/or ice flows that periodically occur during the winter. Similar to that described above for Stage 1 drawdown, if the decision is made to modify the Stage 2 drawdown in response to exceedance of downstream water quality warning limits then the rate of reservoir drawdown could be slowed or halted or reservoir water levels could be progressively raised until downstream concentrations are again below warning limits. Once downstream concentrations drop sufficiently to provide a buffer between observed concentrations and warning limit levels then the reservoir water levels will begin to be progressively lowered until either full Stage 2 drawdown is reached or a subsequent exceedance of downstream water quality warning limits associated with reservoir drawdown is observed.

Control of reservoir water levels during the Stage 3 drawdown is expected to be limited. To the degree practicable, breaching the cofferdams upstream and downstream of the removed dam sections (i.e., the radial gate and/or spillway depending on dam removal sequencing) will be done in a staged manner as part of the basic design. However, cofferdam breaching is likely to rely on a combination of mechanical removal and natural erosion so once initiated it is unlikely that modifications to slow the rate or amount of cofferdam breach could be safely done.

Based on the available data, raising reservoir water levels and/or slowing the rate of drawdown during Stages 1 and 2 drawdowns should be effective in addressing drawdown-related exceedance of downstream surface water criteria. However, as previously noted raising reservoir water levels could potentially have significant effects on the ability to complete the required Stages 1 and 2 work in a safe and timely manner or could result in other environmental impacts that offset any benefit from scour reduction. For example raising water levels during Stage 1 could re-saturate sediment in SAA I potentially slowing production rates for constructing the bypass channel. If completion of the bypass channel is sufficiently delayed that Stage 2 work can not be initiated the following fall than the entire project could be delayed by a full year. Also the additional sediment saturation is likely to result in additional discharge of dissolved metals and arsenic to the river from sediment dewatering. Similarly, raising reservoir water levels during Stage 2 drawdown could result in extending the construction timeframe and increasing siltation impacts associated with cofferdam construction (if higher water levels occurred early in Stage 2) or increased seepage through the cofferdams into the dam removal area potentially affecting dam removal production rates and/or generate additional discharge from dam excavation dewatering (if higher water levels occurred later in the Stage 2 drawdown). Therefore, the decision by EPA, in consultation with the State, on whether or not to modify reservoir drawdown in response to a drawdown related exceedance of surface water quality warning limits will consider the following factors:

- Impact on downstream resources;
- if RA activities are only a relatively minor contributor to the exceedance;
- if the exceedance is limited to the turbidity warning limit (which is primarily an aesthetic-based criteria);
- if the exceedance is limited to turbidity or TSS and occurs outside the typical river user season of July 1 through October 19 (and particularly if it occurs during spring high flow conditions when concentrations are typically naturally elevated);
- if the exceedance is above warning limits but below actual construction standards;
- if the drawdown modification could potentially slow production rates sufficiently to jeopardize the ability to meet the critical seasonal milestones of completing all Stage 1 work by October and all Stage 2 work by March;
- if the reduction in contaminant concentrations expected from the drawdown modification are likely to be offset by increased contaminant release from other sources caused by having to work under higher reservoir water level conditions (e.g., increased loading from sediment dewatering or cofferdam construction); and
- if the drawdown modification could potentially result in increased potential for failure of key infrastructure (e.g., reduced stability of constructed berms or cofferdams) or other risks to workers, the environment or the public.

### 5.3 Contingency Plan for Surface Water Exceedance Related to Sediment Dewatering with Wells

As discussed in Section 4.2, a surface water exceedance associated with SAA I sediment dewatering from wells is likely to be identifiable by comparing well discharge contaminant loads (determined based on measured discharge sample concentrations and flow rates) versus incremental loads at the Milltown Project POC (i.e., sample concentrations and flow rates at this station adjusted to remove loads measured at upstream stations or allocated to other activities). Results for water samples collected during a pump test conducted in SAA I (see Table D-4 in DSR #2, Envirocon, 2004) show that the water generated from sediment dewatering with wells is likely to have neutral pH, be low in TSS and dissolved metals but potentially have elevated dissolved arsenic concentrations in the 200 to 400 ug/l range. However, even assuming the high end of the arsenic concentration range and conservative total pumping rates for sediment dewatering along the bypass channel alignment of 15 cfs, the discharge is expected to increase in-stream concentrations by a maximum of 1 ug/l after mixing with river water. Therefore, discharge of water from SAA I sediment dewatering using wells is unlikely to result in any exceedance of in-stream water quality warning limits at the Milltown Project POC but if an exceedance is identified, it will likely be for dissolved arsenic. Should this unlikely event occur, the following potential mitigative measures will be evaluated for implementation:

