



# California Regional Water Quality Control Board Central Valley Region



Winston H. Hickox  
Secretary for  
Environmental  
Protection

Robert Schneider, Chair

Gray Davis  
Governor

## Sacramento Main Office

Internet Address: <http://www.swrcb.ca.gov/rwqcb5>  
3443 Rottier Road, Suite A, Sacramento, California 95827-3003  
Phone (916) 255-3000 • FAX (916) 255-3015

7 March 2003

Ms. Emilee Ford  
Chief of Staff  
Office of Assemblymember Simón Salinas  
State Capitol  
Sacramento, CA 95814

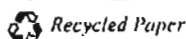
### ***NEW IDRIA MINE, SAN BENITO COUNTY***

As we agreed at our meeting on 6 January 2003 regarding the New Idria Mine in San Benito County, enclosed is a report by staff of the Fresno office of the Central Valley Regional Board. Staff visited the mine site on 15 January 2003, collected and analyzed water samples, took photographs, and compiled and evaluated historical data and available information.

Key points from the report include:

- Surface water in San Carlos Creek continues to be degraded by mercury and acid mine drainage for a segment downstream of the New Idria Mine of approximately four miles;
- Located in a remote area, the predominant and currently identifiable beneficial uses of San Carlos Creek surface water appear to be limited to agricultural supply (livestock watering), along with perhaps wildlife and ephemeral aquatic life uses (frogs, seasonal use by aquatic insects).
- Impacts to beneficial uses for freshwater wildlife habitat have not been documented, and impacts due to groundwater recharge are unknown due to a lack of data and wells in the area;
- Due to percolation losses, there is typically little or no flow in San Carlos Creek below the impaired 4-mile segment downstream of the New Idria Mine, and consequently, effluent from the mine likely does not discharge into the lower watershed in Panoche Creek during normal and dry season conditions;
- The Coordinated Resource Management Planning (CRMP) program for the Panoche Creek watershed may ultimately be able to mitigate some of the concerns regarding possible upper watershed impacts to the Panoche Creek lower watershed, which could include the New Idria Mine;

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- San Carlos Creek, for a distance of 5.1 miles (segment downstream of New Idria Mine), is assigned a low priority for TMDL completion on the recently adopted Clean Water Act 303(d) list for impairment by mercury;
- USEPA concluded under its Remedial Site Assessment Decision, dated 1 June 1998, that further assessment was needed under CERCLA (Superfund);
- Due to limited mercury water quality data in the lower watershed, it is not currently possible to adequately evaluate the potential for mercury loads entering the lower Panoche Creek watershed from the New Idria Mine or any other sources.

Considering all the information presently available, further action at the New Idria Mine at this time is severely hampered by its relatively low priority as compared to other known pollutant sources, the difficulties encountered in identifying responsible and financially solvent parties, and the costs involved in a satisfactory remedial action. We will, however, evaluate the contributions of mercury from the watershed in the context of the mercury TMDL for the Delta. If the New Idria Mine appears to be a significant source of mercury to the San Joaquin River and Delta, more work may be needed at the Mine site.

Please contact either me at (916) 255-3039, or Loren Harlow, Assistant Executive Officer in the Fresno office, at (559) 445-5116, if you would like to discuss the staff report or have any questions.

THOMAS R. PINKOS  
Executive Officer

cc: Brian Haddix, Agency Undersecretary, CalEPA  
Robert Schneider, Chair, Regional Board  
Loren Harlow, Assistant Executive Officer, Fresno



# California Regional Water Quality Control Board

## Central Valley Region



**Winston H. Hickox**  
Secretary for  
Environmental  
Protection

**Robert Schneider, Chair**

**Gray Davis**  
Governor

**Fresno Branch Office**

Internet Address: <http://www.swrcb.ca.gov/~rwqcb5>  
3614 East Ashlan Avenue, Fresno, California 93726  
Phone (559) 445-5116 • FAX (559) 445-5910

**TO:** Lonnie M. Wass  
Supv. WRC Engineer

**FROM:** Pete A. Osmolovsky  
Associate Engineering Geologist

**DATE:** 7 March 2003

**SIGNATURE:** \_\_\_\_\_

**SUBJECT: *SITE INVESTIGATION AND FILE REVIEW, NEW IDRIA MERCURY MINE, SAN BENITO COUNTY***

**EXECUTIVE SUMMARY**

Historical and recent site investigations indicate ongoing mercury degradation of a 4-mile segment of San Carlos Creek in San Benito County, likely due to releases of acid mine drainage from the abandoned New Idria Mine. Other pollutants detected in surface water and source effluent that exceed numeric water quality goals include nickel, zinc, iron, and sulfide.

