COLORADO

Hazardous Materials
& Waste Management Division

Department of Public Health & Environment

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, 2018

January 2019

This is the annual report provided to the Colorado Water Quality Control Commission (Commission, WQCC) 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. Any additional information will be provided to the Commission upon request.

HAZARDOUS WASTE PROGRAM

No major changes have been made in the Hazardous Waste Program over the last year; which is Colorado's equivalent of the Federal RCRA, Subtitle C program. The program is continuing to require groundwater at hazardous waste sites to be remediated to applicable state groundwater standards; while evaluating some low risk sites with low-level residual groundwater contamination relative to, the HMWMD's Conditional Closure Policy and Guidance (CCP&G). Although, the CCP&G have been in effect since 2014, only five conditional closure requests have been approved by the program.

The Hazardous Waste Program is currently involved in the remediation of approximately 200 hazardous waste sites in Colorado, the vast majority of which include impacts to groundwater. The sites range in complexity from the Rocky Flats Department of Energy site in Jefferson County, to your local small business dry cleaning facility.

No Further Action Determinations Involving Groundwater

Over the past year, the Hazardous Waste Program approved the final remediation and closure of eight hazardous waste sites. All eight of these hazardous waste sites involved remediating contaminated groundwater. One of these eight sites, Colorado Crystal (described below), was closed with groundwater contamination exceeding WQCD's Regulation 41 Standards pursuant to the Program's CCP&G, while the other seven sites with groundwater issues were remediated below WQCD's Regulation 41 Standards.

Site Specific Summary – Colorado Crystal

Colorado Crystal was a manufacturing site in Loveland Colorado that processed various types of industrial grade diamonds. Their operations included machining, which resulted in releases of chlorinated solvents to soil and groundwater from a waste process sump located in the center of the site. Prior to remedial activities groundwater contamination, several orders of magnitude over standards, was wide spread and extended off-site to adjacent properties.

Cleanup of the site through the Hazardous Waste Program began in 1991. Activities to address contamination in soil and groundwater involved multiple phases of site characterization and cleanup, including: three phases of soil excavation in the source area with off-site disposal, site-wide groundwater containment and treatment via an on-site iron filings funnel and gate system, groundwater extraction and treatment in select areas to enhance property boundary containment, soil vapor extraction/dual phase extraction at the bedrock interface below the

source area, aboveground treatment of vapor and water, and enhanced bioaugmentation. Groundwater monitoring data from 2013 through 2017 demonstrated that groundwater contamination over standards had receded back to a small pocket in the original source area and no longer posed a risk to off-site properties. Therefore a Restrictive Notice was put in place prohibiting future groundwater use at the site and it was closed out pursuant to the Program's CCP&G. Though the site has been closed, it will continue to be inspected and tracked to ensure that the Restrictive Notice Placed on the site prohibiting groundwater use will continue to be complied with until the groundwater meets applicable standards.

Emerging Contaminants – PFOS/PFOA

Due to the recent discovery of Perfluorooctyl sulfonate and Perfluorooctanoic acid (PFOS/PFOA) in groundwater and drinking water in the State of Colorado, the Hazardous Waste Program added PFOS/PFOA to the Appendix VIII list of regulated hazardous constituents in April of 2018. Through this listing, the Hazardous Waste Program will be able to require sites performing corrective action for hazardous waste releases to also evaluate the nature and extent of PFOS/PFOA that may have been released due to site operations. To date, groundwater investigation proposals have been requested from about fifteen hazardous waste sites to screen for the presence of PFOS/PFOA. The Program will likely begin receiving preliminary data from these screenings by the end of 2018.

General Program Observations

Most sites remediated and closed by the Hazardous Waste Program exhibit certain characteristics: they are relatively small in size; the source areas, if found, are small in size and are indicative of a limited release to the environment; the ground water contamination is of limited extent; they take between 5 and 10 years to remediate; and contaminant concentrations in ground water are generally under 200 µg/L when they are brought to our attention. These sites have the greatest chance of achieving state ground water standards in a reasonable period of time, assuming that the responsible party has the will and financial resources to perform the necessary work.

Other sites managed by the Program have larger source areas and associated higher levels of contamination in soil and groundwater that take considerably longer to remediate, potentially decades. They are required to perform any and all reasonable tasks necessary to reduce contamination in the source area and reduce groundwater contaminant concentrations. These longer term cleanups often rely on long-term monitored natural attenuation to further reduce groundwater contaminant concentrations and demonstrate that the contamination will meet standards in the foreseeable future, which makes them eligible for closure pursuant to the Program's CCP&G.

