Appendix 5: Environmental Considerations, Regulations, and Guidance for Soil Disturbing Activities at Lowry (revised December 15, 2025)

The Lowry Community Master Association (LCMA) is conveying this notice as a courtesy to future developers and builders at the request of the Colorado Department of Public Health and Environment/Hazardous Materials and Waste Management Division (CDPHE/HMWMD). The LCMA makes no express or implied warranty as to the contents of this document. Further, the LCMA bears no responsibility to ensure that future developers and builders comply with all applicable local, state, and federal environmental regulations.

This appendix provides information that all developers and builders should be aware of when undertaking new construction and renovation projects at Lowry where soil disturbing activities, such as foundation excavation, trenching, grading, drilling, or boring, will occur. The contents of this appendix are arranged as follows:

In the event the developer/builder wishes to follow other procedures, those alternative procedures must be submitted to, and approved by, CDPHE prior to the commencement of soil disturbing activities. Figure 1 illustrates the boundaries of Lowry to which this appendix applies.

1 Background Regarding Environmental Issues at Lowry

As an "infill" development of a former Air Force base, Lowry had a rich history before it was redeveloped into a vibrant Denver neighborhood. As the former Lowry Air Force Base, it housed thousands of service men and women for over 57 years as a technical training center and airfield. After the base was closed in 1994 and redevelopment began in the late 1990's, an environmental program was instituted at Lowry to identify and resolve impacts from past Air Force operations, in accordance with federal and state regulations. The environmental program was overseen in succession by the U.S. Air Force, the U.S. Environmental Protection Agency (USEPA), and subsequently by the CDPHE/HMWMD. Through the implementation of the environmental program at Lowry, all of the known environmental conditions in soil were successfully addressed to the satisfaction of CDPHE. As the former base was being redeveloped a number of previously unrecognized or unexpected environmental conditions were

encountered in soil and those conditions also were satisfactorily addressed with CDPHE concurrence. That noted, because of its role as a former Air Force base and the historical operations conducted at the base, there is always the potential to encounter additional previously unrecognized environmental conditions during soil disturbing activities at Lowry.

Documentation of the historical environmental program implemented at Lowry can be found at the following locations:

- Colorado Department of Public Health and Environment
  - https://cdphe.colorado.gov/hm/lowry_afb
- Air Force Administrative Record – (found under the BRAC section of the website)
  - https://ar.cce.af.mil/

Additionally, the CDPHE maintains an information repository where the public can review and study site-specific documents at the CDPHE/HMWMD Records Center located at 4300 Cherry Creek Drive South, Denver. For an appointment to review documents at the CDPHE/HMWMD Records Center, contact personnel there by telephone at (303) 692-3331 or by e-mail at cdphe_cora_hmwmd.state.co.us.

If issues arise associated with accessing information or contacting the CDPHE/HMWMD regarding environmental issues at Lowry, please contact the Customer Technical Assistance Line at 303-692-3320/comments.hmwmd.state.co.us or access CDPHE/HMWMD via the following website: www.Colorado.gov/cdphe/HM

Similarly, if issues arise associated with accessing information or contacting the United States Air Force regarding environmental issues at Lowry, please contact the Air Force Civil Engineering Center (AFCEC) Public Affairs office at 1-866-725-7617 or 210-925-0956 or via the following website: http://www.afcec.af.mil/

The developer/builder must perform their own due diligence and review of available historical documentation for their property prior to commencing soil disturbing activities. Please refer to the historical information repositories for Lowry environmental programs cited above.

2 Lowry Operational History and Potential Environmental Issues

Lowry Air Force Base (Lowry) operated from 1937 to 1994 as an Air Force technical training center. The primary mission at Lowry through its 57 years of operational history focused on training Air Force personnel. Based on the operational history, training programs at Lowry focused on armament and photographic training. However, a variety of base-related operations such as routine aircraft overhaul and maintenance (prior to 1966) as well as facility maintenance and support activities occurred prior to base closure.