In accordance with Section 303(d) of the Clean Water Act, a segment of San Carlos Creek is listed as an impaired waterbody due to mercury. Effluent acid mine drainage from the New Idria Mine is identified as a pollutant source. Pursuant to the 303(d) listing and TMDL planning process, San Carlos Creek is assigned a low priority, based on the waterbody's importance and extent of its beneficial uses, degree of impairment, and other factors.

In 1988, Regional Board staff concluded that the mine discharge was causing pollution and creating a condition of nuisance, and required the property owner to submit a workplan for mitigating the conditions caused by mine drainage. The proposed work was never implemented, and in 1991 the property was sold to the current owner, Future's Foundation, Inc. Regulatory enforcement and further recommendations for remediation by the Regional Board staff at the New Idria Mine reportedly languished due to prioritization issues, limited budgetary resources, and difficulty in identifying responsible parties

Pressure from local landowners and environmental stakeholders prompted the United States Protection Agency (USEPA) to conduct a preliminary site evaluation in 1997 pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and assess the eligibility of the site for placement on the National Priorities List (NPL) for remedial action. USEPA holds an interest in the New Idria Mine due to its ongoing involvement in the Coordinated Resource Management Planning (CRMP) effort in the Panoche/Silver Creek area. The CRMP program for the Panoche Creek watershed is authorized to develop alluvial fan

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assessment and management plans, with the goals of implementing monitoring and best management practices to manage flood flows, erosion, and sediment transport. Local landowners, local, state, and federal agencies, and other interested parties participate in the CRMP program. In 1998, USEPA concluded that a significant and ongoing release of mercury and acid mine drainage from the New Idria Mine has degraded San Carlos Creek to approximately 4.7 miles downstream from the mine. However, the site has not been placed on the NPL Superfund cleanup list. USEPA considered site-specific conditions (sparse population, creeks are not used for drinking water, does not support fisheries or sensitive environments) and concluded under its Remedial Site Assessment Decision, dated 1 June 1998, that further assessment was needed under CERCLA.

A site investigation by Regional Board on 15 January 2003 confirmed that surface water in San Carlos Creek continues to be degraded by mercury and acid mine drainage for an approximately four miles segment downstream of the New Idria Mine.

The Tulare Lake Basin Plan designates multiple beneficial uses of surface water in Westside streams, including San Carlos Creek. Westside streams are not designated for municipal or domestic use. Located in a remote area, the predominant and currently identifiable beneficial uses of San Carlos Creek surface water appear to be limited to agricultural supply (livestock watering), along with perhaps wildlife and ephemeral aquatic life uses (e.g., frogs, seasonal use by aquatic insects). Title 22 metals during the 15 January 2003 sampling event did not exceed applicable water quality guidelines for toxic substances in livestock drinking water. However, water quality guidelines for recommended limits of iron in livestock drinking water have not been established. Impacts to beneficial uses for freshwater wildlife habitat have not been documented. Impacts due to groundwater recharge are unknown due to a lack of data and wells in the area.

A key area of concern regarding the acid mine runoff is whether mercury loads in San Carlos Creek flow downstream into the lower watershed of the Silver Creek/Panoche Creek drainage. San Carlos Creek is an intermittent stream; however, it is effluent-dominated below the New Idria Mine, and consequently may flow year round in a limited downstream-segment. Due to percolation losses, there is typically little or no flow in San Carlos Creek below the impaired 4-mile segment downstream of the New Idria Mine. Consequently, effluent from the mine likely does not discharge into the lower watershed in Panoche Creek during normal and dry season conditions. However, reportedly during major storm events and resultant flash floods, drainage and mercury-impacted sediment loads from the San Carlos Creek watershed potentially discharge downstream into Silver Creek/Panoche Creek.

The Coordinated Resource Management Planning (CRMP) program for the Panoche Creek watershed is structured and implemented so that it may ultimately mitigate some of the concerns regarding possible upper watershed impacts to the Panoche Creek lower watershed, which could include the New Idria Mine. In addition, current CRMP projects reportedly in-progress include implementation of pilot projects in the upper watershed of the Panoche Creek drainage. Efforts associated with the CRMP may mitigate possible loading of particulate-bound mercury from the upper watershed to the lower watershed/Mendota Pool areas during flood events.

## **GENERAL BACKGROUND**

### **Mine Location and History**

New Idria Mine (NIM) is located in the town of Idria. The New Idria Mine lies in a heavily mineralized area of the southern Diablo Range and occupies an estimated two square miles of property (see Appendix A—Figure 1). Cinnabar (mercury sulfide) predominantly occurs in the rock as veins and impregnations. The first recorded production at the mine was in 1854. The mine was one of North America's largest producers of mercury until its closure in 1972.

The mine and mill were owned and operated by New Idria Mining and Chemical Company from 1951 to April 1972, when the mine was closed due to declining mercury prices. Since 1974, surface and mineral ownership of the property, which are severed, have changed several times. In the early 1980's the Idria Land and Development Co. bought the property, and reportedly had plans to mine the waste piles at New Idria for gold and other metals. However, no other significant mining developments have occurred. An entity called New Idria Associates purchased the property in 1986, reportedly for use as an agricultural preserve. In 1991, the Futures Foundations of San Jose bought the property after leasing it from New Idria Associates for several years.

