

ANNUAL REPORT
to the COLORADO WATER QUALITY CONTROL COMMISSION
from the HAZARDOUS MATERIALS and WASTE MANAGEMENT DIVISION
COLORADO DEPARTMENT OF PUBLIC HEALTH and ENVIRONMENT

SB 181 Implementation
COMPLIANCE WITH WATER QUALITY STANDARDS AND CLASSIFICATIONS
for the Fiscal Year Ending June 30, 2006

September 29, 2006

This is the annual report provided to the Colorado Water Quality Control Commission (Commission) by the Hazardous Materials and Waste Management Division (HMWMD). This report documents HMWMD activities that protect water quality in Colorado, support the mission of the Commission, and implement state water quality standards.

The paragraphs that follow present issues and examples of sites where releases have impacted ground water quality and where HMWMD decisions and actions concerning water quality classifications and standards have established clean-up criteria. There are numerous other examples, not chosen, where the state water quality standards have been used to determine the need for further site investigations or remediation to address chemical releases to the soil, ground water or surface water. For any site, added information that is of interest or use to members of the Commission will be provided on request.

GENERAL

A few years ago, the WQCC modified regulation 61 (Colorado Discharge Permit System) to delete the table of individual Practical Quantitation Limits (PQLs) and made the WQCD responsible for developing a PQL Guidance Document. This draft guidance has been released for public comment, and is potentially problematic to HMWMD. The document specifically refers to Regulation 41 (Basic Standards for Ground Water), noting that whenever the PQL for a pollutant is higher than a standard, the PQL shall be used in regulating specific activities. The document states "the PQLs identified in this guidance are appropriate for use by an implementing agency unless the agency has adopted an alternate PQL. For activities regulated by an implementing agency, it is recommended that the regulated entity contact the implementing agency to determine if the alternate PQL has been adopted." For several contaminants, the PQL in the guidance document is significantly higher than the groundwater standard we use as our cleanup goal. HMWMD fears that this guidance now gives polluters license to perform less protective cleanups than we are currently requiring, and severely compromises our ability to comply with SB 181.

The new PQL guidance also has ramifications for solid waste facilities. Appendix B of the Solid Waste regulations establishes the identification of a statistically significant increase based on background concentrations. Many of our facilities identify the background concentration of organic constituents as non-detect, as many are not naturally occurring constituents. Unfortunately the new "elevated" PQLS could result in solid waste facilities establishing background concentrations above the state groundwater standards. This would prove deleterious to the protection of groundwater based on potential releases from solid waste facilities.

It may be that as this guidance applies only to implementation of the Clean Water Act, that HMWMD maintains its authority under our existing authority to require cleanups that meet state standards. HMWMD will be preparing comments on the draft guide that at a minimum calls for clarification on this issue.

SOLID AND HAZARDOUS WASTE PROGRAM

Solid Waste:

Activities Database Improvements - Improvements continue in the database designed to contain and inter-relate important solid waste data statewide. All significant types of data for all solid waste facilities that meet the minimum level of data quality will be entered. Groundwater well logs and applicable groundwater chemistry data are entered into the EQIS database. The location of groundwater wells in relationship to actual mapped locations have been completed for several major facilities. An electronic format for reporting data is available so facilities can send the data directly to the appropriate Solid Waste Unit staff member who can enter it directly into the system. Access to the data has already proven to be very useful to staff and interested members of the public.

Data-Driven Compliance Monitoring Efforts - Use of the inspection and enforcement database has enabled the Solid Waste Unit to track enforcement actions and inspections, and evaluate frequency of violation by facility size, staff time, waste volumes, landfill size, status of monitoring and other solid waste related parameters. The information assists efforts toward solid waste facility compliance. Preliminary indications are that the data is useful to target compliance-related information and technical assistance training. Accurate information on some parameters, such as landfill size and remaining capacity/ life, has proven difficult to obtain due to the function of the database and due to the fact that no one has tracked these data consistently. This will be an ongoing project; corrections are made as needed and as we move forward.

Solid Waste Unit has begun tracking individual facility compliance rates. The compliance rate determined by the data appears lower than expected; but it is clear that small facilities are actively correcting various problems with their facilities. Efforts to tabulate and track compliance data properly have led the Unit to re-assess the methods of data collection and data entry as well as data quality. It will probably take at least another inspection season to establish the necessary baseline.

Specific Site Summaries:

A Preliminary Injunction was filed against Rivera's Vacuum Service, which is in the business of pumping septic tanks and sand traps. Mr. Rivera was dumping/disposing of septic material on his property. The groundwater is approximately 8-9" below ground surface and the Purgatory River is approximately 200' from one of the disposal sites. The site was investigated and it was determined that no further action was required based on no residual impacts to soil or groundwater.