The training programs and the facilities associated with that training listed below are an indication of the various training programs throughout the operational duration of Lowry that may have resulted in potential environmental concerns, and include:

- Armament-Related Training (including small arms): Facilities where personnel were trained on the proper maintenance, handling, storage, and loading operations for conventional weapons.
- Chemical Warfare Training: Facilities where personnel were trained in chemical warfare including incendiary control, decontamination, and first-aid training for gas casualties
- Fire Fighting Training: Open areas, vehicle and aircraft mockups, and buildings used to train personnel on extinguishing fires.
- Flight Training: Facilities associated with flight training.
- Missile Training (guided and Intercontinental Ballistic Missile (ICBM)): Facilities associated with missile (e.g., Snark, Titan, and Peacekeeper) training and inspection.
- Ordnance Training: Facilities associated with small and medium-caliber (i.e., 20mm arms firing ranges, skeet and trap ranges, aircraft machine gun "pits," and ordnance storage facilities).
- Photography and Cinematography Training: Facilities associated with the development of film and maintenance of photography equipment.
- Precision Measurement Equipment Laboratory (PMEL) Training: Facilities associated with field-level maintenance and calibration of test, measurement, and diagnostic equipment (TMDE).

The historical identification of potential contaminants of concern was divided into those associated with training programs and those associated with daily base operations. As for training programs at Lowry, chemicals and materials were generally used in quantities appropriate for instructional purposes, including the use of mockups. The types of chemicals that were potentially used, stored, and disposed of for training purposes included volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), radionuclides, metals, petroleum-based products (petroleum, oil, and lubricant [POL]), water and chemical based foams (including per- and polyfluoroalkyl substances [PFAS]), powders used to extinguish fires (organic chemical) and other emerging contaminants; munitions and explosive of concern (MEC), and dioxins and furans generated during chlorinated-fuel combustion.

During its operational history, Lowry was comprised of over 1,000 facilities (e.g., buildings, structures, or areas) that supported training, maintenance, and other missions. Although the initial training facilities were located in the western portion of the base, the tremendous expansion experienced in a relatively short period during World War II led to the construction of additional training facilities in the eastern portions of the base. A large infrastructure was developed to support and sustain a residential and working population that ranged from less than 200 to more than 10,000 people annually. These facilities included gas stations, garages, machine shops, hobby facilities, outdoor maintenance facilities, multiple coal-fired steam plants, and associated steam lines for heating. Other features of the infrastructure that are relevant to environmental concerns included storage and warehousing of materials and chemicals, waste accumulation facilities, and on-base landfills. Other prominent features of the infrastructure were the sewer lines or septic systems, sumps, oil-water separators, and floor drains, as these are potential release points to the subsurface. Generally, potential contaminants of concern include asbestos used on underground steam lines or in building construction materials; fuels used in emergency power generating units; associated underground storage tanks, pipelines, and above ground storage tanks; POL products; solvents; paints; pesticides, herbicides, Polychlorinated Biphenyls (PCBs), PFAS, and metals.

3 Developer/Builder Soil Disturbing Activities

All known and identified environmental conditions in soil were remediated at Lowry, and properties were subsequently approved for development. It is possible, however, given the historical base uses, that previously unrecognized environmental conditions could still be identified during future development activities. All developers and builders have the responsibility to follow all applicable local, state and federal environmental regulations and statutes when conducting soil disturbing activities at Lowry.

The CDPHE/HMWMD has the right to access, for the purpose of inspection, any properties on which soils disturbing activities are ongoing. As such, the developer/builder shall provide CDPHE with a minimum of a 72-hour notification prior to implementing soil disturbing activities at Lowry. This pre-construction notification should be provided to the CDPHE/HMWMD, Federal Facility Remediation & Restoration Unit Leader located at 4300 Cheery Creek Drive South, Denver, CO, 80246. The CDPHE/HMWMD Federal Facility Remediation & Restoration Unit Leader may also be contacted via the Customer Technical Assistance Line at 303-692-3320/comments.hmwmd.state.co.us or the following website: www.Colorado.gov/cdphe/HM

3.1 Defining Soil Disturbing Activities

Pursuant to Section 1.2 of the *Regulations Pertaining to Solid Waste Sites and Facilities, 6 CCR 1007-2, Part 1*, as amended, 'soil-disturbing activities' means "digging, excavating, staging, loading, stockpiling, backfilling, compacting, grading, tilling, drilling, intrusive sampling, and equipment or vehicle movement or any other mechanical activity, that when used, disturbs the surface and/or subsurface soil. For the purposes of Section 5.5 disturbance or removal of debris and/or Regulated Asbestos Contaminated Soils (RACS) is considered soil disturbing activity. For the purposes of Section 5.5 hand disturbance or removal of RACS is subject to this regulation, but is not considered to be a mechanical disturbance."

