



THE MEADOWS

At Historic Castle Rock.

THE MEADOWS FILING 19 LAND SUITABILITY ANALYSIS REPORT

PREPARED FOR:

CASTLE ROCK DEVELOPMENT COMPANY
3033 EAST FIRST AVENUE, STE 305
DENVER, CO 80206

OCTOBER 2018



VOGEL & ASSOCIATES

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Appendix A LSAR Maps

- Exhibit A Site Context Map
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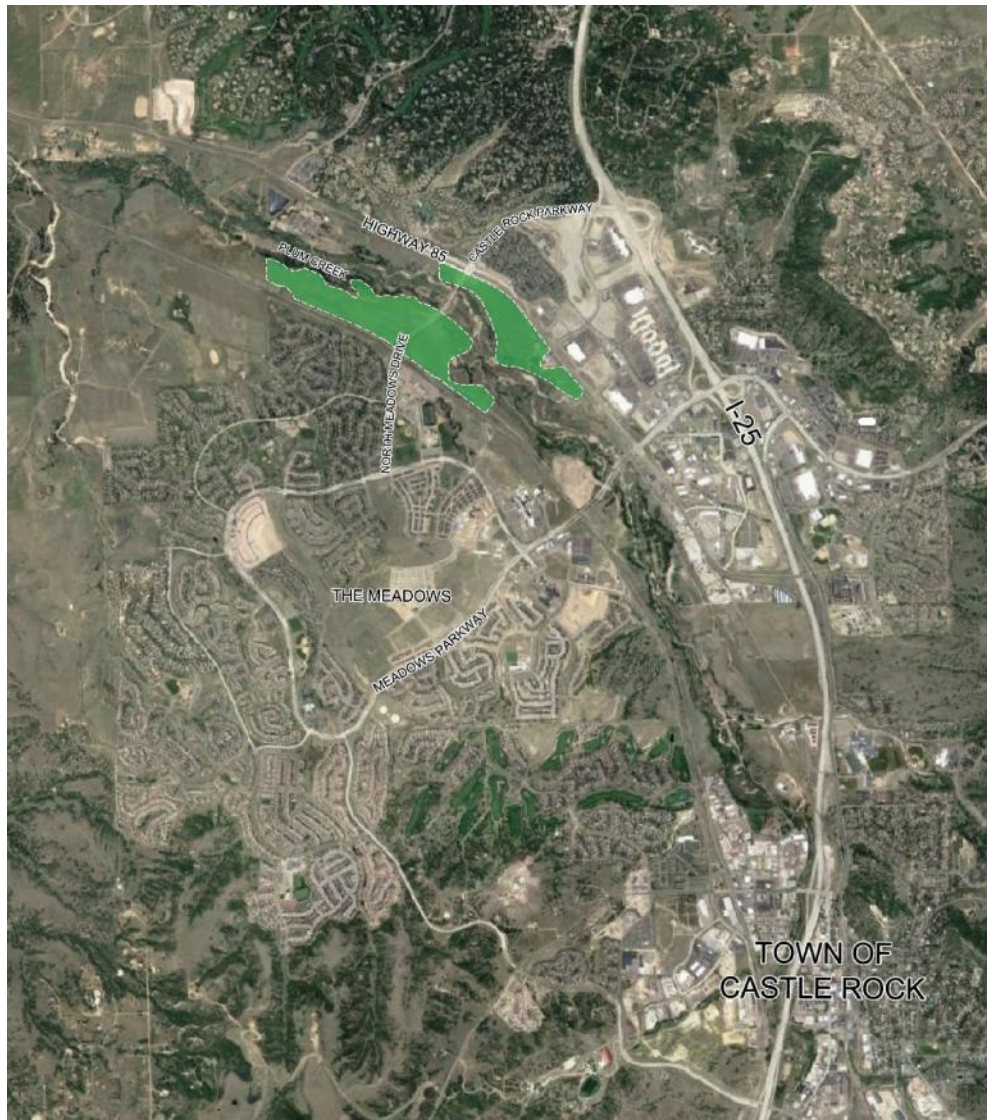
Appendix B Preliminary Geotechnical Study for The Meadows Filing 19

Appendix C Environmental Assessment/ Habitat Conservation Plan for a Portion of The Meadows, Amendment to the Environmental Assessment/ Habitat Conservation, and Supplemental Material

Introduction

This Land Suitability Analysis Report (LSAR) has been prepared for The Meadows - Filing 19 on behalf of Castle Rock Development Company (CRDC). The property comprises 167.6 acres and is currently zoned COI (Commercial-Office-Industrial) per the Meadows Preliminary P.D. Site Plan (The Meadows Fourth Amendment). This report is a preliminary analysis of the property's opportunities and constraints for a mixed-use development by identifying surrounding land use and environmental context, valleys, drainages, the slope of topography, existing vegetation, existing man-made improvements, geology, wildlife habitat, soils, wildfire mitigation, and other unique natural features found on the site.

Vicinity Map



Location

This site is located in a portion of Sections 27 and 28 of Township 7 South, Range 66 West of the sixth principal meridian, all in the County of Douglas, State of Colorado. The site is at the intersection of Highway 85 and N. Meadows Drive. The southern boundary is the railroad right-of-way and is bisected by East Plum Creek. The project site is approximately ¾ mile southwest from the I-25 Interstate Highway and Castle Rock Pkwy / N Meadows Dr interchange (Exit 185).

Site Context

The site is located within the Meadows Preliminary P.D. Site Plan (The Meadows Fourth Amendment) and within the Castle Rock Urban Service Area. Developments to the north east, across Highway 85, is high density multifamily and retail. To the south west of the project, across the railroad parcel, is existing single family residential (Meadows Filing NO. 8). The remaining borders of the project are adjacent to open space and East Plum Creek corridor.

There is approximately 4,000 feet of frontage along Highway 85. Castle Rock High School and Middle School is approximately 1/3 of a mile from project south border. Primary access to the site is along North Meadows Drive.

Site context is mapped on Exhibit A Site Context Map located in Appendix A.

Methodology

This report was compiled using geotechnical and wildlife reports created specifically for the site as well as the published documents list below. The report also utilized the Town of Castle Rock GIS mapping, Google Maps, surveying/engineering CAD bases to create the existing development conditions and constraints maps and plans for the site. Along with the previously stated documents some on site field analysis was conducted to verify and inventory site conditions. The collected site inventory based on the documents, maps, and field analysis can be found in the appendices of this report along with the geotechnical and wildlife reports.

Sources of information researched in the development of this LSAR include:

- o AG Wassenaar, Inc.; Preliminary Geotechnical Study for The Meadows Filing 19, March 8, 2017;
- o Athabasca Consulting, Inc. and Kaplan Kirsch & Rockwell L.L.P.; Environmental Assessment/ Habitat Conservation Plan for a Portion of The Meadows, December 15, 2003
- o ACI Consulting; Minor Amendment to the Habitat Conservation Plan
- o for a portion of The Meadows Property, June 2015
- o Town of Castle Rock; 2020 Comprehensive Master Plan, May 1, 2001;

- o Town of Castle Rock; Parks, Recreation, Trails and Open Space Master Plan Update, December 2002;

Slope Analysis

Generally, the site consists of a wide variety of topography. Small areas of steep slopes occur throughout the site, with larger areas concentrated along the major drainages along the East Plum Creek corridor and adjacent to N. Meadows Drive. The slope analysis was prepared using 2' contour intervals with categories of 0-10%, 10-15%, 15-20%, 20-25% and greater than 25%.

SLOPE RANGE PERCENTAGE

Range	Beg.- End.	Percentage of Site
1	0%-10%	80.5
2	10%-15%	5.4
3	15%-20%	3.2
4	20%-55%	2.5
5	+25%	8.5

Elevations range from approximately 5948' to over 6161'.

The slope analysis is mapped on Exhibit B Slope Analysis Map located in Appendix A.

Soil Types/Conditions & Geologic Hazard

A Preliminary Geotechnical Study for The Meadows Filing 19 was prepared by AG Wassenaar, Inc. Dated March 8, 2017 and is included in this report as Appendix B. The following is the summary provided on the cover letter of the Preliminary Geotech Report:

In general, the subsurface materials encountered consist of fill, topsoil, clay, and sand overlying sedimentary bedrock. Claystone and/or sandstone bedrock were encountered at depths of 14 to 34 feet in 15 of the 32 test borings. Ground water was measured at depths of 16 to 31 feet in 12 of the 32 test borings during this study.

Site development considerations should include provisions for the presence of existing fill, expansive soils, and deep bedrock.

Based upon the results of this preliminary study, we expect that most of the structures will likely be founded on spread or pad-type footings or a post-tensioned slab type foundation bearing on properly placed and compacted fill. We expect that a significant number of the structure pads will require the expansive clays to be modified prior to construction of shallow foundations. In limited areas, drilled pier foundations may be feasible. Preliminary foundation design concepts are presented in the report

Slabs-on-grade will require some special consideration because of the expansion potential of the soils. Interior floor systems engineered for expansive soils are recommended for any areas where slab movement cannot be tolerated.

Perimeter subsurface drainage systems will be necessary for all below grade areas.

Sulfate test results indicate that foundation concrete may be designed for negligible (SO) sulfate exposure.

Vegetation and Coverage

Exhibit C Vegetative Cover Map (Appendix A) illustrates the existing vegetation and coverage on the site. The map was created based on aerial photography and on-site inventory. The vegetation consists of two types of areas:

The upland grassland areas include native shortgrass with small or isolated vegetation commonly found such as but not limited to western wheatgrass, blue grama, smooth brome, yucca, and prickly pear cactus. The upland areas have very few shrubs or trees if any.

The riparian areas, mostly on adjacent open space areas along the East Plum Creek Corridor, include trees such as ponderosa pine, various willows, alder, dogwood, plains cottonwood, coyote willow, and Gambel oak. The Shrub species in the riparian area are western snowberry, chokecherry and some grass species also occur in the area such as bluestem and sedge grass.

The majority of the development would occur in the grassland areas to limit the disturbance to the riparian areas. The impacts to vegetation within the Meadows Filing 19 boundary would result in a small reduction in the existing trees and shrubs but there would be a decrease in the amount of native grass. Additionally, the existing trees and shrubs that would be removed would occur in isolated areas in the upland grass area and would limit disturbance to the natural vegetation/wildlife habitat in the East Plum Creek corridor and adjacent open space. Proposed landscape adjacent to these areas would introduce native plant material in organic masses and non-irrigated native seed will be used on any disturbed portion of the grassland area not being developed.

Wildlife Habitat/Mitigation

Portions of the site falls within the Preble's Jumping Mouse habitat protection area. Preble's Jumping mouse was listed as a threatened species in 1998 and in accordance to federal laws an Environmental Assessment/ Habitat Conservation Plan (HCP) for the area was created. The full Environmental Assessment/ Habitat Conservation Plan (HCP) and minor amendment can be found in Appendix C.

The following is a portion of the report that summarizes the Wildlife Habitat and Mitigation efforts:

The proposed development plan may result in the reduction of overall habitat available to local offsite wildlife species. However, mitigation include in the HCP not only would offset such habitat reduction, but also may increase the amount of quality habitat available to wildlife species. Offsite impacts to wildlife include displacement of some species from proposed development areas, possible increase of generalist species, possible introduction and /or increase of predator species, and the reduction in overall habitat available to wildlife. Wildlife utilizing the subject lots would largely be displaced to adjacent areas, which could result in increased competition for nesting, foraging, and breeding habitat, as well as cover in general. Urban development often results in increases in generalist species, or species that are successful within a wide range of habitats including human impacted areas. Increases in species that are habitat generalist (e.g., crows, jays, and deer mice) often occur at the expense of species with narrower habitat requirements. Possible introduction and/or increase of predators such as house cats, crows, and jays can have an impact on wildlife communities, particularly nesting birds.

Threatened or Endangered Species Offsite impacts pertaining to endangered species may include a reduction in overall foraging and hibernation habitat for Preble's. However, implementation of the mitigation plan described in the HCP will minimize and mitigate potential onsite impacts, and may actually increase the amount of quality habitat available to Preble's.

The habitat protection area is mapped on Exhibit D Existing Wildlife Mitigation Map located in Appendix A.

Wildfire Mitigation Zones

The majority of the development area is within the upland grassland vegetation coverage area, as described in the Vegetation and Coverage section of the report. This area has little to no trees and shrubs, which minimizes the threat of wildfire in the proposed development area. As we move forward with specific development types and phases of development there will be a closer determination of wildfire mitigation and if necessary a wildfire mitigation plan will be created.

Opportunities and Constraints / Conclusion

Future development areas would preserve the Preble's Habitat, vegetated areas, steep slopes, and major drainageways. The future development design will not significantly impact wildlife, vegetation and natural features. Constraints to development identified by this report are minor, and can be avoided or mitigated through design. This Land Suitability Analysis Report determines that this site is suitable for the proposed development.

The developable area is mapped on Exhibit E Developable Area Map located in Appendix A.

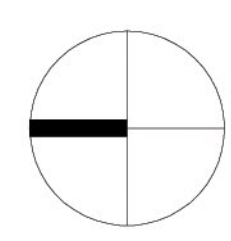
APPENDIX A



MEADOWS - FILING 19
CONTEXT MAP



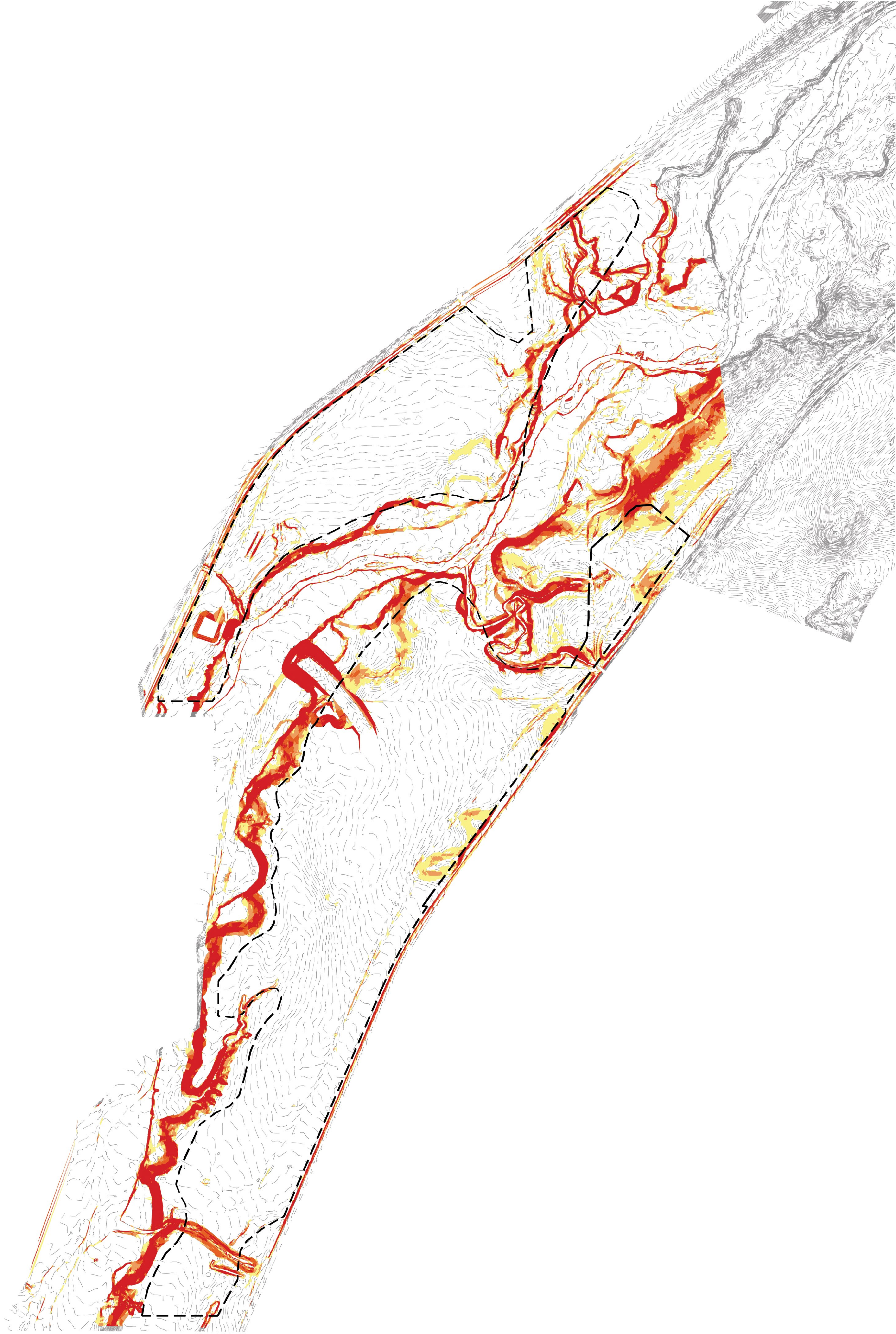
VOGEL & ASSOCIATES



SCALE: 1"=500



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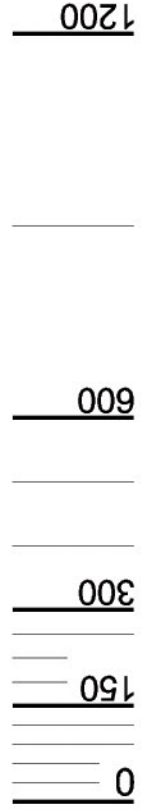
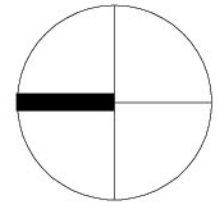


MEADOWS - FILING 19

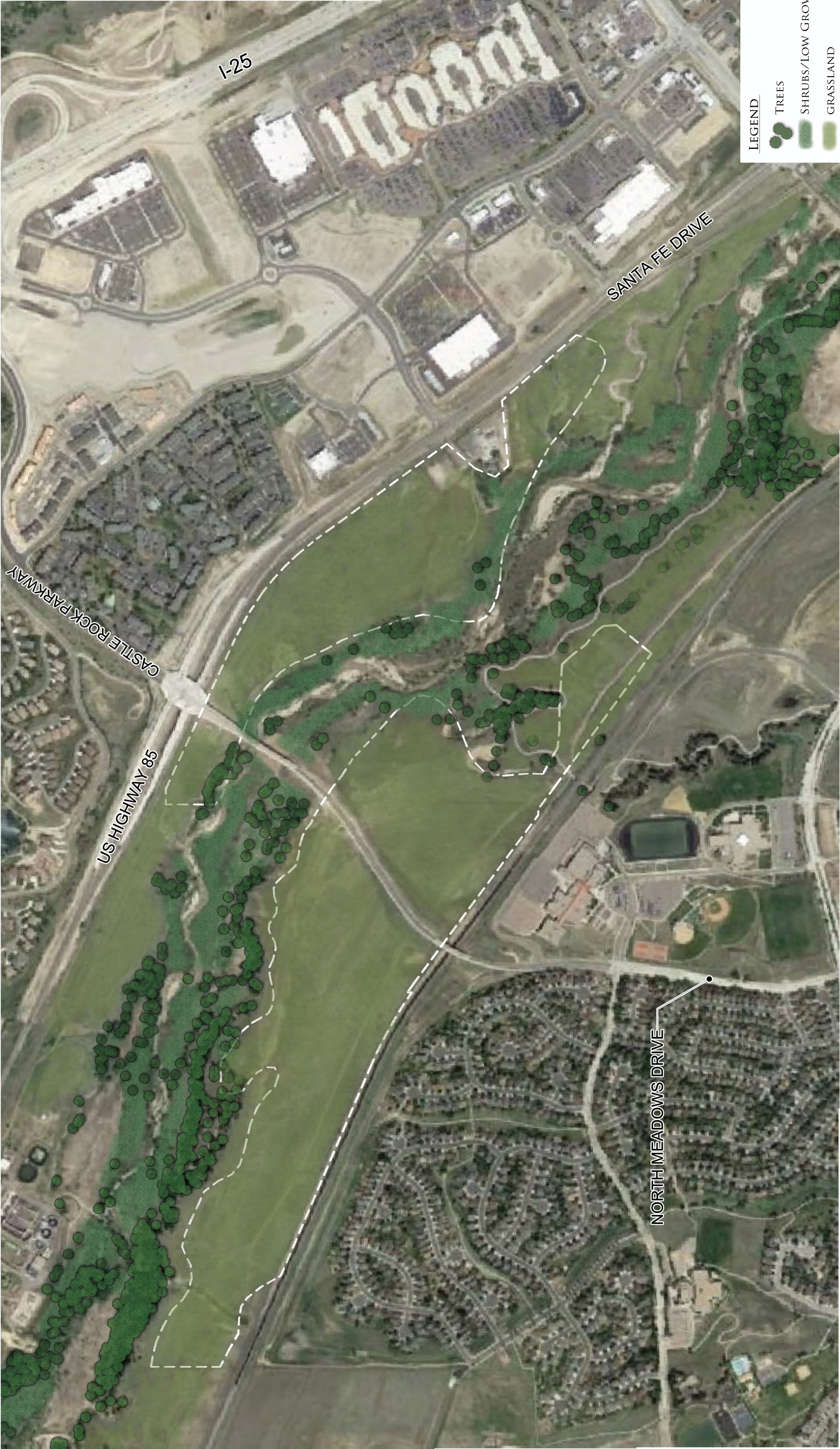
SLOPE ANALYSIS



VOGEL & ASSOCIATES



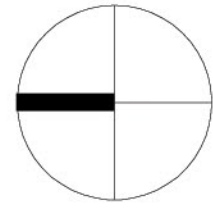
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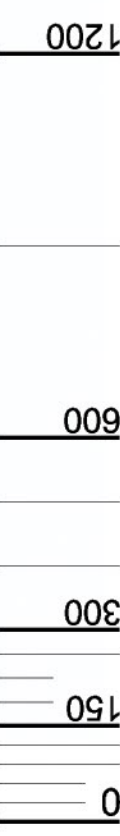
MEADOWS - FILING 19
VEGETATIVE COVERAGE



VOGEL & ASSOCIATES



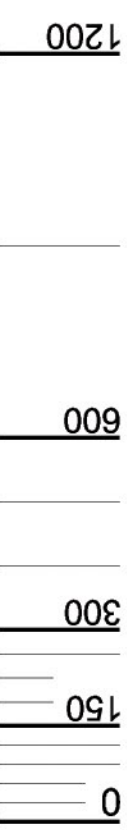
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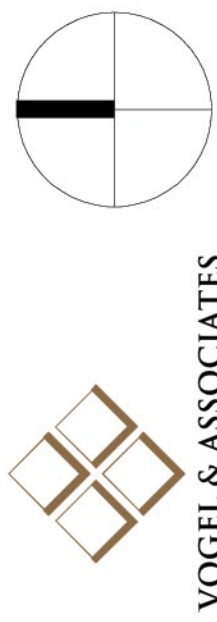




- LEGEND
- DEVELOPMENT AREA
 - EXISTING TRAIL
 - 100 YEAR FLOOD PLAIN
 - HABITAT CONSERVATION BOUNDARY
 - UTILITY/ELECT. EASEMENTS



SCALE: 1"=300'



APPENDIX B

A.G. Wassenaar

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Inc.

GEOTECHNICAL SITE DEVELOPMENT STUDY FOR

THE MEADOWS, FILING 19
SOUTH OF SANTE FE DRIVE AT NORTH MEADOWS DRIVE
CASTLE ROCK, COLORADO

PREPARED FOR

CASTLE ROCK DEVELOPMENT COMPANY
3033 EAST 1ST AVENUE, SUITE 305
DENVER, COLORADO 80206

MARCH 8, 2017
PROJECT NUMBER 165963

March 8, 2017

Castle Rock Development Company
3033 East 1st Avenue, Suite 305
Denver, Colorado 80206

Attention: Mr. Malcolm Mulroney

Subject: Geotechnical Site Development Study
The Meadows, Filing 19
South of Sante Fe Drive at North Meadows Drive
Castle Rock, Colorado
Project Number 165963

Dear Mr. Mulroney:

We have conducted the geotechnical site development study for the proposed mixed-use development at the subject site. Our summary of the data collected during our field and laboratory work and our analysis, opinions, and conclusions are presented in the attached report. The purpose of our study is to provide design criteria for planning, site development, and preliminary design concepts for foundation systems, interior floor support, and streets for the proposed development.

In general, the subsurface materials encountered consist of fill, topsoil, clay, and sand overlying sedimentary bedrock. Claystone and/or sandstone bedrock were encountered at depths of 14 to 34 feet in 15 of the 32 test borings. Ground water was measured at depths of 16 to 31 feet in 12 of the 32 test borings during this study.

Site development considerations should include provisions for the presence of existing fill, expansive soils, and deep bedrock.

Based upon the results of this preliminary study, we expect that most of the structures will likely be founded on spread or pad-type footings or a post-tensioned slab type foundation bearing on properly placed and compacted fill. We expect that a significant number of the structure pads will require the expansive clays to be modified prior to construction of shallow foundations. In limited areas, drilled pier foundations may be feasible. Preliminary foundation design concepts are presented in the report

Castle Rock Development Company
Project Number 165963
March 8, 2017
Page 2

Slabs-on-grade will require some special consideration because of the expansion potential of the soils. Interior floor systems engineered for expansive soils are recommended for any areas where slab movement cannot be tolerated.

Perimeter subsurface drainage systems will be necessary for all below grade areas.

Sulfate test results indicate that foundation concrete may be designed for negligible (S0) sulfate exposure.

Preliminary pavement guidelines and other recommendations are presented in the following report.

If you have any questions regarding the contents of this report or our analyses of the subsurface conditions which will influence the proposed development, please call us. We have appreciated the opportunity to provide this service for you.

Sincerely,

A. G. WASSENAAR, INC.


Travis J. Marsh
Staff Engineer

TJM/KAN/kan

Reviewed by:


Kathleen A. Noonan, P.E.
Senior Engineer



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GEOTECHNICAL SITE DEVELOPMENT STUDY

The Meadows, Filing 19
South of Sante Fe Drive at North Meadows Drive
Castle Rock, Colorado

PURPOSE

This report presents results of a geotechnical site development study for a proposed mixed-use development to be located south of Sante Fe Drive at North Meadows Drive in Castle Rock, Colorado (see Figure 1). The study was made to assist in determining preliminary design criteria for planning, site development, foundation systems, slabs-on-grade, and drainage. Preliminary geotechnical design concepts are also presented for street construction. Factual data gathered during the field and laboratory work is summarized on Figures 1 through 9 and on Table I. Our opinions and recommendations presented in this report are based on the data generated during this field exploration, laboratory testing, our experience with similar type projects, and our understanding of the proposed project.

This report is not intended to provide design criteria for individual foundations or street construction. Additional geotechnical studies will be required to develop these types of final design criteria and construction recommendations.

PROPOSED CONSTRUCTION

We understand the proposed 121-acre development will consist of commercial, industrial, and residential structures and the associated utility and roadway infrastructure. The approximate locations of our test borings are shown on Figure 1. Based on the conceptual overlot grading plans provided by Core Consultants on March 8, 2017, cut depths at our test boring locations range from approximately 1 to 10 feet and fill depths at our test boring locations range from 1 to 12 feet.

The plans indicate that the site is to be rough graded to provide a working platform for future construction. If the grading plans change from what has been provided, the recommendations in this report should be reviewed by this office.

SITE CONDITIONS

The site is bounded by a residential subdivision, Castle View High School, and railroad tracks to the south and a wastewater treatment plant and Santa Fe Drive to the north. A portion of the site is periodically used to graze horses. Plum Creek traverses the site from the northwest to the southeast. Overall, the site slopes gently downward towards Plum Creek. North Meadows Drive bisects the site. Site vegetation includes native grasses, yucca, cactus, and ponderosa pine. No bedrock outcrops were observed.

FIELD EXPLORATION

Subsurface conditions were explored by drilling 32 test borings at the approximate locations indicated on Figure 1. The test borings were advanced using a 4-inch diameter, continuous flight auger powered by a truck-mounted drill rig. At frequent intervals, samples of the subsurface materials were obtained using a Modified California sampler and a split spoon sampler which were driven into the soil by dropping a 140-pound hammer through a free fall of 30 inches. The Modified California sampler is a 2.5-inch outside diameter device. The split spoon sampler is a 2.0-inch outside diameter by 1.5-inch inside diameter device. The number of blows required for the sampler to penetrate 12 inches and/or the number of inches that the sampler is driven by 50 blows gives and indication of the consistency or relative density of the soils encountered. Results of the penetration tests and locations of sampling are presented on the "Test Boring Logs", Figures 2 through 9. Ground water measurements were made at the time of drilling and between 3 to 10 days after drilling.

LABORATORY TESTING

The samples obtained during drilling were returned to the laboratory where they were visually classified by a geotechnical engineer. Laboratory testing was then assigned to specific samples to evaluate their engineering properties. The laboratory tests included 63 swell-consolidation tests to evaluate the effect of wetting and loading on the selected samples. The results of the swell-consolidation tests are presented on Figures 10 through 41. Thirty-four gradation analyses and Atterberg limits tests were conducted to evaluate grain size distribution and plasticity. These results are presented on Figures 42 through 58. Moisture-density testing was performed on one sample. In addition, four representative samples were tested for pH, resistivity, chlorides, and water soluble sulfates. The test results are summarized on Figures 2 through 9 and on Table I.

SUBSURFACE CONDITIONS

Our test borings indicate the subsurface materials encountered consist of fill, topsoil, clay, and sand overlying sedimentary bedrock. Claystone and/or sandstone bedrock was encountered at depths ranging from 14 to 34 feet in 15 of the 32 test borings. Ground water was measured at depths ranging from 16 to 31 feet in 12 of the 32 test borings during this study. A more complete description of the subsurface conditions is shown on Figures 2 through 9.

FILL

Fill was encountered in one of the 32 test borings and was 4½ feet thick. The fill consisted of clayey sand. It was medium dense, silty, slightly moist, and mottled brown. It is not known whether the existing fill encountered during this study was placed as fill capable of supporting a structure or other structural elements. The fill should be removed prior to placement of new fill, structures, flatwork, or other structural appurtenances.

NATURAL SOIL

Topsoil was found in 31 of the 32 test borings. The topsoil encountered consisted of sandy clay and clayey sand and was up to 3 feet thick. It was organic, moist, and dark brown. The topsoil is not considered capable of supporting structures and should be removed.

Clay was encountered in 30 of the 32 test borings. The clay was soft to very stiff, silty, sandy to very sandy, with trace gravel to gravelly, with interbedded sand lenses, slightly moist to wet, and brown to light brown to gray. This clay is considered to possess low to very high expansion potential and low to moderate consolidation potential.

The sand encountered in all of the test borings was loose to very dense, slightly silty to very silty, clean to very clayey, with trace gravel to gravelly, slightly moist to wet, and brown to light brown. The sand is considered to possess no to very high expansion potential and low to moderate settlement potential.

BEDROCK

Claystone bedrock was encountered in 5 of the 32 test borings at depths ranging from 14 to 34 feet. The claystone was weathered to very hard, silty, slightly sandy to sandy, iron stained, with sandstone lenses, moist to very moist, and brown to gray to rust to olive. The claystone is assessed to possess high expansion potential.

Sandstone bedrock was encountered in 11 of the 32 test borings at depths ranging from 24 to 34 feet. The sandstone was firm to very hard, poorly cemented, clean to clayey, silty, iron stained, slightly moist to wet, and brown to gray to rust. As a mass, this material is assessed to possess low expansion potential.

GROUND WATER

Ground water was measured at depths ranging from 16 to 31 feet in 10 of the 32 test borings at the time of drilling. When checked between 3 to 10 days after drilling, ground water was measured at depths ranging from 18½ to 31 feet in 12 of the 32 test borings. Ground water levels are expected to fluctuate (typically 3 to 4 feet) with changing seasons and irrigations patterns and may rise after irrigation of lawns commences.

GEOTECHNICAL CONCERNS

EXISTING FILL

Any fill encountered during construction should be considered to have not been placed as fill capable of supporting a structure. The existing fill should be removed prior to placement of new fill, structures, or other structural appurtenances. The fill should be evaluated for quality at the time of removal to determine its suitability for placement as new fill on the site.

EXPANSIVE SOILS AND DEEP BEDROCK

Natural clayey sands and sandy clays with moderate to very high expansion potential were encountered across the site. The average measured swell in the clayey sands and sandy clays across the site was 1.1% under a 1,000 psf surcharge with a range from -2.3% to 7.9%. Approximately 25% of the tests on the clayey sands and sandy clays samples exhibited moderate to very high (2% or more) swell. Bedrock was encountered in only 15 of the 32 test borings at depths of 14 to 34 feet. This depth of bedrock may preclude the economic drilling of piers across most of the site. Therefore, depending upon the site grading and depth of foundation construction, foundations and any slabs constructed on grade will need to be designed for the

potential of future movement of the soils. The clayey sands and sandy clays within a certain distance of the foundation in portions of the site must be modified to reduce the potential for future heave if footing foundations are desired. This soil modification is anticipated across the entire parcel north of Plum Creek and across approximately 1/3 of the south parcels. A separation of up to 10 feet between the lowest foundation element and the top of the moderately to very highly expansive clayey sands and sandy clays will be necessary.

SITE DEVELOPMENT

OVERLOT GRADING

We assume the fill materials used at the site will be from on-site cut areas. In general, suitable inorganic on-site or off-site soils may be used for structural fill. All existing topsoil or soil containing vegetation or other organic or deleterious material should be removed prior to placement of new fill. Off-site material considered for new fill should be evaluated by our office prior to hauling to the site.

Construction of the fill embankments throughout the site will consist of proper foundation preparation, constructing embankment benching where necessary, disposition of strippings, proper fill placement and compaction, and designing and vegetating slopes in accordance with the analysis performed and the applicable governing regulations. Following are general site grading recommendations:

1. It is recommended that we be called to observe and test the fill placement.
2. Based upon the subsurface information and our assumption that the near surface soils will be used for fill, we have included general fill placement specifications in the Appendix. Fill depths of 20 feet or more will require extra effort during construction to limit settlement.

3. All topsoil and vegetation beneath planned fill areas should be thoroughly stripped and removed prior to fill placement. The organic soils or topsoil should be wasted from the site or stockpiled for future use in revegetating exposed slopes. In no case should these materials be used in new fills or where the stability of slopes will be affected by their low shear strength.
4. Any existing fill in structural areas should be entirely removed. The excavated fill must be observed for quality at the time of excavation. Material containing organic soils, debris, etc. should not be used as new fill on the site. The existing structures and driveways should also be entirely removed from the site.
5. The stripped foundation areas should be observed by this office prior to fill placement. Any soft soils found in these areas must be removed or stabilized as necessary prior to fill placement.
6. Where the natural slopes are steeper than a 5:1 (horizontal to vertical), benching will be required for structural integrity of any fills (see Figure 59).
7. After the fill areas have been cleared, the exposed soils should be scarified to a minimum depth of 6 inches, brought to the proper moisture content, and then compacted according to the Appendix.
8. Particular attention should be paid to compaction of the exterior faces of slopes.
9. Other specifications outlined in the Appendix should be followed.