- reduce well pumping rates, and hence dissolved arsenic discharge loads, by the amount necessary to reduce in-stream concentrations to below the 8 ug/l warning limit; or
- treat pumped water prior to discharge to reduce dissolved arsenic concentrations, and hence dissolved arsenic discharge loads, by the amount necessary to reduce in-stream concentrations to below the 8 ug/l warning limit.

Various treatment methods are available to reduce dissolved arsenic concentrations with the preferred option dependent on flow rates, influent concentrations and removal efficiencies required. Given the uncertainties on these parameters at this point in the design process, the specific approach for water treatment as a contingency will be developed as part of the pending Stage 1C bypass channel design rather than included in this contingency plan.

### 5.4 Contingency Plan for Surface Water Exceedance Related to Sediment Dewatering from Excavations or Sediment Stockpiles

As previously noted, water generated by SAA I sediment dewatering from excavations or stockpiles will be routed through sedimentation ponds prior to discharge. Therefore, a surface water exceedance associated with SAA I sediment dewatering from excavations and stockpiles is likely to be identifiable by first identifying if sediment pond discharge is a significant contributing source (by comparing sediment pond discharge loads versus incremental loads at the Milltown Project POC) and then assessing the degree to which the SAA I sediment dewatering component of sediment pond inflow is responsible for discharge loads.

Elutriate tests (see Table 1 in Appendix K of EPA's Supplemental Data Summary Report, EPA, 2002) and existing pore water concentration data (see Table 1 in Appendix 1 of the Remedial Investigation Report, ARCO, 1995) show that water generated from SAA I excavation or stockpile sediment dewatering is likely to have neutral pH, moderate to low TSS and moderate dissolved copper and arsenic concentrations in the 20 to 400 ug/l range. Dewatering flow rates are likely to be significantly less than the conservative 15 cfs assumed for well pumping. Therefore, even assuming the high end of the concentration range, the discharge is expected to increase in-stream dissolved copper and arsenic concentrations by less than 1 ug/l after mixing with river water. Therefore, discharge of water from SAA I sediment dewatering from sediment excavations or stockpiles is unlikely to result in any exceedance of in-stream water quality warning limits at the Milltown Project POC. However, if an exceedance is identified it would most likely be for dissolved arsenic or less likely for copper. Should this unlikely event occur, the following potential mitigative measures will be evaluated for implementation:

- reduce pumping rates from excavations, and hence dissolved arsenic and arsenic discharge loads from the sediment pond, by the amount necessary to reduce in-stream concentrations to below the respective warning limits; or
- treat water in, or before it enters, the sediment pond prior to discharge to reduce dissolved arsenic and copper concentrations, and hence discharge loads, by the amount necessary to reduce in-stream concentrations to below the warning limits.

Various chemical treatment methods are available to reduce dissolved arsenic or copper concentrations in the sediment pond prior to discharge with the preferred option dependent on flow rates, influent concentrations and removal efficiencies required. Given the uncertainties on these parameters at this point in the design process, the specific approach for possible chemical water treatment of sediment pond water as a contingency will be developed as part of the pending Stage 1C bypass channel design rather than included in this contingency plan.