RADIATION PROGRAM

The Radiation Program, in part, regulates the operational activities and cleanup of current and former uranium processing and disposal facilities. It works to isolate the radioactive and heavy-metal wastes and by-products produced in Colorado from the public and environment. This program works in conjunction with Remediation programs in the HMWMD and implements the Water Quality regulations for surface and ground water at those sites. The Program works with the Division of Reclamation, Mining and Safety and with the Oil and Gas Conservation Commission on issues relating to treatment or monitoring of radioactive materials in ground

water. The Program issues and oversees licenses for uranium mills and other activities involving radioactive material.

Site Specific Summary-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. Ownership of the site was transferred from Cotter to Colorado Legacy Land, LLC in March 2018. Ground water concentrations of uranium and molybdenum have declined down gradient of the Old Ponds Area and in Lincoln Park. The investigation into the source, extent, and nature of uranium and Trichloroethylene (TCE) in ground water found moving north-northwest from the Cotter facility is being conducted pursuant to the Comprehensive Environmental Response Compensation Liability Act (CERCLA or Superfund). The Superfund remedial investigation/feasibility study process has been progressing. In addition, the Cotter facility is undergoing full decommissioning of its' radioactive materials license and will meet Superfund and Colorado requirements.

All wells, but one, tested in Lincoln Park show molybdenum contamination is below ground water standards. The Colorado molybdenum ground water standard is 210 ug/L. However, the Nuclear Regulatory Commission (NRC) cleanup goal of 100 ug/L molybdenum for ground water is applicable. Some wells in Lincoln Park show uranium contamination above the Colorado standard of 30 ug/L.

Site Specific Summary-UMETCO/Uravan site, Uravan, Montrose County
Complete remediation of the Uravan site was accomplished in 2008. ACLs (alternate concentration limits) are in place for several contaminants in ground water. A long-term program of ground water and surface water monitoring is in place to demonstrate that the ACLs continue to be protective of the river and that contaminant concentrations are stable or decreasing now that the source has been removed. At license termination and deletion from the Superfund National Priorities List (NPL), the facility will be transferred to the U.S. Department of Energy for long-term surveillance. EPA and CDPHE signed a Record of Decision for the site in June 2018. The Record of Decision requires specific institutional controls for the areas in Uravan with residual contamination above the cleanup levels for unrestricted uses. Institutional controls will be implemented in accordance with the Record of Decision.

Department of Energy atomic blast sites, Garfield and Rio Blanco Counties The Radiation Control Program advises the Oil and Gas Conservation Commission on the monitoring and testing of ground water for radioactive materials from gas wells being drilled near the Rulison and Rio Blanco atomic blast sites.

REMEDIATION PROGRAM

Superfund/Brownfields Unit

Site Specific Summary- Captain Jack Mill, Boulder County
Located approximately one mile south of Ward in Boulder County, the Captain Jack Mill Superfund site was added to the NPL to address soil contamination and acid mine drainage from the Big Five tunnel. Surface remediation was completed in 2012 and removed mine waste from floodplains, consolidated and capped it, and installed run-on and run-off controls. A flow-through bulkhead was installed in the Big Five tunnel in 2017, along with an in-situ mine pool

treatment system and monitoring arrays. On May 9, 2018, the innovative treatment system began operating. A comprehensive monitoring plan was developed and includes frequent data collection to evaluate the treatment system performance. While the mine pool develops, no water will exit the tunnel. Once the mine pool operating level is obtained, the flow-through valve will be partially opened to maintain a static elevation and the water quality exiting the tunnel will be monitored for two years. If the in-situ treatment system does not allow attainment of water quality standard in Left Hand Creek downstream of the site, an ex-situ passive treatment system will be required.

Site Specific Summary-Central City/Clear Creek, Clear Creek and Gilpin Counties

Over the last 20 years, significant work has been completed within the four operable units that comprise the Central City\Clear Creek Superfund site. Along the main stem of Clear Creek, clean-up efforts have resulted in the capping of more than 15 mine waste piles and construction of two water treatment plants. The Argo Tunnel water treatment plant is located in Idaho Springs and treats the Argo, Big Five tunnel discharges and Virginia Canyon ground water. The North Clear Creek water treatment plant is located in Black Hawk and treats the National tunnel and Gregory Incline discharges.