OVEREXCAVATION AND PLACEMENT OF MOISTURE TREATED FILL

An option to reduce the amount of swell of the expansive soils would be to remove them from beneath foundation and pavement areas and to place the excavated material as a moisture

treated fill. This procedure can result in a fill that is able to support shallow foundations and involves excavating to a depth below the foundations and pavements as determined by the amount of potential swell in the soils. The excavated soil is then wetted to at or above optimum moisture content and compacted into the excavations (see Appendix). We estimate that an overexcavation of the moderate to very highly expansive soils to depths of up to 10 feet would be necessary beneath structure foundations. The actual amount of overexcavation needs to be determined by the geotechnical design level reports for each specific structure. This procedure would be feasible for lightly and some moderately loaded structures. However, heavier loaded structures would need to be founded upon piers. Placement of moisture treated fill beneath the pavement areas is discussed in the "Preliminary Street Pavement Design" section of this study.

SLOPES AND RETAINING WALLS

Slope stability and retaining wall analyses were not conducted as part of this study. Where natural slopes exceed 5 to 1 (horizontal to vertical), benching prior to fill placement will be required (see Figure 59). Construction of conventional fill slopes should be limited to 2 to 1 or flatter. Cut slopes steeper than 2 to 1 should be evaluated for stability. Specific analyses will also be required if retaining walls are to be constructed on this site.

CONSTRUCTION EXCAVATIONS

In our opinion, the majority of the site grading, utility, and foundation excavations may likely be constructed using conventional earth-moving equipment for the Front Range area. Excavations deeper than 3 feet should be properly sloped or braced to prevent collapse of potentially caving soils. The fill, sand, and any soil influenced by ground water classify as a "Type C", the clay soils classify as "Type B", and the underlying bedrock may be classified as a "Type A" according to OSHA regulations. Local, city, county, state, and federal (OSHA) regulations should be followed.

Trench backfill should be compacted to prevent future settlement. Trenches, as a minimum, should be compacted to the same specifications as required for overlot grading. Trenches in streets should be compacted to the Town of Castle Rock specifications. Observation and testing of fill placement must be performed during trench backfilling.

SUBSURFACE DRAINAGE

The existing ground water levels are not anticipated to cause significant problems across the site during development. Clay soils were encountered in the test borings drilled for this study. These materials have a relatively low permeability and can develop a perched water condition. Perched water conditions occur after development and construction have taken place, when landscape irrigation and surface drainage conditions are changed.

We recommend an overall area drain be considered for the site. In addition, the overall area drain can also provide for a discharge and collection point for individual foundation drains. Typically, underdrains can be designed and constructed with installation of the sanitary sewer system; however, the Town of Castle Rock should be consulted to determine where an area drain system is allowed. The civil engineering company contracted to design the infrastructure should be able to provide this design. We are available to assist in drain design. For the system to work, the area drain must be graded to a positive discharge point. If a permanent outfall for an area drain cannot be determined, the area drain should not be constructed.

If the Developer or Client elects not to install or the municipality will not allow an overall area drain, an acceptable alternative would be to establish points of positive gravity discharge for the gravel bedding beneath the sewer. We also recommend any basement or below grade area be provided

with a perimeter subsurface drainage system sloped to drain to a positive gravity discharge such as a sump or connected directly to the underdrain system.

SURFACE DRAINAGE

We recommend that provisions be made to divert surface runoff away from development areas. This should reduce potential problems associated with excess water and soils which are susceptible to instability. The site should be designed such that a 10% slope can be established near the structures after foundation construction. Slopes of at least 2% should then be planned in unsurfaced areas once the water is away from the foundations.

SITE CONCRETE AND CORROSIVITY

Testing performed on selected soil samples indicated water soluble sulfate contents of less than 100 parts per million (ppm). This is considered to be a negligible concentration relative to potential corrosive attack on concrete. Therefore, all concrete in contact with the soils on the site may be designed for negligible (S0) sulfate exposure in accordance with the current American Concrete Institute (ACI) Design Manual.

The pH test results ranged from 7.4 to 7.8. Resistivity test results at in-situ moisture ranged from 978 to 1,779 ohm•cm. Chloride test results ranged from 0.0002% to 0.0041%. These results are summarized on Figures 2 through 9 and on Table I. The results of this testing should be used as an aid in choosing the construction materials in contact with these soils which will be resistant to the various corrosive forces. Manufacturer's representatives should be contacted regarding the specific corrosivity resistance to the stated levels of pH, resistivity, and chlorides for their particular product. In addition, municipality specifications should be consulted when selecting pipe materials.

PRELIMINARY FOUNDATION DESIGN CONCEPTS

The foundation recommendations for each structure are dependent upon the subsurface profile and engineering properties of the materials encountered at and near the depth of the proposed foundation. These are dependent upon the final configuration and construction methods used for overlot grading at the site. Therefore, foundation design recommendations for each structure cannot be presented until site grading is complete. **The information presented in the following sections presents preliminary foundation concepts which must be finalized for each building site upon completion of the overlot grading operations.** We should be retained to perform additional soil and foundation explorations after completion of site grading to provide specific foundation design recommendations for each structure.

FOOTINGS

Where low expansive materials are encountered or if expansive soils are encountered and are overexcavated and placed as moisture treated fill, it is likely that a suitable foundation system for the structures would be spread footings or pad-type footings. The footings must be founded below frost depth. The footings will likely be designed for a maximum soil pressure ranging from 1,000 to 3,000 psf. A minimum dead load pressure on the order of 700 to 1,000 psf will likely be required.

POST-TENSIONED FOUNDATION

Where low expansive materials are encountered or if expansive soils are encountered and are overexcavated and placed as a moisture treated fill, an acceptable foundation system for the proposed structures would be post-tensioned slab foundations bearing below frost depth. This type of foundation system should provide for a foundation and floor system which moves together as one unit. The foundations will likely be designed for a soil bearing pressure not to exceed 2,000

to 3,000 psf. The parameters provided below should be used for design of the foundation system. These parameters were developed using practices established by our firm, as well as our evaluation of published information and experience in working with these types of foundations.

Center Lift

Edge Moisture Variation Distance (e_m) = 7 to 9 feet

Differential Movement (y_m) = 1 to 3 inches

Edge Lift

Edge Moisture Variation Distance (e_m) = 4 to 6 feet

Differential Movement (y_m) = 1 to 3 inches

We suggest that the structural engineer consider the information contained in "Design and Construction of Post-Tensioned Slabs-on-Grade" by the Post-Tensioning Institute (Third Edition) for design of the slab. All portions of the structure should be supported on the post-tensioned slab. If this recommendation is not followed, cracking between the post-tensioned slab and the sections supported on other foundation systems may occur.

DRILLED PIERS

A suitable foundation system for structures where moderately to highly expansive soils are encountered would be straight shaft piers drilled into bedrock. This will also be the case if the foundation loads are high. We anticipate allowable end bearing pressures on the order of 20,000 to 40,000 psf, a minimum dead load pressure between 10,000 and 15,000 psf, and a side shear between 1,600 and 3,200 psf. The side shear would be applied for that portion of the pier in undisturbed bedrock. Minimum dead load based on pier end area on each pier of 10,000 to 15,000 psf should be anticipated. Horizontal modulus of subgrade reactions on the order of 300 to 500

tcf can be anticipated in the bedrock. Pier lengths on the order of 30 to 45 feet can be anticipated. Water may be encountered in some of the piers and casing may be necessary.

SEISMIC EVALUATION

Based on the subsurface soil profile encountered in the upper 35 feet, our knowledge of the local geotechnical conditions, and averaging the soil properties, this site is classified as Seismic Site Class D in accordance with Section 1613 of the International Building Code. Shear wave velocity testing may be used to modify the Seismic Site Class. We are available to discuss this with you.

LATERAL EARTH PRESSURES

Foundation walls with fill on only one side will need to be designed for lateral earth pressures. For this site, lateral earth pressures calculated based upon equivalent fluid densities on the order of 50 to 80 pcf should be anticipated. The preliminary estimates are for properly placed and compacted fill at foundation walls. They should not be used for site retaining walls. These values should be evaluated during the design-level geotechnical study.

INTERIOR FLOOR CONSTRUCTION

Where footing foundations are recommended, it is likely that most of the sites will be assessed with a low or moderate slab risk performance evaluation. If the risk tolerance for slab movement is zero, structural floors should be constructed in all areas. Post-tensioned slabs are structural and would not be subject to these types of movements.

DRAIN SYSTEMS

Due to the nature of the soils encountered on the site, drain systems will be required around the lowest excavation level for each structure. Either interior or exterior drains may be used. Extensive

interior drains will be necessary where ground water approaches foundation elevation. The drains must consist of rigid perforated pipe encased in gravel and sloped to a positive gravity outfall or sump.

BACKFILL AND SURFACE DRAINAGE

Backfill should be moistened and compacted to reduce potential future settlement. Site grading should consider a slope of 10% away from the foundations at the completion of construction. All other drainage swales in landscaped areas on the lots should slope at a minimum of 2%.

FILL PLACEMENT

Where fill soils are necessary beneath structural elements such as interior slabs, foundations, exterior flatwork, pavements, etc. the on-site, inorganic materials may be used. The soil must be placed in maximum 8-inch loose lifts, within 0 to +4% of optimum moisture content, and compacted to a minimum of 95% of Standard Proctor maximum dry density, according to ASTM D698 for A-6 to A-7-6 soils. For all other soil types, the soils should be placed within -2 to +2% of optimum moisture content and compacted to a minimum of 95 percent of Modified Proctor maximum dry density according to ASTM D1557. Where backfill is necessary around the exterior of the structure in landscaped areas, the material should be placed within -3 to +3% of optimum moisture content and compacted to a minimum of 90% of the appropriate Proctor maximum dry density for the material type. As a minimum, the structural designer should be consulted regarding the need for bracing and the timing of backfill. All topsoil, existing fill, and soil containing organic material should be removed prior to placement of new fill. Off-site material considered for fill beneath structural elements should be of similar or better quality as the on-site soils and must be evaluated by this office prior to importation. Fill quality specifications are presented in the

Appendix. A guide specification for proper placement and compaction of fill is presented in the Appendix.

PRELIMINARY STREET PAVEMENT DESIGN

Pavement design procedures are based on strength properties of the subgrade and pavement materials, the assumed design traffic conditions, and the Town of Castle Rock pavement regulations. The subgrade materials encountered on this site are potentially expansive and require additional precautions be taken to provide for adequate pavement performance. The pavement design procedures outlined address expansive subgrade materials primarily by modifying the subgrade materials in such a manner as to reduce the swell potential and then by attempting to minimize subgrade wetting after construction.

Based upon our preliminary analysis, it appears the proposed pavement subgrade materials will be a mixture of sandy clays and clayey sands. Their AASHTO soil classification will likely be A-1-b, A-2-4, A-2-6, A-6, and A-7-6. From this classification, we have estimated strength values in order to determine the preliminary pavement thicknesses.

The Town of Castle Rock requires moisture treatment and chemical or mechanical stabilization based upon the materials encountered on this site. The depth of moisture treatment is based on the average swell of the samples tested. Moisture treatment consists of "removing the soil, adding moisture until the soil moisture content is between 1 and 3% above optimum as determined by AASHTO T99 (ASTM D698), and compacted to at least 95% of maximum Standard Proctor density". The moisture treatment must extend to the back of curb at a minimum. Per the "Town of Castle Rock Transportation Design Criteria Manual", a stabilized subgrade is also required. A

minimum of the top 12 inches of the moisture treated fill must be stabilized by chemical (lime, etc.) or mechanical (Geogrid) methods.

Table 14.4 of the "Town of Castle Rock Transportation Design Criteria Manual" provides ESAL (Equivalent Single Axle Loadings – 18 kip equivalent) default values. The table indicates a default value of 1,000,000 for a 20-year life design for a "Industrial Street/Commercial Frontage" classification. The manual states: "This is a one-directional and per lane ESAL value which may not be reduced for directional travel or lane distribution."

Based on this information and utilizing structural numbers as determined from the Town of Castle Rock design nomograph, the alternatives presented below were calculated. Alternate B is only recommended if mechanical stabilization of the subgrade is selected. It should be emphasized that the design alternatives provided are preliminary. The final design thicknesses could be more or less than indicated.

Pavement Thickness Recommendations

Alternate	ACS (in.)	ABC (in.)	CTS (in.)	Moisture Treated Fill
A	4 to 5	—	12	18 to 36
B	4 to 5	8 to 14	—	18 to 36

ACS = Asphaltic Concrete Surface ABC = Aggregate Base Course CTS = Chemically Treated Subgrade

Proper surface and subsurface drainage is essential for adequate performance of pavements constructed on these types of subgrade materials. It has been our experience that water from landscaped areas can infiltrate pavement subgrade soils and result in loss of subgrade integrity followed by pavement damage. Therefore, provisions should be made to maintain adequate drainage and/or contain runoff from such areas. This is especially important since composite pavement sections which include base course tend to promote further subgrade moisture

infiltration and damage. In addition, water and irrigation lines should be thoroughly pressure tested for leaks prior to placement of pavement materials.

It must be reiterated that the information contained in this section is preliminary in nature. More detailed information will be required by the Town of Castle Rock prior to issuance of a paving permit. Therefore, when overlot grading is complete at the site, a final pavement evaluation must be performed.

FINAL DESIGN CONSULTATION AND CONSTRUCTION OBSERVATION

This report has been prepared for the exclusive use of Castle Rock Development Company for the purpose of providing geotechnical criteria for the proposed project. The data gathered and the conclusions and recommendations presented herein are based upon the consideration of many factors including, but not limited to, the type of structures proposed, the configuration of the structures, the proposed usage of the site, the configuration of surrounding structures, the geologic setting, the materials encountered, and our understanding of the level of risk acceptable to the Client. Therefore, the conclusions and recommendations contained in this report shall not be considered valid for use by others unless accompanied by written authorization from A. G. Wassenaar, Inc.

It is recommended that A. G. Wassenaar, Inc. be retained to provide general review of the final design and specifications in order that the recommendations presented may be properly interpreted and implemented. Our firm should also be retained to provide geotechnical engineering and material testing services during construction of the site grading, utilities, and structures. The purpose is to observe the construction with respect to the geotechnical design concepts,

specifications or recommendations, and to facilitate design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

GEOTECHNICAL RISK

The concept of risk is an important aspect of any geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be tempered by engineering judgment and experience. Therefore, the solutions or recommendations presented in any geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as desired or intended. What the engineering recommendations presented in the preceding sections do constitute is our best estimate, based on the information generated during this evaluation and our experience in working with these conditions, of those measures that are necessary to help the development perform in a satisfactory manner. The Owner must understand this concept of risk, as it is they who must decide what is an acceptable level of risk for the proposed development of the site.

LIMITATIONS

We believe the professional judgments expressed in this report are consistent with that degree of skill and care ordinarily exercised by practicing design professionals performing similar design services in the same locality, at the same time, at the same site and under the same or similar circumstances and conditions. No other warranty, express or implied, is made. In the event that any changes in the nature, design or location of the facility are made, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing. Because of the

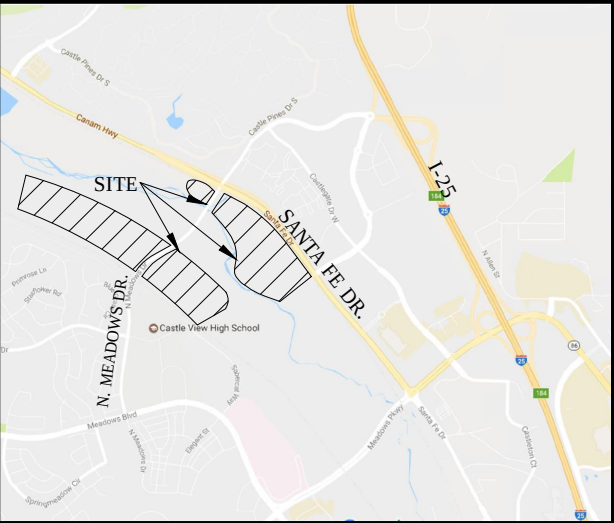
constantly changing state of the practice in geotechnical engineering, and the potential for site changes after our field exploration, this report should not be relied upon after a period of three years without our firm being given the opportunity to review and, if necessary, revise our findings.

The test borings drilled for this study were spaced to obtain a reasonably accurate picture of underground conditions for design purposes. Variations frequently occur from these conditions which are not indicated by the test borings. These variations are sometimes sufficient to necessitate modifications in the designs. If unexpected subsurface conditions are observed by any party during site development, we should be notified to review our recommendations.

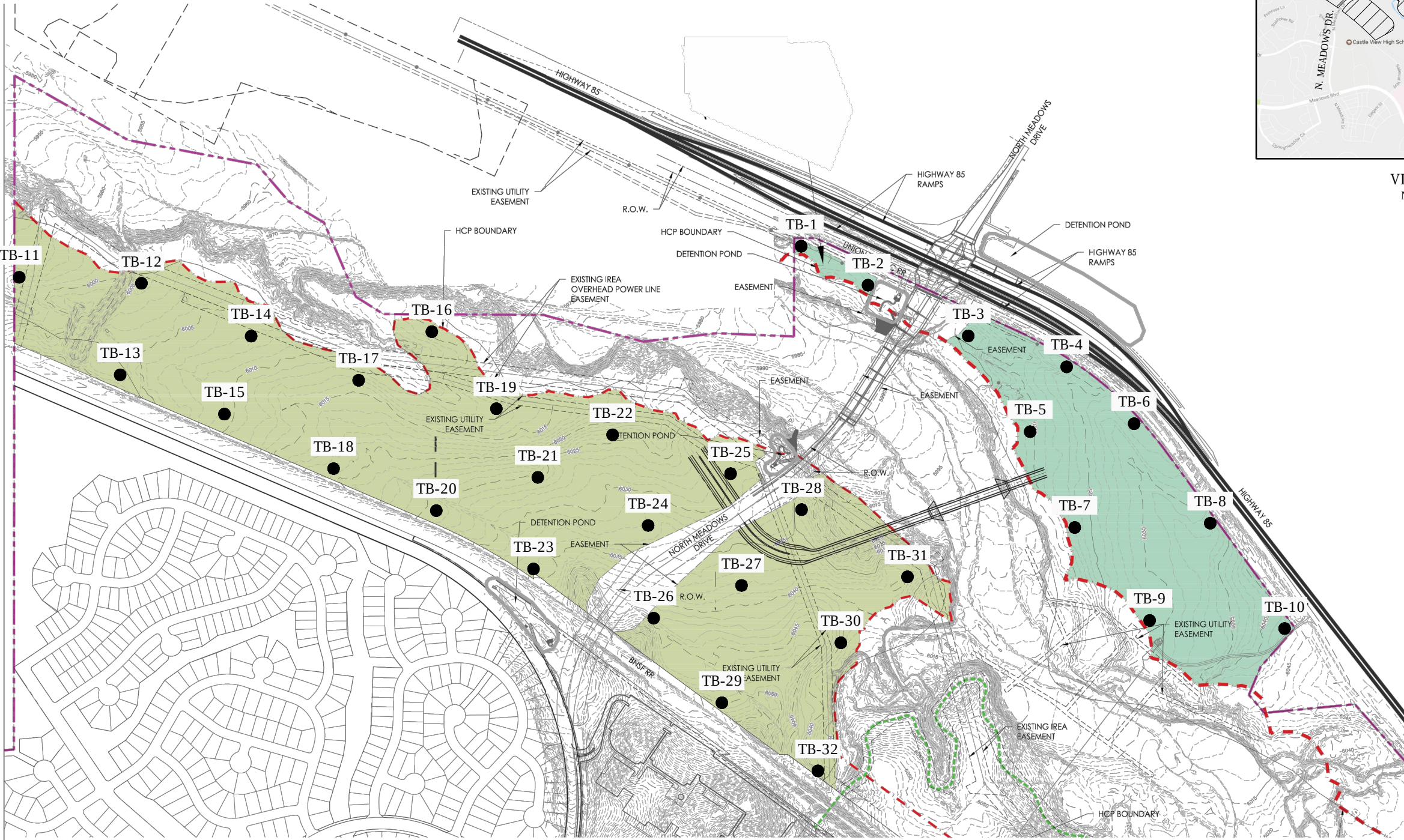
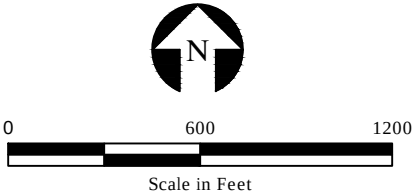
Our scope of services for this project did not include, either specifically or by implication, any research, identification, testing, or assessment relative to past or present contamination of the site by any source, including biological (i.e., mold, fungi, bacteria, etc.). If such contamination were present, it is likely that the exploration and testing conducted for this report would not reveal its existence. If the Owner is concerned about the potential for such contamination or pollution, additional studies should be undertaken. We are available to discuss the scope of such studies with you.

Our scope of services for this project did not include a local or global geological risk assessment. Therefore, issues such as mine subsidence, slope stability, active faults, etc. were not researched or addressed as part of this study. If the Owner is concerned about these issues, we are available to discuss the scope of such studies upon your request.

THE MEADOWS, FILING 19



VICINITY MAP
NOT TO SCALE



- NOTES:
1. TEST BORINGS ARE OVERLAID ON "THE MEADOWS FILING 19" PLAN, PREPARED BY CORE CONSULTANTS, DATED OCTOBER 2015
 2. ALL LOCATIONS ARE APPROXIMATE

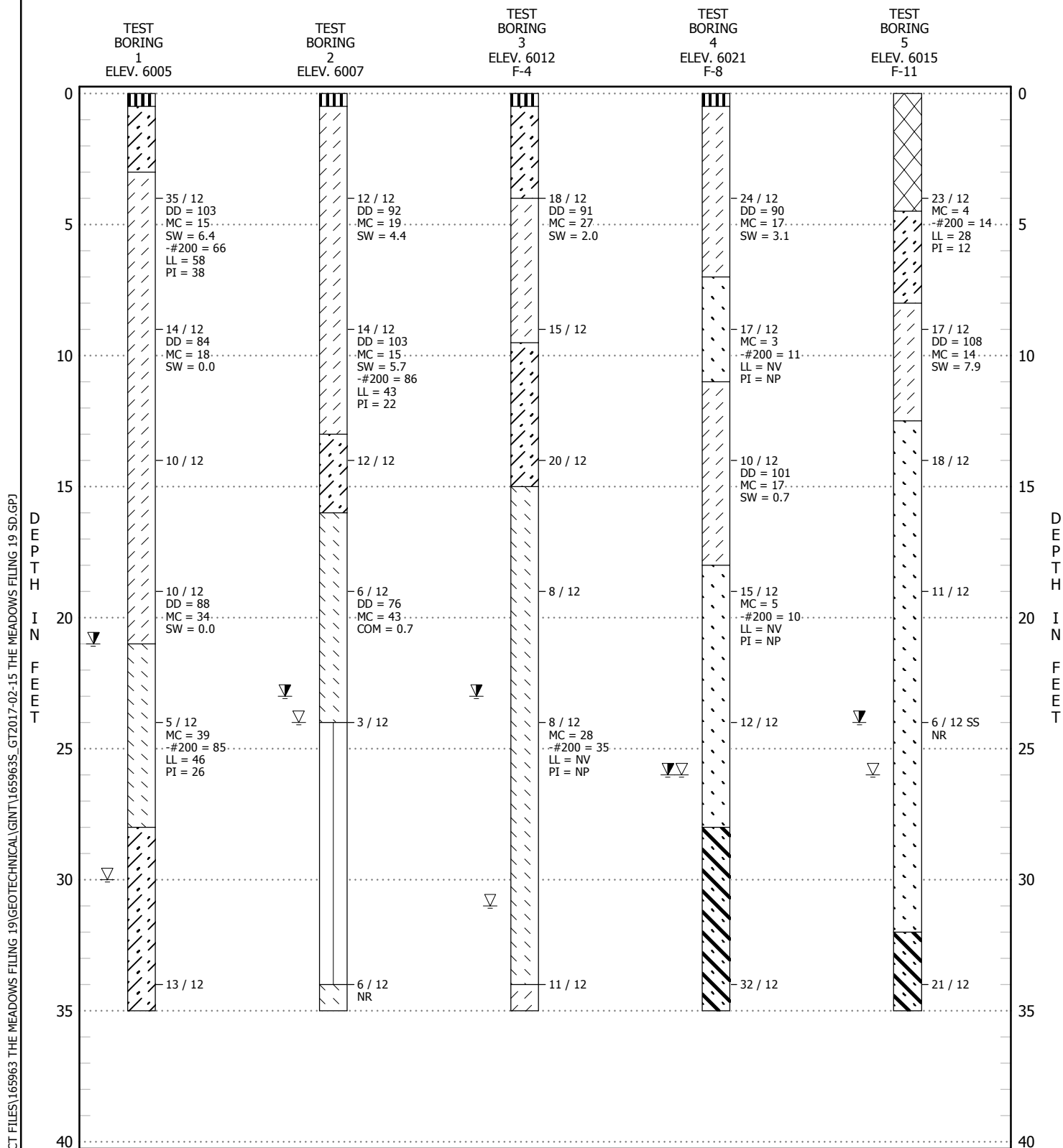
A.G. Wassenaar Geotechnical and Environmental Consultants 	
SITE PLAN AND VICINITY MAP	PROJECT NO. 165963 FIGURE 1