Examples of soil disturbing activities that routinely occur during construction at Lowry include, but are not limited to:

- foundation excavations;
- underground utility installations (including wet utility installation (deep), dry utility installation (shallow) and utility tie-ins);
- bulk grading;
- foundation backfill;
- subsurface demolition;
- drilling and boring activities (soil cuttings brought to the surface); and,
- any other soil disturbing activity, except to the extent that any or all of these activities have been excluded below.

Soil disturbing activities exclude the following:

- normal maintenance and operation associated with the current ownership of previously developed or redeveloped commercial or residential property;
- backfilling for grade or fine grading;
- fence, patio and light fixture installation;
- maintenance of previously installed utilities;

- normal maintenance and operation of the golf course and existing parks, including repairs and maintenance to existing sprinkler systems;
- planting of flowers and shrubs;
- import and placement of clean soils or other materials that originate from a location other than Lowry.

Regardless of the soil disturbing activity exclusions listed above, the builder and developer remain responsible for identifying and notifying CDPHE within 24-hours, regarding the identification of any suspected asbestos containing material in soil and/or any building materials suspected of containing asbestos.

3.2 Applicable Environmental Regulations, Guidance, and Notifications

Broadly, there are six (6) categories of potential environmental conditions that may be encountered in soil at Lowry including:

- Asbestos-Containing Material and/or Regulated Asbestos Contaminated Soil;
- Petroleum, Oil, and Lubricant Contaminated Soil
- Other Contaminated Soil;
- Per- and Polyfluoroalkyl Substances and other Emerging Contaminants;
- Munitions and Explosives of Concern; and
- Unknown Environmental Condition in Soil

Due diligence and research, by the developer, is prudent, expected, and necessary to optimize the sampling and laboratory analyses processes and protocols needed to objectively determine the presence or absence of the majority of the six (6) potential environmental conditions listed above. Scientific sampling protocols and laboratory analyses are generally a crucial part of these characterization processes, because the human eye alone, is incapable of making these important determinations. Different state and federal environmental regulations and guidance may be applicable to the handling and disposition of suspect materials at Lowry depending on the conditions encountered in soil. If questions arise, regardless of which category or categories of potential environmental conditions may be present, please notify the CDPHE/HMWMD Federal Facility Remediation & Restoration Unit Leader via the Customer Technical Assistance Line at 303-692-3320/comments.hmwmd.state.co.us or the following website: www.Colorado.gov/cdphe/HM

Developers and builders shall closely and continuously observe their soil-disturbing activities in order to identify any suspect materials in a timely manner to prevent worker and public exposure and to minimize or avoid the spreading of potential hazardous materials, including but not limited to, asbestos containing material and regulated asbestos contaminated soils.

3.2.1 Asbestos-Containing Material and/or Regulated Asbestos Contaminated Soil

Because of the potential to encounter asbestos containing material (ACM) and RACS, Section 5 of the *Regulations Pertaining to Solid Waste Sites and Facilities, 6 CCR 1007-2, Part 1*, as amended, must be

followed by the developer/builder for all soil disturbing activities at Lowry. The handling of any discovery of ACM and/or RACS must be in accordance with Section 5, *6 CCR 1007-2, Part 1*, as amended. It is important to note that prior to initiating soil-disturbing activities at Lowry, a certified asbestos inspection must be completed, and CDPHE must be notified in writing at least 10 working days in advance if ACM or RACS will be disturbed. All abatement, handling, transportation, and disposal activities shall be conducted by CDPHE-certified professionals, with documentation maintained on-site as required by the above regulation.

3.2.2 Petroleum, Oil, and Lubricant Contaminated Soil

Suspect contaminated soil not associated with RACS at Lowry has been impacted most typically by petroleum-based products whether related to former underground storage tanks (USTs), aboveground storage tanks (ASTs), tank piping, or uncontrolled releases to the surface or subsurface. Dependent on the source of POL contaminated soil, regulatory requirements will vary. In the event that the soil is contaminated with POL associated with a tank or piping regulated by the Colorado Department of Labor and Employment (CDLE) - Division of Oil and Public Safety (OPS), the soil shall be managed in accordance with the regulations of the CDLE-OPS *Storage Tank Regulations, 7 CCR 1101-14*, as amended. Exempted tanks under OPS include federally owned ASTs and USTs outlined in Section 2.1.1(b) of *7 CCR 1101-14.* In the event that the soil contaminated with POL is not associated with a tank regulated by the CDLE-OPS, the soil must be managed in accordance with the Colorado Hazardous Waste Act and its implementing regulations at 6 CCR 1007-3.