### **Watershed Characteristics**

San Carlos Creek is a tributary of Panoche Creek via Silver Creek (See Figure 2). San Carlos Creek has a length of approximately 9 miles from its headwaters at San Benito Mountain to its confluence with Silver Creek. Flows are intermittent with sustained flows only after extended wet periods. Due to percolation losses, flows from San Carlos Creek into the Silver Creek/Panoche Creek drainage may only occur during major storm events.

Several small historic mines (Aurora, Molina, and San Carlos mines) are located in the upper portion of the San Carlos watershed. However, the closed New Idria Mine, located along San Carlos Creek approximately four miles upstream of the San Carlos-Silver Creek confluence is by far the largest mine in the region. Acid mine drainage containing mercury from the New Idria Mine likely impairs the water quality in a downstream segment of San Carlos Creek.

As indicated above, San Carlos Creek is a part of the upper watershed of Panoche Creek, a significant Westside stream in the Tulare Lake basin. Panoche Creek has defined channel banks downstream to County Road J1 (Belmont Ave.), approximately 8 miles west of the City of Mendota. The Panoche Creek alluvial fan between County Road J1 and Fresno Slough (approximately two miles east of Mendota) does not have a channel with well-defined banks. During large rain events, runoff waters from the Panoche Creek watershed flow into Fresno Slough and Mendota Pool, and subsequently to the lower San Joaquin River.

A site investigation report conducted by the United States Environmental Protection agency suggests that the New Idria Mine site may be part of a larger contamination problem associated with the Silver/Panoche Creek watershed. This watershed is a principal source of selenium, salts,

and trace elements which impact the soils and groundwater in the Panoche alluvial fan and the San Joaquin River.

### **Acid Mine Drainage**

On-site wastes consist of formational overburden materials and smelted ore tailings (see site map, Figure 3). Since the mine is no longer in operation, mine wastes are not currently generated, though previously generated wastes remain on the site. The presence of metallic sulfides in the waste rock and overburden give rise to the development of acid mine drainage; iron sulfides are oxidized, resulting in the release of sulfuric acid, ferrous iron, and metals to solution. These chemical reactions color the affected water red.

Effluent draining from the mine results from water filtering through extensive shafts and tunnels before exiting the mine. The runoff water is uncontained, and drains from a mine adit ("Portal No. 10") approximately 4 feet in diameter (see Figure 4, 5, 6) and forms a tributary, which drains through the tailings pile (see Figures 7, 8, 9) into San Carlos Creek approximately 2,000 feet downstream from Portal No. 10 (see Figure 10). San Carlos Creek becomes Silver Creek approximately 4 miles downstream from the mine, and joins with Panoche Creek approximately 18 miles downstream. All of these creeks are ephemeral.

In an attempt to control the flow of water from the mine, Portal No. 10 was originally sealed with a concrete bulkhead. However, as water backed up in the mine, it eventually broke through the bulkhead. During the 15 January 2003 sampling event, flows from Portal 10 could not be measured due to access problems. However, effluent (pH~3.5 to 5.5) runoff from Portal No. 10 fluctuates seasonally, and reportedly averages between five to ten gallons per minute. On 15 January 2003, observed flow appeared to be much higher than 10 gallons per minute. Previous attempts to contain runoff are evidenced by currently non-functioning and non-maintained settling ponds. When the acidic mine water mixes with the water in San Carlos Creek (pH~9), the sudden shift in pH precipitates dissolved metals out of solution, and the water in this mixing zone changes from cloudy to orange/brown in a span of about ten meters. The discoloration of the creek water by mine effluent is observable for at least four miles downstream of the New Idria Mine (see Figures 11, 12, 13). The discoloration has been attributed to the precipitation of iron flocculent (amorphous iron hydroxides).

In contrast, stream water and drinking water from the reservoir upstream from the New Idria Mine is largely devoid of discoloration, metal precipitates, and/or siltation (see Figure 14).

### **Surrounding Land Use – Beneficial Uses of Surface Water – Water Rights**

The mine site is located in a sparsely populated and remote area. Downstream property owners appear to be engaged primarily in ranching and livestock activities. The town of Idria is an abandoned mining town; however, several year-round residents reportedly reside on the Futures Foundation property at the mine.

The Tulare Lake Basin Plan (Basin Plan) designates beneficial uses of Westside streams that include agricultural, industrial process and service supply; recreation; warm freshwater and wildlife habitat including rare, threatened or endangered species; and groundwater recharge. Westside streams are not designated for municipal beneficial use. Residents downstream of the mine do not use the creek for drinking water. A small reservoir on San Carlos Creek, upstream from the New Idria Mine, is used for drinking water by residents of the Futures Foundation property. Reportedly, livestock may drink from the creek.