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado



SEE FIGURE 9 FOR LEGEND AND NOTES TO TEST BORINGS

TEST BORING LOGS

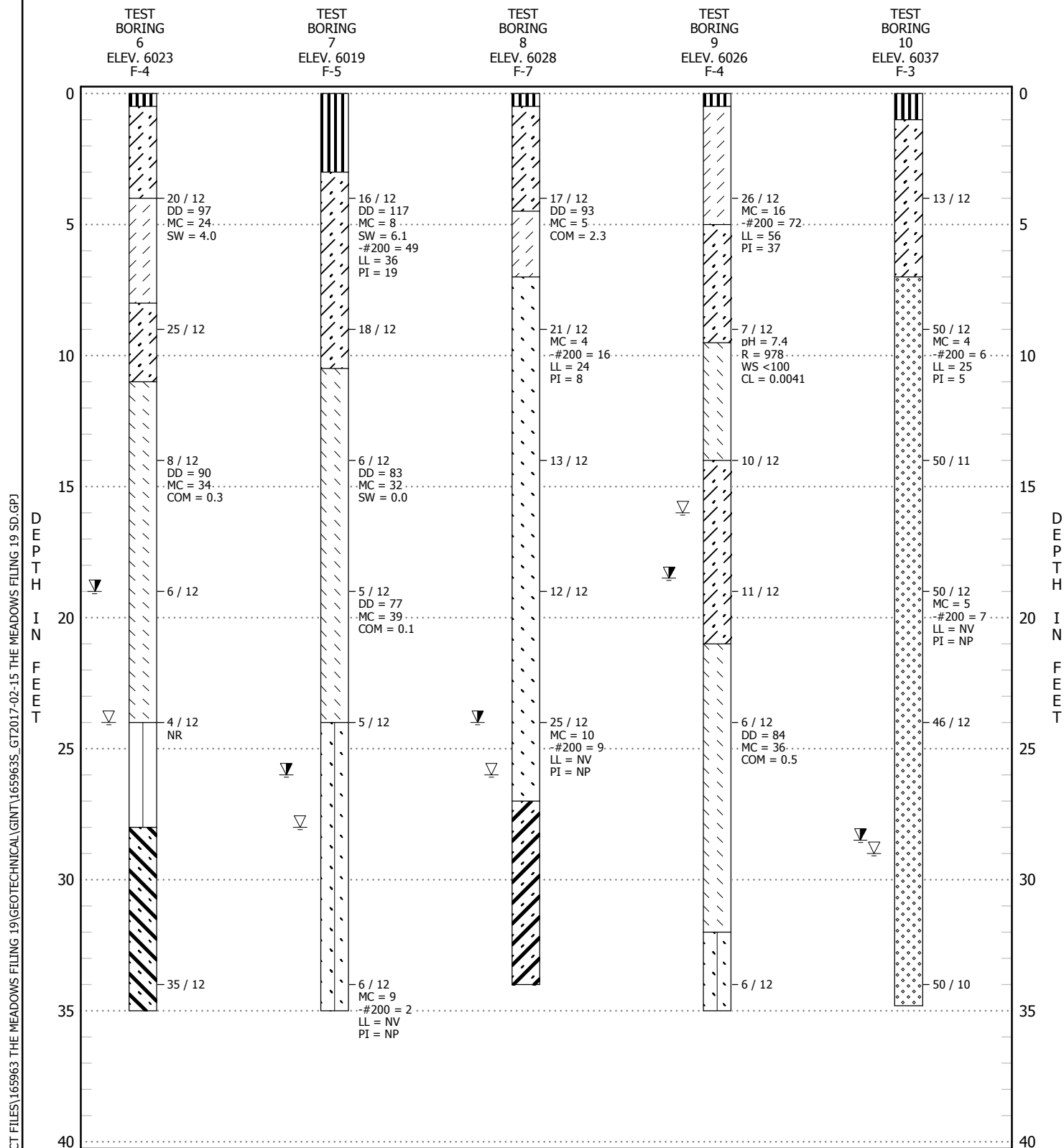
FIGURE 2

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado



SEE FIGURE 9 FOR LEGEND AND NOTES TO TEST BORINGS

TEST BORING LOGS

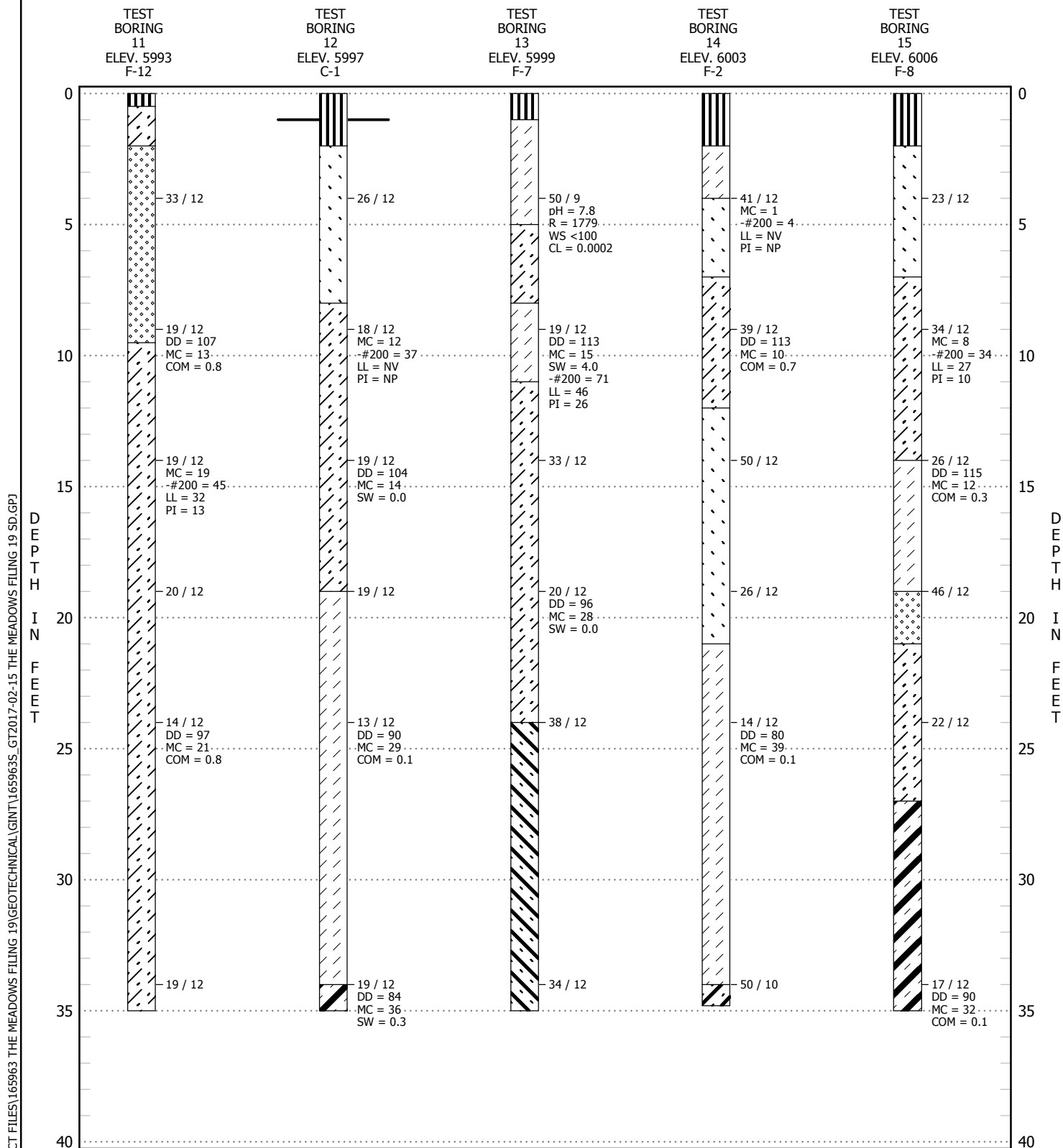
FIGURE 3

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado



SEE FIGURE 9 FOR LEGEND AND NOTES TO TEST BORINGS

TEST BORING LOGS

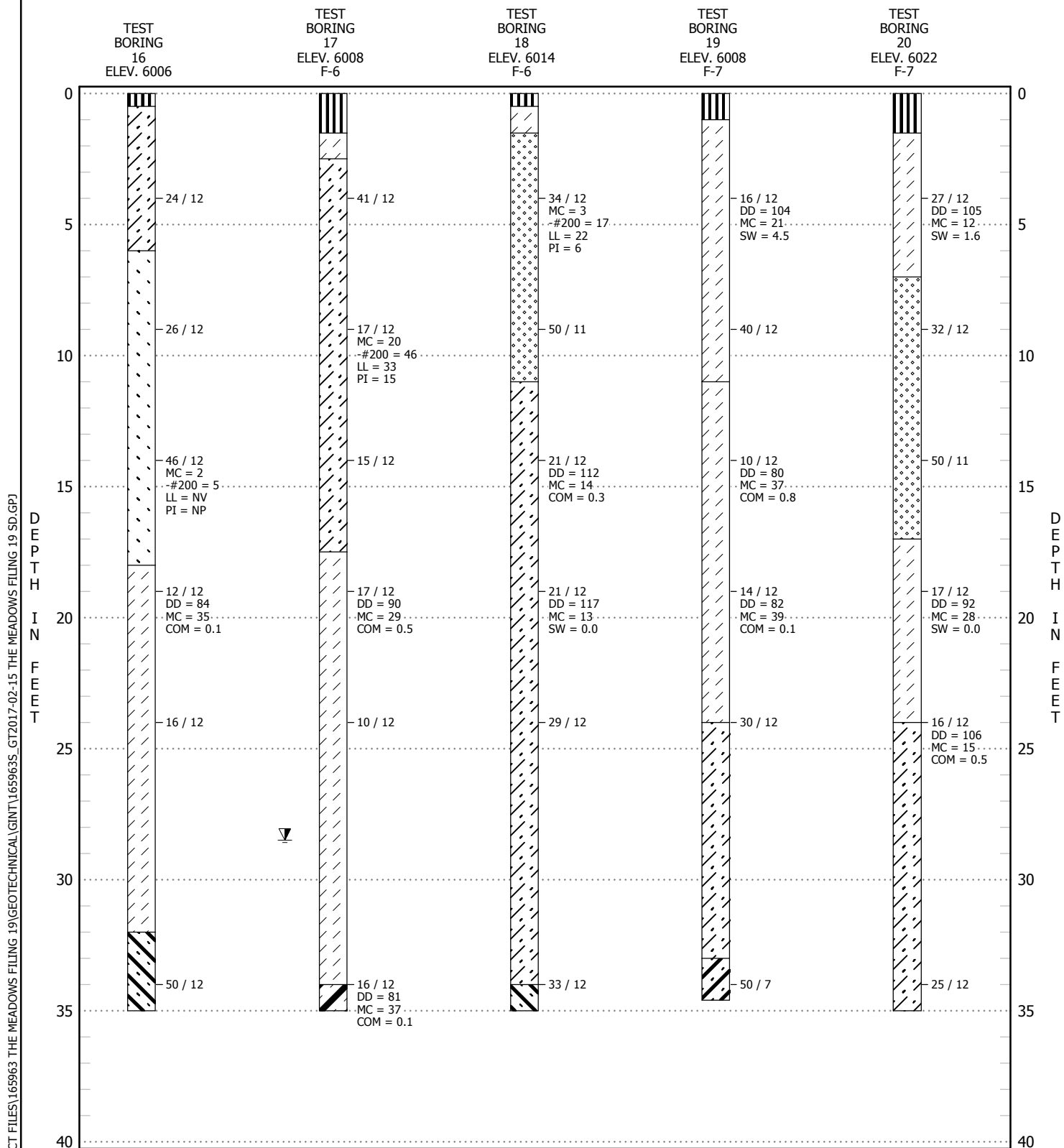
FIGURE 4

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado



SEE FIGURE 9 FOR LEGEND AND NOTES TO TEST BORINGS

TEST BORING LOGS

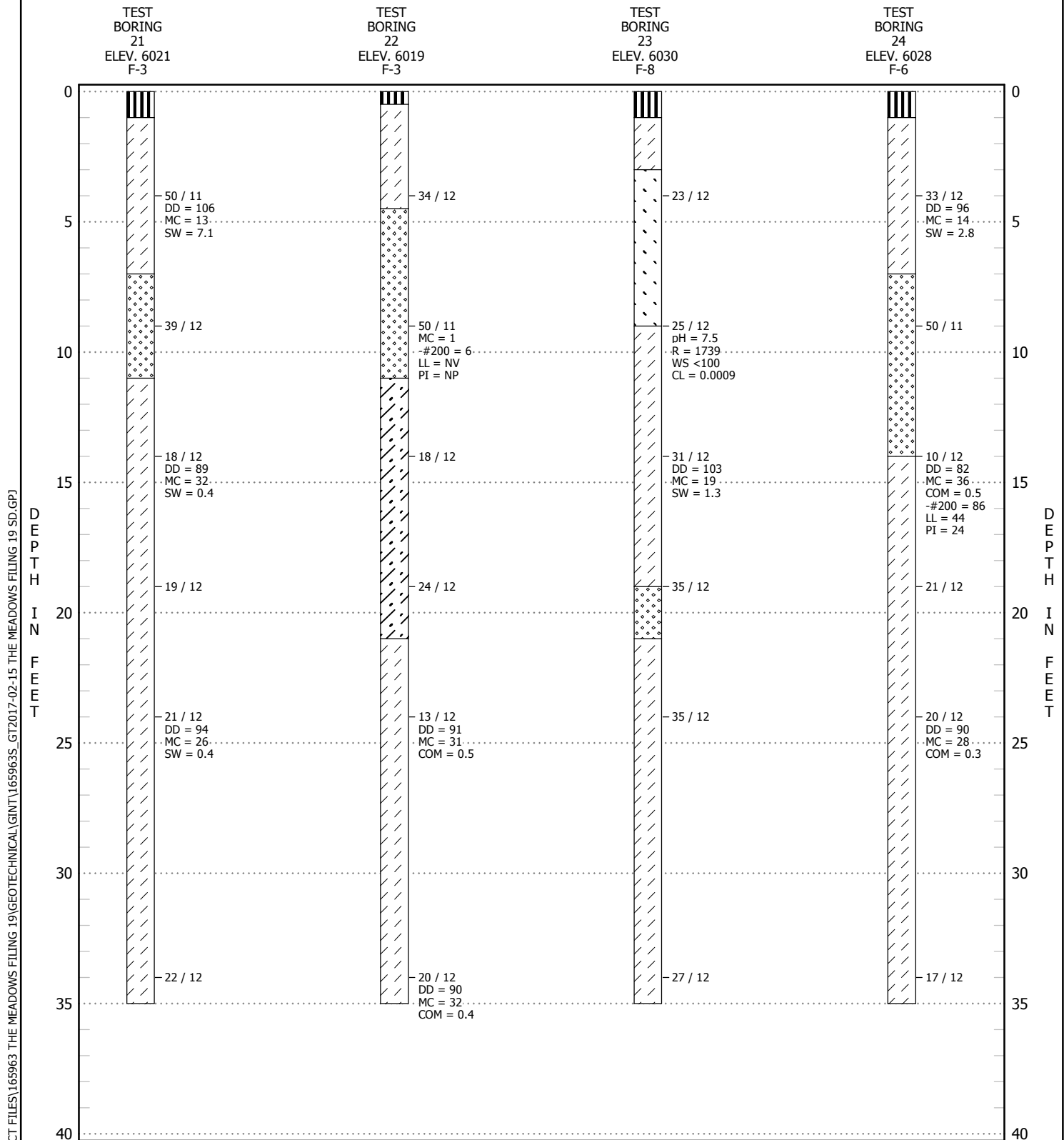
FIGURE 5

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado



SEE FIGURE 9 FOR LEGEND AND NOTES TO TEST BORINGS

TEST BORING LOGS

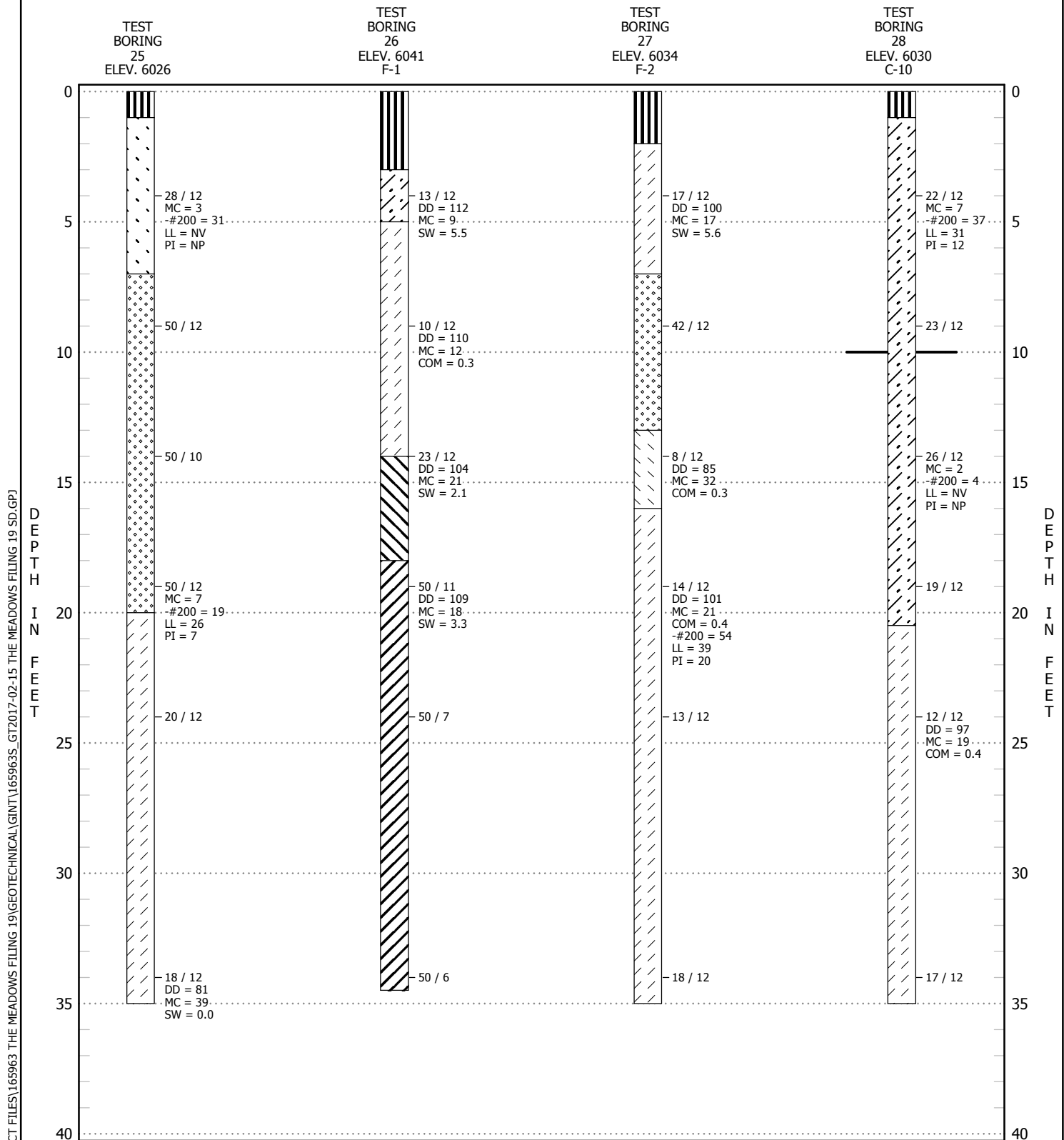
FIGURE 6

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado



SEE FIGURE 9 FOR LEGEND AND NOTES TO TEST BORINGS

TEST BORING LOGS

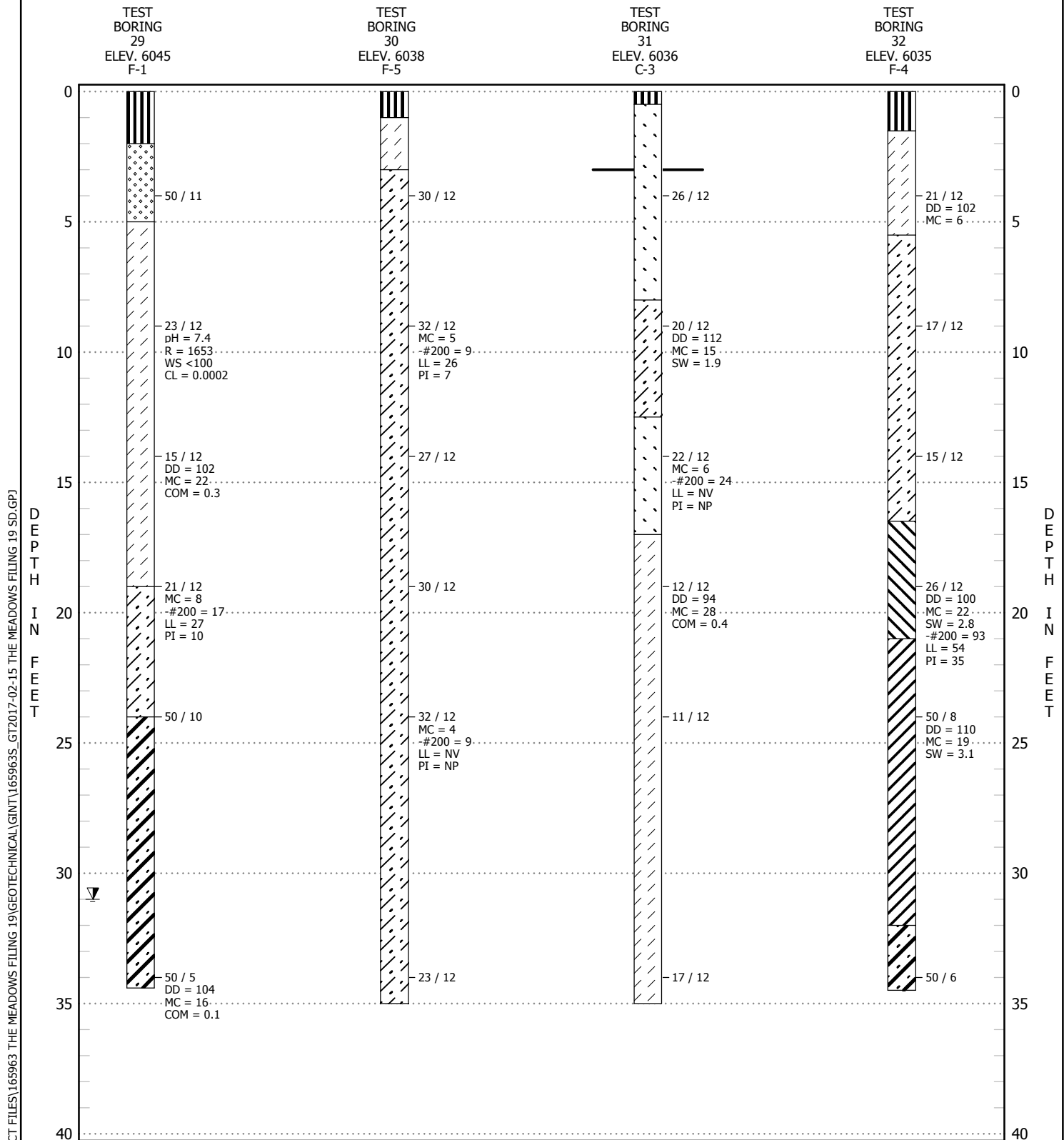
FIGURE 7

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado



SEE FIGURE 9 FOR LEGEND AND NOTES TO TEST BORINGS

TEST BORING LOGS

FIGURE 8

CLIENT Castle Rock Development Company

PROJECT NAME The Meadows Filing 19

PROJECT NUMBER 165963

PROJECT LOCATION Castle Rock, Colorado

SOIL DESCRIPTIONS

	Topsoil, clay, sandy, organic
	Fill, clay, stiff to very stiff, silty, sandy
	Clay, soft
	Clay, medium stiff
	Clay, stiff to very stiff
	Sand, loose
	Sand, medium dense, silty
	Sand, medium dense, silty, clayey
	Sand, dense to very dense, silty
	Clay (weathered claystone), medium stiff to stiff
	Claystone (Bedrock), firm to medium hard
	Claystone (Bedrock), hard to very hard
	Sandstone (Bedrock), firm to medium hard
	Sandstone (Bedrock), hard to very hard

ABBREVIATIONS

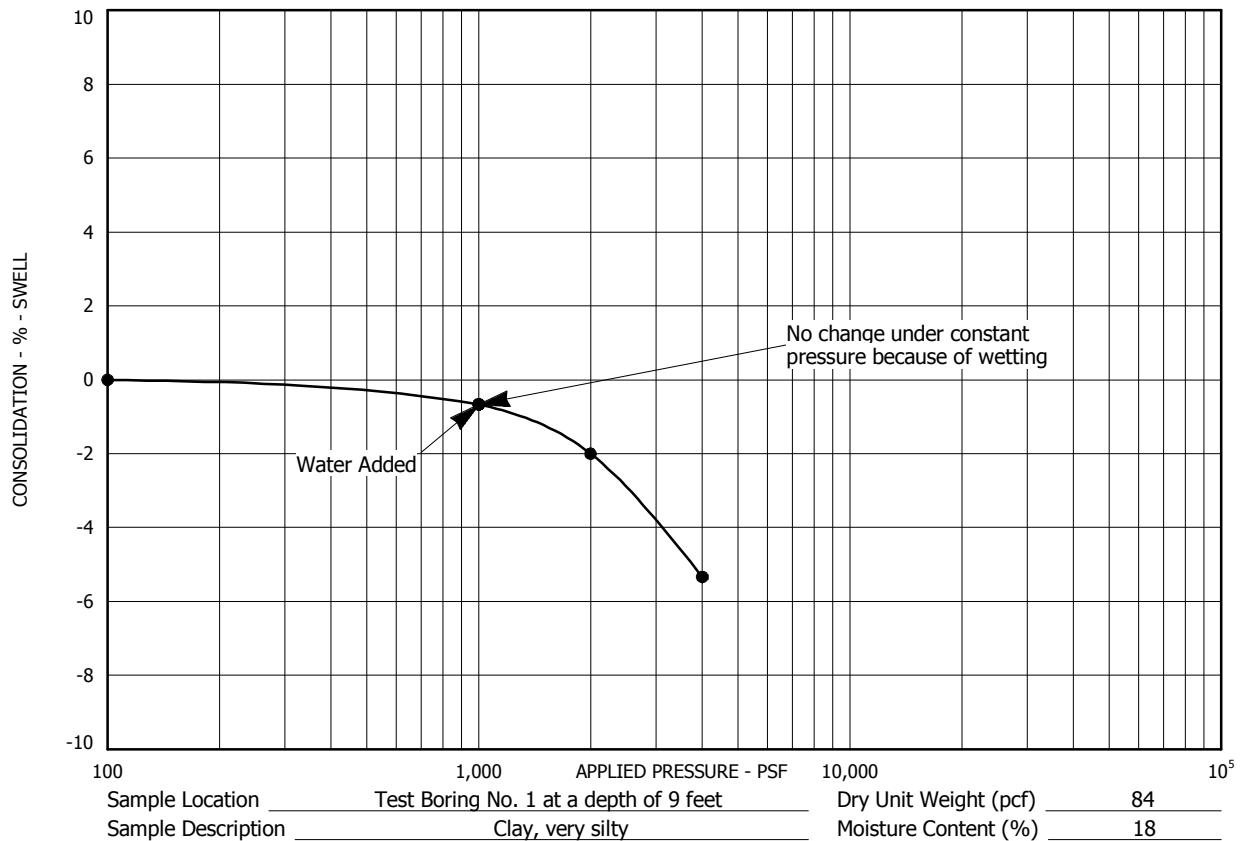
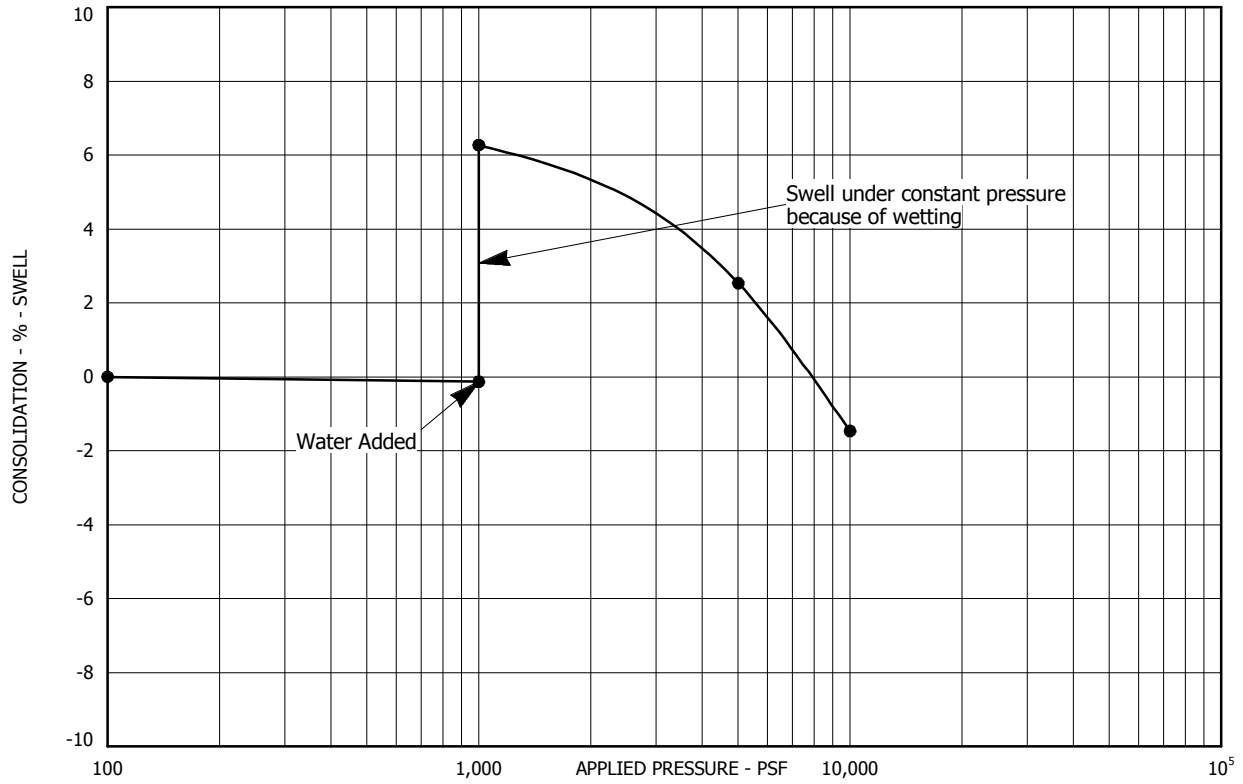
DD	Dry density of sample in pounds per cubic foot (pcf)
MC	Moisture content as a percentage of dry weight of soil (%)
SW	Percent swell under a surcharge of 1000 pounds per square foot (psf) upon wetting (%)
COM	Percent compression under a surcharge of 1000 pounds per square foot (psf) upon wetting (%)
UC	Unconfined compressive strength in pounds per square foot (psf)
-#200	Percent passing the Number 200 sieve (%)
LL	Liquid Limit
PI	Plasticity Index
NP	Non-Plastic
NV	No Value
pH	Acidity or alkalinity of sample in pH units
R	Resistivity in ohms.cm
WS	Water soluble sulfates in parts per million (ppm)
CL	Chlorides in percent (%)
x/y	X blows of a 140-pound hammer falling 30 inches were required to drive a 2.5-inch outside diameter sampler Y inches
x/y SS	X blows of a 140-pound hammer falling 30 inches were required to drive a 2.0-inch outside diameter sampler Y inches
C-x	Depth of cut to grade (rounded to the nearest foot)
F-x	Depth of fill to grade (rounded to the nearest foot)
FG	Finished grade (rounded to the nearest foot)
NR	No sample recovered
Bounce	Sampler bounced during driving
B	Bulk sample
AS	Auger sample
	Moderately to well cemented layer
—	Approximate depth of cut
▲	Depth at which practical drilling refusal was encountered
▽	Water level at time of drilling
▷	Caved depth at time of drilling
▽	Water level 3 to 10 days after drilling
►	Caved depth 3 to 10 days after drilling

Notes:

1. Test borings were drilled January 31, 2017 to February 3, 2017 with a 4-inch diameter, continuous flight power auger.
2. Location of the test borings were staked by others at locations chosen by this firm.
3. The horizontal lines shown on the logs are to differentiate materials and represent the approximate boundaries between materials. The transitions between materials may be gradual.
4. Elevations were obtained from staking provided by others and have been rounded to the nearest foot.
5. Boring logs shown in this report are subject to the limitations, explanations, and conclusions of this report.

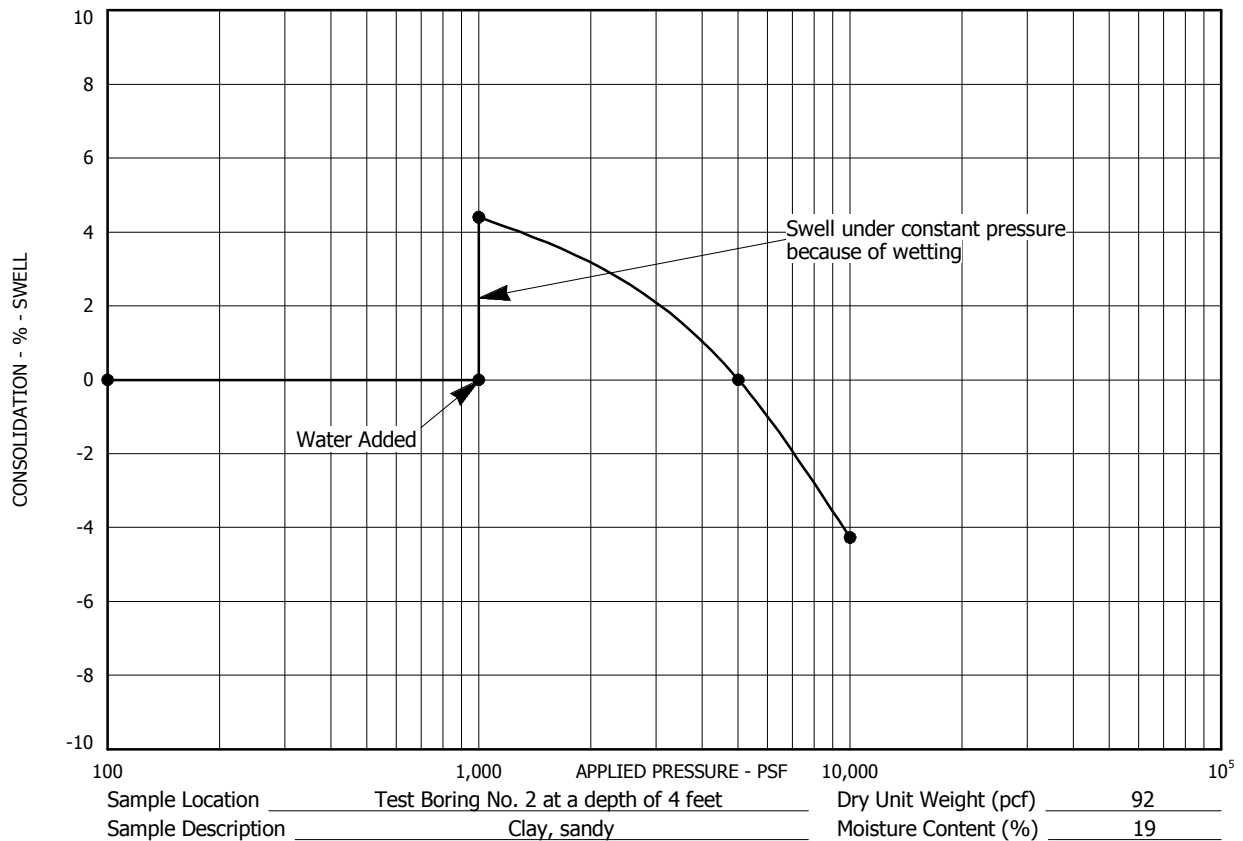
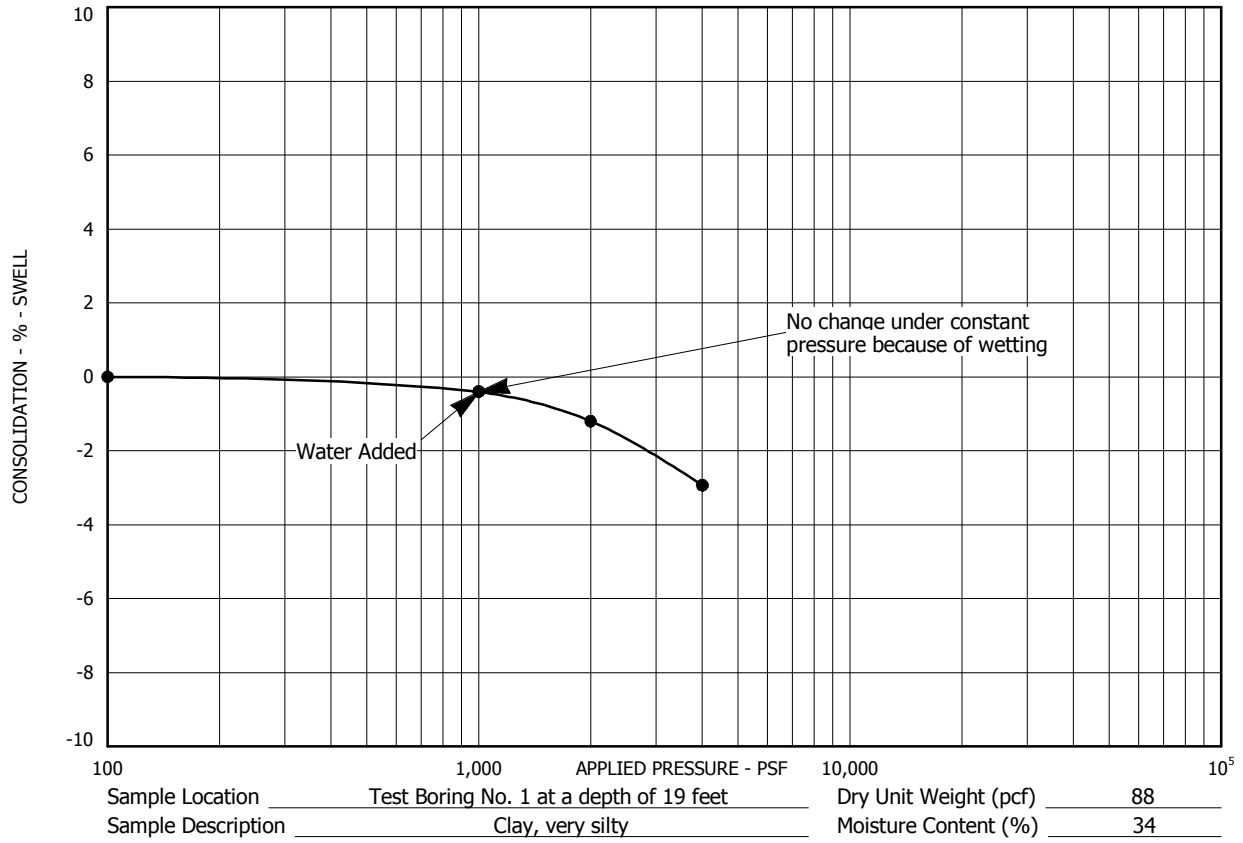
LEGEND AND NOTES

FIGURE 9



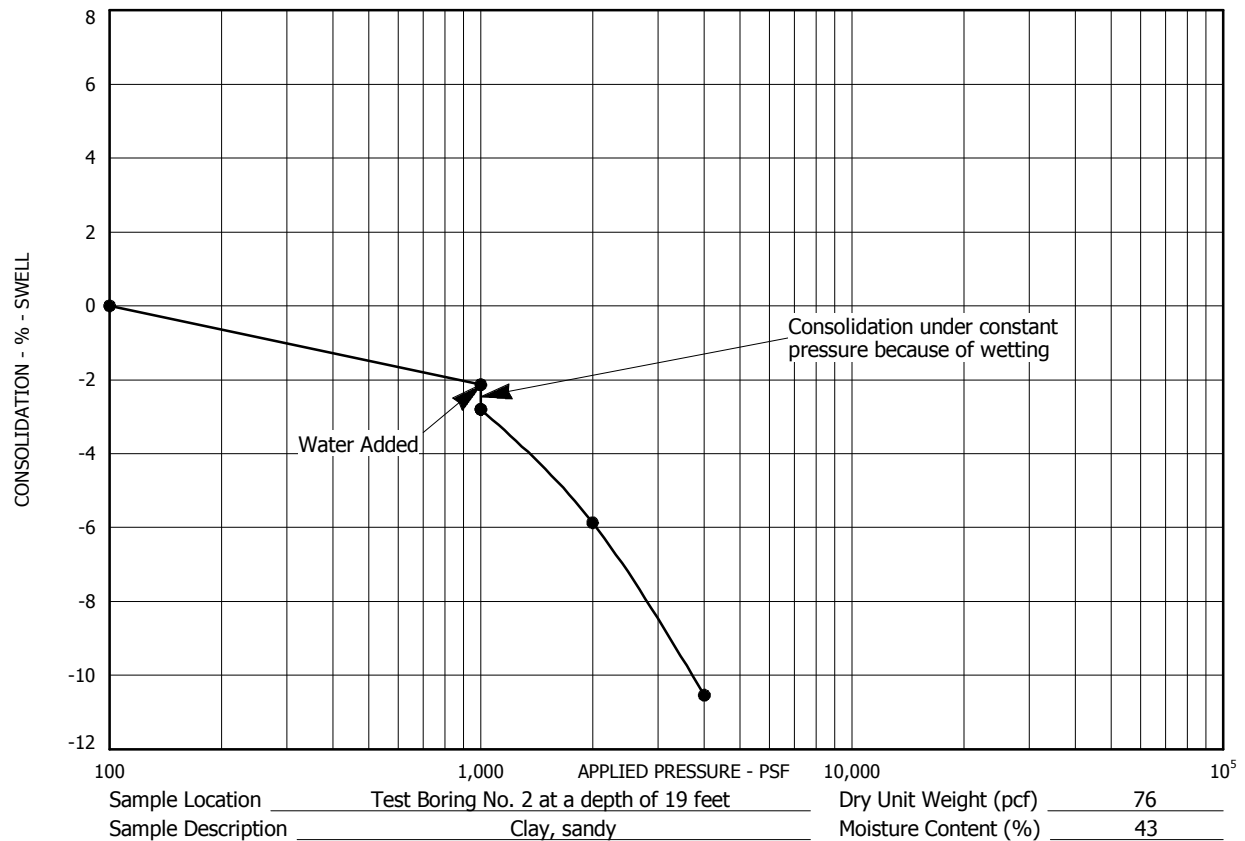
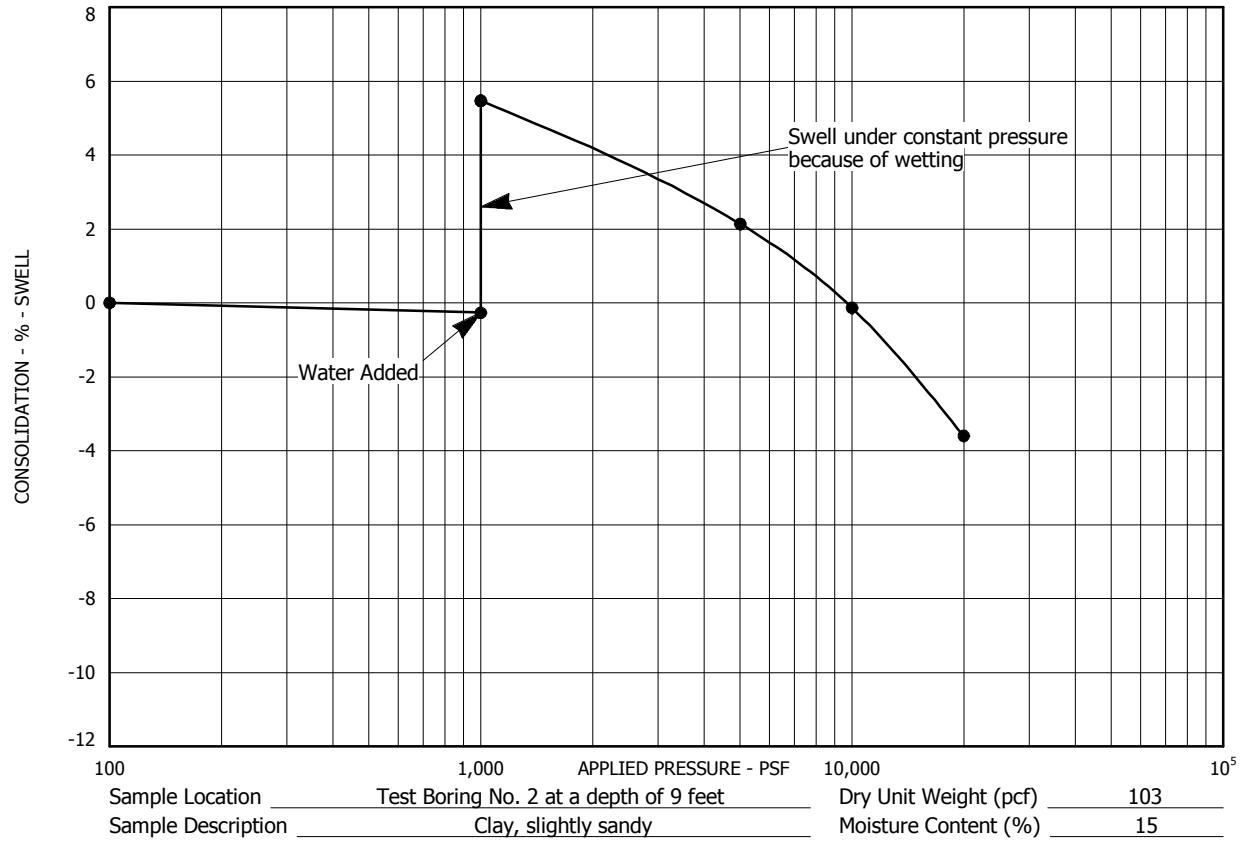
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 10