## 5.5 Contingency Plan for Surface Water Exceedance Related to Storm Water Runoff

Like water generated from sediment excavations and stockpiles, storm water runoff from disturbed portions of the RA project area will be routed through sedimentation ponds prior to discharge. Therefore, unless a breach occurs in the storm water containment and collection system, a surface water exceedance associated with storm water runoff is likely to be identifiable by first identifying if sediment pond discharge is a significant contributing source (using the methodology described in Section 5.3) and then assessing the degree to which the storm water runoff component of sediment pond inflow is responsible for discharge loads. Storm water runoff impacts to water quality should be identifiable based on timing (i.e., occurring during, or immediately after, a precipitation or snowmelt event that generates runoff) and constituent form (i.e., relatively higher total compared to dissolved concentrations). As described in Section 2.2, the baseline design includes numerous BMPs to reduce storm water runoff impacts to water quality. If despite these measures a surface water exceedance associated with storm water runoff from the RA project area occurs then the following additional measures will be evaluated for implementation:

- increase storm water residence time in the sedimentation ponds;
- install additional erosion controls (e.g., silt fences and hay bales) around work areas;
- enhance run-on/runoff controls if overtopped (e.g., install or raise containment berms or increase ditch capacity);
- reduce the total area of, or slopes within, disturbed grounds (e.g., by grading, cover placement and/or revegetation); and
- provide additional buffer zones around work areas.

### 5.6 Contingency Plan for Surface Water Exceedance Related to Construction/Removal of In-stream Structures

As discussed in Section 4.2, a surface water exceedance associated with construction/removal of instream structures may be identifiable by the timing and nature of exceedance. In-stream construction activities are anticipated to primarily generate increases in turbidity and TSS levels while the activity is ongoing. As described in Section 2.3, the baseline design already includes using BMPs (such as flow diversion and silt curtains) and construction scheduling to the degree practicable to reduce in-stream construction's impacts to water quality. Additional BMPs or construction schedule modifications are likely to be either cost-prohibitive (e.g., diverting flow around areas where bank stabilization is being installed) or counter productive (e.g. installing and removing additional silt curtains may itself generate short term water quality impacts while slowing the rate at which cofferdams are constructed or removed extends the timeframe of the impact and increases the risk of getting high flows or other potentially deleterious conditions during construction). Therefore, the potential benefits and negative impacts of such BMP or control implementation will be evaluated by EPA in consultation with the State on a case by case basis before implementation.

## 6.0 REFERENCES

ARCO, 1995, “Milltown Reservoir Sediments Operable Unit, Final Draft Remedial Investigation Report”, prepared by Titan Environmental Corp., February.

Envirocon, 2004, “Draft Remedial Design Data Summary Report #2 Covering July 2004 through September 2004 Field Activities, Milltown Reservoir Sediment Site”, November.

Envirocon, 2005, “Appendix C, Consent Decree for the Milltown Site, Remedial Design/Remedial Action Statement of Work” July.

Envirocon, 2006, “Remedial Action Monitoring Plan, Milltown Reservoir Sediments Site”, May.