Hazardous Waste:

Since last year, no major changes have been made in the Hazardous Waste Program, which is Colorado's equivalent of the federal Resource Conservation and Recovery Act, Subtitle C (RCRA) program. There have been no recent significant changes in implementing regulations that alter the way in which HMWMD applies Colorado's water quality standards and classifications for discharges to state waters, including ground water. A review of the Hazardous Waste Program and the various mechanisms contained within the Colorado Hazardous Waste Statute and Regulations

governing the protection of state waters may be found in the document entitled "Hazardous Materials and Waste Management Division Report Describing How Programs Are Assuring Compliance With Water Quality Standards and Classifications" (April 16, 1991). As discussed in that report, water quality standards are used as clean-up criteria unless a site-specific demonstration can be made showing that alternate concentration limits are equally protective of human health and the environment. The ability to establish site-specific ground water standards is limited to regulated units at facilities that are permitted to treat, store or dispose of hazardous waste. The regulatory ability to establish unit-specific alternate concentration limits does not apply to facility-wide corrective action. Nor does it apply to facilities that do not have or are not seeking a permit to treat, store or dispose of hazardous waste (i.e., illegal disposal sites). In these situations, the facility has the option of developing site-specific ground water standards, but they must do so by petitioning the Water Quality Control Commission for the adoption of the site-specific standard. Otherwise they must use the established standards as targets for the cleanup of releases. The Hazardous Waste Program's Corrective Action Guidance Document, published in May 2002, provides an overall implementation framework and model scopes-of-work for site characterization, interim actions, evaluation of remedial alternatives and remedy implementation. Section 5.1.3.1 of the Corrective Action Guidance Document states that clean-up standards for ground water are established in "The Basic Standards for Ground Water" of the Water Quality Regulations (Section 3.11.0 in 5 CCR 1002-8). The guidance also informs facilities that they have the option of developing site-specific ground water standards and petitioning the Water Quality Control Commission for their adoption.

The Hazardous Waste Program continues to deal with issues associated with "emerging" chemicals of concern. These are chemicals of two kinds: (1) chemicals that are new to the regulatory field because they have been identified only recently as being associated with other regulated waste streams and can pose significant risk; or (2) chemicals whose toxicity and related risk information has been updated by recent health assessments conducted by USEPA. One example of an emerging chemical of concern dealt with by the Hazardous Waste Program this past year is tetrachloroethene (PCE), a contaminant found at numerous sites in Colorado, especially dry-cleaning facilities. The Environmental Protection Agency (EPA) is currently evaluating the toxic potential of PCE, including its carcinogenicity, and therefore no relevant cancer toxicity values are available. In response to an EPA directive, the Division prepared a policy that formally adopts the California EPA PCE inhalation cancer slope factor, thereby lowering the risk-based indoor air concentration by more than an order of magnitude. This will allow Division staff to make protective risk management decisions on a site-specific basis using the most current thinking on the risk posed by PCE. As a consequence of this change, the Division also modified its ground water screening values to match the State ground water standard, suggesting that buildings overlying contaminant plumes containing PCE at concentrations above the 5 µg/L standard have the potential to cause vapor intrusion problems, triggering the need to evaluate this exposure pathway.

USEPA will continue to re-evaluate the toxicity information for a fairly large number of chemicals over the next few years. The Division anticipates having to deal with other emerging chemicals of concern in the future. If it becomes necessary to establish ground water cleanup goals for these new chemicals of concern, we will do so in a manner consistent with how Colorado calculates its State ground water standards.

Specific Site Summaries:

The Former Redfield Rifle Scope Site (Redfield) is the source of solvent contaminated ground water, the plume from which travels over a mile beneath a variety of residential and commercial properties. The solvents released contain the contaminant 1,4-dioxane. The Water Quality Control Commission is familiar with the issue of 1,4-dioxane, having adopted a new State ground water standard for it on September 14, 2004. Since then Brown Group Retail, the Redfield site property owner has been operating a pair of systems to treat ground water contaminated with both the normal suite of volatile organic compounds and 1,4 dioxane. In late 2005 they installed an advanced oxidation process (AOP) for the sole purpose of removing this contaminant. To date, the AOP system has successfully reduced 1,4-dioxane concentrations in the effluent to as low as 1.7 µg/L, well below the standard of 6.6 µg/L. Unfortunately, naturally occurring constituents in the ground water have been fouling the AOP unit, an unexpected occurrence even though treatability studies were performed during the design of the system. Continued adjusting and testing of the system are currently being conducted to achieve and maintain adequate 1,4-dioxane removal.