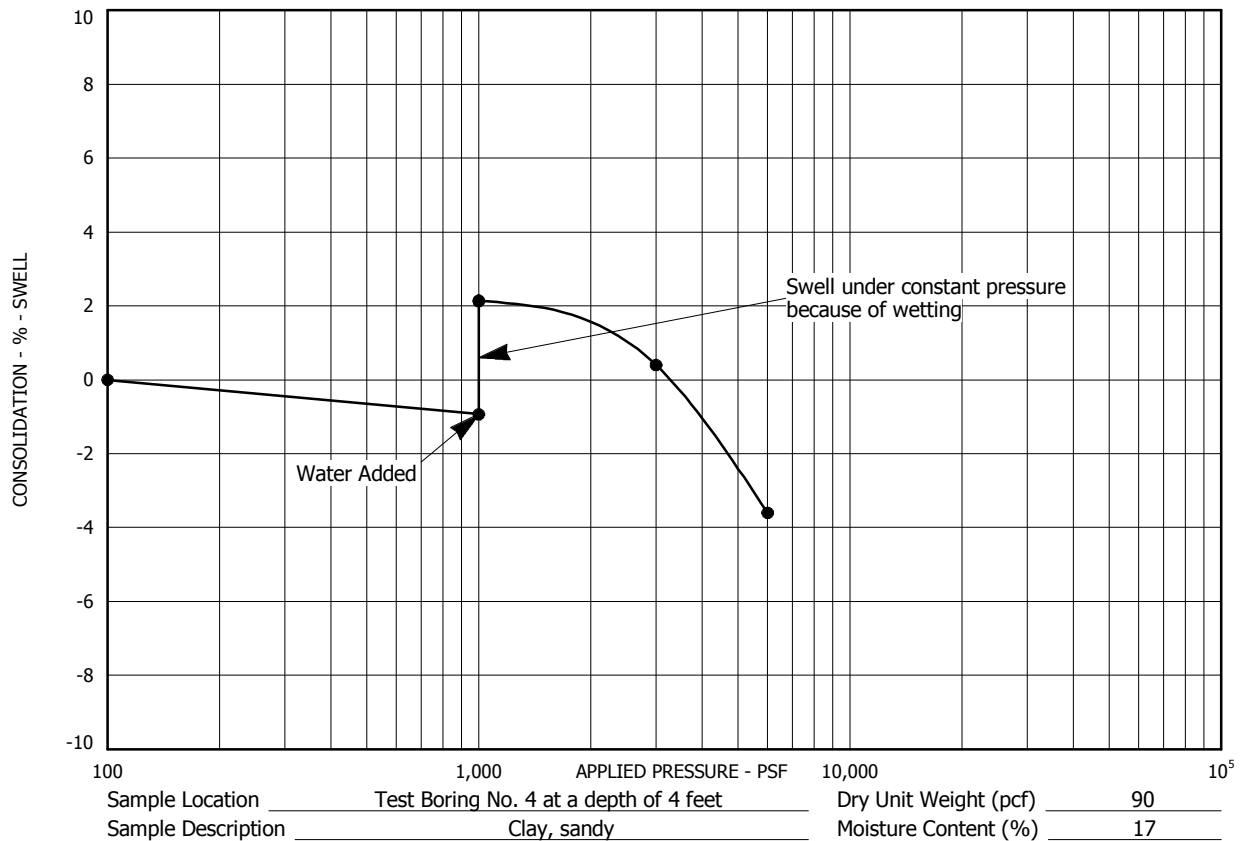
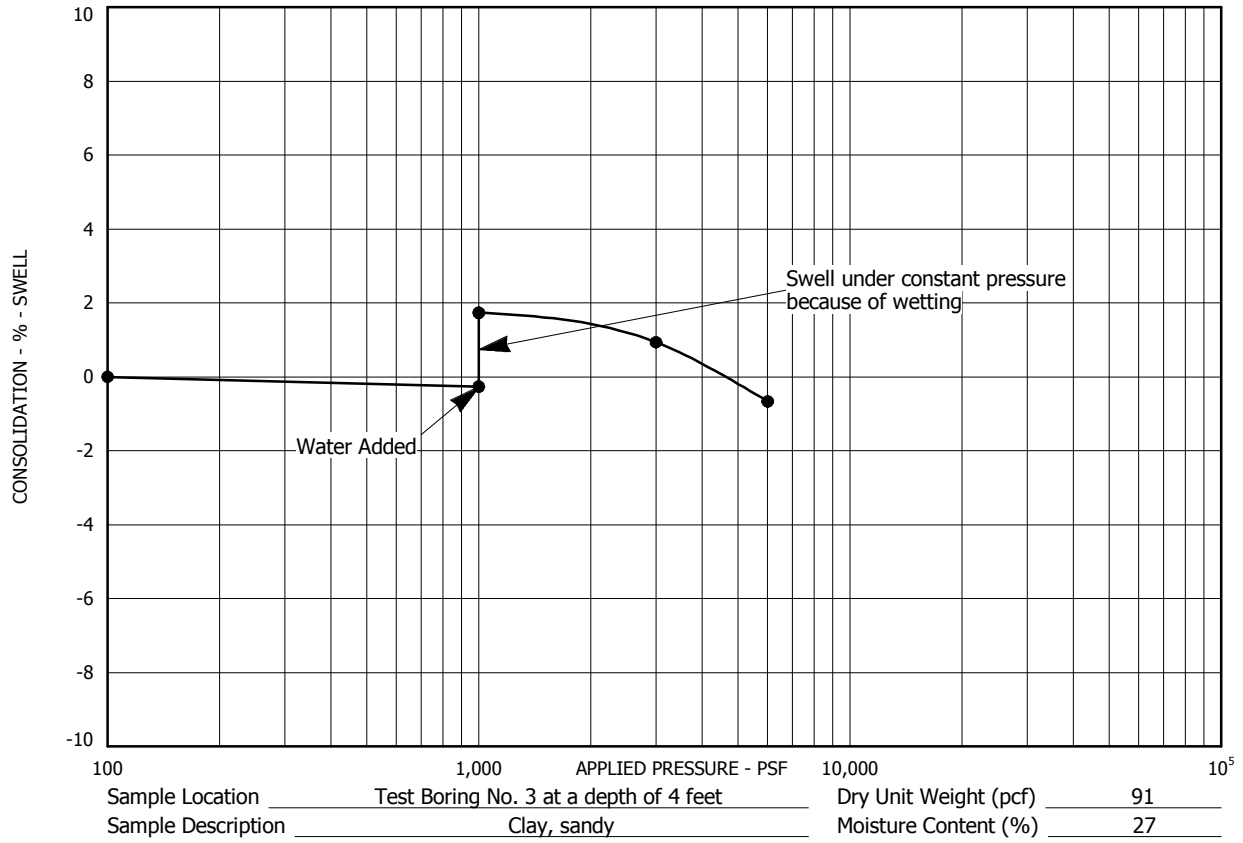


SWELL - CONSOLIDATION TEST RESULTS

FIGURE 11

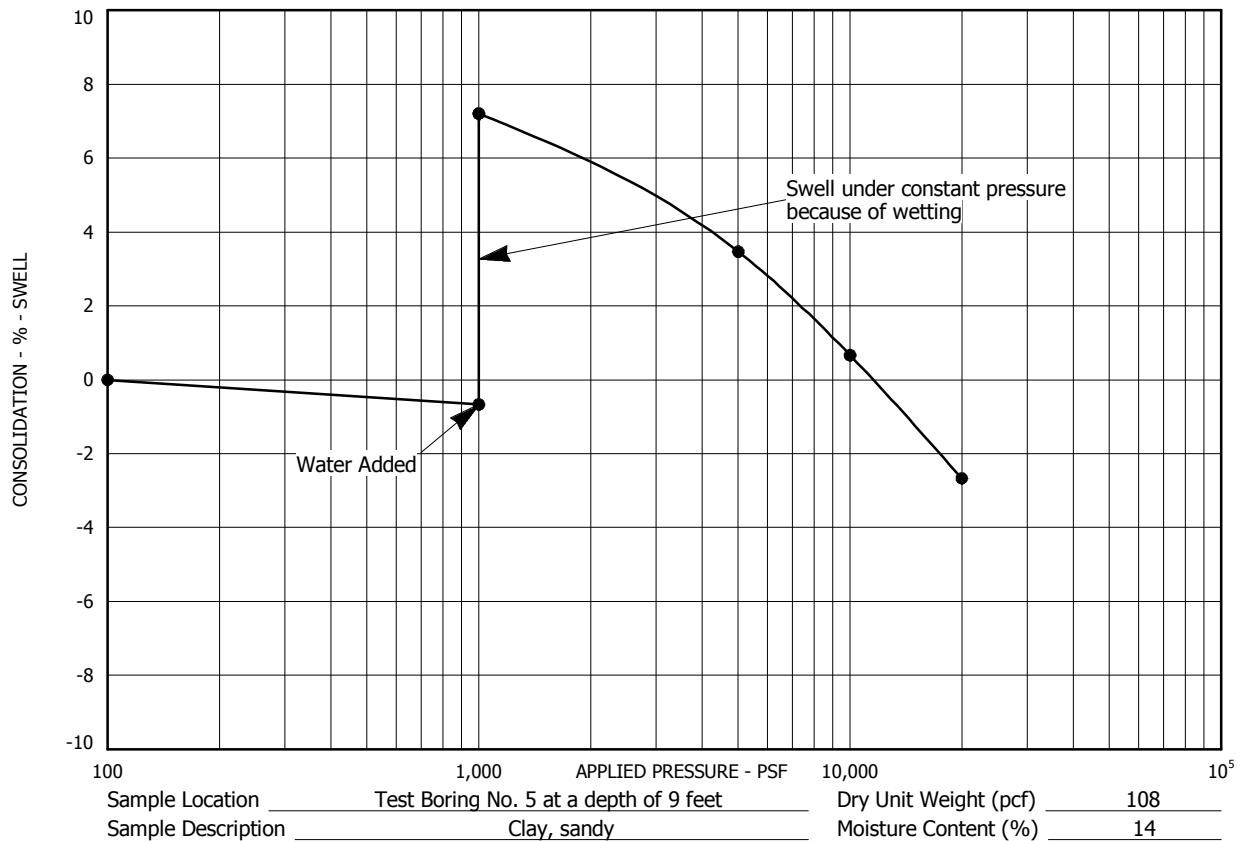
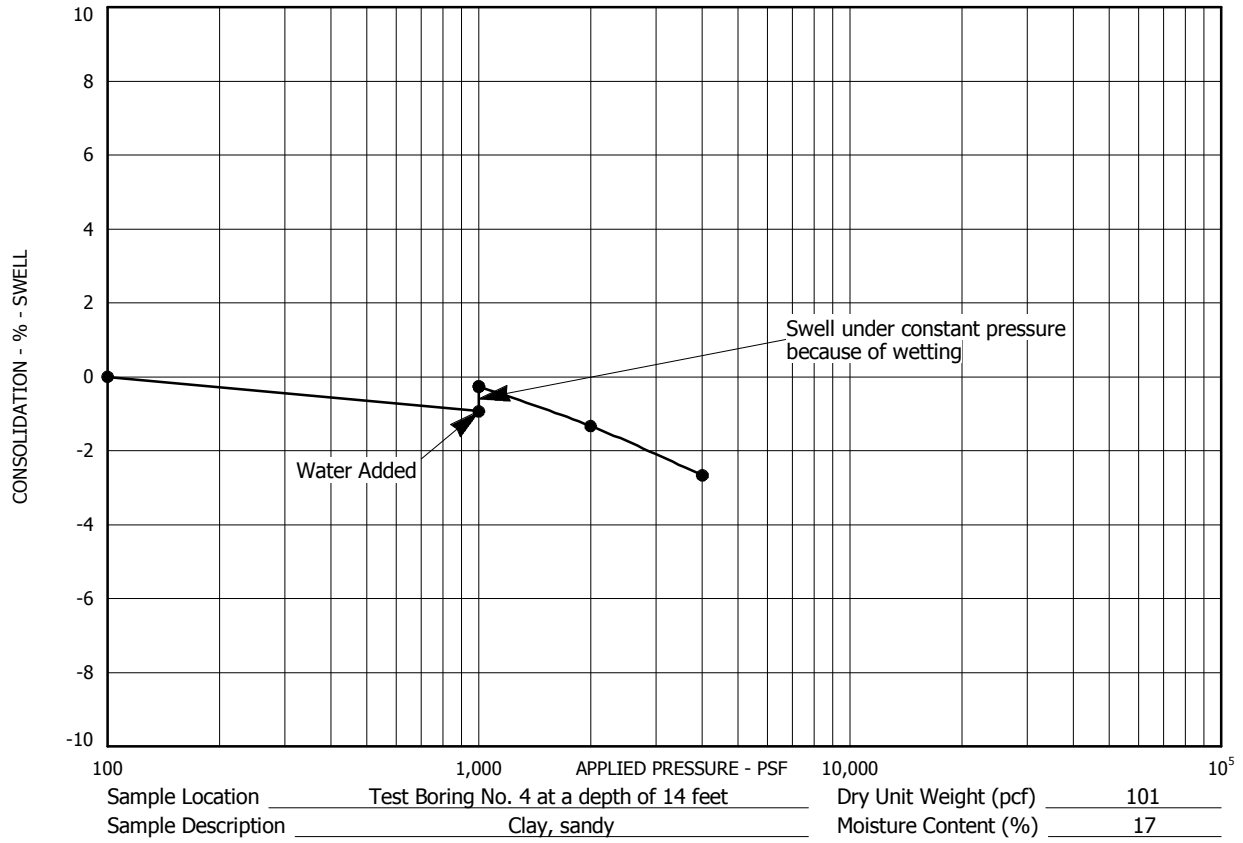


SWELL - CONSOLIDATION TEST RESULTS
FIGURE 12



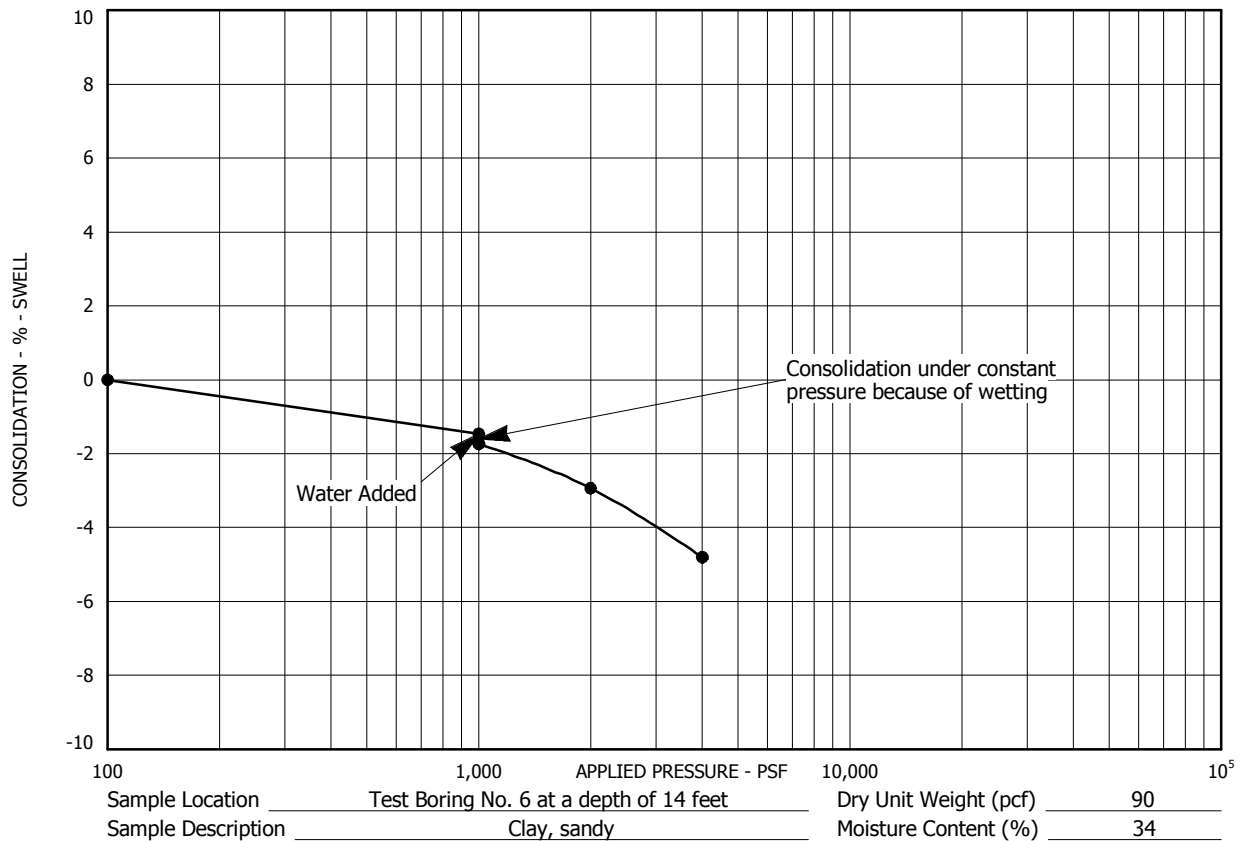
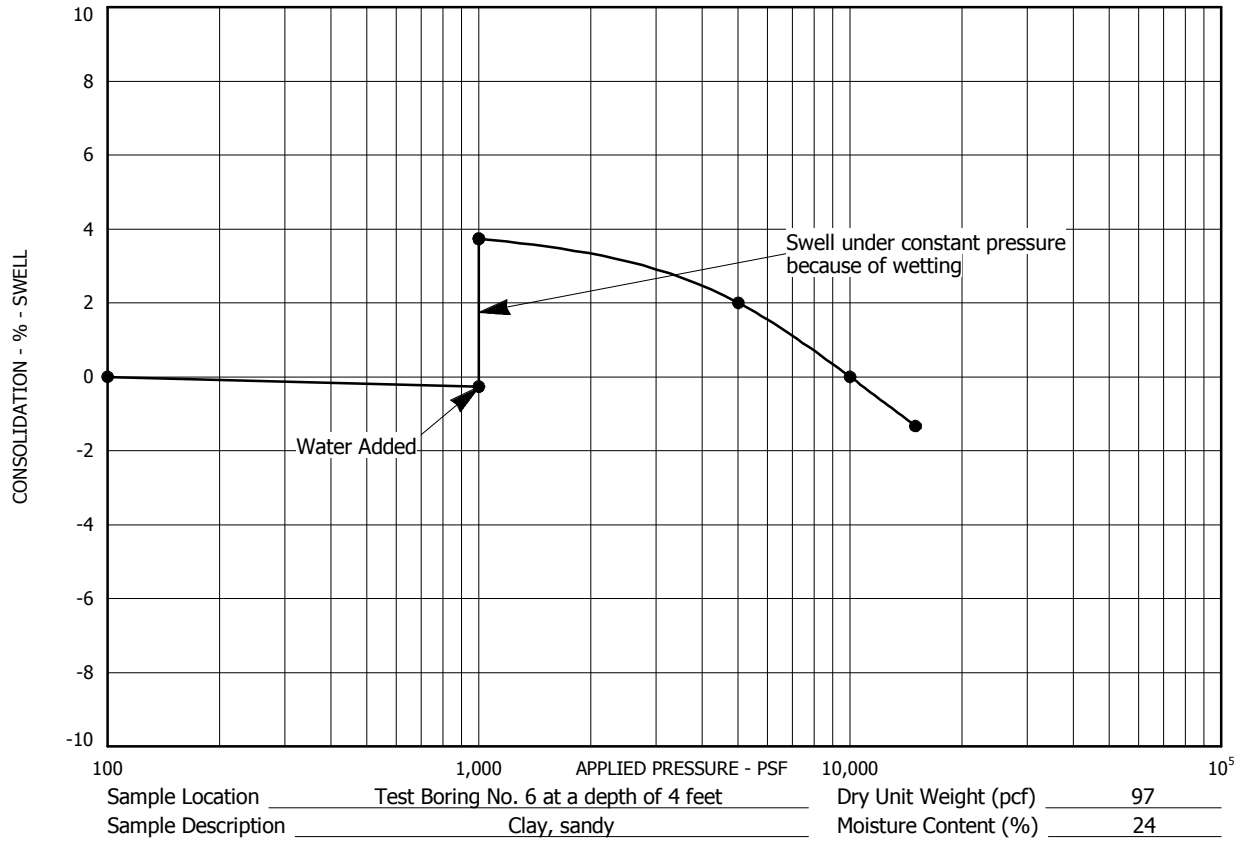
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 13



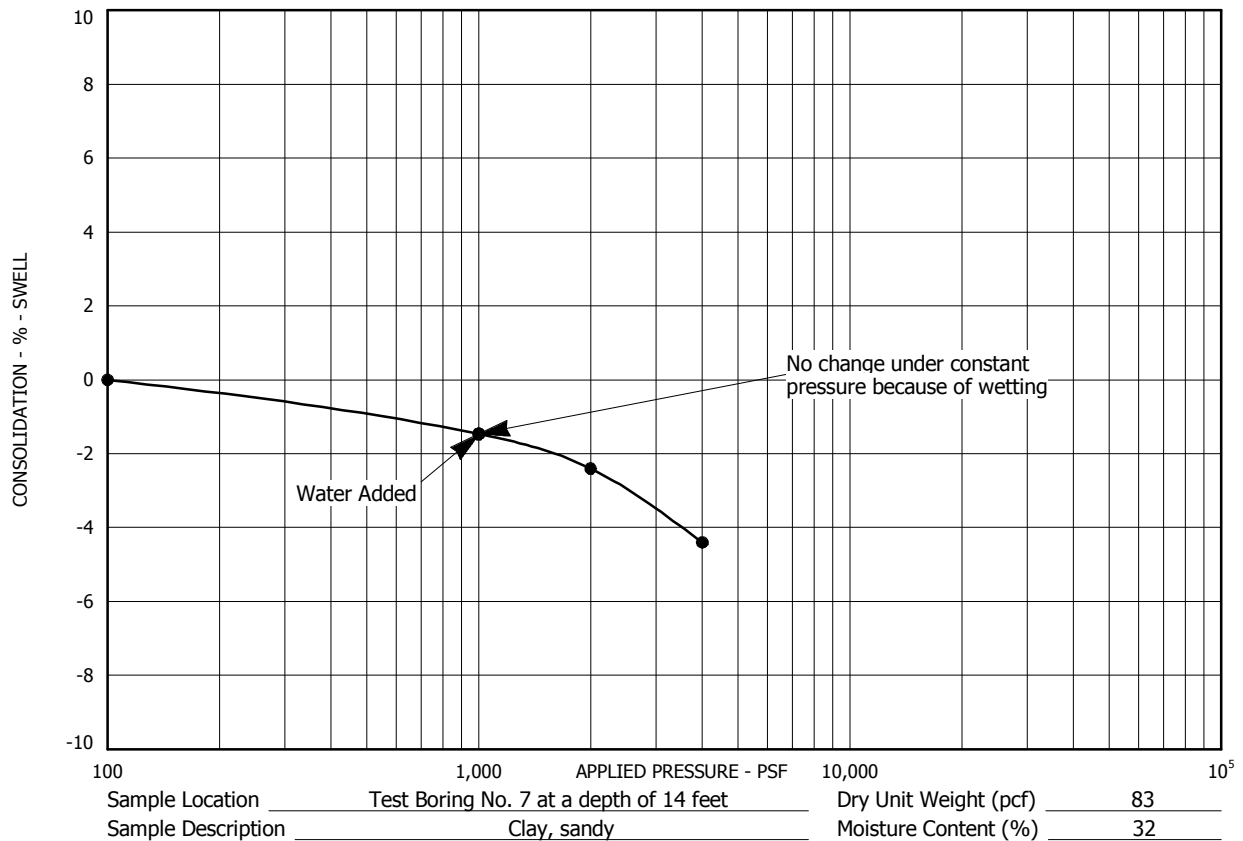
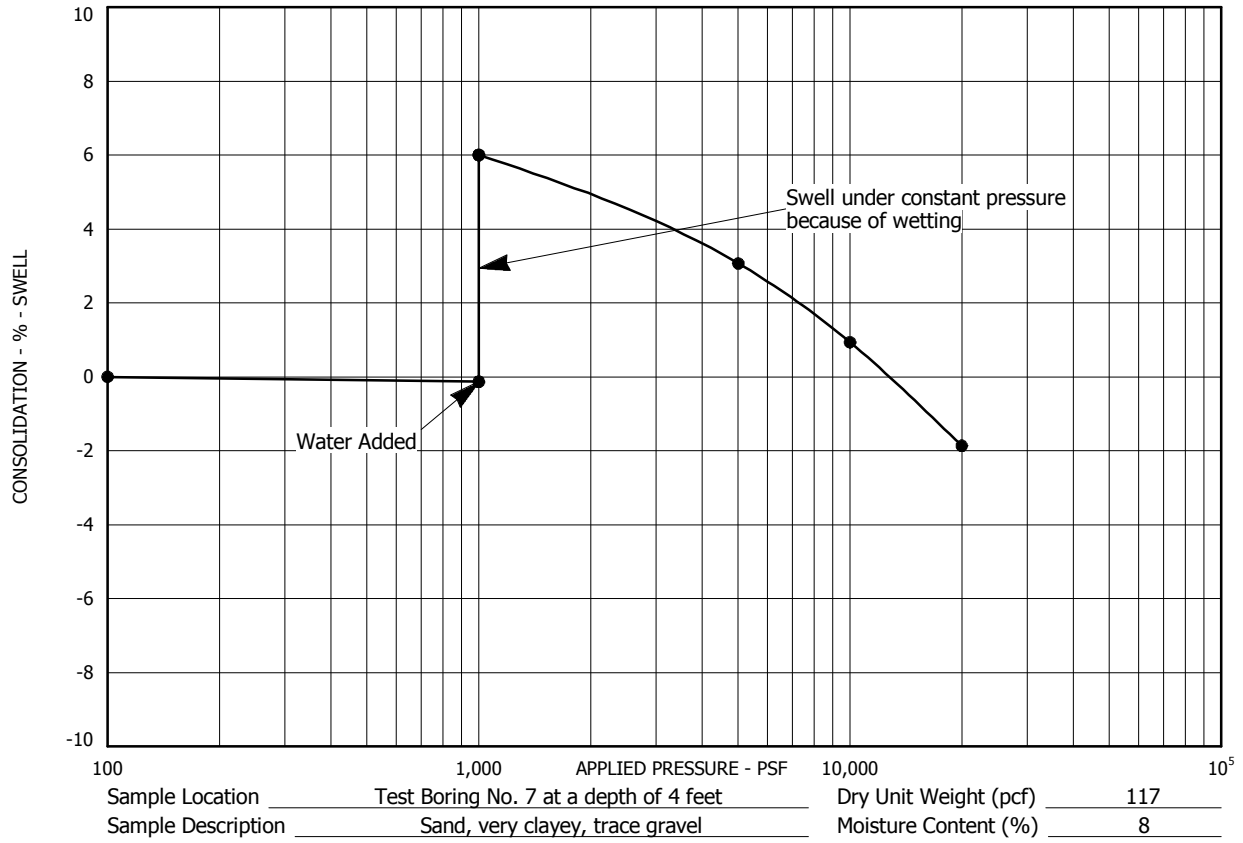
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 14



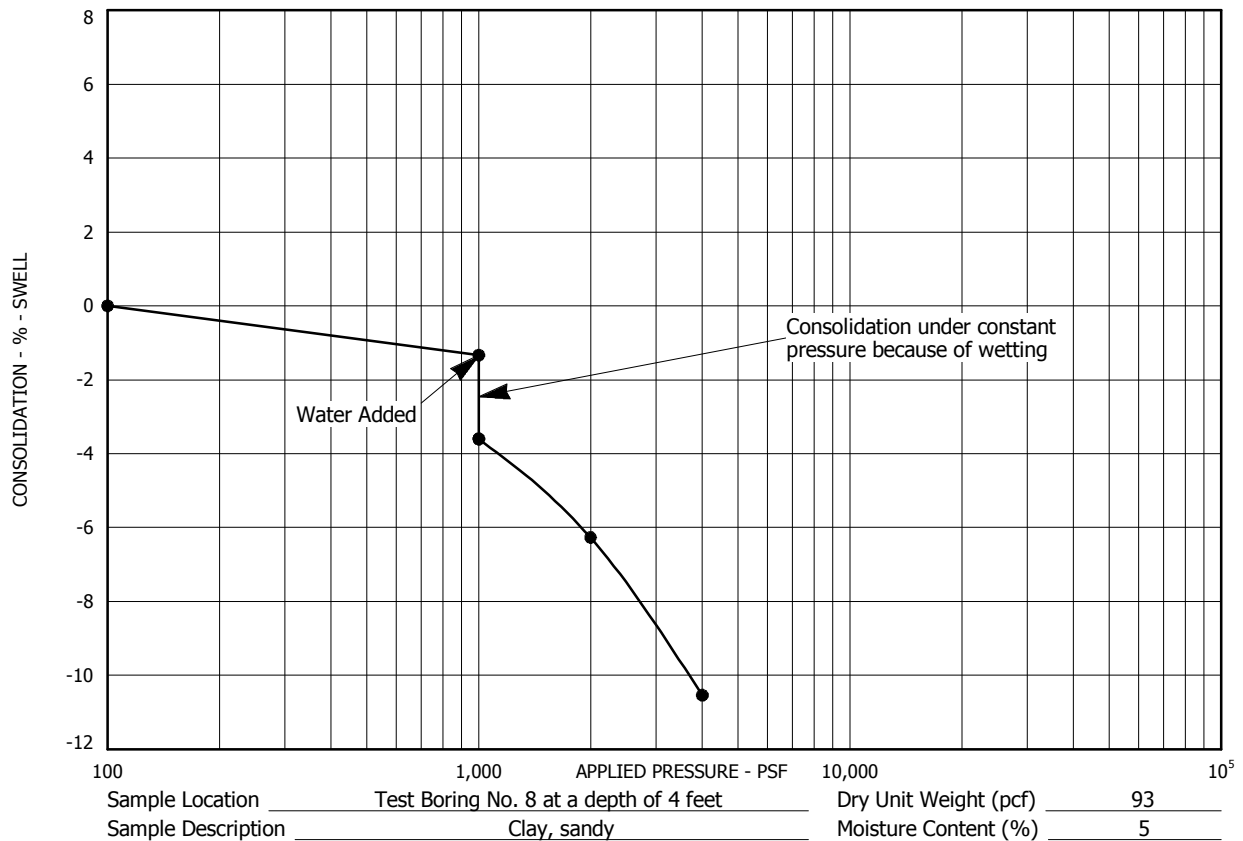
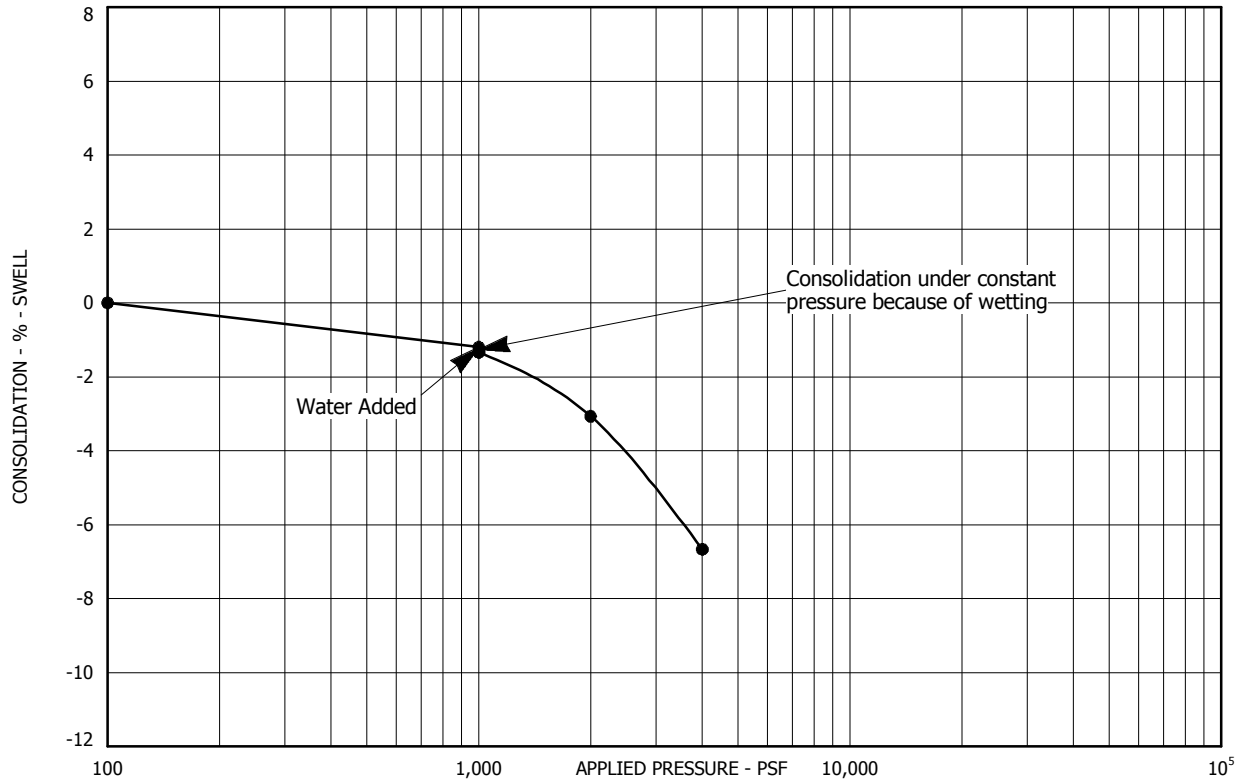
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 15