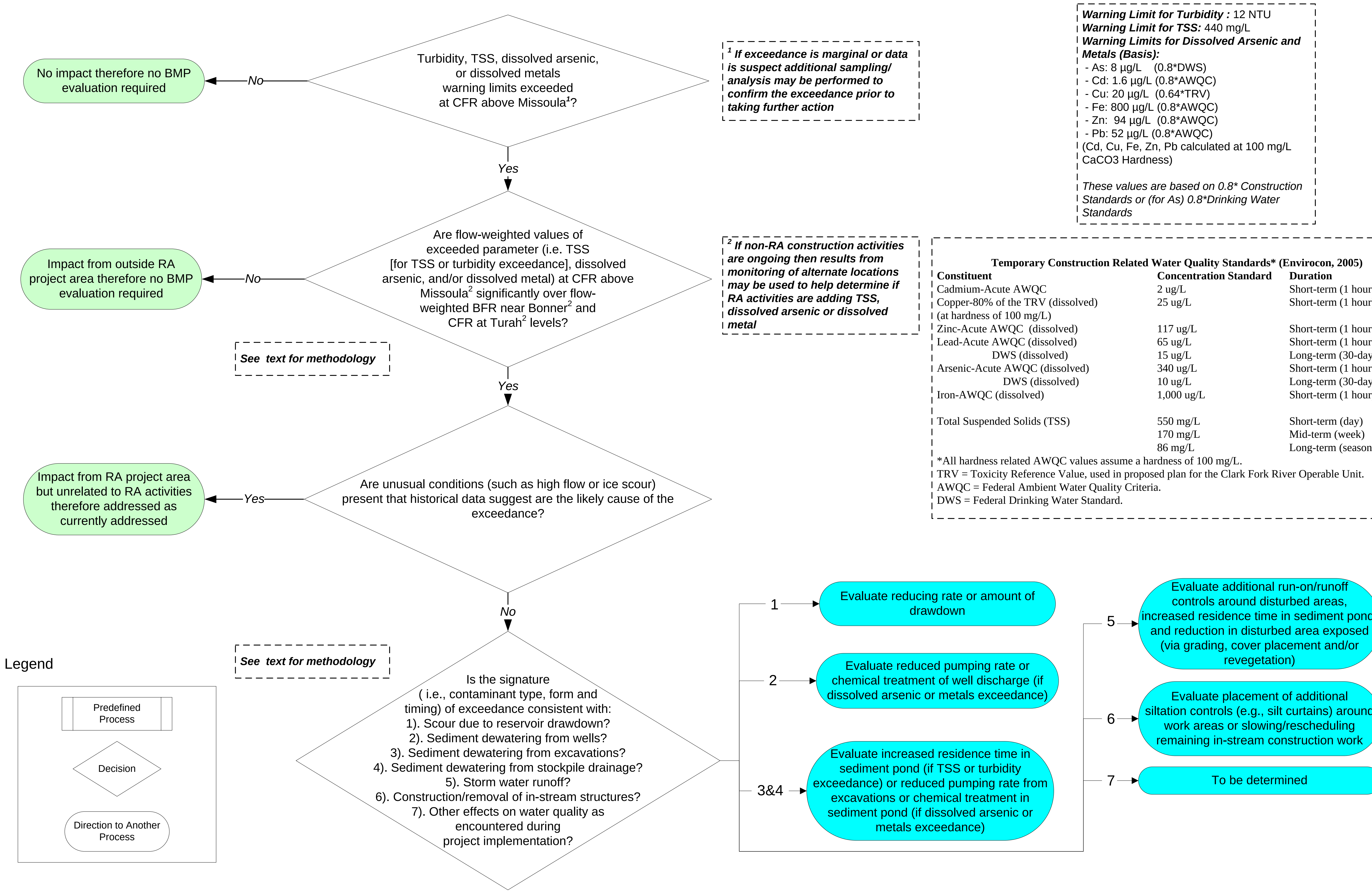
EPA, 2002, “Supplemental Data Summary Report: Milltown Reservoir Sediments, Sediments Operable Unit”, prepared by $CH_2M$ Hill, November.

USGS, 2003, “Water-Quality, Bed-Sediment, and Biological Data October 2002 through September 2003”.

USGS, 2004, “Statistical Summaries of Data for Streams in the Upper Clark Fork Basin, Montana", Open-File Report 2004-1340.

# FIGURES

Figure 1. Surface Water Quality Exceedance Contingency Plan Logic Diagram




**Temporary Construction Related Water Quality Standards* (Envirocon, 2005)**

| Constituent | Concentration Standard | Duration |
|---|---|---|
| Cadmium-Acute AWQC | 2 ug/L | Short-term (1 hour) |
| Copper-80% of the TRV (dissolved) (at hardness of 100 mg/L) | 25 ug/L | Short-term (1 hour) |
| Zinc-Acute AWQC (dissolved) | 117 ug/L | Short-term (1 hour) |
| Lead-Acute AWQC (dissolved) | 65 ug/L | Short-term (1 hour) |
| DWS (dissolved) | 15 ug/L | Long-term (30-day average) |
| Arsenic-Acute AWQC (dissolved) | 340 ug/L | Short-term (1 hour) |
| DWS (dissolved) | 10 ug/L | Long-term (30-day average) |
| Iron-AWQC (dissolved) | 1,000 ug/L | Short-term (1 hour) |
| Total Suspended Solids (TSS) | 550 mg/L | Short-term (day) |
| | 170 mg/L | Mid-term (week) |
| | 86 mg/L | Long-term (season) |

*All hardness related AWQC values assume a hardness of 100 mg/L.
TRV = Toxicity Reference Value, used in proposed plan for the Clark Fork River Operable Unit.
AWQC = Federal Ambient Water Quality Criteria.
DWS = Federal Drinking Water Standard.