Evidence of groundwater impacts due to the acid mine drainage has not been documented. California Department of Water Resources well completion records do not indicate the presence of any wells within a 1-mile radius of the New Idria Mine. The only well completion record available within the San Carlos Creek watershed is located on private property in T17S R12E Section 8, located adjacent to a minor ephemeral tributary of San Carlos Creek, approximately three miles north of the town of Idria.

Water rights information is available via the Water Rights Information Management System database maintained by the State Water Resources Control Board. The only water right identified in the San Carlos Creek watershed is a historical seasonal diversion permit located in the SW Quarter NE Quarter of Section 21, T17S, R12E approximately 2 miles north (downstream) of New Idria. The permit was issued in 1934. No water rights are identified for the drinking water reservoir on San Carlos Creek upstream of the mine.

## **REGULATORY BACKGROUND**

### **Permit Status**

Careful review of the file did not show that Waste Discharge Requirements Resolution No. 70-205, adopted 26 June 1970, has been rescinded. Resolution 70-205 does not reflect the current status or ownership of the mine, and also does not reflect current regulations and policies of the Regional Board.

The discharge of mine drainage to San Carlos Creek is not regulated by a National Pollutant Discharge Elimination System permit.

### **303(d) Listing Status**

Section 303(d) of the Clean Water Act requires the identification of waterbodies that do not meet, or are not expected to meet, water quality standards and are considered impaired. The affected waterbody, and associated pollutant, is then prioritized in the 303(d) list to guide Total Maximum Daily Load (TMDL) planning. TMDLs are ranked into high, medium, and low categories based on the waterbody's importance and extent of its beneficial uses, degree of impairment, and other factors.

San Carlos Creek is on the current 303(d) list for impairment by mercury, with impairment occurring over an affected size of 5.1 miles. The 303(d) list assigns a low priority designation to San Carlos Creek. Current 303(d) listing and TMDL information are shown in Table 1:

**TABLE 1 - 303(d) LISTING/TMDL INFORMATION**

|                                     |   |
|-------------------------------------|---|
| <i>Waterbody Name</i>               | San Carlos Creek  |
| <i>Pollutants/Stressors</i>         | Mercury   |
| <i>Potential Sources</i>            | Resource Extraction (abandoned mines)<br>Acid Mine Drainage |
| <i>Size Affected</i>                | 5.1 miles   |
| <i>Extent of Impairment</i>         | Downstream from New Idria Mine                              |
| <i>Original 303(d) Listing Year</i> | 1988  |
| <i>TMDL Priority</i>                | Low   |

As previously indicated, San Carlos Creek is a part of the upper watershed of Panoche Creek, a significant Westside stream in the Tulare Lake basin. Panoche Creek is also on the 303(d) list (low priority) for impairment by mercury, siltation, and selenium. The source for mercury impairment in Panoche Creek is listed as resource extraction, associated with abandoned mines.

### Site Investigations

Regional Board efforts at enforcement have been sporadic since the 1970's. Complaint investigations have occurred, and periodic efforts have been made to identify responsible parties and have corrective action measures implemented. Regulatory enforcement at the New Idria Mine has reportedly languished due to prioritization issues, limited budgetary resources, and unsuccessful attempts to identify responsible parties.

On 22 July 1988, Regional Board staff concluded, based on analytical sampling and field observations that the mine discharge was causing pollution, and was creating a condition of nuisance. As a result, Regional Board staff required the property owner (New Idria Associates at that time) to submit a workplan and time schedule for eliminating the existing pollution and nuisance conditions caused by mine drainage, and subsequently to submit a Report of Waste Discharge and filing fee to update the existing Waste Discharge Requirements (Resolution No. 70-205). The proposed work was never implemented either before or since the property was sold to the Future's Foundation in 1991. Regional Board staff quotes to the media in March 1999 indicated that regulatory follow through on the drainage mitigation plan was set aside based on higher priority issues.

In a memorandum dated 21 March 1990, Regional Board legal counsel indicated that the owner of mineral rights should be considered a potentially responsible party for the mine drainage problems. Subsequently, in a letter dated 19 April 1990, Regional Board staff informed Tom



Galles of Four G Oil, located in Casper, Wyoming, that Four G Oil was a responsible party for water quality impacts associated with the mine drainage. Legal Counsel for Four G Oil indicated the company had a 50 per cent interest of the mineral rights, but disputed liability for the discharge.

In 1992, Regional Board staff issued an administrative civil liability (ACL) complaint against the Future's Foundation for non-payment of annual fees. Futures Foundation maintains it is not liable for the acid mine drainage since it does not own the mineral rights to the property. No enforcement has occurred to recover the fees. The ACL was subsequently withdrawn by Regional Board staff, as stated in a letter dated 24 September 1992, because it had been issued to Future's Foundation "in error". Presumably, the ACL was withdrawn because Regional Board staff concurred with Futures Foundation contention that the mineral rights owner was liable for the acid mine drainage.