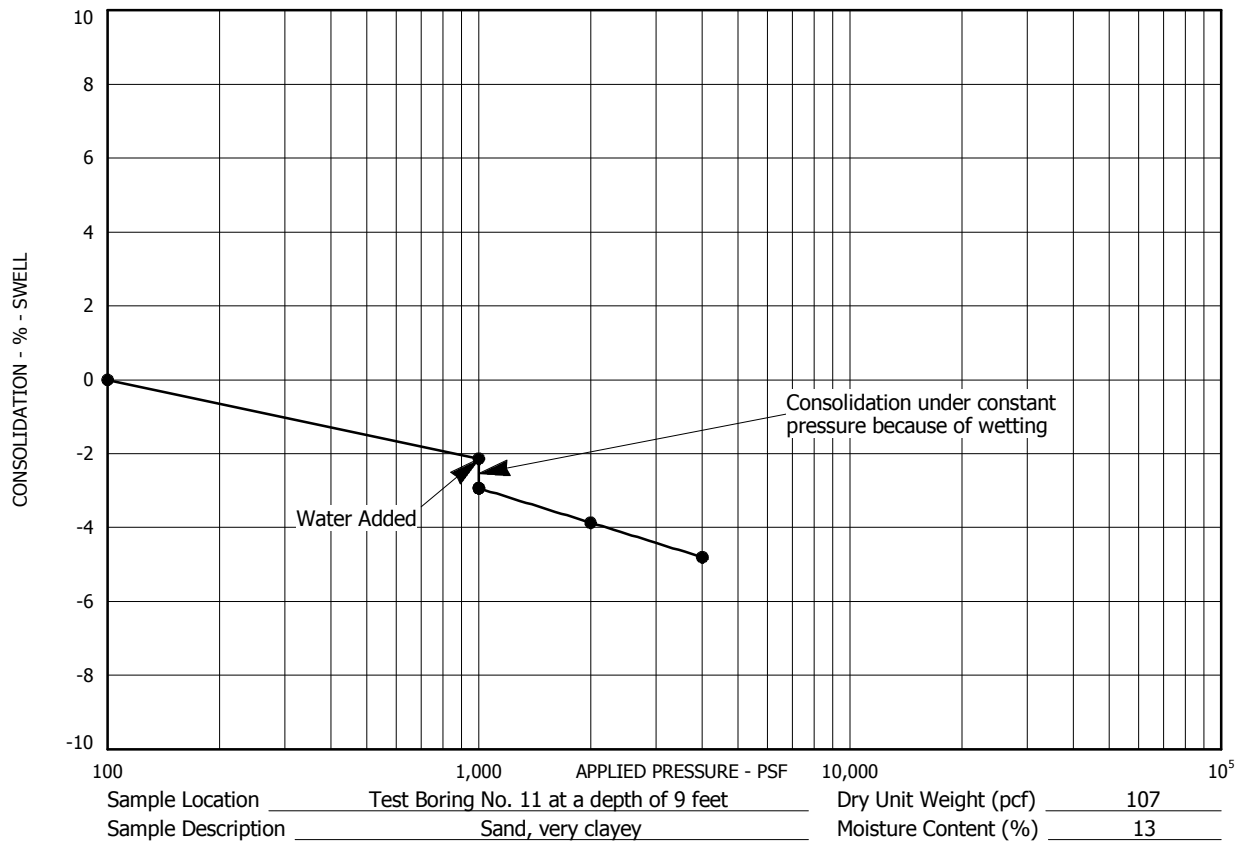
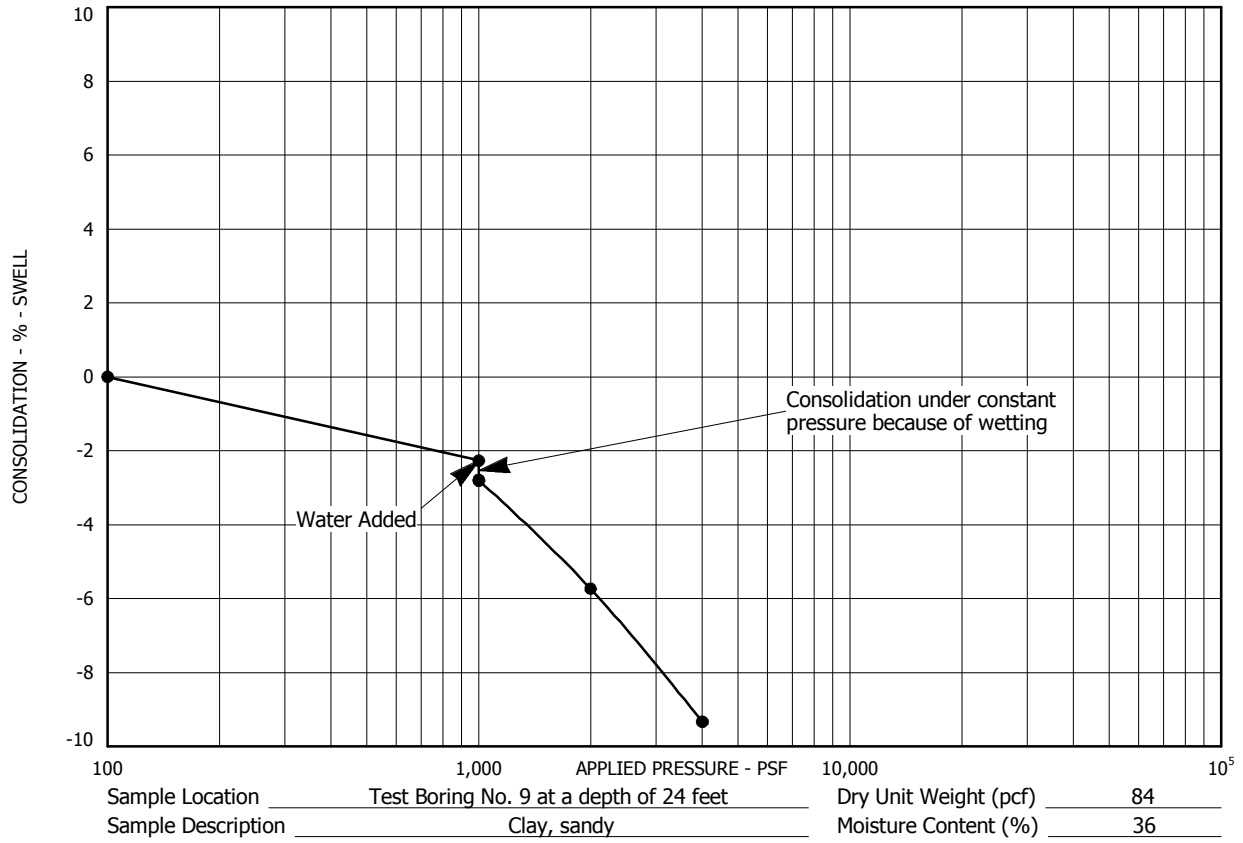
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 16



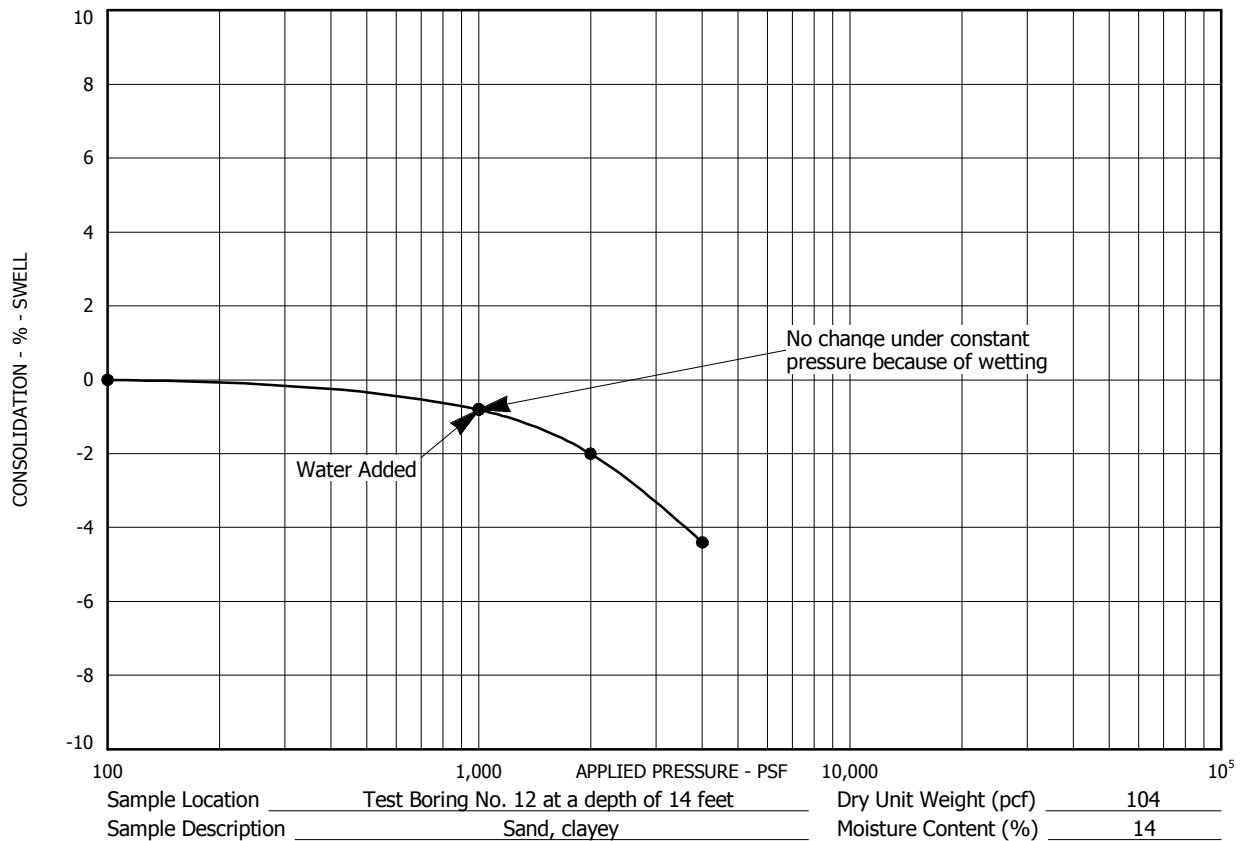
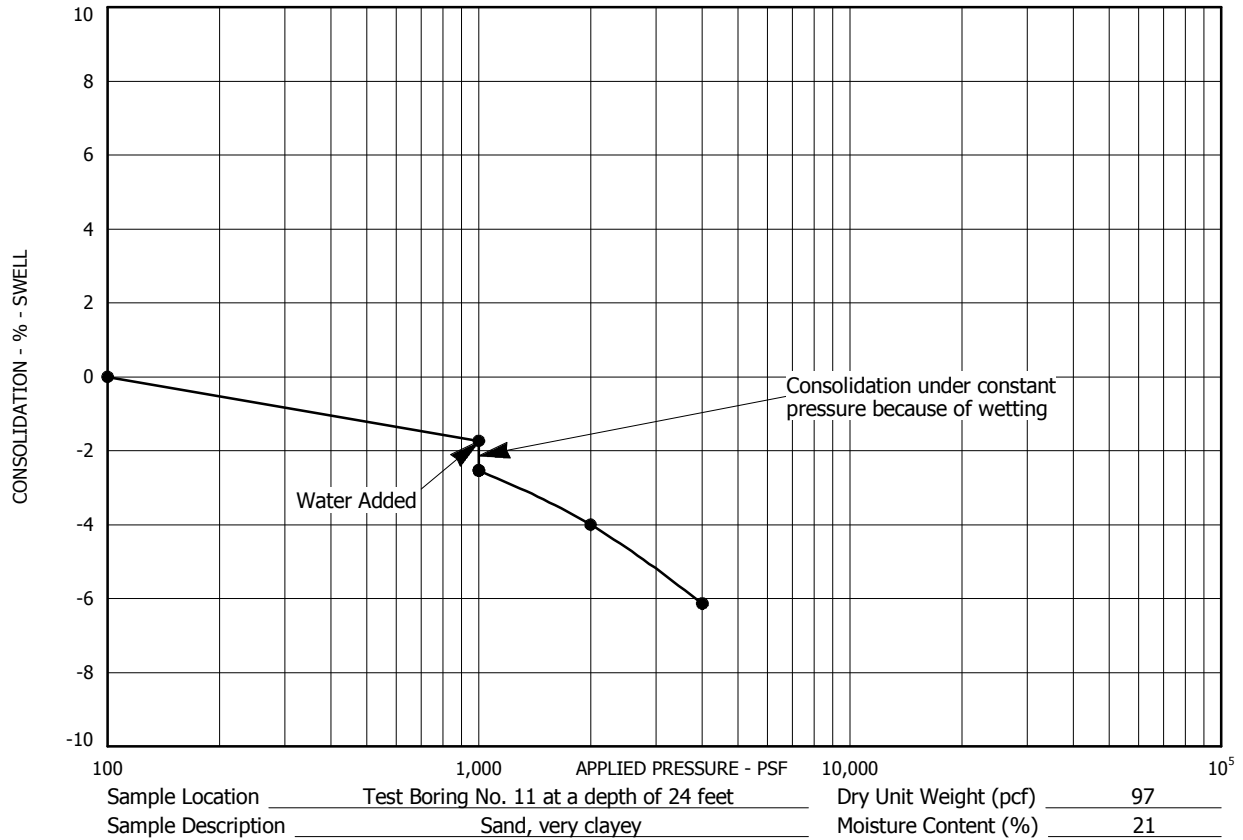
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 17



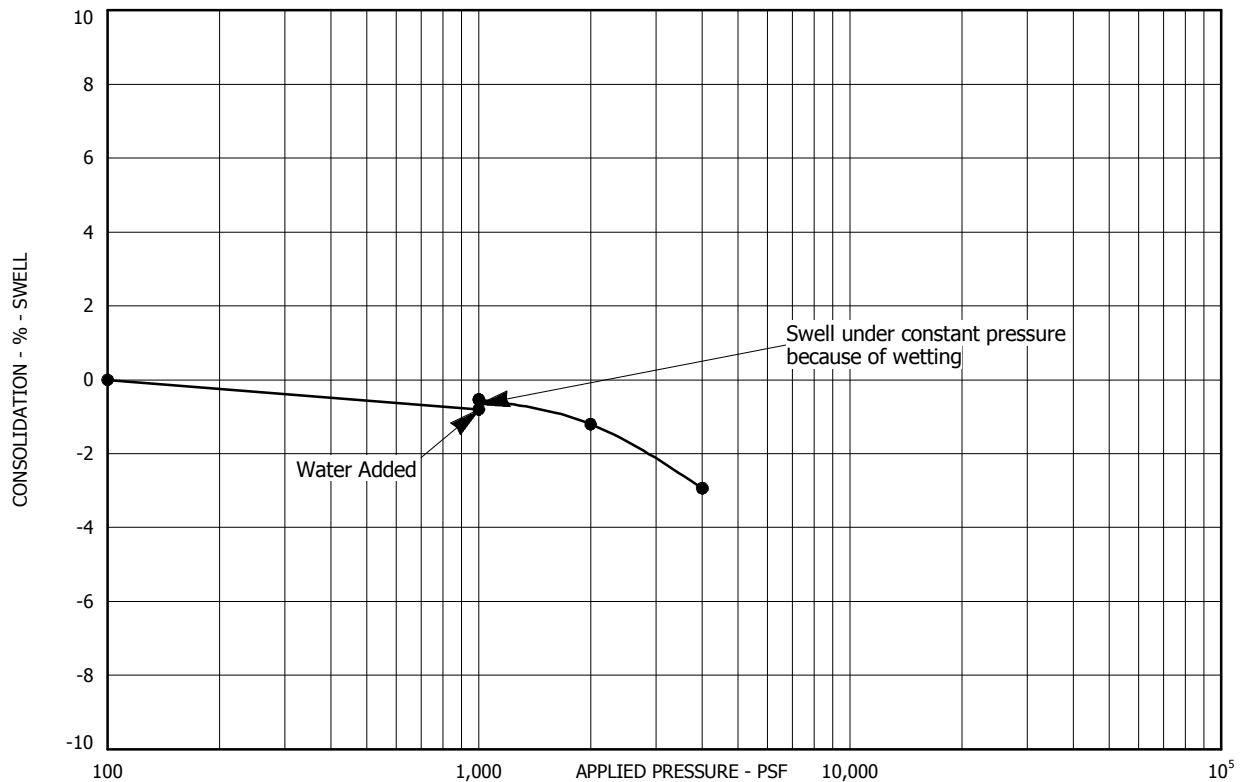
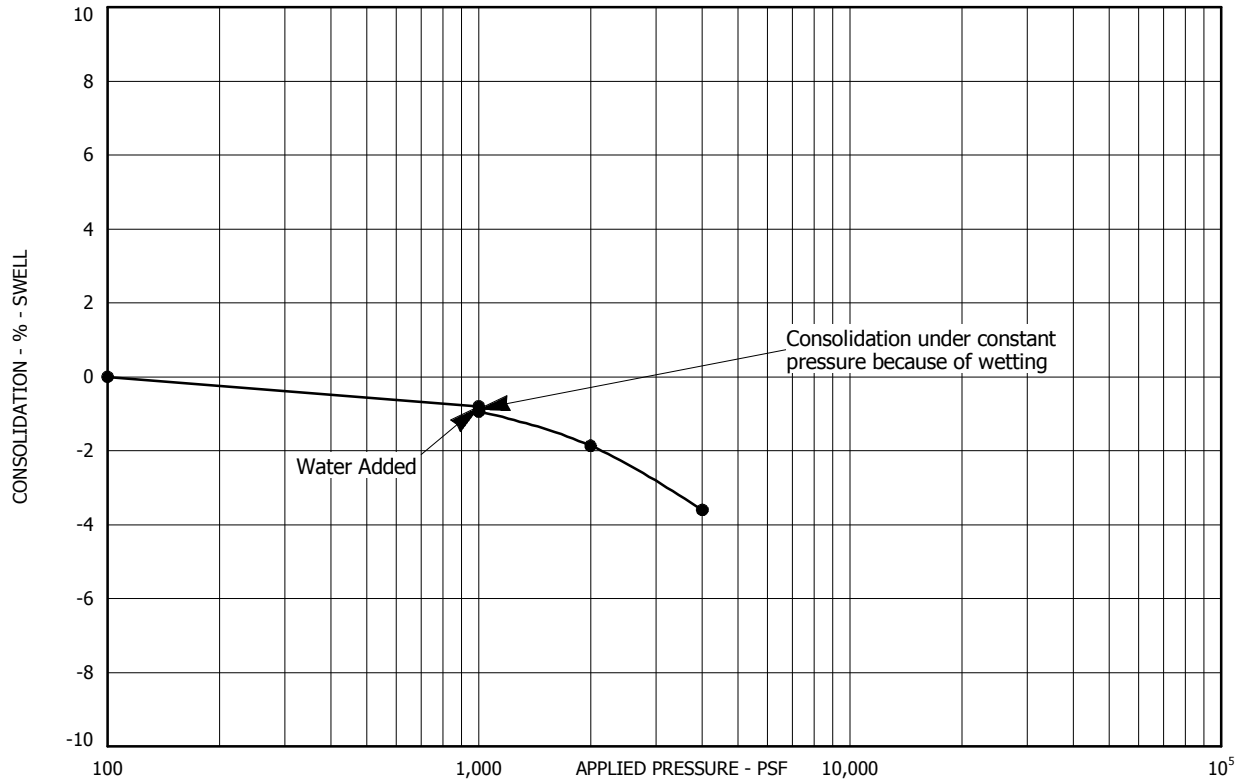
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 18



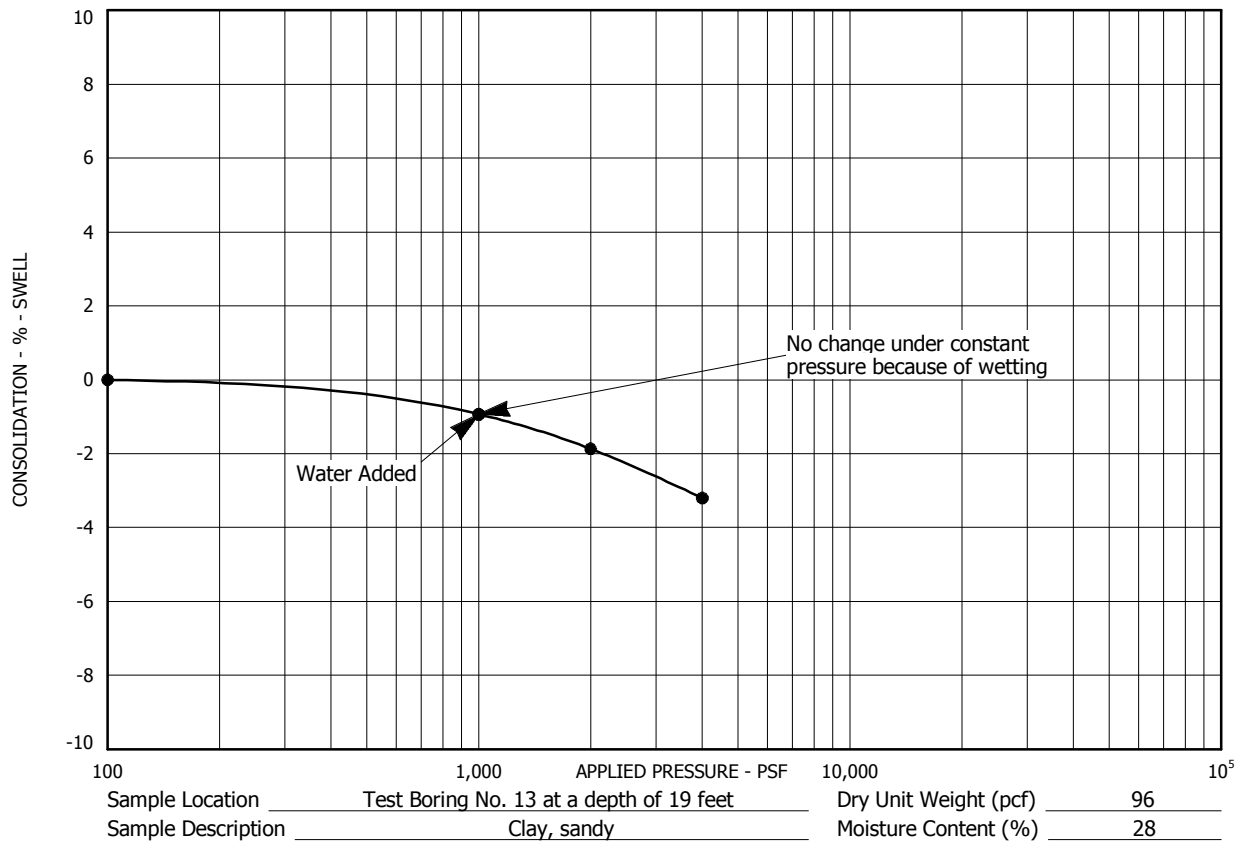
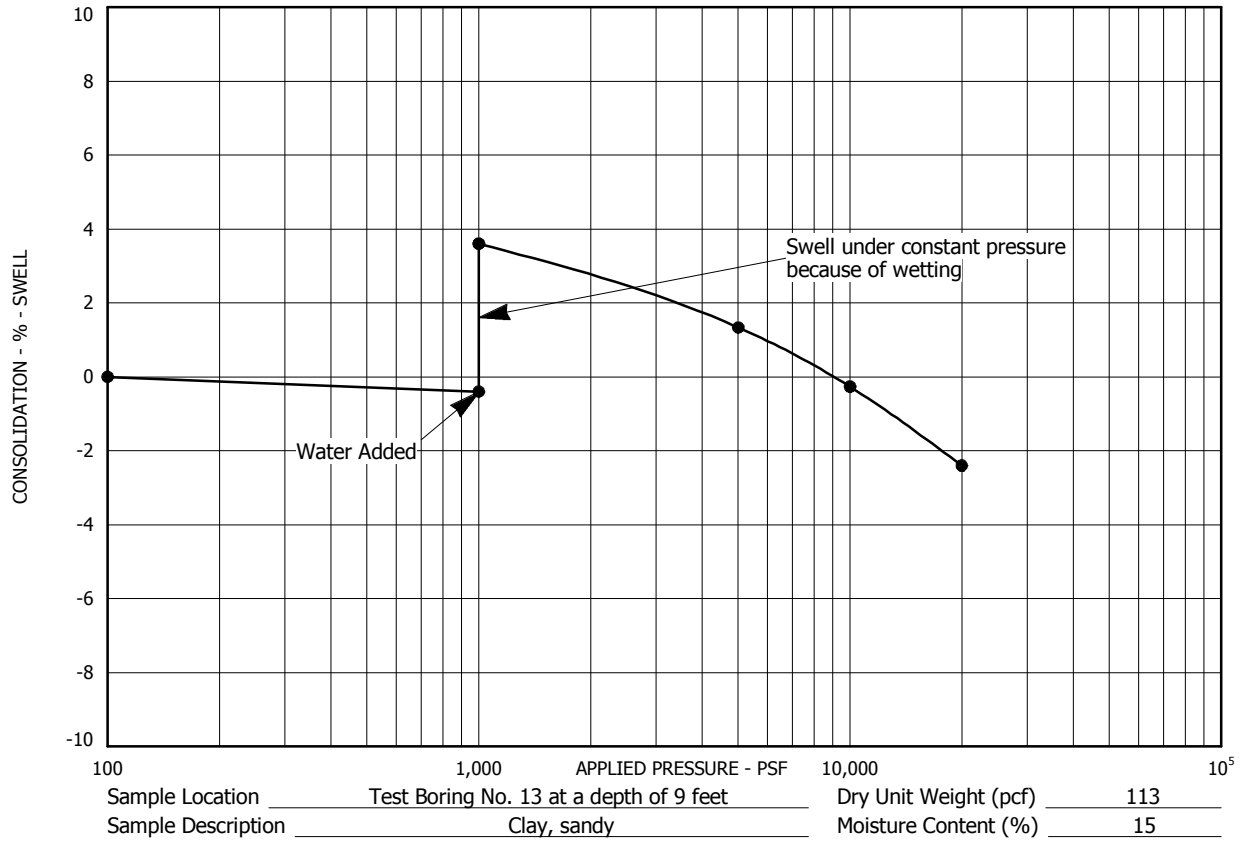
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 19



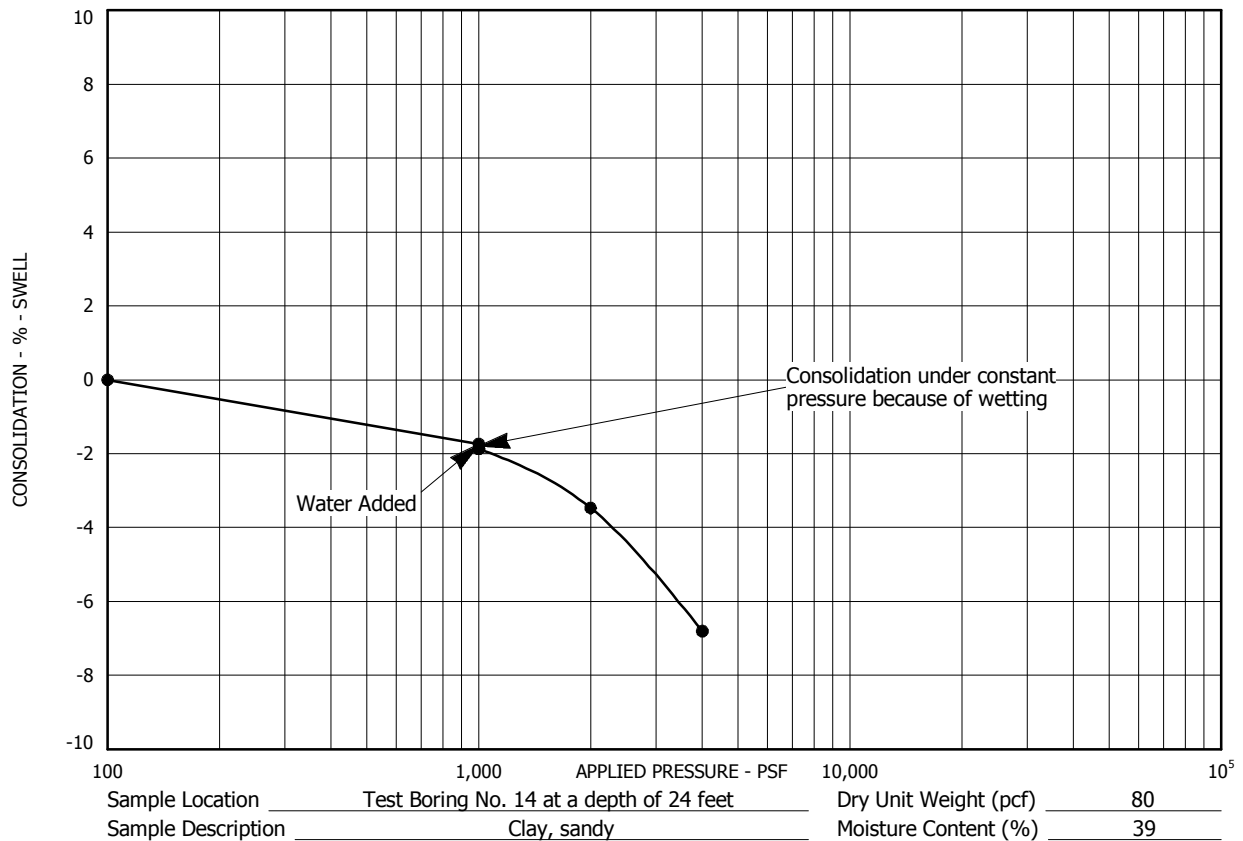
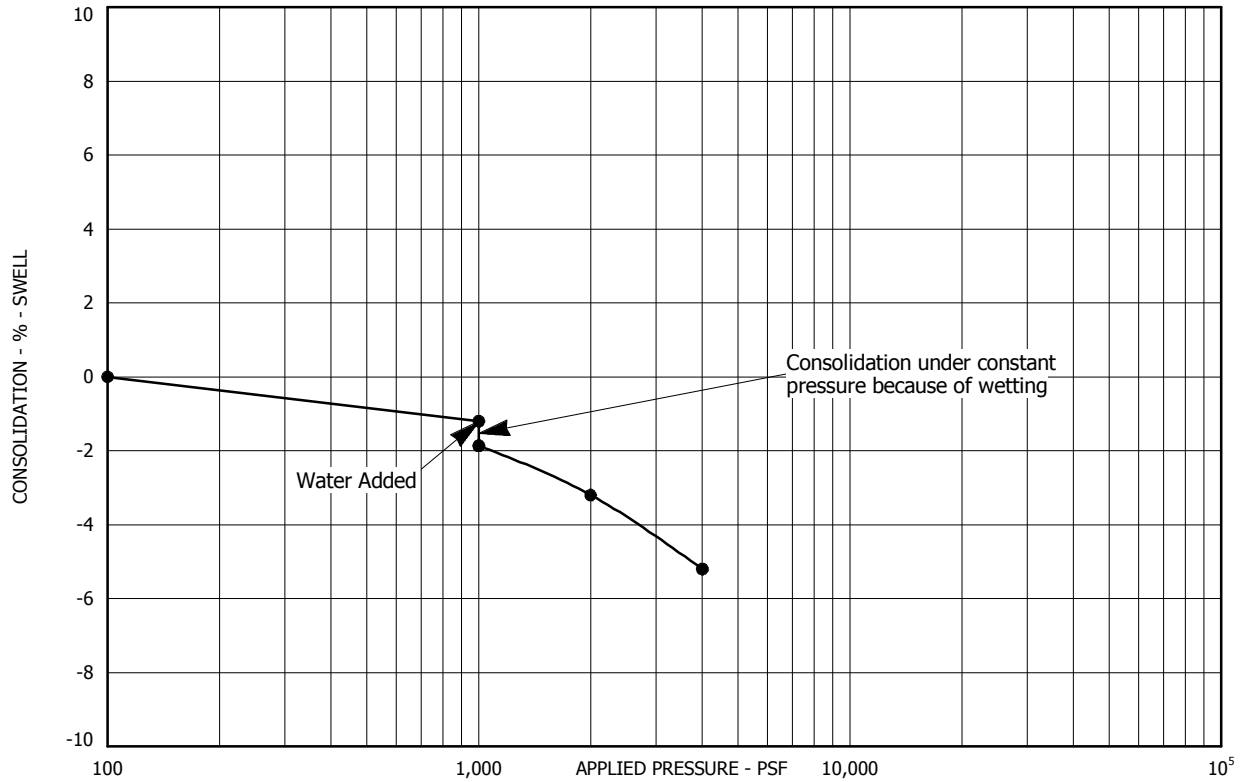
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 20