TCE is found in ground water downgradient of the Hewlett-Packard (HP) facility in Colorado Springs, this plume of contamination passing beneath a residential community. Operation of a boundary containment system helped prevent contaminants from migrating off-site, but residual contamination in ground water and sorbed to the aquifer materials prevented ground water from declining to the point where state standards were achieved. Because the TCE concentrations in ground water beneath the residences were at levels that could potentially pose a risk via the vapor intrusion pathway (indoor air contamination), the HMWMD initiated a series of meetings to discuss actions needed to respond to this new development. As a consequence of these meetings, HP agreed to install an in-situ ground water treatment system, using oxidizing compounds to chemically destroy TCE and other volatile organic compounds. The goal of this interim measure was to aggressively treat the water, to perhaps levels even below State standards, such that it will not be capable of generating vapors that could migrate into overlying homes at levels that pose an unacceptable risk to the inhabitants. After more than a year of pilot testing, the injection of chemical oxidants has failed to maintain adequate cleanup of the highly permeable aquifer: treatment following injection is very limited in extent and duration, the contaminant concentrations rebounding shortly after the test. Since the source of TCE vapors (ground water) may not be eliminated from beneath the residential community, the need for collecting direct evidence (indoor air testing) to evaluate the potential for vapor intrusion will once again need to be discussed. Such a testing program would need to be carefully designed because TCE is present in household products and any data collected would need to be evaluated to distinguish the true source of any vapors detected (subsurface versus background).

Hamilton Sundstrand operated a facility in north Denver for many years, during which time solvents were released into soil and ground water. The resulting ground water plume travels several thousand feet through a highly transmissive aquifer, largely beneath vacant property with only the northern plume boundary crossing into a residential neighborhood. Two years ago the facility ceased operating at the location, but this did not terminate their obligation to continue investigating source areas and remediating ground water under U.S. EPA and Colorado Department of Health and Environment's oversight. Within the last year Sundstrand has been negotiating with a developer to purchase and eventually build a community of mixed residential and commercial

structures on property underlain by the offsite ground water plume. To accomplish this, the Department is communicating with the environmental contractor responsible for performing the site-wide cleanup. The objectives of the developer are to remediate ground water to the degree that 1) they meet State ground water standards and 2) it no longer poses a threat via the vapor intrusion pathway. They hope to achieve these goals within a very short period of time so as not to impede future development plans, requiring that a very aggressive ground water remediation program be implemented quickly. The Department and developer are working in a collaborative and accelerated fashion in an effort to meet these short timeframes.

Dry cleaners continue to be the number one new site with ground water impacts brought to our attention year after year. They use the highly mobile, high toxicity, recalcitrant solvent PCE to clean clothing. As a result of poor historical material handling practices, lack of knowledge and the highly mobile nature of this chemical, many dry cleaners are believed to have impacts to soil and ground water that require some level of characterization. The traditional approach to cleaning up dry cleaning facilities oftentimes cannot be used: the parties responsible for remediating the release (the “mom and pop” business operator or strip mall owner) do not have the financial resources to deal with problems of this magnitude. Consequently, the corrective action process has been pared down to those requirements deemed to be absolutely necessary to support remedial decisions. In an effort to save staff time having to explain this process to each new site brought to our attention, on March 2006 the Division issued the “Dry Cleaner Remediation Guidance Document” for use at these sites. The document establishes goals and expectations for all aspects of the corrective action process for these facilities. Not only does the document identify the State ground water standards as a cleanup objective, but it also includes screening levels that consider the potential for vapors to migrate into overlying structures. The document discusses a variety of subjects related to ground water investigation and cleanup, including whether or not ground water standards need to be met before a property can qualify for a “no further action” determination. The Division will consider terminating remedial activities at dry cleaning facilities if the following conditions are met: the source of contamination has been eliminated; residual soil contamination must be below levels that pose no risk to ground water quality via leaching; treatment of ground water is occurring to reduce contaminant mass in and downgradient of the source area, thereby stabilizing or reducing the size of the plume; ground water contamination is relatively low level and largely confined within the property boundary, and; there is no opportunity for the disturbance of the site to remobilize contamination causing it to increase in magnitude or renew migration. The belief is that the residual contamination will naturally attenuate following closure and eventually achieve state standards in the not too distant future, regardless of whether we are monitoring ground water or not.