After the early 1990's, the Regional Board has had relatively little regulatory input into drainage issues at the mine. Print media has quoted Regional Board staff in March 1999 stating "It's been a conscious decision not to put our limited resources on this particular problem... abandoned and inactive mines are notorious for consuming resources with little to show for it, and this one is in a remote area".

In 1996, Coastal Advocates, an environmental advocacy group, petitioned USEPA to conduct a preliminary site evaluation pursuant to CERCLA. USEPA holds an interest in the New Idria Mine due to its ongoing involvement in the CRMP effort in the Panoche/Silver Creek area. USEPA decided to study the mine site to determine where it fell on the agency's Hazard Ranking System (HRS). The HRS helps determine federal cleanup status.

Data collected during the USEPA Preliminary Assessment and Site Investigation during 1997 indicated releases of mercury, nickel, zinc, iron, and sulfates to San Carlos Creek and Silver Creek. Runoff from Portal No. 10 was identified as a contaminant source.

USEPA characterizes the report as a preliminary assessment. The report did not study the wildlife, or the effect on livestock that use creek water. It also did not identify the specific form of mercury being released. Though a release was documented, the agency considered site-specific conditions (sparse population, creeks are not used for drinking water, does not support fisheries or sensitive environments) and concluded under its Remedial Site Assessment Decision, dated 1 June 1998, that further assessment was needed under CERCLA.

## **EVIDENCE OF WATER QUALITY IMPAIRMENT**

Water samples collected between June 1971 and January 1999 indicate that San Carlos Creek is impaired by mercury downstream of the New Idria Mine. The available data are summarized in the Table 2:

**Table 2 - Historical Water Quality Data for Mercury – San Carlos Creek**

| Sampling Location  | # of Samples | Range of Concentrations (ppb) | % of Samples Exceeding Mercury Criteria |               |                                    |
|--|--------------|-------------------------------|---|---------------|------------------------------------|
|  |              |                               | CTR Criterion (0.05 ppb)                | MCL (2.0 ppb) | USEPA Wildlife Criterion (1.4 ppb) |
| Reservoir Upstream of NIM*                               | 5            | ND**–0.013                    | 0%                                      | 0%            | 0%                                 |
| NIM Drainage   | 13           | ND–4.0                        | 46%                                     | 15%           | 23%                                |
| San Carlos Creek-Dry Season–adjacent & downstream of NIM | 16           | ND–16.0                       | 88%                                     | 69%           | 69%                                |
| San Carlos Creek-Storm Event (adjacent to NIM)           | 1            | ND–207.0                      | 100%                                    | 100%          | 100%                               |

CTR: California Toxics Rule  
MCL: Maximum Contaminant Level

\* NIM=New Idria Mine  
\*\* ND= mercury not detected

Runoff from Portal No. 10 at the New Idria Mine is identified as a contaminant source. Analytical data for source surface water indicate that mercury, nickel, iron, zinc, and sulfates exceed maximum contaminant levels (MCLs) and California Toxics Rule (CTR) criteria. The data have historically been compared to drinking water criteria, even though San Carlos Creek has not been designated for municipal or domestic use. Background surface water samples were within acceptable ranges for MCLs and CTR criteria. Releases of mercury, nickel, zinc, iron, and sulfide to surface water were identified downstream of the mine site. Though mercury levels fluctuated, downstream levels are greater than background and generally exceed the MCL and CTR criteria. No evidence of groundwater impacts by these waste constituents has been documented.

A recent site investigation by Regional Board staff on 15 January 2003 confirmed ongoing water quality degradation of a four mile segment of San Carlos Creek, downstream of the New Idria Mine. Sampling locations are shown on Figure 15. Sampling was conducted for Title 22 metals. Title 22 regulations govern the listing of chemicals that are carcinogenic or toxic at specified concentrations. Title 22 metals are common constituents of acid mine drainage. Analytical lab results are compiled in Appendix B. GPS information on the sampling locations is documented in Appendix C.