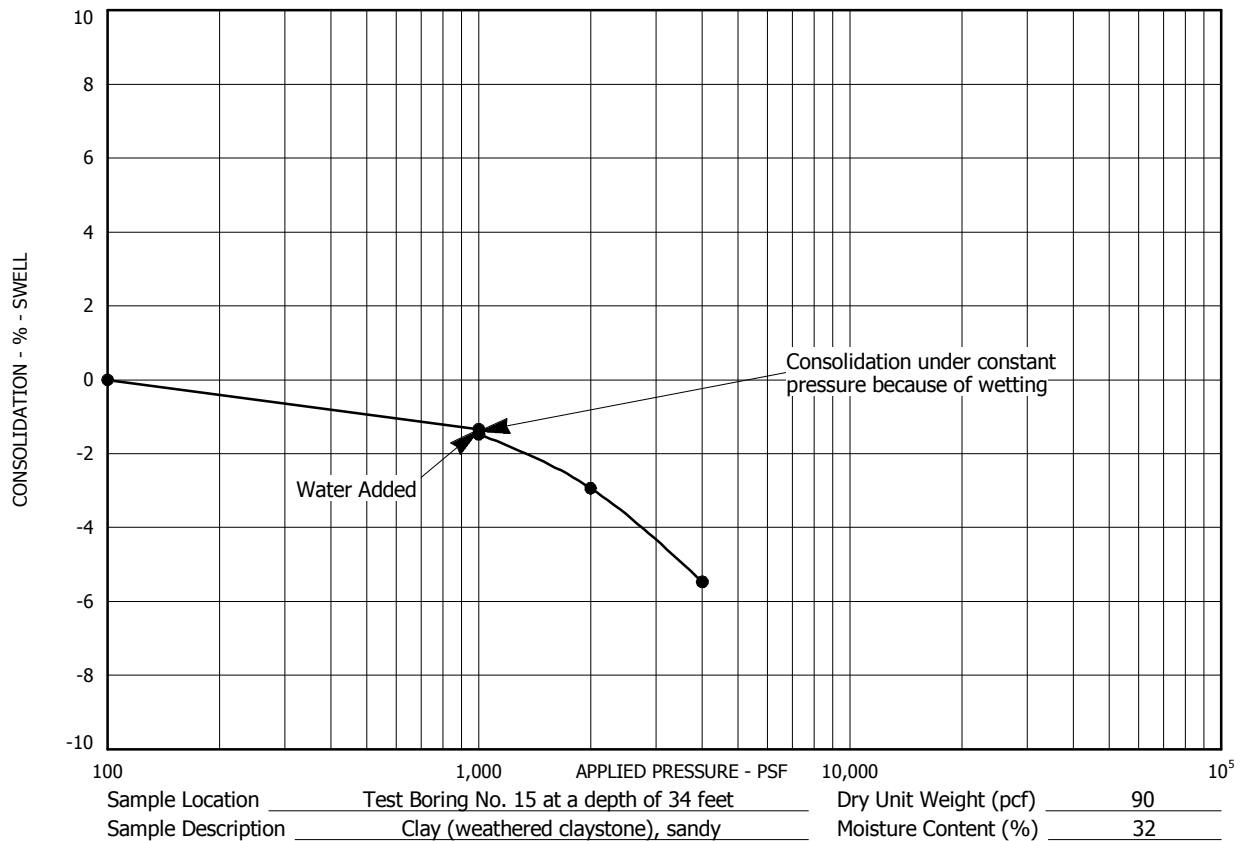
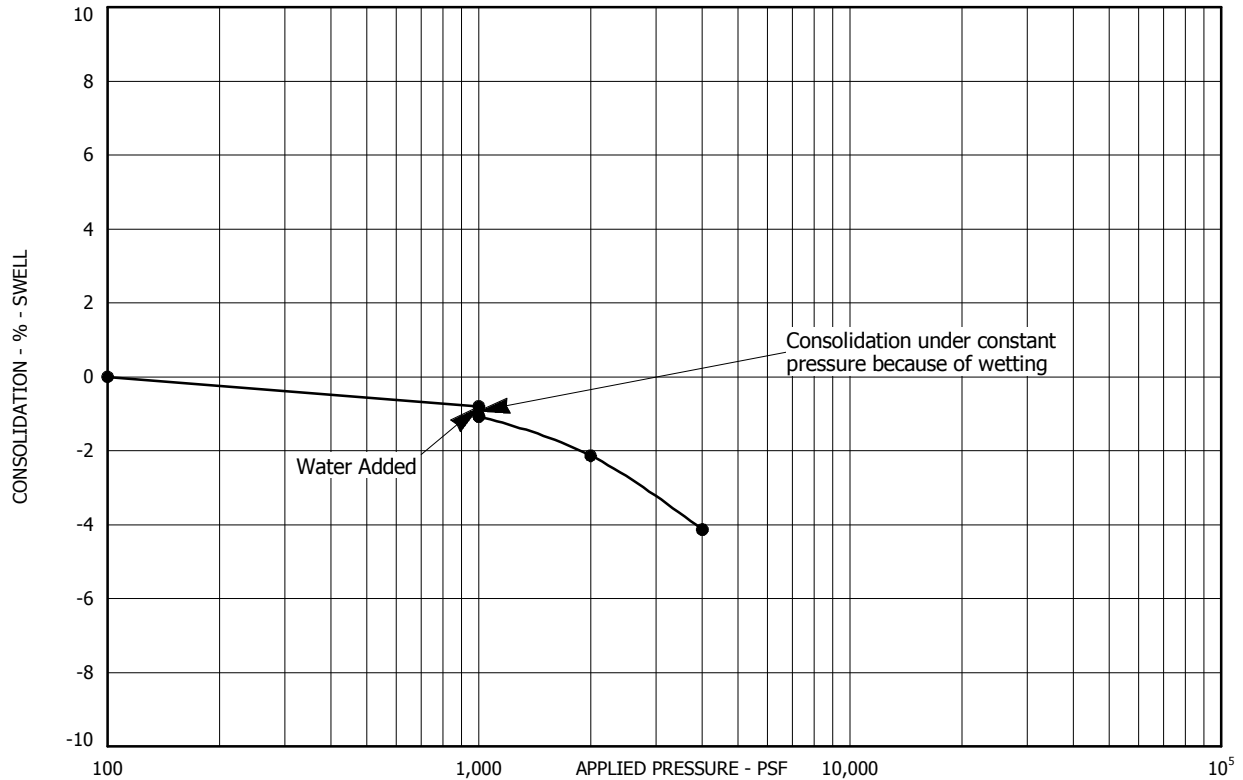
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 21



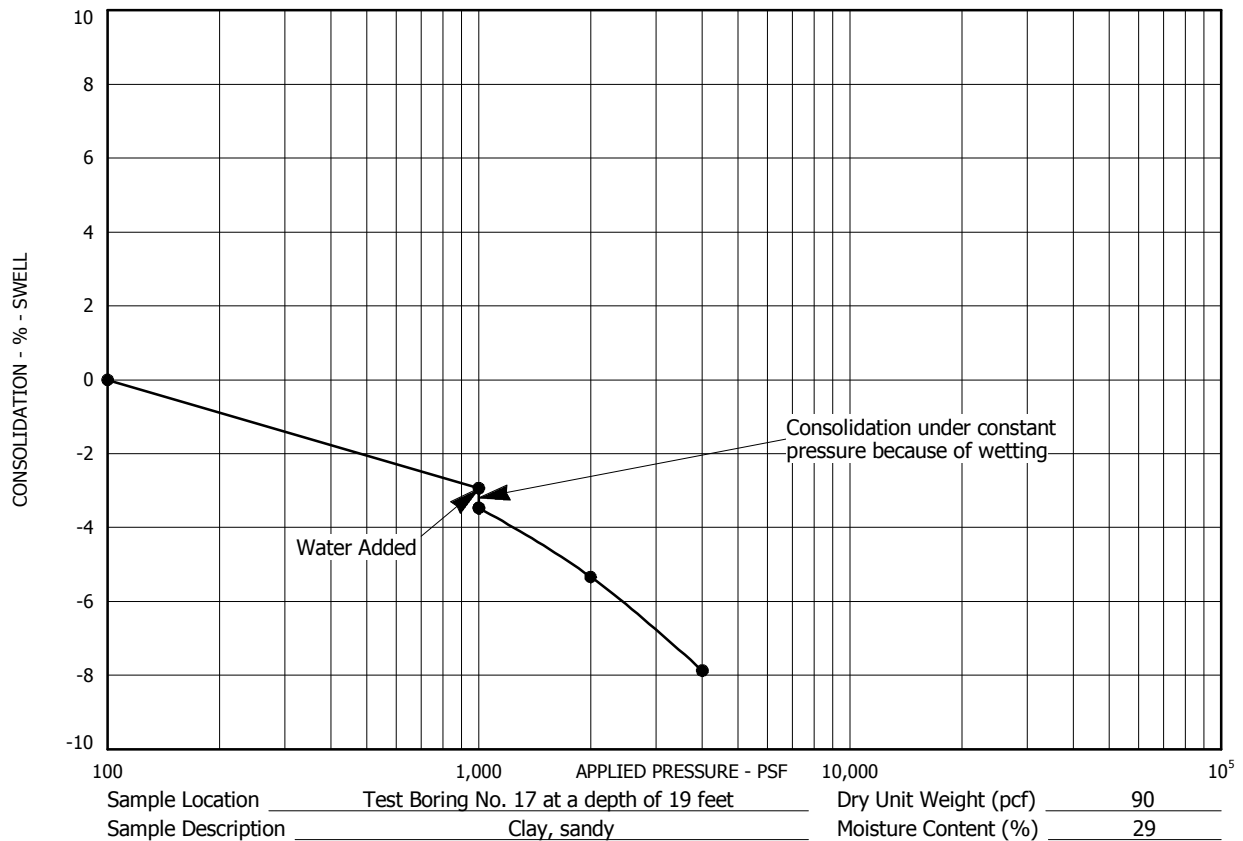
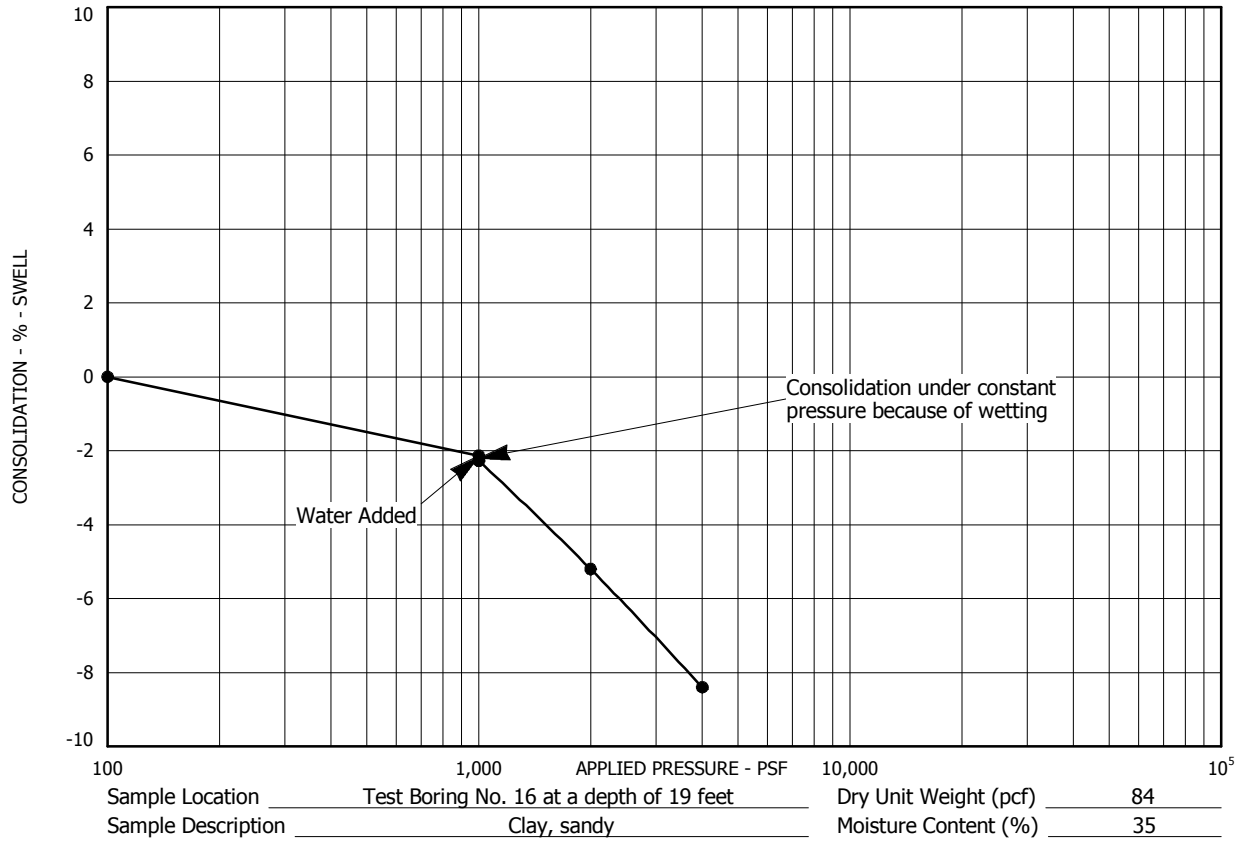
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 22



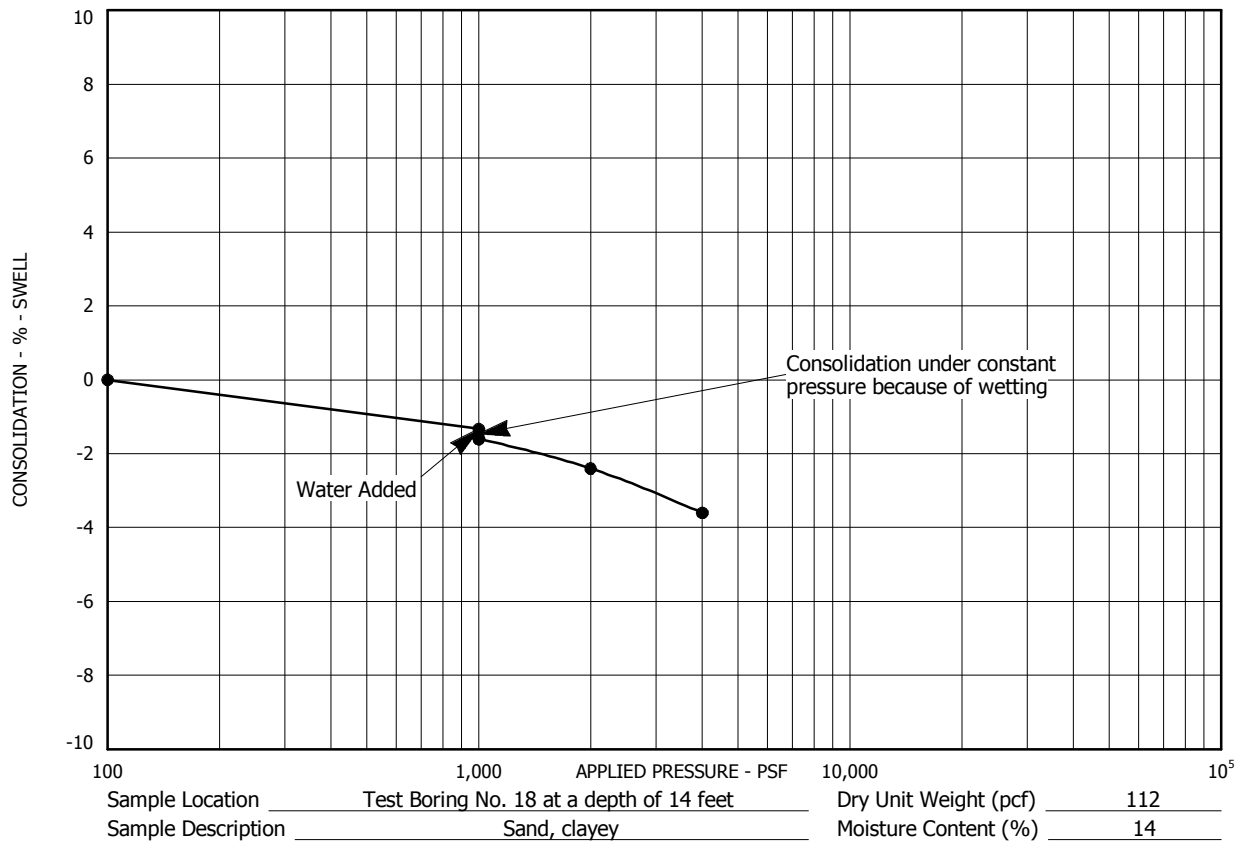
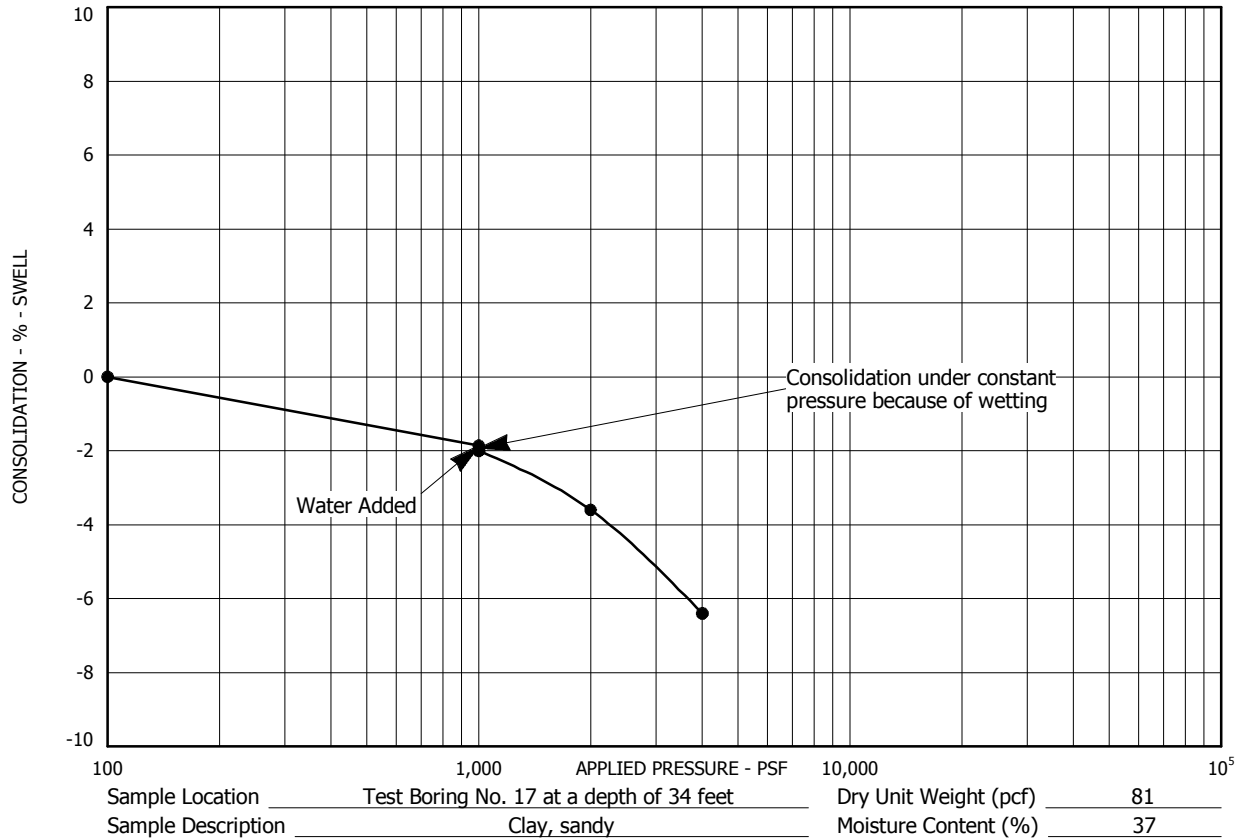
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 23



SWELL - CONSOLIDATION TEST RESULTS

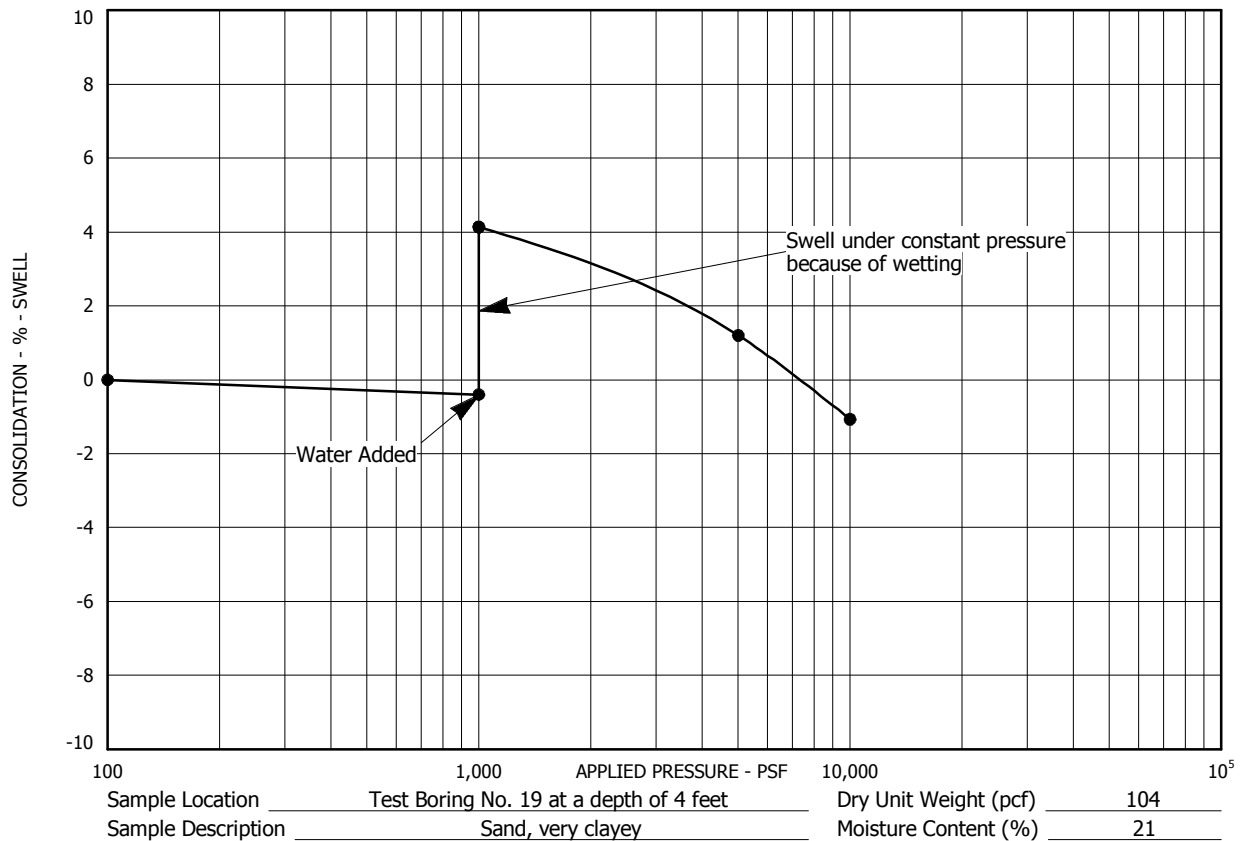
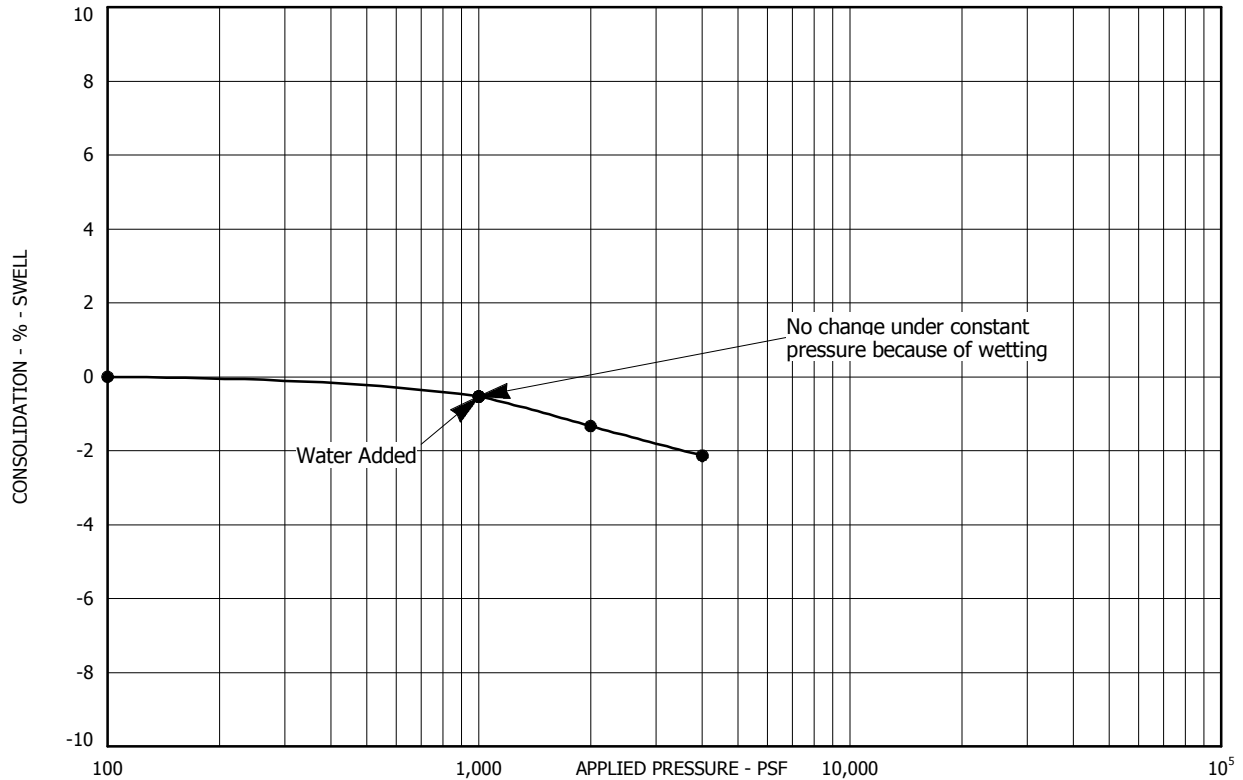
FIGURE 24



SWELL - CONSOLIDATION TEST RESULTS

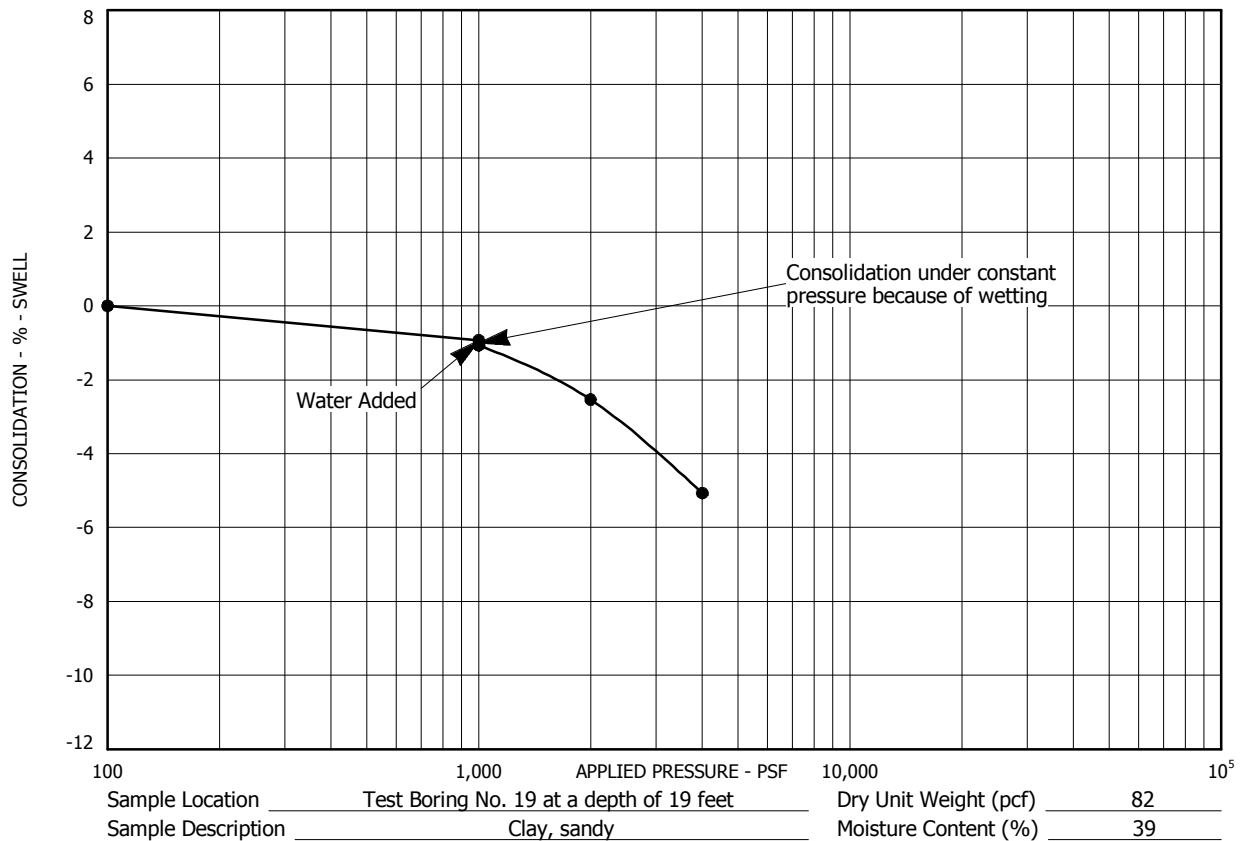
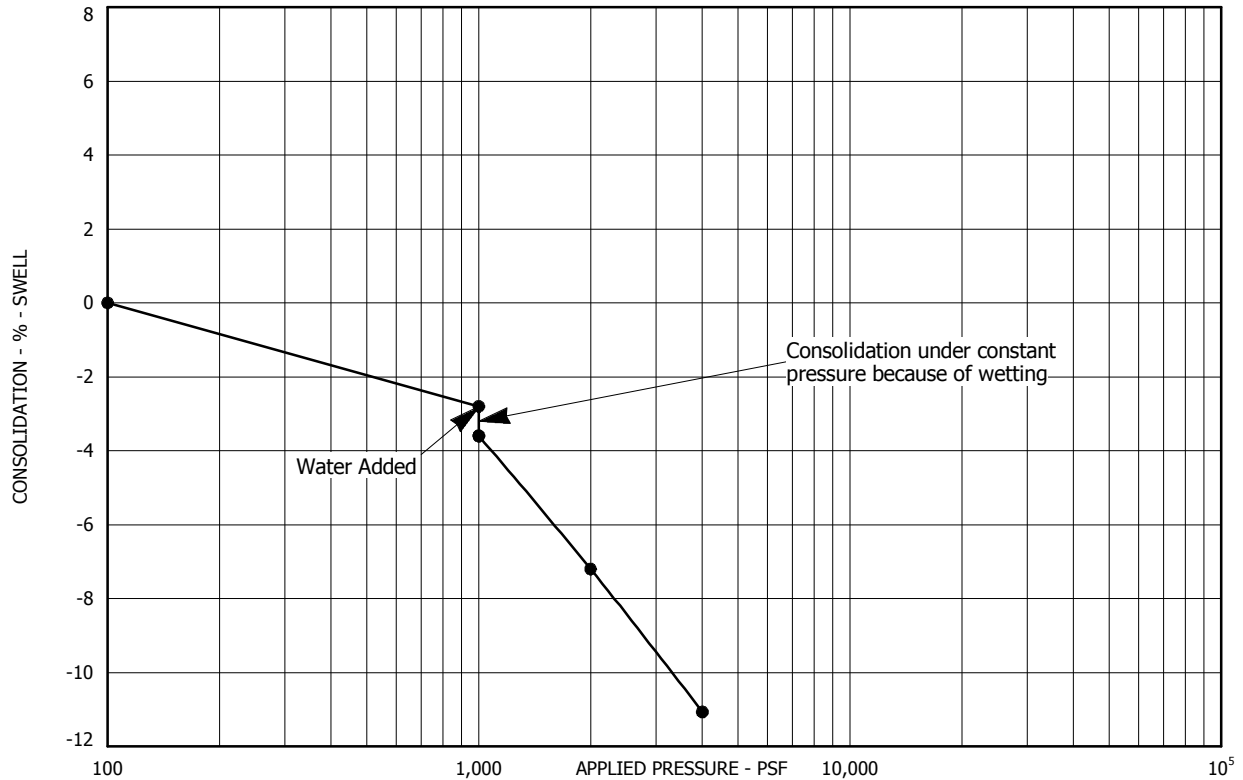
FIGURE 25

PROJECT NO. 165963



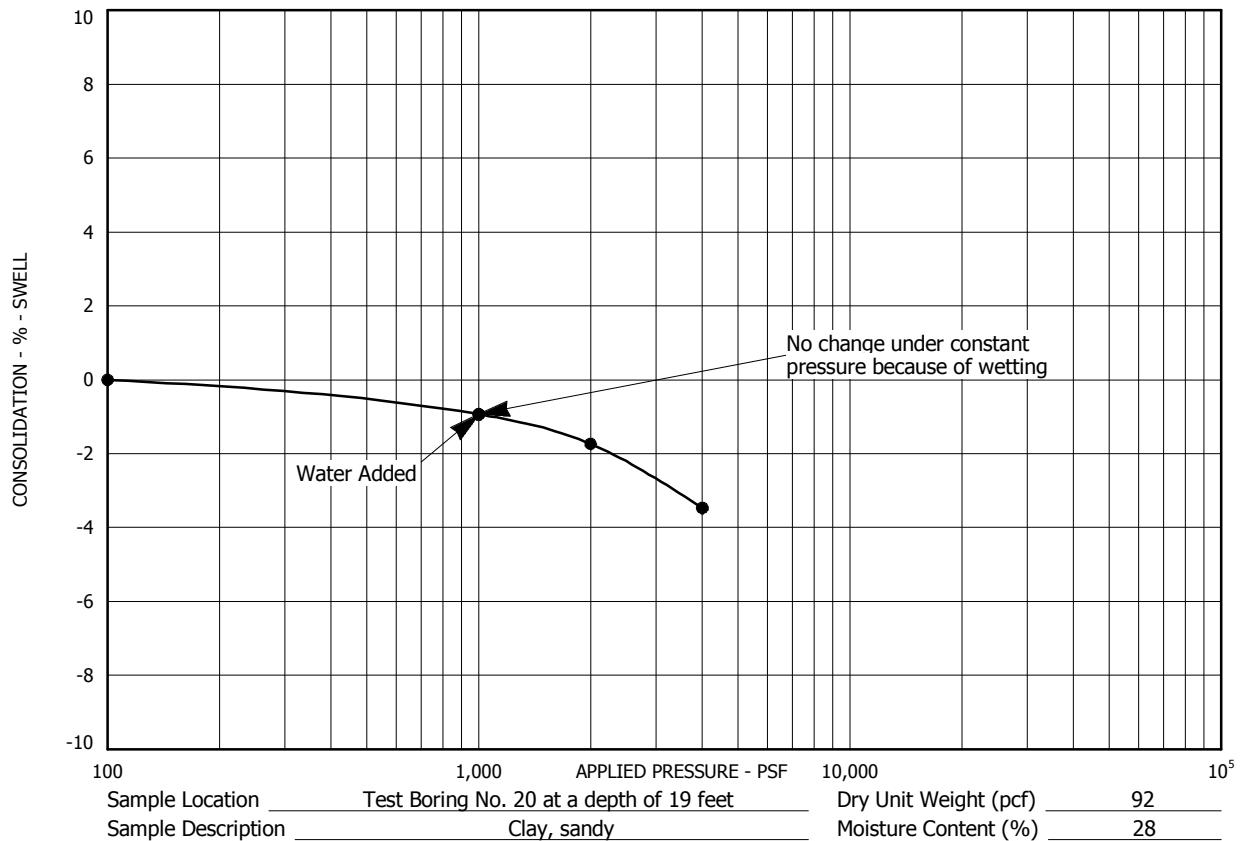
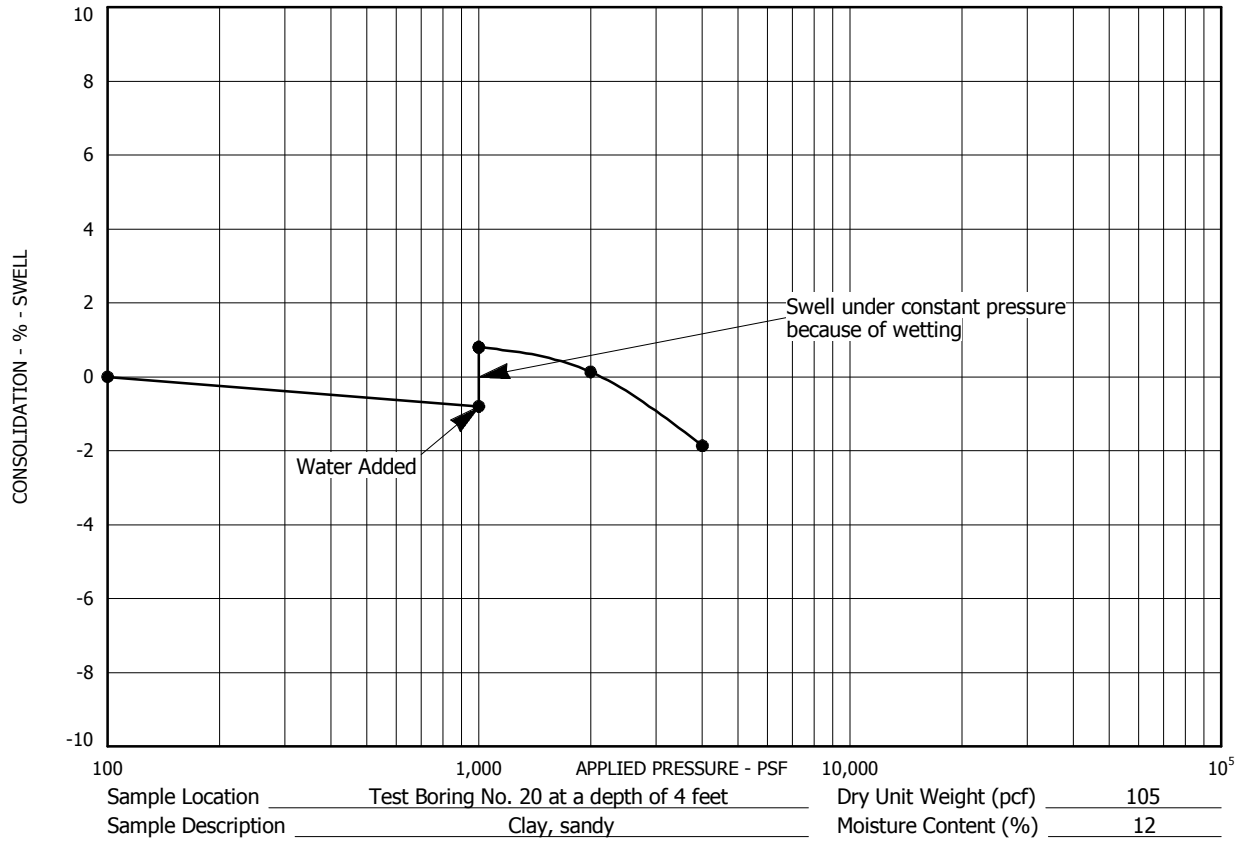
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 26