## Figure 2
## Reservoir Water Level Control During Stage 1 Drawdown

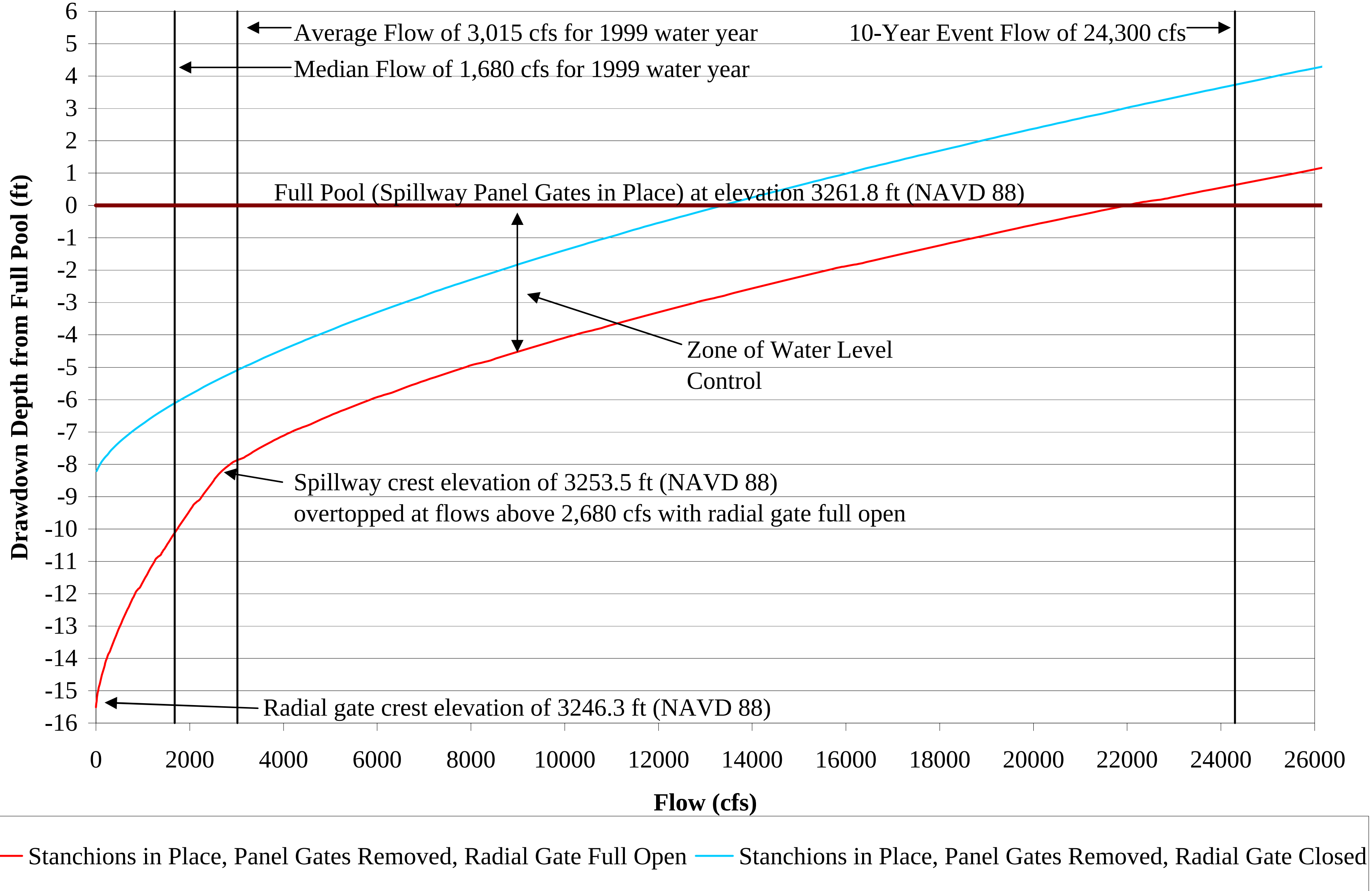