Although remedial actions for the Central City Clear Creek Site are nearing completion, and despite significant improvements in water quality in the main stem, ambient water quality exceeds inorganic (metals) standards in several segments. In 2019, the WQCD will complete a 303(d) listing review of this basin. Following the updated assessment, CDPHE and EPA will evaluate the need for CERCLA Technical Impracticability waivers of water quality standards on certain segments of the watershed.

Site Specific Summary-Chemical Sales Company, Adams County

HMWMD has been working with EPA to address groundwater contaminated with volatile organic compounds (VOCs) at the Chemical Sales Company Superfund site (CSC) for over 20 years. By 2014, HMWMD was implementing the final phases of a remedy to reduce source area concentrations of VOCs at the site. However, due to the emergence of 1,4-dioxane as an additional contaminant of concern at sites with VOC contamination, and in response to the detection of 1,4–dioxane in several water supply wells operated by the South Adams County Water and Sanitation District (SACWSD), HMWMD has confirmed that the CSC site contributes to elevated 1,4-dioxane levels, above the State groundwater standard, present in SACWSD water supply wells.

In 2018, HMWMD has secured a contract with a qualified engineering firm to conduct a Focused Feasibility Study (FFS) to provide site characterization, define remediation alternatives and provide a detailed analysis for suitable remedial action alternatives both for VOCs and 1,4-dioxane. CDPHE has been working with the contracted party to get the FFS into its final stages. EPA and CDPHE have been working together to finalize this FFS. Additionally, HMWMD completed annual groundwater monitoring throughout OU1 and OU2 to provide current data for VOCs and 1,4-dioxane.

Site Specific Summary-Eagle Mine Superfund site, Eagle County

The September 2017 Eagle Mine Operable Unit 1 Record of Decision (ROD) amendment formally adopted the WQCC site-specific standards for copper, cadmium and zinc as ARARs for remediation. The OU1 decision also required additional remediation to meet the surface water

standards. With regard to the arsenic 0.02 ug/l water + fish standard, the OU1 ROD amendment formally waived this standard and replaced it with an alternate remedial goal (ARG) of 3 ug/l to be applied as an effluent limit for the Eagle Mine water treatment plant (WTP). Through discussion with WQCD staff HMWMD learned that they were not able to incorporate the arsenic ARG into the Eagle Mine WTP CDPS permit. As a result, EPA and HMWMD prepared a Permit Equivalent Document (PED) for the Eagle Mine WTP that contains key procedural elements, standards, and requirements from the CDPS permit to create an enforceable arsenic limit for the discharge at 3 ug/L. The PED will also maintain enforceable, WQCC limits for other contaminants. The draft PED for Eagle Mine Water Treatment Plant, prepared by HMWMD, is currently under review with the WQCD Permits Section.

Similarly, a PED will also be prepared for the Liberty No. 4 (LIB-4) well, associated with the Eagle Mine Site. The LIB-4 pumping system reduces the amount of clean water inflow that would otherwise recharge the Eagle Mine and consequently require treatment at the Eagle Mine WTP. Untreated water pumped from the LIB-4 well has been historically discharged to Willow Creek under provisions of a CDPS permit.

Once finalized, the PED will replace the CDPS permit. Therefore, the responsible party has withdrawn their earlier appeal to the March 2018 Eagle Mine WTP CDPS permit renewal. The responsible party will continue operating both the Eagle Mine WTP and LIB-4 well under existing permits until a new Long-Term Operation/Maintenance Consent Decree has been negotiated and they have gone through the formal CDPS permit termination processes; after which, both the treatment plant and LIB-4 will operate under PEDs.

Site Specific Summary-Summitville Mine Superfund Site, Rio Grande County

Although the remedial actions at the Summitville Mine site are complete and the new water treatment plant has been operating since 2012, some of the inorganic (metal) water quality standards in the Alamosa River downstream of the site are exceeded. Aluminum is the dominant contributor to water quality compliance problems. However, much of this metal loading is from naturally occurring sources outside of the Superfund site boundary. CDPHE is evaluating administrative options for addressing the standard exceedances which may include obtaining a standard waiver under CERCLA.