Due to the complexities in determining sources of known or suspected POL impacted soils and/or associated tanks and piping, if encountered, the developer/builder must immediately notify the CDPHE Federal Facilities Unit Leader for guidance because the applicable requirements vary appreciably between OPS and CDPHE-Hazardous Waste Corrective Action Unit. The CDPHE/HMWMD Federal Facility Remediation & Restoration Unit Leader may be contacted via the Customer Technical Assistance Line at 303-692-3320/comments.hmwmd.state.co.us or the following website: www.Colorado.gov/cdphe/HM

3.2.3 Other Contaminated Soil

For impacts in suspect contaminated soil not associated with ACM, RACS, or POL, analytical sample results for the suspect soil should first be evaluated by comparison to the current USEPA Regional Screening Level (RSL) Summary Tables for the intended land use (e.g., industrial or residential). Unless otherwise proposed and demonstrated to CDPHE, the residential RSLs are typically the most appropriate soil action levels at Lowry. The most current USEPA RSL Summary Tables are available on-line at the following website link: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables.

These RSLs are typically updated every six (6) months. If the analytical results for the contaminants of concern exceed the applicable RSL concentrations, the developer/builder should contact CDPHE to establish an acceptable removal plan for the impacted soil.

3.2.4 Per- and Polyfluoroalkyl Substances and other Emerging Contaminants

For impacts in suspected PFAS contaminated soil, analytical sample results for the suspect soil should first be evaluated by comparison to the most current USEPA RSL Summary Tables for the intended land use (e.g., industrial or residential). Unless otherwise proposed and demonstrated to CDPHE, the residential RSLs are typically the most appropriate soil action levels at Lowry. If the analytical results for the contaminants of concern exceed the applicable RSL concentrations, the developer/builder should contact CDPHE to establish an acceptable removal plan for the impacted soil.

The following precautions should be considered while sampling suspected PFAS contaminated soil.

- All clothing should be made of cotton and well-laundered without fabric softener. Refrain from using water resistant and waterproof clothing. All footwear should be made of PFAS-free materials. Clothing and shoes containing Gore-Tex™ should be avoided.
- Teflon® containing materials and low-density polyethylene tubing should be avoided. Additional items to be avoided during sampling and handling include Post-It Notes®, chemical ice packs, aluminum foil, Tyvek® suits, plastic clipboards, cosmetics, hand cream, non-approved sunscreen and insect repellent, and food wrappers.
- Samples should be collected in laboratory-provided bottles. Glass containers should be avoided. Containers should be labeled with a pen after samples are collected. Fine- or ultra-fine tipped Sharpies are acceptable.
- If possible, disposable sampling equipment should be used, otherwise appropriate equipment decontamination is required between uses. Liquinox® soap and Alconox® are acceptable for use. Decon 90 should be avoided. Water used for decontamination should be provided by the laboratory and verified as PFAS-free. Cotton towels or paper towels with 0% recycled content are acceptable for use.
- Appropriate QC samples (i.e. equipment blanks and field blanks) should be collected.

3.2.5 Munitions and Explosives of Concern

Due to the operational history of former Lowry Air Force Base and its use as a military training facility, there is a potential to encounter suspect MEC during construction and soil disturbing activities. If suspect munitions items are discovered during redevelopment activities, to protect themselves and others from the hazards associated with exposure to MEC, individuals must be aware of and follow the 3 Rs of Explosive Safety: Recognize, Retreat, Report.

1. **Recognize** - When you may have come across a munition, and that munitions are dangerous.

   The ability to recognize munitions during an encounter is the first and most important step in reducing the potential risk of injury or death. Munitions are dangerous and should be considered as such regardless of appearance or condition. If you believe you have encountered a munition, do not approach or move closer to inspect it.

2. **Retreat -** Do not approach, touch, move, or disturb it, but carefully leave the area.

Immediately stop any ground disturbing or intrusive activity in the area surrounding the suspect munitions, warn others of the potential danger, and keep others away from it. Carefully retreat the area using the same path of entry.

3. **Report -** Immediately what you saw and where you saw it to local law enforcement – call 911.

   After retreating, immediately notify your supervisor and call local law enforcement.