Rocky Flats Environmental Technologies Site (RFETS)

Cleanup in the Industrial Area of the site is complete. Ground-water flow systems were modeled to ensure surface water standards would continue to be met. Long-term ground water monitoring will be performed to monitor any changes in contaminant levels in plumes and verify water quality and movement. Routine ground water monitoring has been significantly revised as part of the transition to long-term monitoring. The long-term Integrated Monitoring Plan (IMP) was developed with stakeholder input.

Zero-valent iron was replaced in the East Trenches Plume Treatment System and the Solar Ponds Plume Collection and Treatment System. Both systems continue to treat VOCs. Treatment of contaminated ground-water segments below the treatment systems are enhanced by phytoremediation. Remediation of portions of VOC plumes was also enhanced by chemical treatment via injection of hydrogen reducing compound.

Routine monitoring of surface water is implemented through the Integrated Monitoring Plan. Surface-water sampling is conducted in the operations areas and the three main surface water drainages. The IMP has been updated on an annual basis with stakeholder input.

Dams on the Walnut Creek and Woman Creek drainages will remain intact, except for Pond C-1 on Woman Creek. This pond has been notched on the north end. A new stop-log structure keeps shallow water impounded to support wildlife.

Surface water data collected by the state and DOE, with mapping and charting applications, is incorporated into the CDPHE website for stakeholder access. The web address is: www.cdphe.state.co.us/hm/rf/rfmaps.asp.

RADIATION PROGRAM

The Radiation Program, in part, regulates the operational activities and cleanup of present and former uranium processing, mining, and disposal facilities. It works to isolate the radioactive and heavy-metal laden wastes and by-products produced in Colorado from the environment. This program works in conjunction with CERCLA and RCRA programs in the Hazardous Materials and Waste Management Division and implements the Water Quality regulations for surface and ground water.

NORM/TENORM in Water Treatment Residuals: Program staff worked closely with Water Quality Control Division staff and a large group of internal and external stakeholders to develop a draft guidance document to address proper management and disposal of water treatment residuals that may contain elevated levels of naturally occurring radioactive material (NORM) or technologically enhanced naturally occurring radioactive materials (TENORM). The Hazardous Materials and Waste Management Division and the Water Quality Control Division jointly released the draft document for public review and comment, intended to address water quality, solid waste, and radiation safety concerns. Both divisions are in the process of evaluating, responding, and incorporating comments received into a revised draft for further consideration. The guidance will enhance protection of water quality by promoting the proper management and disposal of water treatment residuals and radiation safety for NORM and TENORM, as appropriate.

Lincoln Park / Cotter, Fremont County: Uranium and molybdenum continue to be monitored in ground water in the Lincoln Park Water Use Area (Operable Unit 2) near the Cotter / Canon City uranium mill tailings site. The previous goal of 35ug/l uranium that was set in 1988 will be revised to coincide with the groundwater standard set by the Commission. The Division approved a plan for soil remediation in the Old Ponds Area in the mill site (Operable Unit 1). This constitutes a major source of ground water contamination at the Cotter Mill facility. The Proposed Plan was

evaluated and approved on its ability to meet ground-water standards at the Point of Compliance, utilizing the federal MCL of 30ug/l uranium.

Gateway: A cleanup of the former Gateway Vanadium Mill in Mesa County was completed. This cleanup was performed at the facility to remove uranium and vanadium-contaminated soils. This cleanup will reduce the heavy-metals load on the adjacent Dolores River and reduce risk to the local people.

REMEDIAL PROGRAMS

Superfund Activities: The Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund) requires that remedies chosen to address hazardous substance releases must either meet existing standards or, in limited cases, waive those standards. During each remedy selection process, the Hazardous Materials and Waste Management Division (HMWMD) submits to the United States Environmental Protection Agency (EPA) a list of state regulations that are either directly applicable to a particular cleanup situation or which are relevant and appropriate requirements (ARARs). Water quality standards are identified after consultation with the Water Quality Control Division (WQCD). The following site summaries are provided for sites that, over the past year, had new activity related to compliance with water quality standards. Information on other Superfund sites can be provided on request.

The California Gulch/Leadville site encompasses much of the Leadville mining district, and impacts California Gulch, Evans Gulch, and the Arkansas River. Discrete cleanup projects at the site have been accomplished and largely completed over the past 10 years. CDPHE and EPA are currently assessing these actions to determine whether they are sufficiently protective. In order to do this a viable end goal must be established. State standards for appropriate segments of the Arkansas River have previously been identified as applicable standards for the cleanup. However, the current standards are Table Values that are not achievable for the site.