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 subject of real estate transactions, the buyers and sellers try to ensure that the cost of cleanup does not make the economics of the deal unfeasible. Therefore, most cleanup plans focus on source control or removal, rather than treatment of contaminated ground water plumes. The VCRA staff strives to assure that ground water standards are met at the property boundary. For sites where ground water standards are not achieved at the property boundary HMWMD policy allows applicants to apply to the WQCC for a variance, a site-specific standard, or HMWMD will consider an alternate point of compliance providing the applicant can demonstrate that there is no current or future exposure risk.

Federal Facilities Remediation and Restoration Unit

Per- and Polyfluoroalkyl Substances (PFAS), El Paso County

Per- and polyfluoroalkyl substances (PFAS) were detected in the Widefield, Security, and Fountain public water systems of El Paso County, during sampling under EPA's third Unregulated Contaminant Monitoring Rule (UCMR 3). Subsequently, the U.S. Air Force (USAF) initiated a CERCLA investigation at Peterson Air Force Base (AFB), to identify potential PFAS source areas and releases. The Peterson AFB Preliminary Assessment report, published in October 2016, identified five possible source areas on the installation. The July 2017 Site Inspection report confirmed releases of PFAS from four of the five possible source areas on Peterson AFB. The USAF's follow-on Expanded Site Inspection, to delineate contaminant pathways from confirmed sources off the installation, began in fall 2017; the results are expected to be published in spring 2019.

In addition to the ongoing CERCLA investigation, drinking water mitigation measures have been installed for the affected public water systems. At this time, water being served by each of the affected systems is below the May 2016 EPA Health Advisory Levels (HALs). Furthermore, the USAF recently entered into Environmental Services Agreements with the affected public water systems to assist with operation and maintenance of the mitigation measures already installed, to procure water from alternate sources to compensate for the lost groundwater, and to analyze longer-term solutions, including redundancy in the systems. For private well owners whose wells tested above the EPA HALs, the USAF has installed reverse osmosis units and continues to maintain those systems. Also, the USAF continues to sample additional private wells in the affected area, as requested.

Concurrently, HMWMD proposed a site-specific groundwater standard of 70ppt for combined PFOA/PFOS, consistent with EPA's May 2016 HALs. The EPA Health Advisories are not enforceable regulations and cannot be used to compel mitigation or future cleanup actions. Based on review of Colorado's UCMR 3 data, no other public drinking water systems in the state were identified as having elevated levels of PFOA/PFOS. As such, the standard proposed was site-specific, applying only to the area of the state in El Paso County where drinking water sources are known to have been affected by PFOA/PFOS contamination. The Division performed extensive public and stakeholder outreach associated with the site-specific standard rule-making process. At the April 9, 2018 rule-making hearing, the Water Quality Control Commission voted unanimously to adopt the site-specific standard, as proposed by the Division. The site-specific PFOA/PFOS standard of 70ppt became effective on June 30, 2018.

SOLID WASTE AND MATERIALS MANAGEMENT PROGRAM

The Solid Waste and Materials Management Program has been working with WQCD staff for the last several years to define areas of potential overlap of regulatory authority and delineate program implementation strategies for these areas. This work has led to several work products:

1. Draft changes to the July 2008 Memorandum of Agreement (MOA) between WQCD, WQCC, and HMWMD. These changes are being brought to the WQCC today for consideration.
2. A draft Table A that will become an addendum to the MOA which describes specific areas of potential program overlap and how they will be handled.
3. A WQCD policy on permitting of land application which is in development within the Division.

In summary, the major changes for areas of program overlap are limited to two areas. First, because of the wording within SB 181, the WQCD has determined that they will no longer permit land application of solid waste liquids. In the past, the Solid Waste Program implemented regulatory control of land application of solid waste liquids where the application rate was less than the evapotranspiration (ET) rate, and the WQCD permitted land application of solid waste liquids at rates greater than the ET rate as a ground water discharge. Going forward, the Solid Waste Program will still oversee land application of solid waste liquids at rates less than the ET rate and since the WQCD will not regulate land application of solid waste liquids at all, application of solid waste liquids at rates higher than the ET rate will not be allowed.

Second, the WQCD will assume regulatory control over all Type A solid waste surface impoundments that are hydrologically connected to surface water. Most of these impoundments are parts of water treatment facilities already fully regulated by the WQCD. Type A impoundments contain very low risk wastes.

Otherwise, the Solid Waste and Materials Management Program continues to implement water quality standards and classifications in remedial cleanup actions, enforcement actions, and design and operations reviews for new and existing facilities.