After notification of local law enforcement and no later than 24 hours after discovery, inform the CDPHE/HMWMD Federal Facility Remediation & Restoration Unit Leader of the encounter via the Customer Technical Assistance Line at 303-692-3320/comments.hmwmd.state.co.us or the following website: www.Colorado.gov/cdphe/HM

Law enforcement officials will respond to the encounter by requesting the support of a Department of Defense Explosive Ordnance Disposal unit that supports their geographic location.

This information and further detail can be found on the Department of Defense Environment, Safety & Occupational Health Network and Information Exchange (DENIX) 3Rs (Recognize, Retreat, Report) Explosives Safety Education Program webpage and in Explosive Safety Guides:

Department of Defense. (2022, October 28). DoD Environment, Safety & Occupational Health Network and Information Exchange. Law Enforcement – 3Rs Explosives Safety Education Program. https://www.denix.osd.mil/uxo/for-work-crews/law-enforcement/.

Department of Defense. (2023, May 9). DoD Environment, Safety & Occupational Health Network and Information Exchange. Construction – 3Rs Explosives Safety Education Program. https://www.denix.osd.mil/uxo/for-work-crews/construction/.

Department of Defense. (2022, November). 3Rs Explosives Safety Guide, Construction Industry. https://www.denix.osd.mil/uxo/denix-files/sites/72/2023/02/3Rs_Guide_Construction-2022.11.10.pdf.

3.2.6 Unknown Environmental Conditions in Soil and Regulatory Notifications for Discovery

In the event that unknown environmental conditions in soil are discovered during the development of a property at Lowry the following notifications should be made within 24 hours of the discovery:

Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, Federal Facility Remediation & Restoration Unit Leader, located at

4300 Cherry Creek Drive South
Denver, CO 80246-1530
Phone: 303-692-3320 (Customer Technical Assistance Line) or via the following website: www.Colorado.gov/cdphe/HM

Per the property Deed, the property owner may be required to contact the Air Force at the numbers/e-mail listed in Section 1 if unknown environmental conditions in soil are encountered.

4 Contaminated Groundwater Considerations

In addition to the environmental conditions in the soils, historical Air Force activities also impacted groundwater in certain locations at Lowry. Extensive studies were conducted which characterized the nature and extent of impacted groundwater and a groundwater remediation program was implemented to address those impacts. The properties affected by impacted groundwater at Lowry are encumbered by State Environmental Covenants HMCOV00022, HMCOV00023, HMCOV00132, and HMCOV00133. Details of these groundwater covenants specific to Lowry can be found on the CDPHE website at:

HMCOV00022

https://oitco.hylandcloud.com/CDPHERMPop/docpop/docpop.aspx?clienttype=html&docid=5003058

HMCOV00023

https://oitco.hylandcloud.com/CDPHERMPop/docpop/docpop.aspx?clienttype=html&docid=5430226

HMCOV00132

https://oitco.hylandcloud.com/CDPHERMPop/docpop/docpop.aspx?clienttype=html&docid=5430312