The analytical data for mercury and other metals in San Carlos Creek surface water samples from the 15 January 2003 sampling event are shown in Table 3:

**Table 3 - Analytical Data for 15 January 2003 Sampling Event - San Carlos Creek**  
(Concentrations are in µg/L)

| Sample #           | 30115-1<br>Panoche<br>Creek | 30115-2<br>Dnstrm | 30115-3<br>Dnstrm | 30115-4<br>Upstrm | 30115-5<br>Upstrm<br>(Reservoir) | 30115-6<br>Upstrm | 30115-7<br>mine<br>effluent | 30115-8<br>settling<br>pond | MCL<br>µg/L         | CTR<br>µg/L        | Livestock<br>Criteria<br>µg/L |
|--------------------|-----------------------------|-------------------|-------------------|-------------------|----------------------------------|-------------------|-----------------------------|-----------------------------|---------------------|--------------------|-------------------------------|
| <b>Constituent</b> |                             |                   |                   |                   |                                  |                   |                             |                             |                     |                    |                               |
| Arsenic            | <5                          | <5                | <5                | <5                | <5                               | <5                | 47                          | <5                          | 10                  | —                  | 200*                          |
| Barium             | 26                          | <50               | <50               | <10               | 40                               | 31                | 13                          | 16                          | 1000                | —                  | —                             |
| Beryllium          | <1                          | <5                | <5                | <1                | <1                               | <1                | <1                          | 1.2                         | 4                   | —                  | 100*                          |
| Chromium           | <10                         | <10               | <10               | 20                | 14                               | 17                | <10                         | <10                         | 50                  | —                  | 1000*                         |
| Cobalt             | <50                         | 54                | 85                | <50               | <50                              | <50               | 150                         | 150                         | —                   | —                  | 1000*                         |
| Mercury            | <0.2                        | 0.28              | 0.41              | <0.2              | <0.2                             | <0.2              | <0.2                        | <0.2                        | 2                   | 0.05               | 10*                           |
| Nickel             | <50                         | 180               | 280               | <50               | <50                              | <50               | 340                         | 340                         | 100                 | 610 <sup>(b)</sup> | >1000 <sup>(c)</sup>          |
| Zinc               | <50                         | 51                | 140               | <50               | <50                              | <50               | 480                         | 480                         | 5000 <sup>(a)</sup> | —                  | 24000*                        |
| E.C.               | 3700                        | 5500              | 5100              | 1100              | 1000                             | 1100              | 4700                        | 4800                        | —                   | —                  | —                             |
| pH                 | 8.0                         | 8.4               | 8.1               | 8.7               | 8.8                              | 8.7               | 5.5                         | 4.7                         | —                   | —                  | —                             |

MCL = Maximum Contaminant Level

CTR = California Toxics Rule-Drinking Water Sources

NAS = National Academy of Sciences

\* Guidelines for Levels of Toxic Substances in Livestock Drinking Water, as published in *Water Quality for Agriculture*, Ayers and Westcot, 1985

(a) Secondary MCL

(b) Expressed as total recoverable

(c) Recommended Limits of Concentration of Toxic Substances in Drinking Water for Livestock, as published in Texas Agricultural Extension Service, *Water Quality: Its relationship to livestock*, Faries et al., 1998

Samples from the current sampling event were analyzed for Title 22 metals only. Constituents such as iron and sulfates, were not analyzed in water samples from the current site investigation.

For consistency with previous site investigations, surface water quality exceedences of drinking water criteria, such as the MCL, have been noted in the current investigation. However, since Westside streams are not designated in the Basin Plan for municipal or domestic use (MUN), exceedences of the MCL may not be relevant to evaluating impacts to beneficial uses. In addition, CTR criterion apply only to drinking water and drinking water plus fish consumption. Note that there is no evidence of fish in San Carlos Creek, so fish consumption is not applicable.

During the 15 January 2003 sampling event, source waters (mine effluent) had elevated levels of arsenic, cobalt, nickel, and zinc relative to background water quality. The current analytical results are consistent with some of the conclusions presented in the previous USEPA investigation; levels of mercury and nickel (exceeding drinking water criteria) are detected in surface water samples from the waterbody segment downstream of the mine, compared to background surface water quality. Note that the current analytical results do not exceed applicable water quality guidelines for Title 22 metals in livestock drinking water. In addition, guidelines for water quality for livestock and poultry use, based on salinity (E.C.), are available in *Water Quality for Agriculture, Table 28* (Ayers and Westcot, 1985). Accordingly, salinity values (E.C.) in surface water samples from San Carlos Creek, taken on 15 January 2003 downstream of the mine, appear to be satisfactory for livestock; however the surface water appears to be unfit for poultry.

Although iron was not analyzed in the current sampling event, USEPA's investigation in 1997 indicated that iron concentrations in surface water downstream of the mine exceeded the secondary MCL (300 µg/L) by almost three orders of magnitude. Recommended limits of iron concentrations in livestock drinking water have not been established.

Note that although elevated levels of nickel were detected in mine effluent – indicating it is a source of this contaminant to San Carlos Creek – mercury concentrations were below detection limits in source effluent during the 15 January 2003 sampling event. Although a release of mercury from the Portal 10 adit runoff was not confirmed in the current sampling event, the preponderance of evidence from previous historical sampling events appear to indicate that the mine is also source of mercury to surface waters of San Carlos Creek (refer back to Table 2). In addition, the presence of many large mine tailings piles in and around the mine may provide additional sources of trace elements to runoff into the creek.