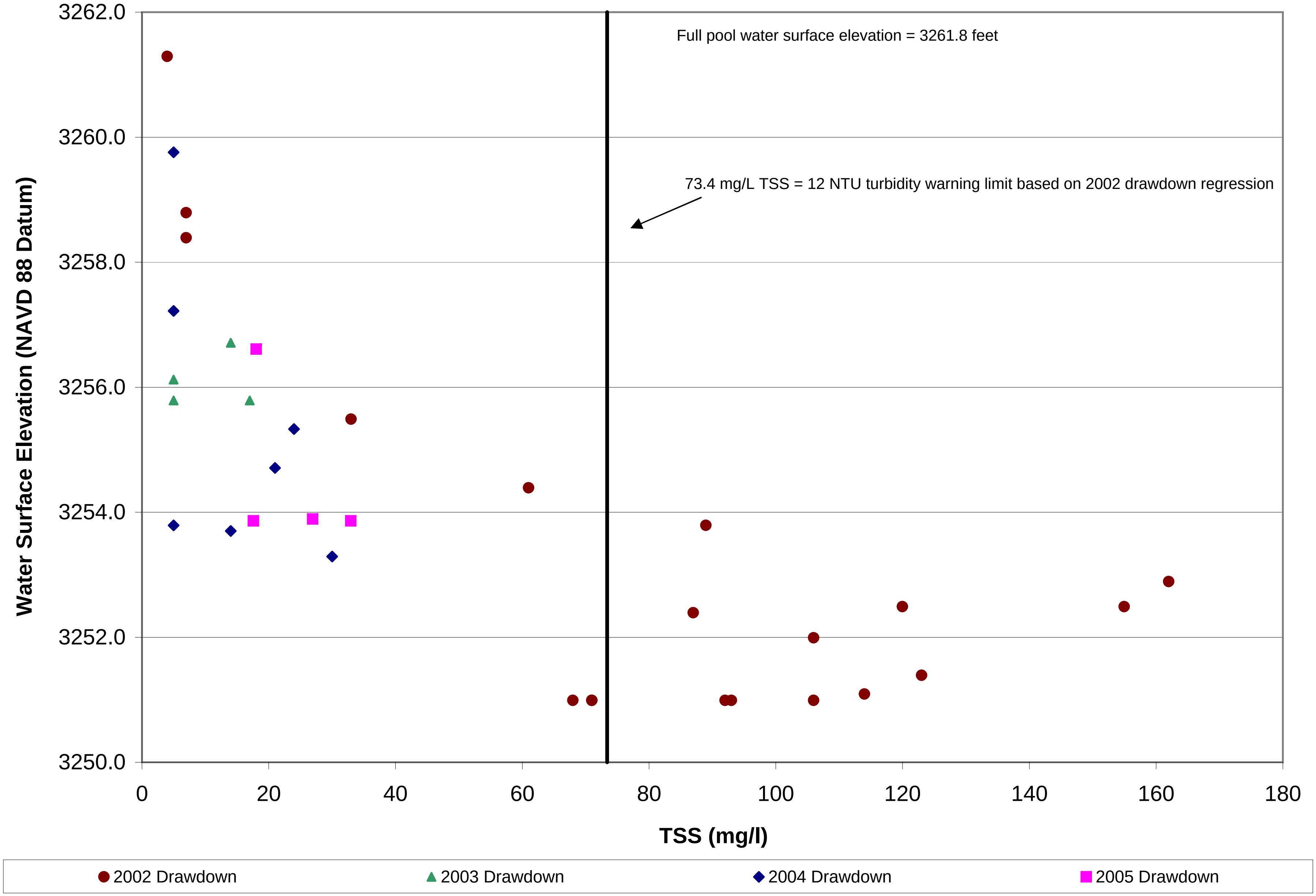
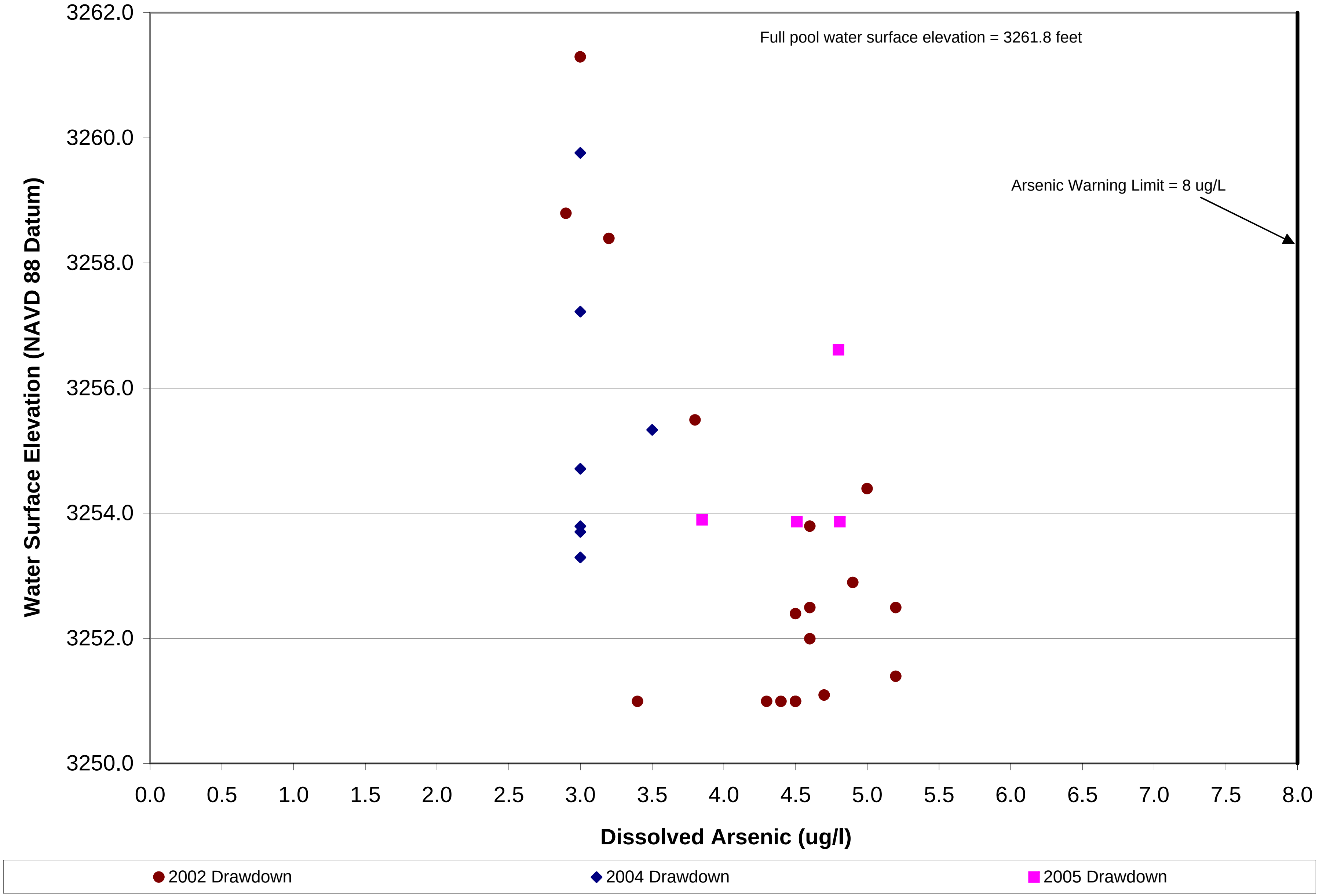