Therefore, at the June 2007 Rule Making Hearing for the Upper Arkansas River, CDPHE Remedial Programs, in cooperation with the CDPHE Water Quality Control Division, the Colorado Attorney General's Office, the Colorado Division of Wildlife, the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife will propose changes to surface water standards for zinc and cadmium for segments 02b, 02c and 05 of the Upper Arkansas River. CDPHE and USEPA are also working with stakeholder mining companies in this process. In the interest of proposing standards that are protective and defensible the proposed standards will take advantage of previous and ongoing work, including but not limited to a "brown trout cleanup goal for zinc" developed by USEPA, a "recalculation procedure" evaluation developed by Resurrection Mining Company, surface water fate and transport modeling, a Use Attainability Analysis (or equivalent), and historic surface water quality and aquatic biology data. In summary, CDPHE Remedial Programs intends to bring "the weight of evidence" in support of our proposal to the June 2007 hearing.

The Eagle Mine in Eagle County consists of a mining complex and associated waste near the town of Minturn. Heavy metals contamination from mining operations has impacted soils, surface water

and ground water. Under the selected remedy, the Eagle Mine is used to store contaminated ground water. The mine pool water is then treated to state and federal standards prior to discharge to the Eagle River. The treatment plant on this site currently treats approximately 400 gallons per minute under a CPDES permit. Contaminated ground water under the consolidated tailings pile is collected via two trenches, and is also treated at the plant. Clean ground water is diverted around the pile by an interceptor trench. Water quality in the Eagle River has been improving for several years. In 2005, CDPHE, EPA, the responsible party, and the local stakeholders attempted to reach consensus on new standards on Segments 5 and 9 of the Eagle River based on this improvement and the associated measured improvement in the aquatic community. Ultimately, the local stakeholders felt that additional improvement in river quality was needed, and they refused to support a permanent standard. In the December 2005 hearing, the Water quality Control Commission adopted new temporary modifications based on the ambient conditions. CDPHE is currently working with the responsible parties to identify and remove additional loading from the river. It is hoped that permanent standard can be agreed upon at the next triennial review.

At the Summitville Mine site in Rio Grande County the state and EPA continue to treat water in the old water treatment plant at a rate of approximately 1000 gpm. A new water treatment plant has been designed which will have the capacity to treat at 1600 gpm and will be able to remove copper and aluminum to lower levels than the current treatment plant. EPA's National Remedy Review Board has evaluated the new water treatment plant and has recommended that the cost of a two-stage plant is not warranted, due to the large upstream concentration of Aluminum in the Alamosa River. As a result, EPA has withheld federal funding to construct the new water treatment plant. CDPHE is preparing a revised Use Attainability Analysis to support a proposed change in the aluminum standard on segments 3b and 3c of the Alamosa River. This proposal is scheduled for the June 2007 WQCC hearing.

Voluntary Cleanup and Redevelopment Activities: The Voluntary Cleanup and Redevelopment Act (VCRA) staff continues to encounter issues related to surface and ground water contamination. The staff works closely with the WQCD on each site-specific decision to assure compliance with the appropriate regulations. Meeting ground water standards is an ongoing issue at VCRA sites. Since these sites are most often the subjects of real estate transactions, the buyers and sellers try to assure that the cost of cleanup does not make the economics of the deal unfeasible. Therefore, most clean-up plans focus on source control or removal rather than treatment of contaminated ground water plumes. The VCRA staff strives to assure that any exceedance of ground water standards is contained on-site. Point-of-compliance wells are established at the property boundary. HMWMD requires any applicant that exceeds ground water standards at the property boundary to apply to the Water Quality Control Commission for a variance, a site-specific standard, or a change in point of compliance (unless this exceedance will only be temporary during cleanup activities and the applicant can show that no surface water body is impacted and no exposure is occurring during this period). This assures that the program complies with water quality regulations.

The Gates Rubber facility in south Denver site has been a high profile site that involves groundwater issues. TCE contamination on the site has migrated north into the adjacent residential community. TCE levels of up to 1500 ppb have been detected off site, and levels 10 times higher have been detected on site. Both Gates Rubber (remediating the parcels east of Broadway), and Cherokee Development (remediating the parcels west of Broadway) have instituted source control

measures at the site that have been successful. Cherokee is injecting molasses into the off-site plume as well as performing mass removal on site. Gates has injected an oxidizer called “Boss 100” into their on site plume. The goal is to reach state groundwater standards at the site boundary within a reasonable timeframe. Indoor air has been tested in the neighborhood, and based on the data is not a problem.