Site investigations at the New Idria Mine have not documented impacts to wildlife, or the effect on livestock that use creek water. In 2002, the U.S. Fish and Wildlife Service (USFWS) reportedly initiated an investigation to study the impact of impaired San Carlos Creek surface water on wildlife – especially endangered species or migratory birds – living in surrounding federal lands. Bureau of Land Management manages significant amounts of land in the watershed. USFWS has no regulatory authority regarding environmental polluters on private land, but may become involved when wildlife impact is documented on federal lands. In January 2003, USFWS staff indicated to Regional Board staff that the San Carlos Creek watershed study and proposed report had languished due to lack of funding. Consequently, results of this watershed study are not available at this time.

## **EXTENT OF WATER QUALITY IMPAIRMENT**

The current 303(d) listing for San Carlos Creek indicates that the impaired waterbody segment is five miles in extent, downstream from the New Idria Mine. A key area of concern regarding the acid mine runoff is whether the mercury-impaired surface water in San Carlos Creek flows into the Silver Creek/Panoche Creek drainage, or whether the mine effluent and creek water are lost to percolation before reaching Panoche Creek. Hydrologically, San Carlos Creek is an intermittent stream; however, it is effluent-dominated below the New Idria Mine, and consequently may flow year round in a limited downstream-segment. During a field investigation on 15 January 2003, Regional Board staff investigated and observed flows at several locations in San Carlos Creek:

- Upstream of the New Idria Mine, 0.5 miles above the drinking water reservoir, measured stream flow was approximately 50 gallons/min.;
- At the New Idria Mine, settling pond overflow discharge into the creek was 10 gallons/min.;
- 4 miles downstream of the mine, measured effluent-dominated stream flow in San Carlos Creek was approximately 12 gallons/min.; and

- 4.7 miles downstream of the New Idria Mine, just upstream of the Silver Creek confluence, lack of flow, and puddles of standing water in the creek bed suggests surface flow is lost to percolation.

From this area of no observed flow in San Carlos Creek (4.7 miles from the mine), it is approximately another 12.7 miles downstream to the confluence of Panoche Creek, suggesting that during normal and dry season conditions, percolation losses likely prevent mine effluent from discharging into the Panoche Creek lower watershed. However, reportedly during major storm events and resultant flash floods, drainage and mercury impacted sediment loads from the San Carlos Creek watershed may flow downstream into Silver Creek/Panoche Creek. It has not been demonstrated to what extent potential mercury loading from the San Carlos Creek watershed impacts the Panoche alluvial fan. However, the San Carlos Creek drainage is volumetrically a relatively small part of the upper watershed of Panoche Creek.

## DISCUSSION OF WATER QUALITY STANDARDS – SAN CARLOS CREEK

Water quality standards are provisions of federal and state law which include the designation of beneficial uses of a waterbody, and establishment of water quality criteria to protect those uses. Although the Basin Plan designates multiple beneficial uses of surface water in Westside streams, including San Carlos Creek, the predominant, and currently identifiable beneficial uses of creek surface water appears to be limited to agricultural supply (livestock watering), along with perhaps wildlife and ephemeral aquatic life uses (e.g., frogs, seasonal use by aquatic insects). The current status of a seasonal surface water diversion permit issued in 1934, on private property downstream of the mine, is unknown. Impacts to freshwater wildlife habitat have not been documented. Impacts to groundwater recharge are unknown due to a lack of data and wells in the area.

Although Westside streams are not designated for MUN, the small reservoir on San Carlos Creek, upstream of the mine discharge, is reportedly used for drinking water. There appear to be no identifiable water rights associated with this reservoir. There are no documented impacts associated with acid mine drainage to water in this reservoir, or in the upper San Carlos Creek watershed above the mine.

The second component of water quality standards is water quality objectives, which include narrative objectives and numeric water quality goals. Based on current and historic water quality data, exceedences of water quality goals (pertaining to drinking water and agricultural supply) in San Carlos Creek, can be summarized as follow:

- Elevated levels of **mercury** and **nickel** commonly exceed their respective MCLs, CTRs, and USEPA National Recommended Ambient Water Quality Criterion in the downstream impaired waterbody segment.
- Elevated levels of **zinc** commonly exceed CTR and USEPA National Recommended Ambient Water Quality Criterion in the downstream impaired waterbody segment.

- Elevated levels of **sulfate** and **iron** exceed applicable respective primary and secondary MCL criterion in the downstream impaired waterbody segment.
- Downstream samples were largely within pH range specified in the Tulare Lake Basin Plan, water quality objectives for pH in surface waters. In contrast, samples upstream from the mine were consistently above the upper limit (pH=8.3) water quality objective for **pH** in surface waters.