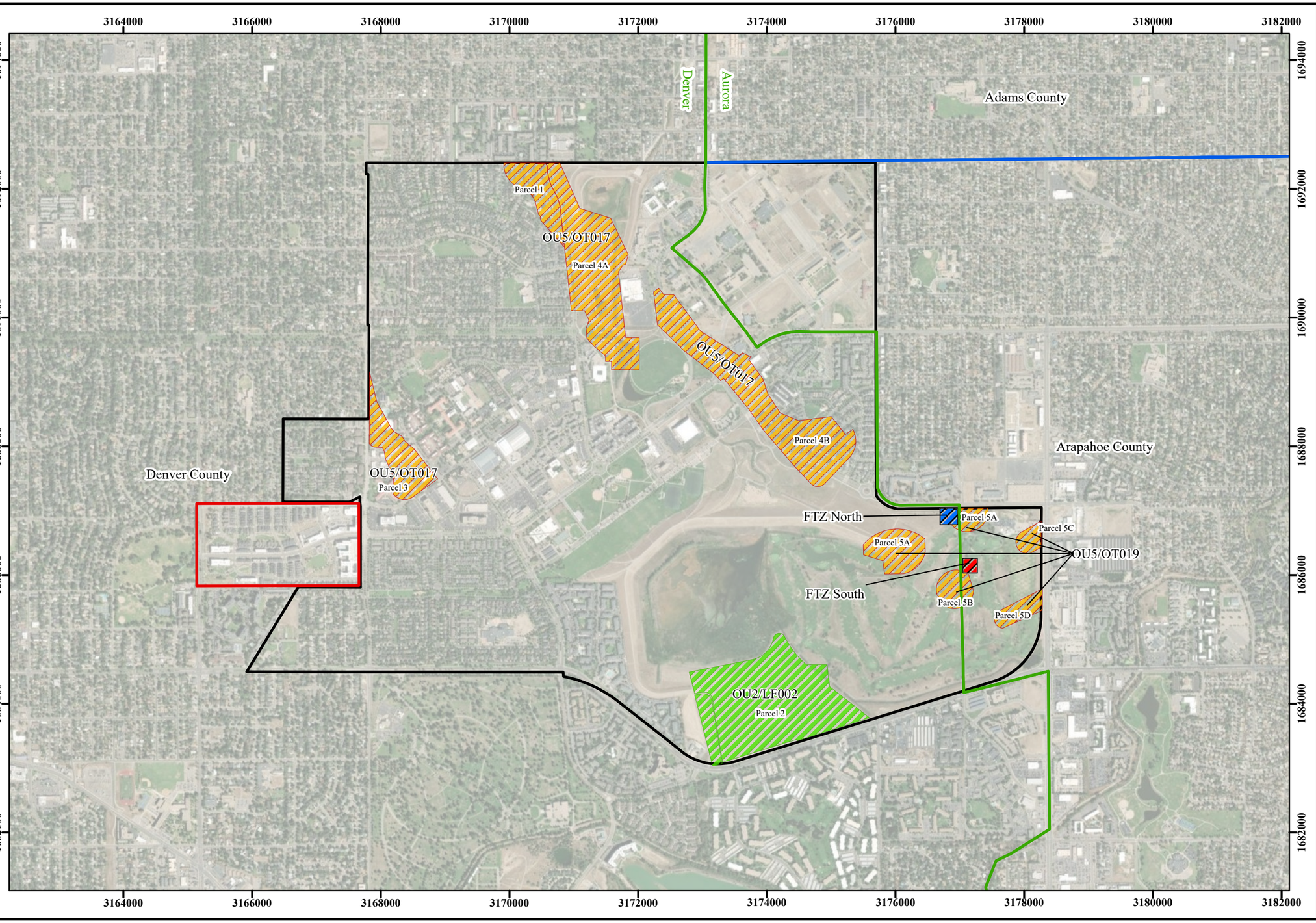
HMCOV00133

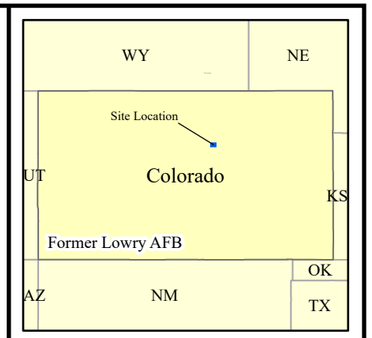
https://oitco.hylandcloud.com/CDPHERMPop/docpop/docpop.aspx?clienttype=html&docid=5438087

If issues arise associated with accessing information regarding this environmental covenant at Lowry, please contact the Customer Technical Assistance Line at 303-692-3320/comments.hmwmd.state.co.us or access CDPHE/HMWMD via the following website to access this information: www.Colorado.gov/cdphe/HM

The associated use restrictions of the groundwater covenant apply to the encumbered properties as well as adjacent properties, if work on an adjacent property could affect the groundwater beneath the covenant area.

Developers and builders should review the property deed to determine if their property is encumbered by the Environmental Covenant and to assure their project is in compliance with the use restrictions. In the event groundwater extraction, associated with the construction project, is anticipated within or adjacent to the environmental covenant boundary, the potential for extracting contaminated groundwater shall be evaluated by the developer or builder and if appropriate, planned for with appropriate treatment and/or groundwater disposal options. Developers and builders should consult the deed(s) to determine whether such treatment or disposal must be approved by CDPHE or the Air Force, or both.





Key Features

- State Environmental Covenant Boundary - HMCOV00132
- State Environmental Covenant Boundary - HMCOV00133
- Site/State Environmental Covenant Boundary - HMCOV00022
- Site/State Environmental Covenant Boundary - HMCOV00023
- Former Air Force Base Boundary
- County Boundary
- City/County Boundary
- Former Buckley Annex

Former Lowry Air Force Base
Denver and Aurora, Colorado

FIGURE 1

Former Lowry Air Force Base Environmental Restoration Sites and State Environmental Covenant Boundaries

Notes:
1. FTZ - Fire Training Zone
2. OU - Operable Unit

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