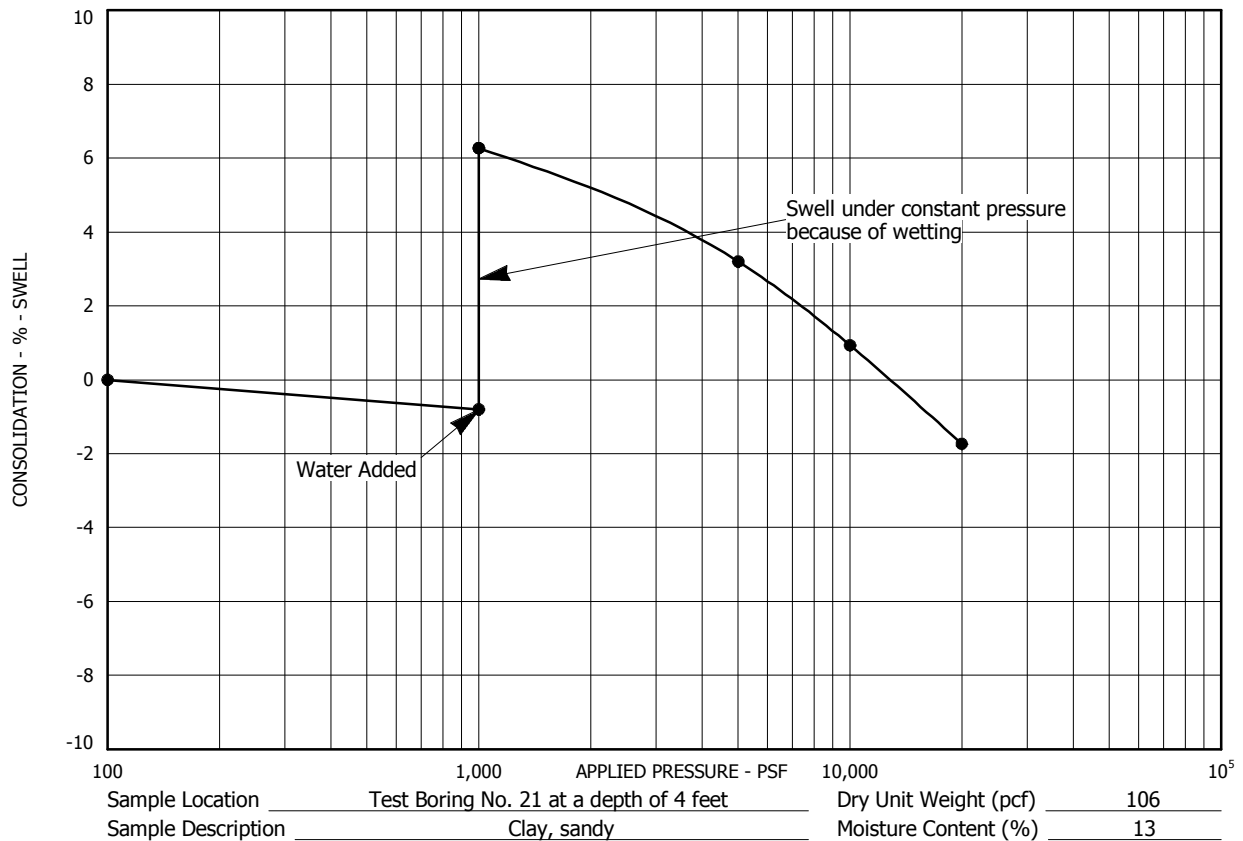
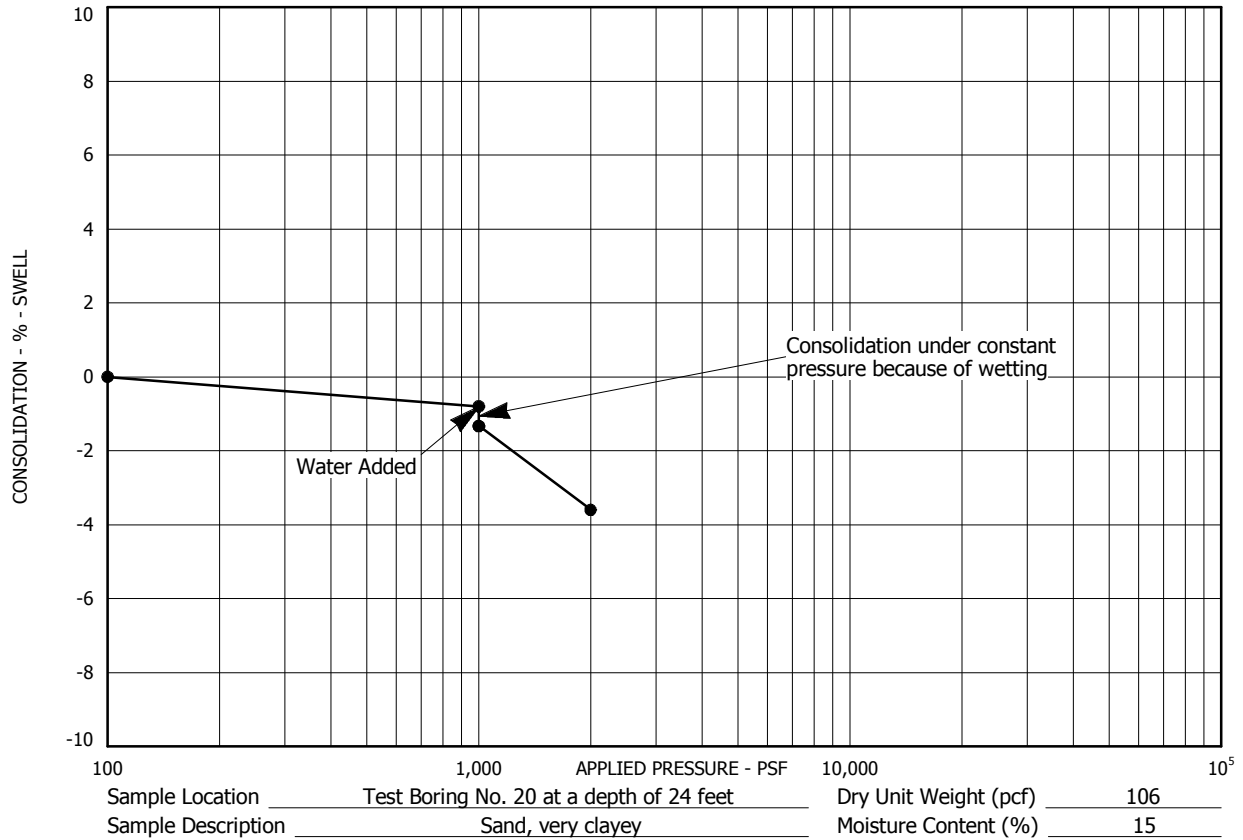
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 27



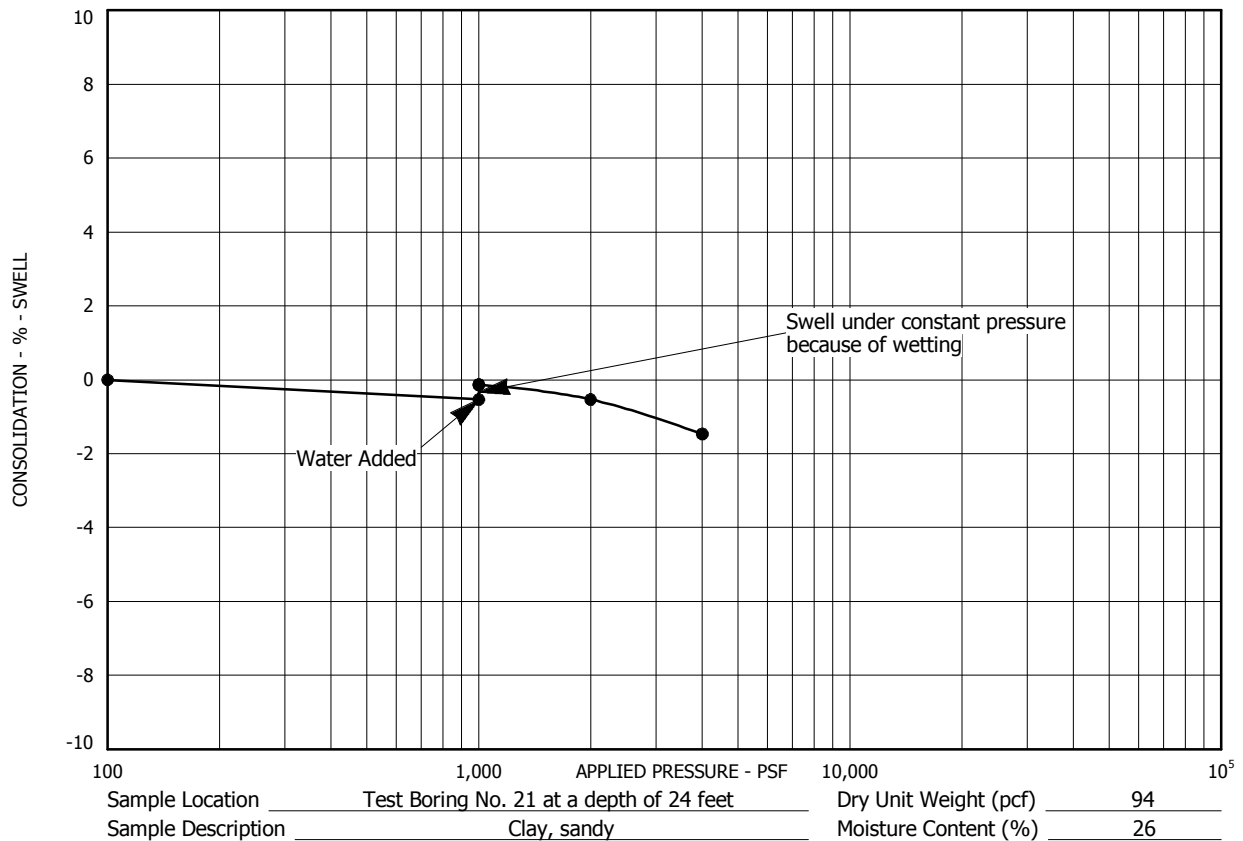
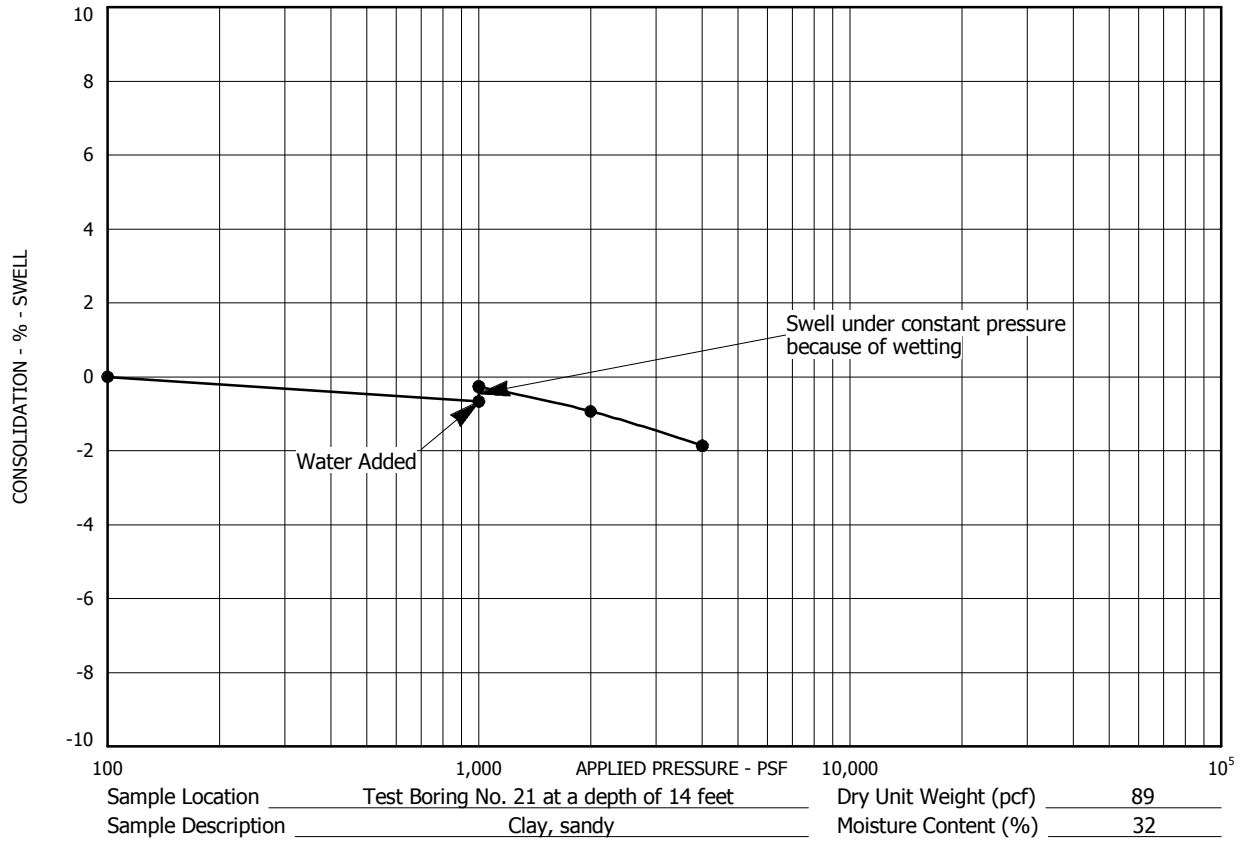
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 28



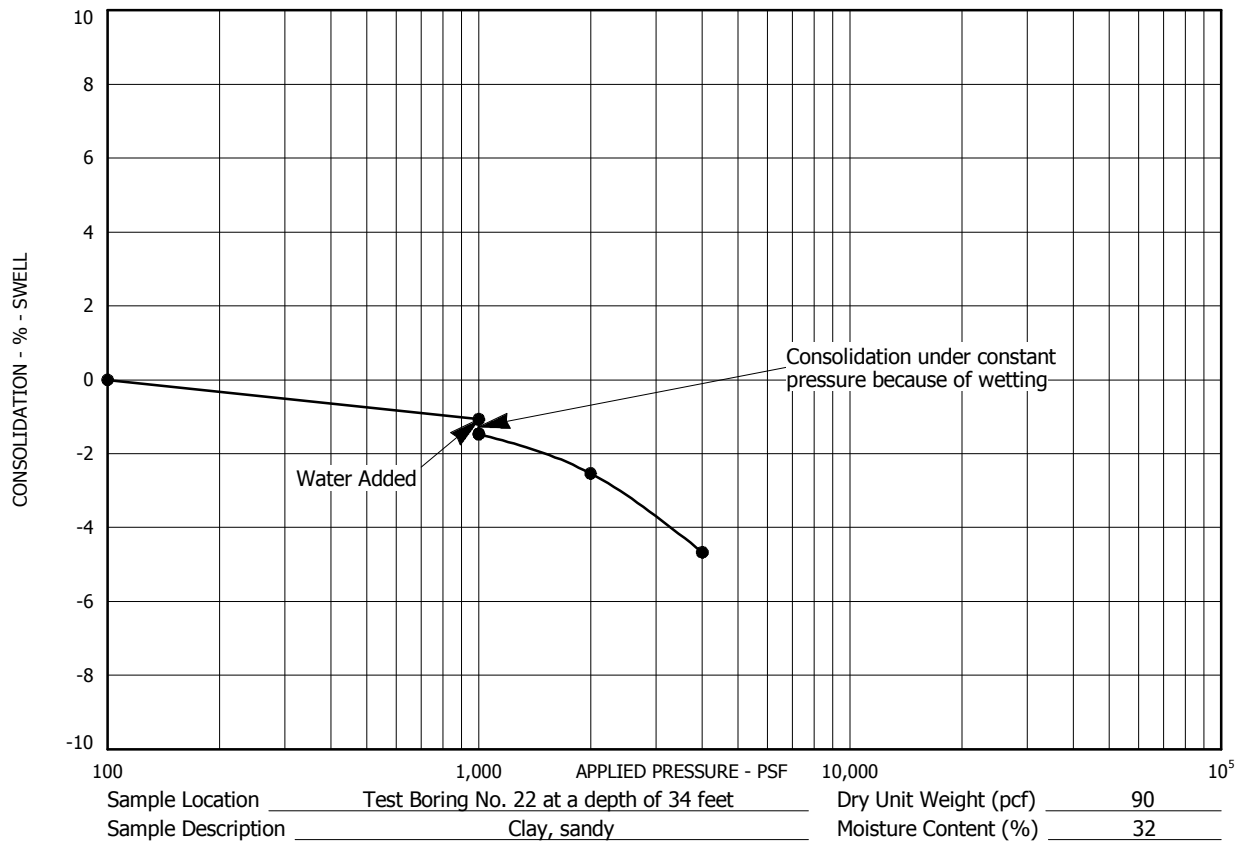
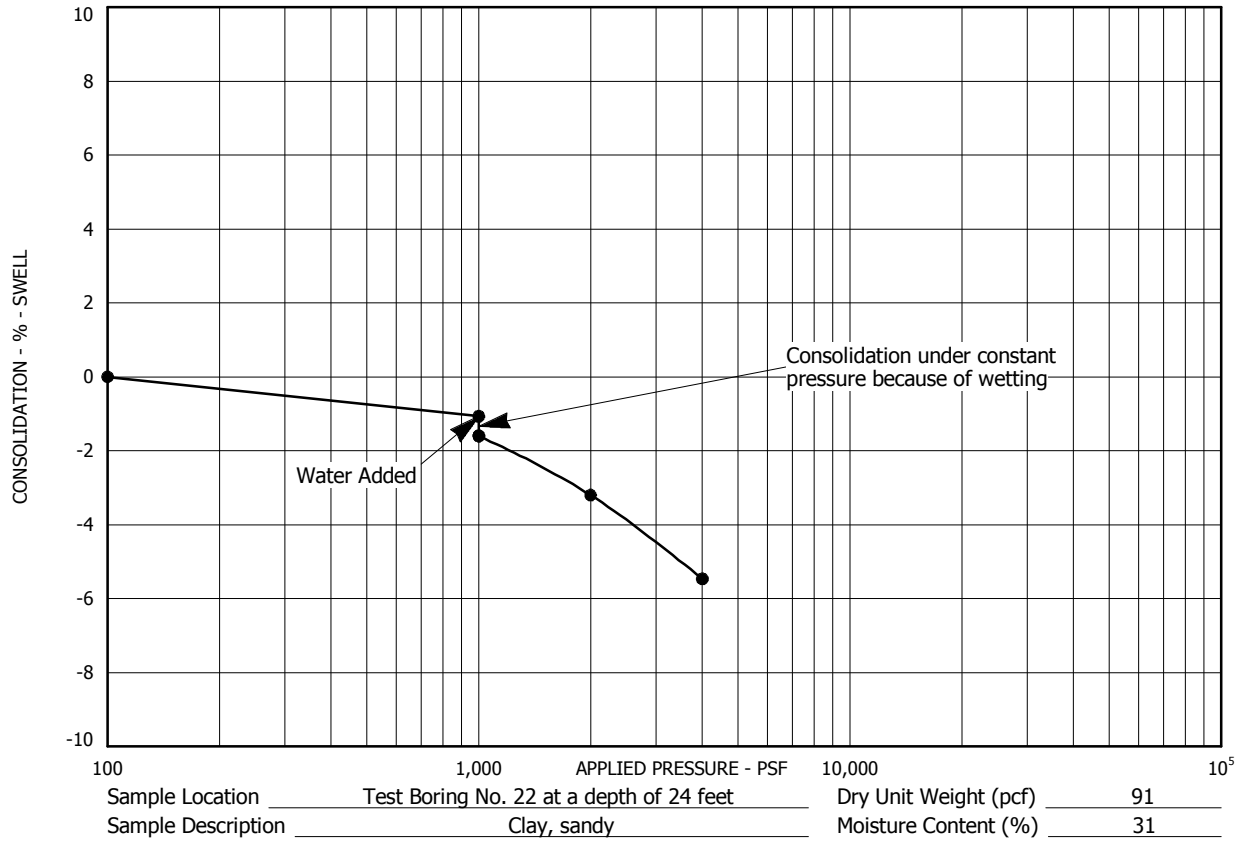
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 29



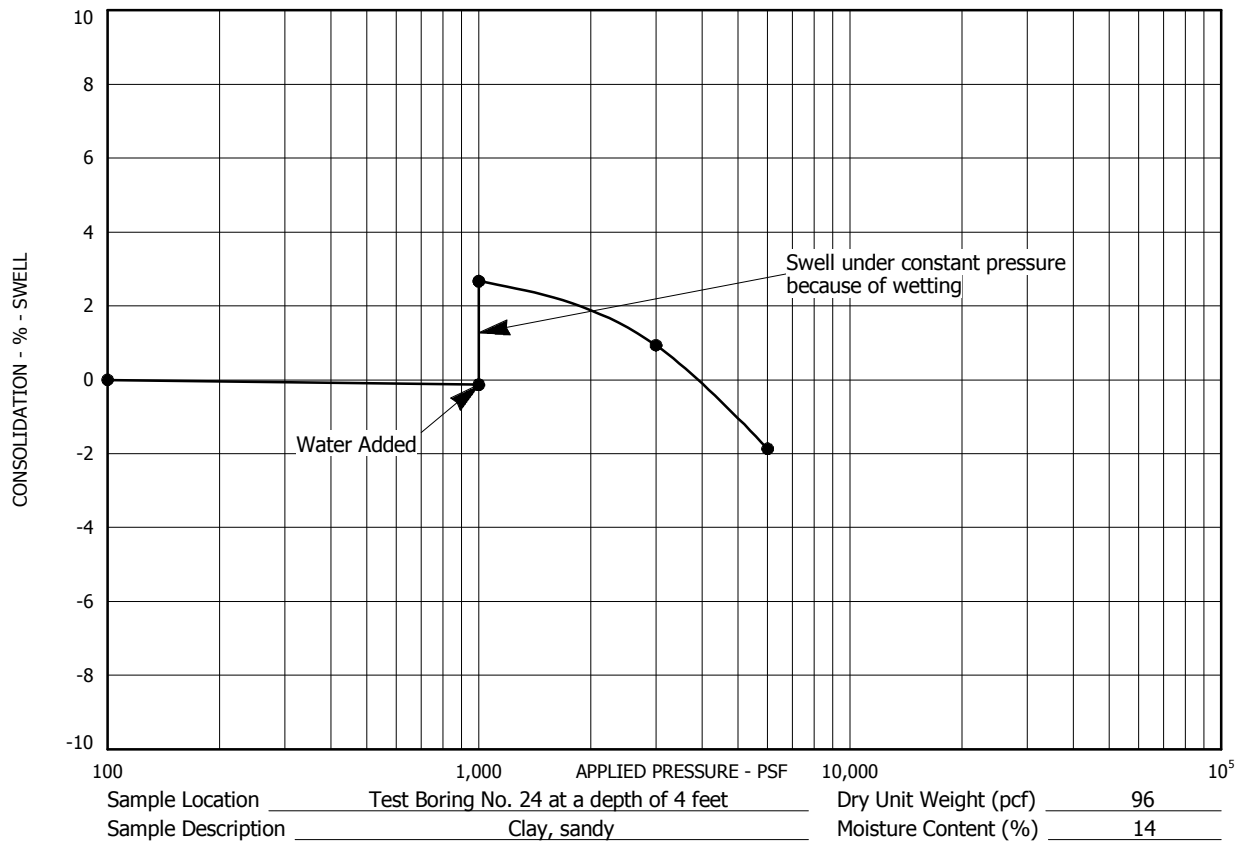
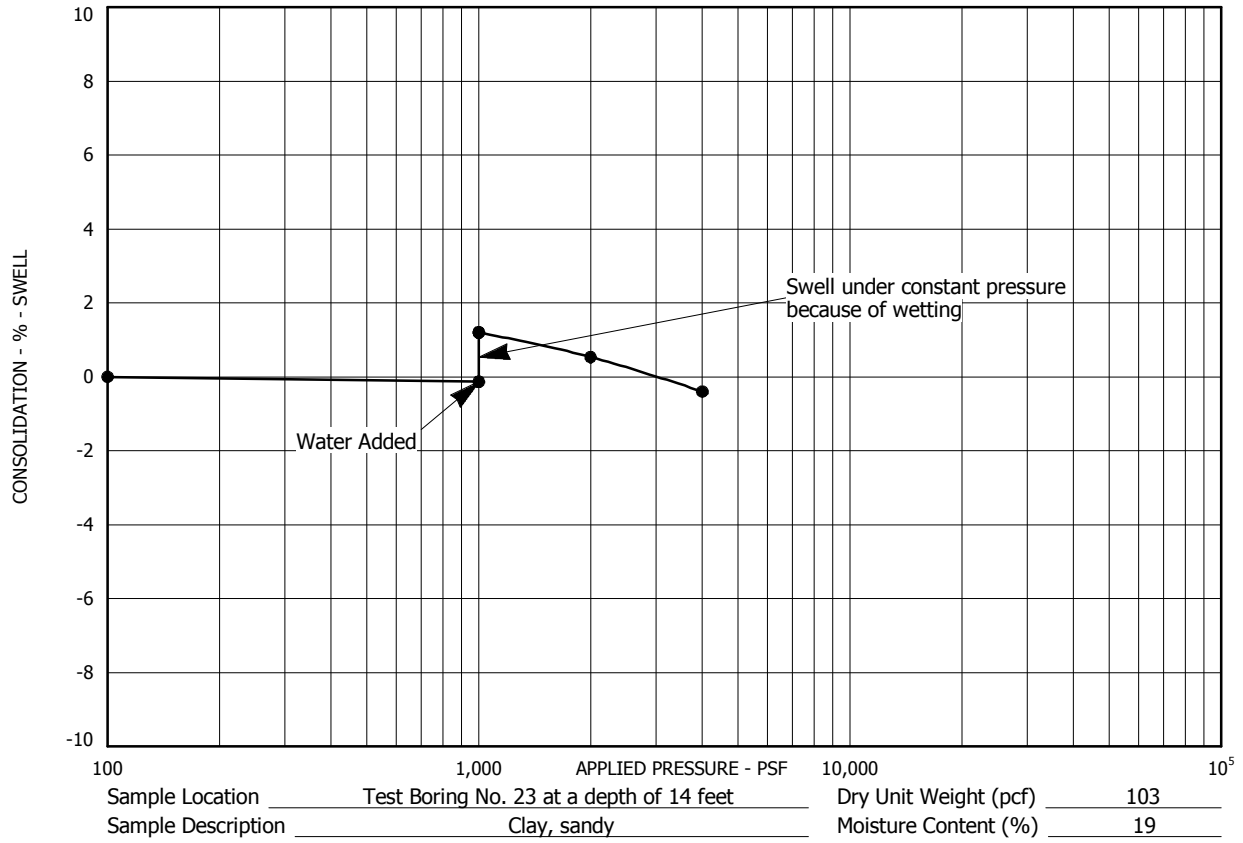
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 30



SWELL - CONSOLIDATION TEST RESULTS

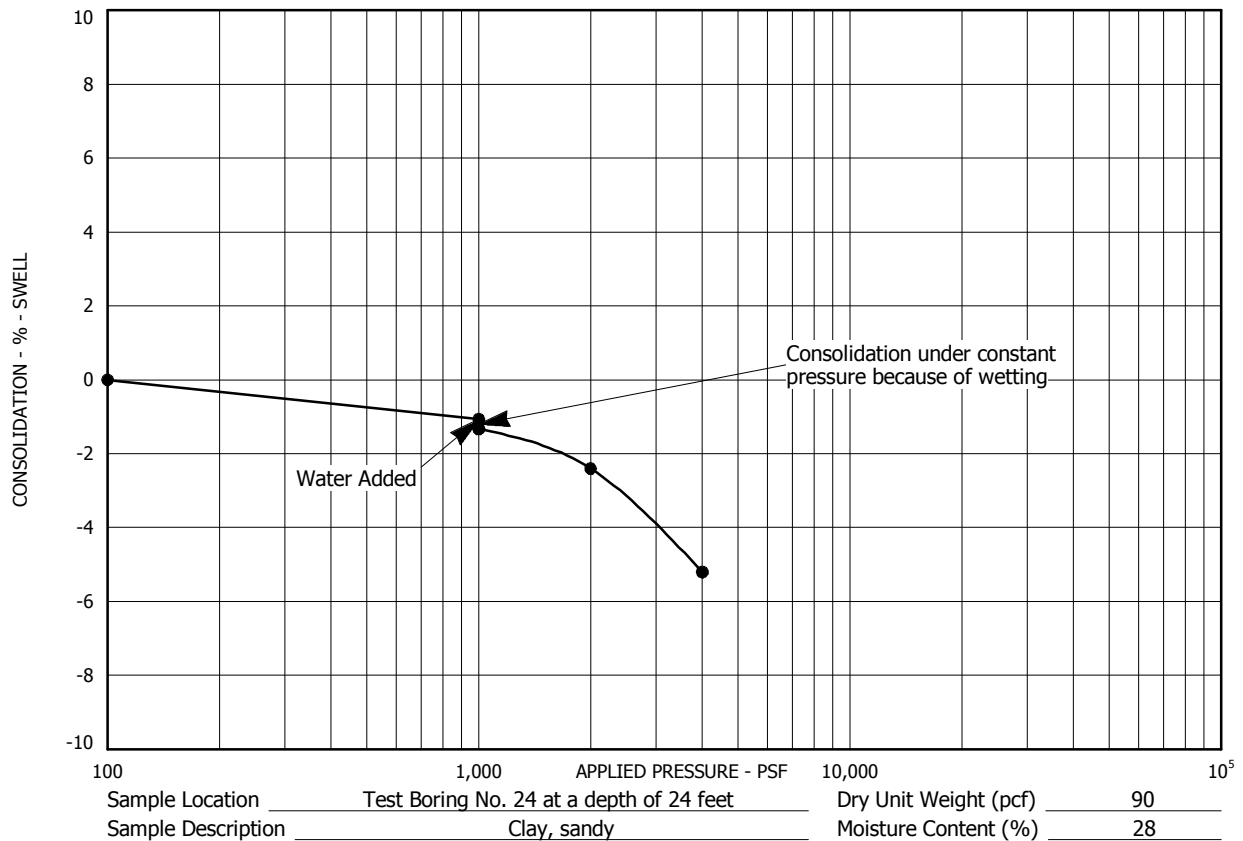
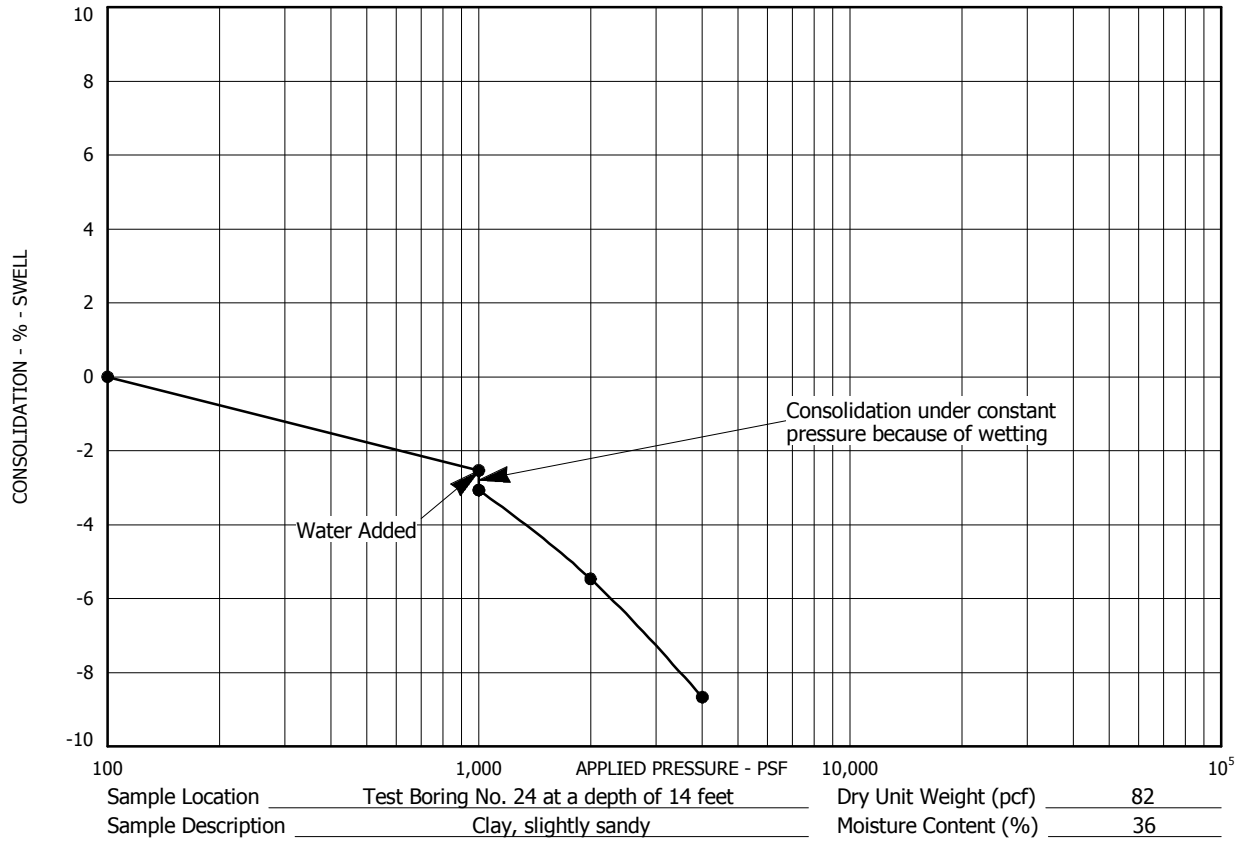
FIGURE 31