Title 22 metals during the 15 January 2003 sampling event did not exceed applicable water quality guidelines for toxic substances in livestock drinking water. Although iron and sulfate concentrations in surface water exceed drinking water goals, such as secondary MCLs and taste and odor thresholds, there does not appear to be numeric water quality goals for iron and sulfate pertaining to livestock watering. However, iron concentrations in surface water exceed the USEPA water quality goal for freshwater aquatic life protection.

### **POSSIBLE LOWER WATERSHED IMPACTS**

San Carlos Creek is an element of the upper watershed of Panoche Creek. The lower watershed – Panoche Creek and alluvial fan – has a long history of flooding and sedimentation impacts near the City of Mendota. More recently, the Panoche Creek watershed was identified as a primary source of salts, selenium, and other trace elements, which impact soils and groundwater in the agricultural areas of the watershed. Selenium is naturally occurring in the marine shale formations in the upper watershed. Since runoff from the Panoche Creek watershed during large rainfall events reaches the San Joaquin River and Mendota Wildlife Area via the Firebaugh Canal Company water delivery system, and the Mendota Pool, degradation of surface water has also become a concern.

It has been speculated that mercury released from the New Idria Mine may have impacts on the lower watershed in Panoche Creek, and farther downstream, where the San Joaquin River empties into the San Francisco Bay. At the bay-delta confluence, sediments are substantially enriched in total mercury compared to the rest of the bay. Because of the complex circulation of the delta and the presence of other, more proximal mercury sources, it is uncertain whether effects noted in the lower San Joaquin River are directly related to New Idria.

Previous water quality sampling by Regional Board staff in the lower Panoche Creek watershed, in conjunction with the CRMP, has focused on sediment and selenium loads. Water quality analyses for mercury were not a priority in developing the CRMP. Due to an apparent dearth of mercury water quality data in the lower watershed, it is not currently possible to adequately evaluate the potential for mercury loads entering the lower Panoche Creek watershed from the New Idria Mine or any other sources. However, during the current file review, two samples of water quality data from the lower Panoche Creek watershed – Mendota Pool area, collected on 15 May 1991 during the CRMP planning process, were reviewed for Title 22 metals concentrations. As previously noted, during flood events Panoche Creek flows into the Mendota Pool. The two samples were collected from the Delta Mendota Canal at Bass Avenue; and from Mendota Pool. Concentrations of mercury and nickel (the primary Title 22 waste constituents in

New Idria acid mine runoff) in both of the Mendota Pool area water quality samples were below detection limits. While limited in scope, these results are not supportive of the aforementioned contention that significant mercury impacts to the Mendota Pool area are occurring due to New Idria acid mine runoff. However, the 303(d) list for Panoche Creek identifies mercury impairment due to resource extraction, and presumably, there is historic water quality monitoring data supporting this listing. It appears that further assessment would be needed to evaluate the potential impact of New Idria acid mine runoff to the lower watershed.

The CRMP program, which was initiated in 1989, is structured and implemented so that it may ultimately mitigate some of the concerns regarding possible upper watershed impacts to the Panoche Creek lower watershed. Local landowners, local, state, and federal agencies, and other interested parties participate in the CRMP program. The CRMP program for the Panoche Creek watershed is authorized to develop alluvial fan assessment and management plans, with the goals of implementing monitoring and best management practices to manage flood flows, erosion, and sediment transport. In addition, current CRMP projects reportedly in-progress include implementation of pilot projects in the upper watershed of the Panoche Creek drainage. Presumably, efforts associated with the CRMP may mitigate possible loading of particulate-bound mercury from the upper watershed to the lower watershed/Mendota Pool areas during flood events.

## CONCLUSIONS

A recent site investigation by Regional Board staff on 15 January 2003 confirmed that a four-mile segment of San Carlos Creek, downstream of the New Idria Mine is impacted by mercury and nickel at concentrations that exceed water quality objectives. Elevated levels of nickel were detected in mine effluent, indicating it is a source of this constituent to surface waters of San Carlos Creek. In the current sampling event, mercury was not detected in source effluent; however, the preponderance of evidence from historical analytical data appear to indicate that the discharge from Portal 10 and/or the tailings waste piles around the mine, are likely a source of mercury to San Carlos Creek.

Regional Board efforts at enforcement have been sporadic since the 1970's. Complaint investigations have occurred, and periodic efforts have been made to identify responsible parties and have corrective action measures implemented.

Recommendations for remediation at the New Idria Mine have reportedly languished due to prioritization issues and limited budgetary resources. San Carlos Creek is identified on the Regional Board's 303(d) list for the San Joaquin Basin, with a Low Priority designation in terms of funding. It appears that Regional Board staff has historically considered the mine site to be of relatively low priority in terms of assigning resources, and enforcement action has reportedly been hampered due to some difficulties in identifying responsible parties.

Concerns about the potential for mercury loading to the lower Panoche Creek watershed, by the San Carlos Creek upper watershed during flood events, have been articulated by some stakeholders and environmental scientists. The Panoche Creek CRMP is structured and