**Figure 3**
**Reservoir Pool Elevation Versus Measured TSS Concentrations at CFR Above Missoula Station During 2002, 2003, 2004 & 2005 Drawdowns**



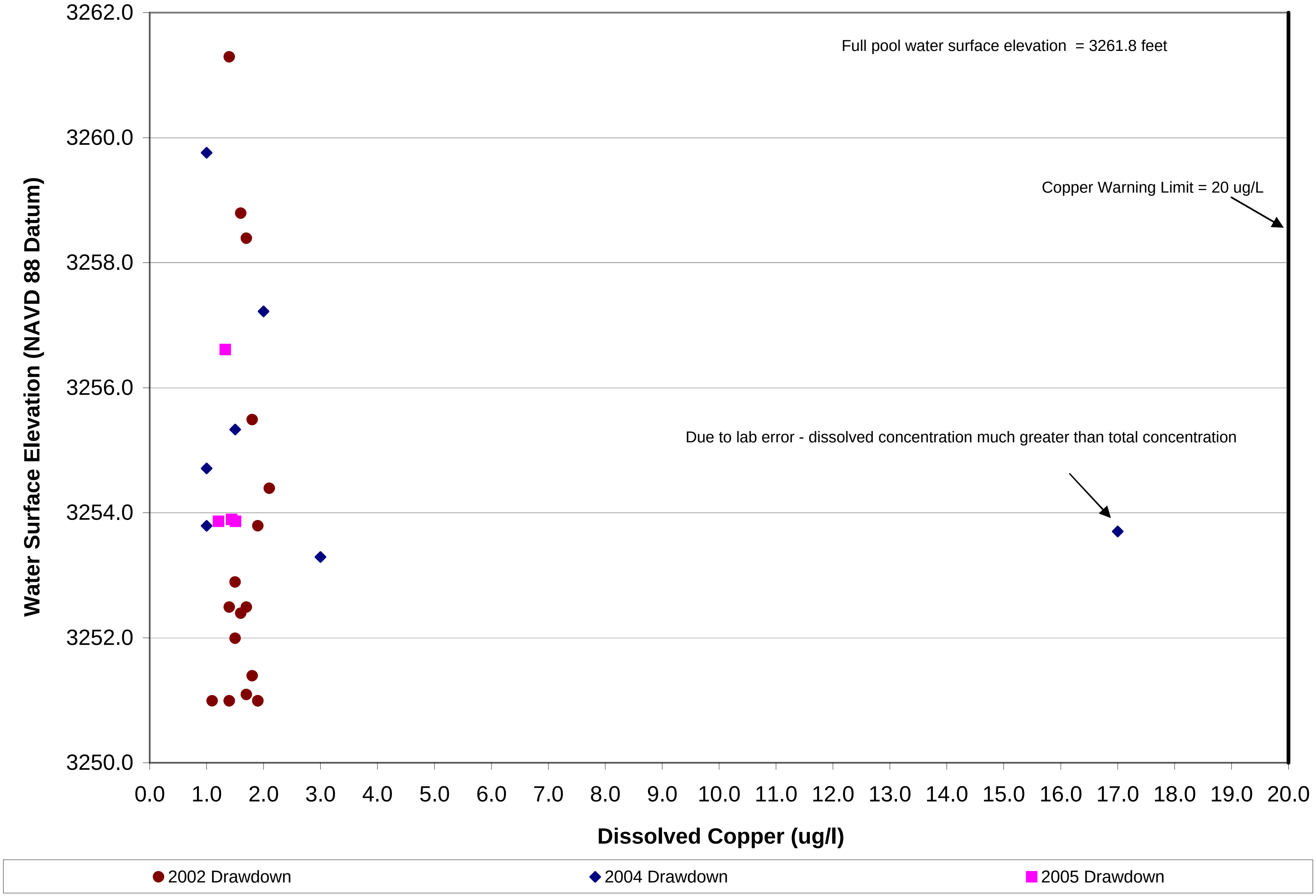

J:\Projects\Milltown RD-RA\T36 Stage 1A RD\DFDR\Contingency Plans\Surface Water Exceedance Contingency Plan\March 28, 2006 ARC Submittal\Figures\TSS vs. drawdown(Fig3); Figure All

## Figure 4
## Reservoir Pool Elevation Versus Measured Dissolved Arsenic Concentrations at CFR Above Missoula Station During 2002, 2004 & 2005 Drawdowns




J:\Projects\Milltown RD-RA\T36 Stage 1A RD\DFDR\Draft Final Contingency Plans\Surface Water Contingency Plan\May 19, 2006 AR Submittal\Figures\Diss As vs. drawdown(Fig4); Figure All

**Figure 5**
**Reservoir Pool Elevation Versus Measured Dissolved Copper Concentrations at CFR Above Missoula Station During 2002, 2004 & 2005 Drawdowns**




J:\Projects\Milltown RD-RA\T36 Stage 1A RD\DFDR\Contingency Plans\Surface Water Exceedance Contingency Plan\March 28, 2006 ARC Submittal\Figures\Diss Cu vs. drawdown(Fig5); Figure All