SWELL - CONSOLIDATION TEST RESULTS

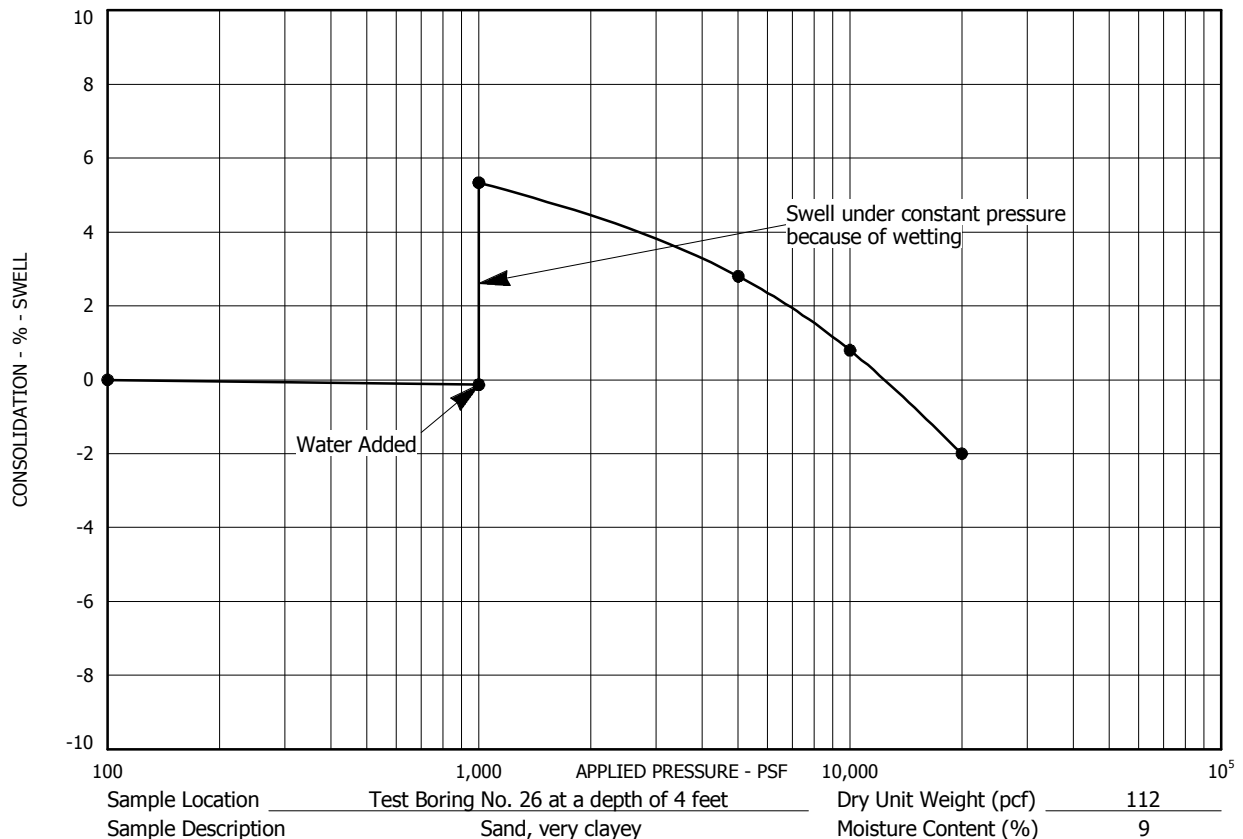
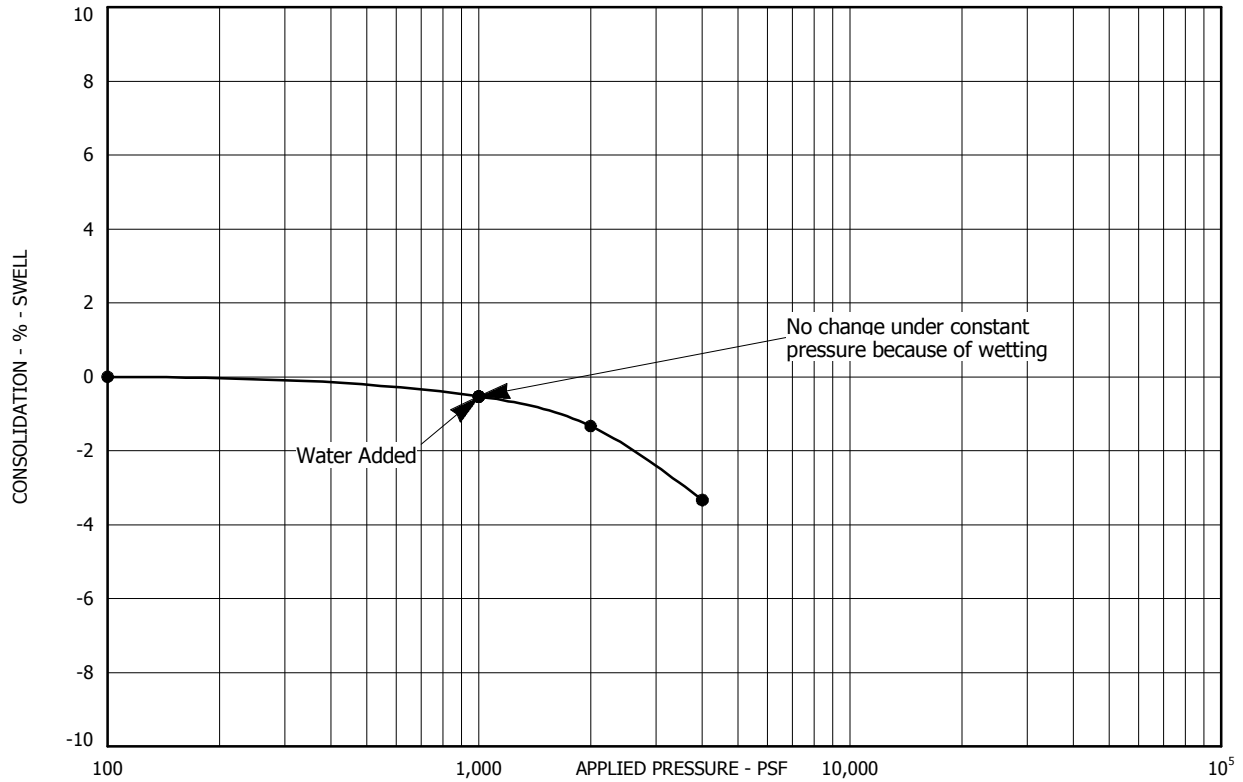
FIGURE 32

PROJECT NO. 165963



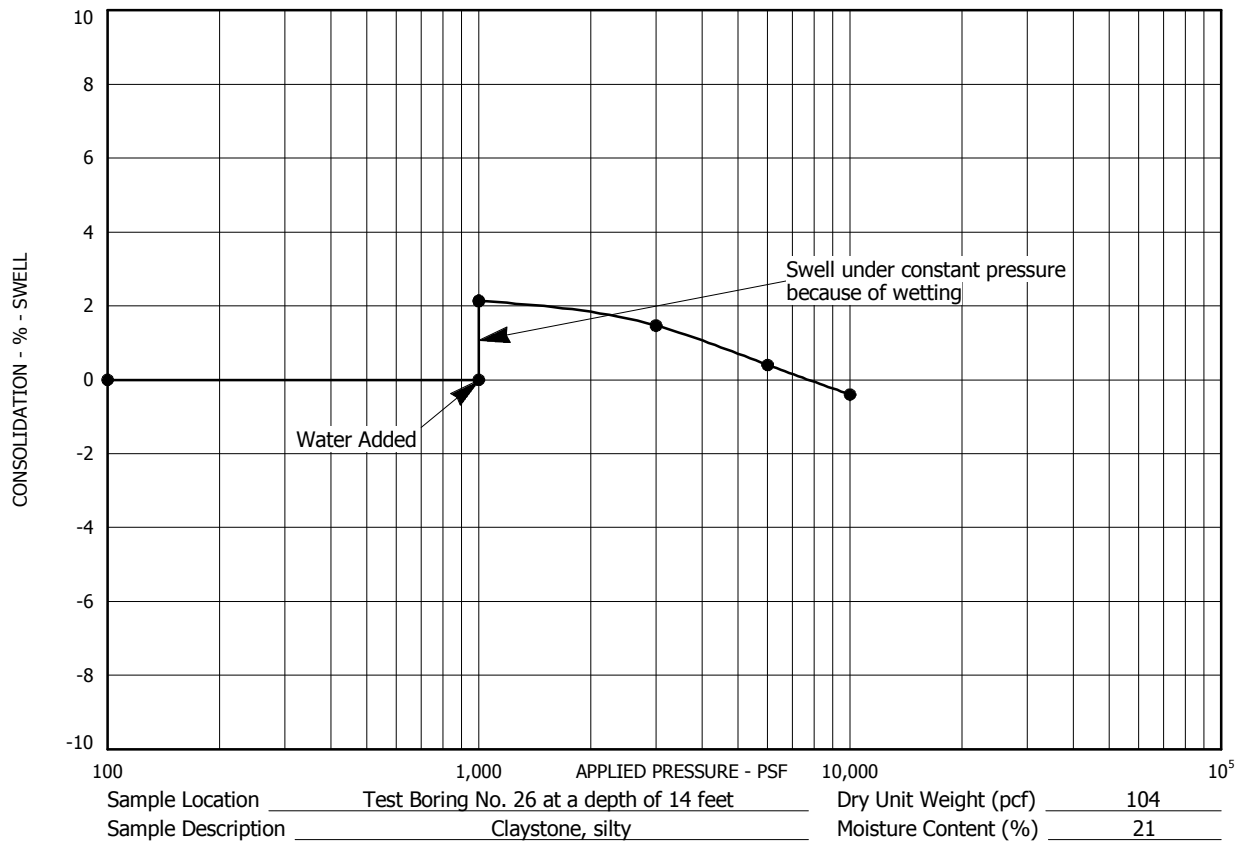
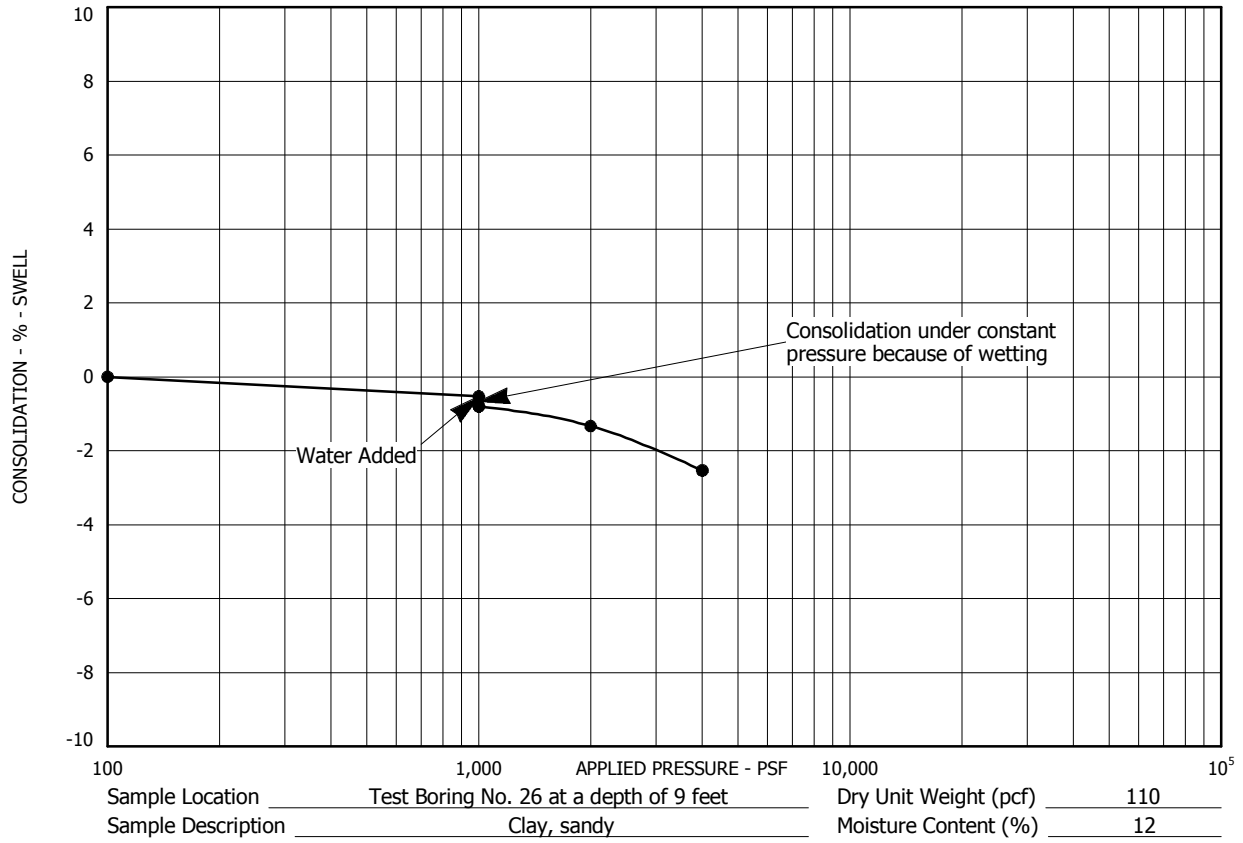
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 33



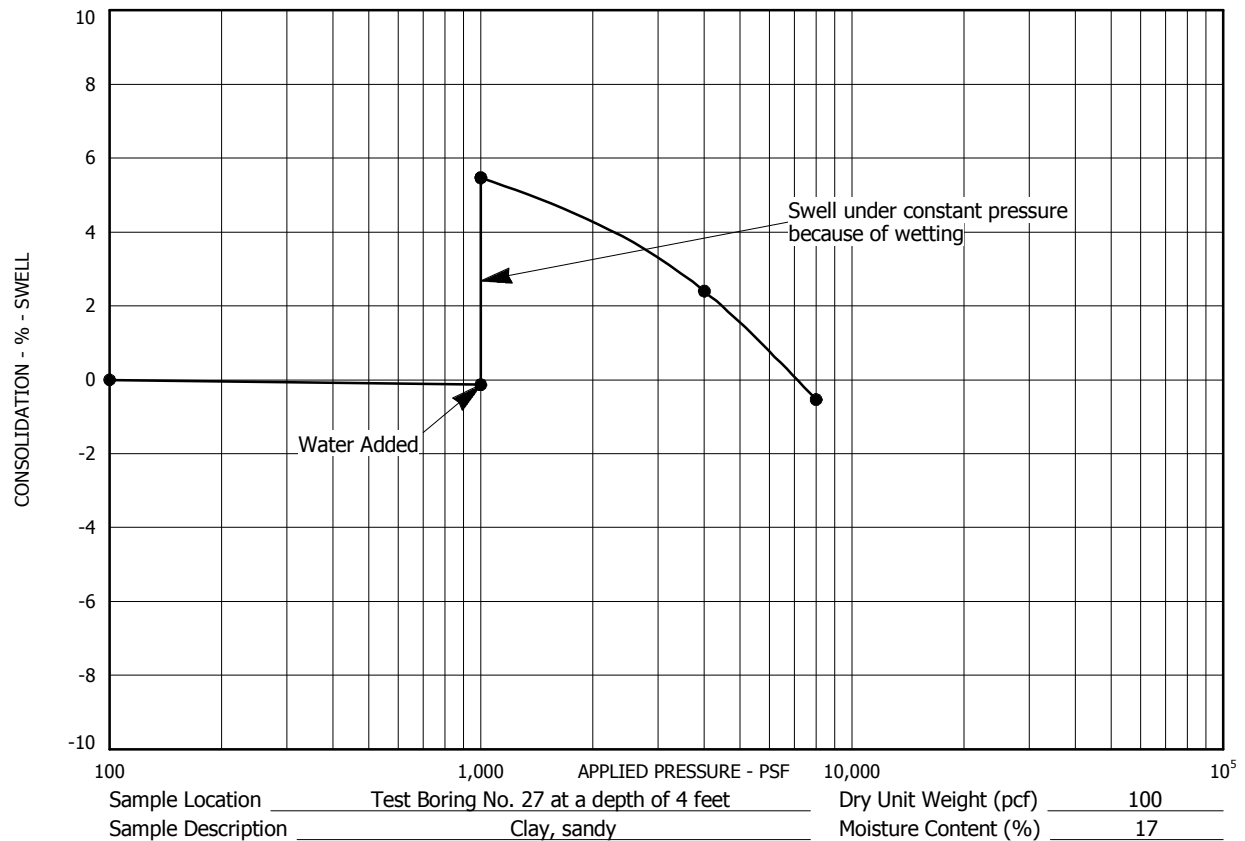
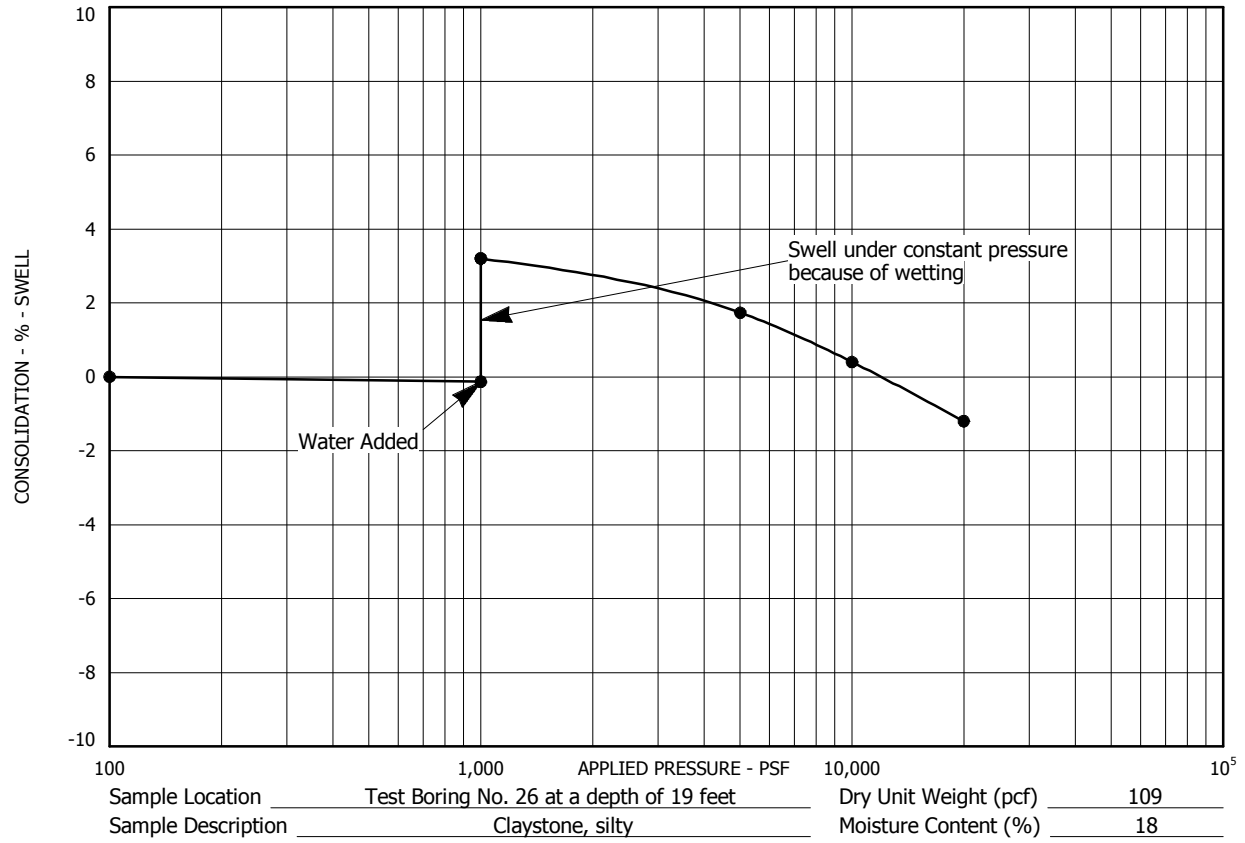
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 34



SWELL - CONSOLIDATION TEST RESULTS

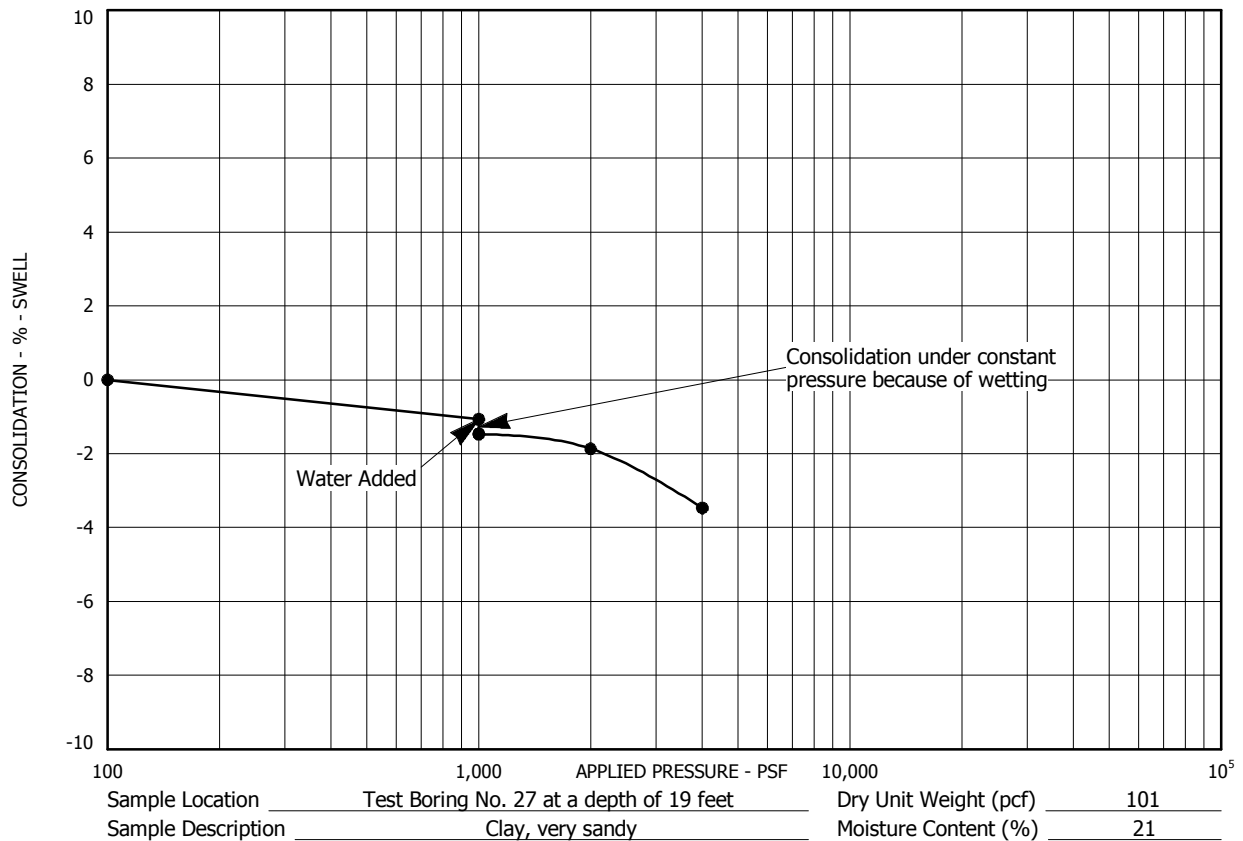
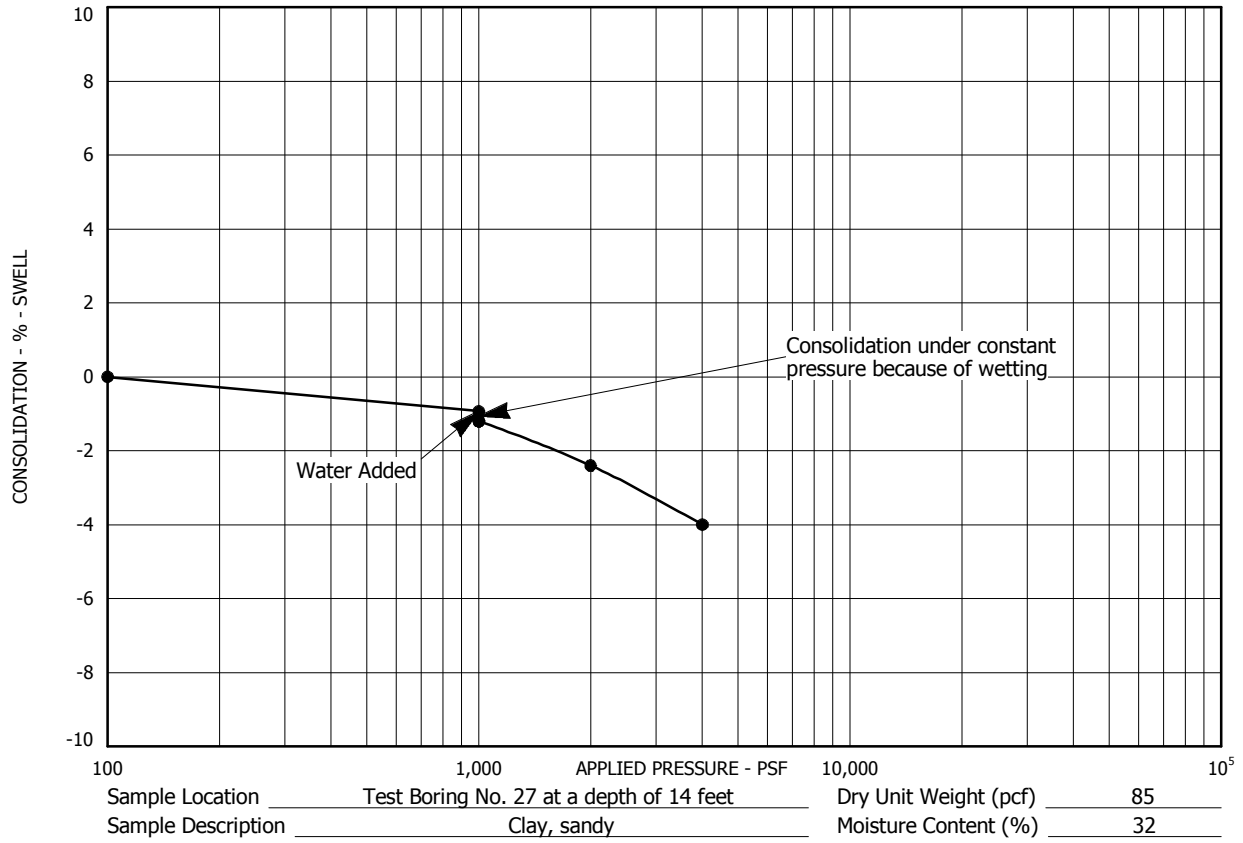
FIGURE 35



SWELL - CONSOLIDATION TEST RESULTS

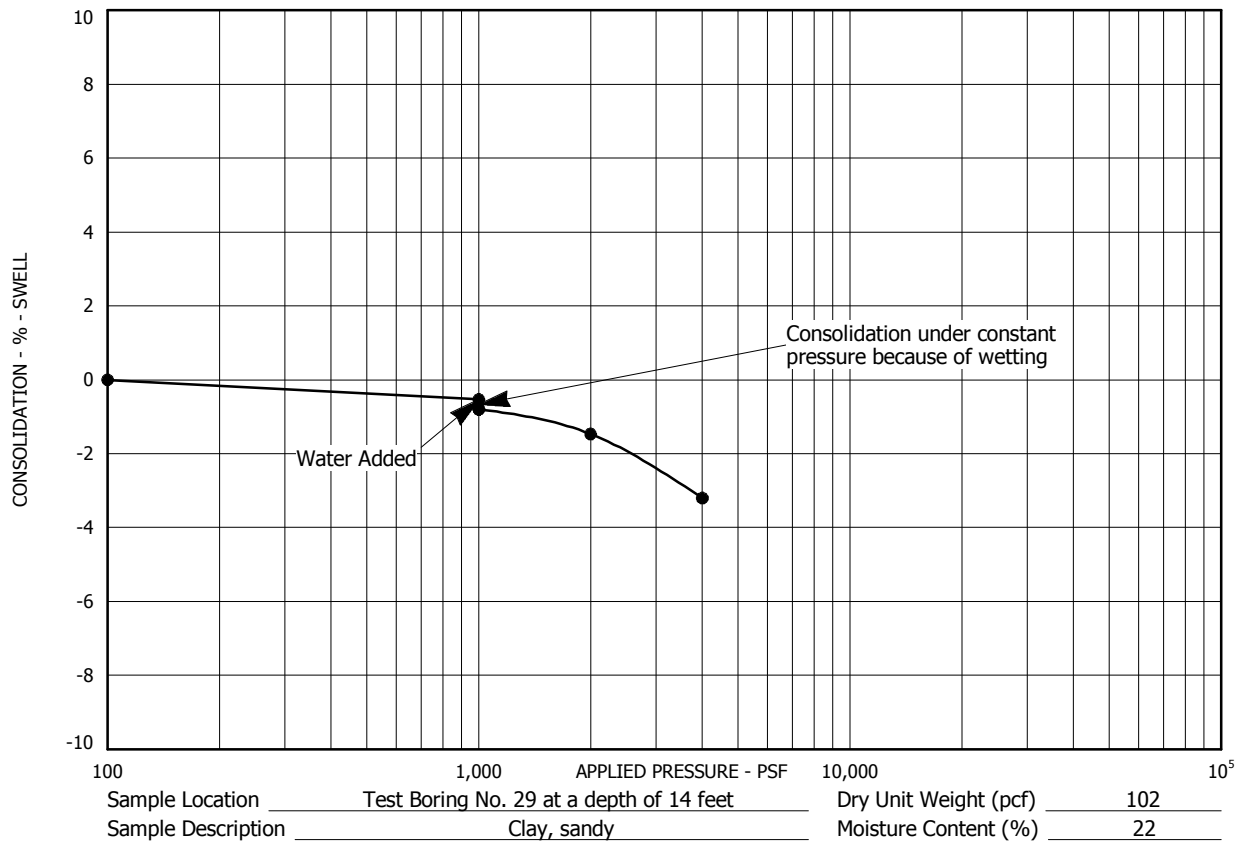
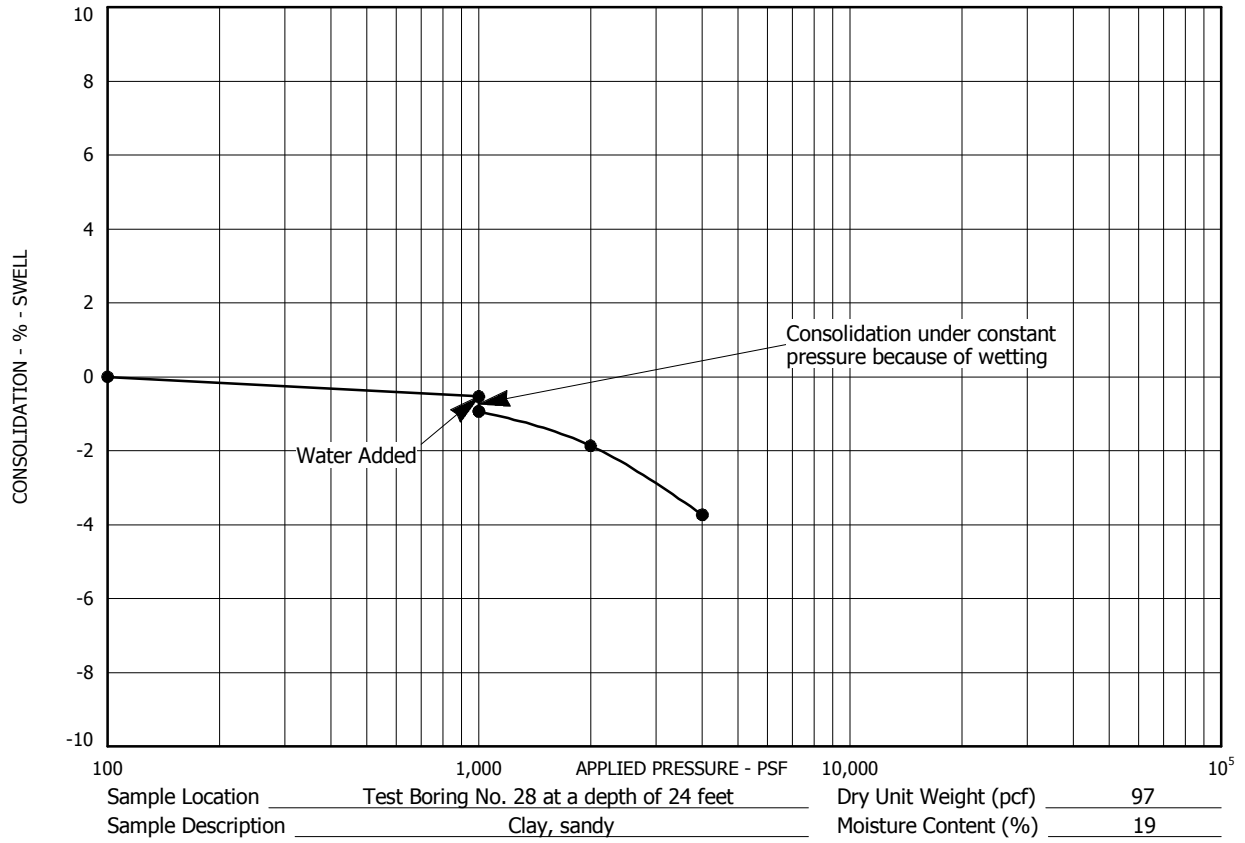
FIGURE 36

PROJECT NO. 165963



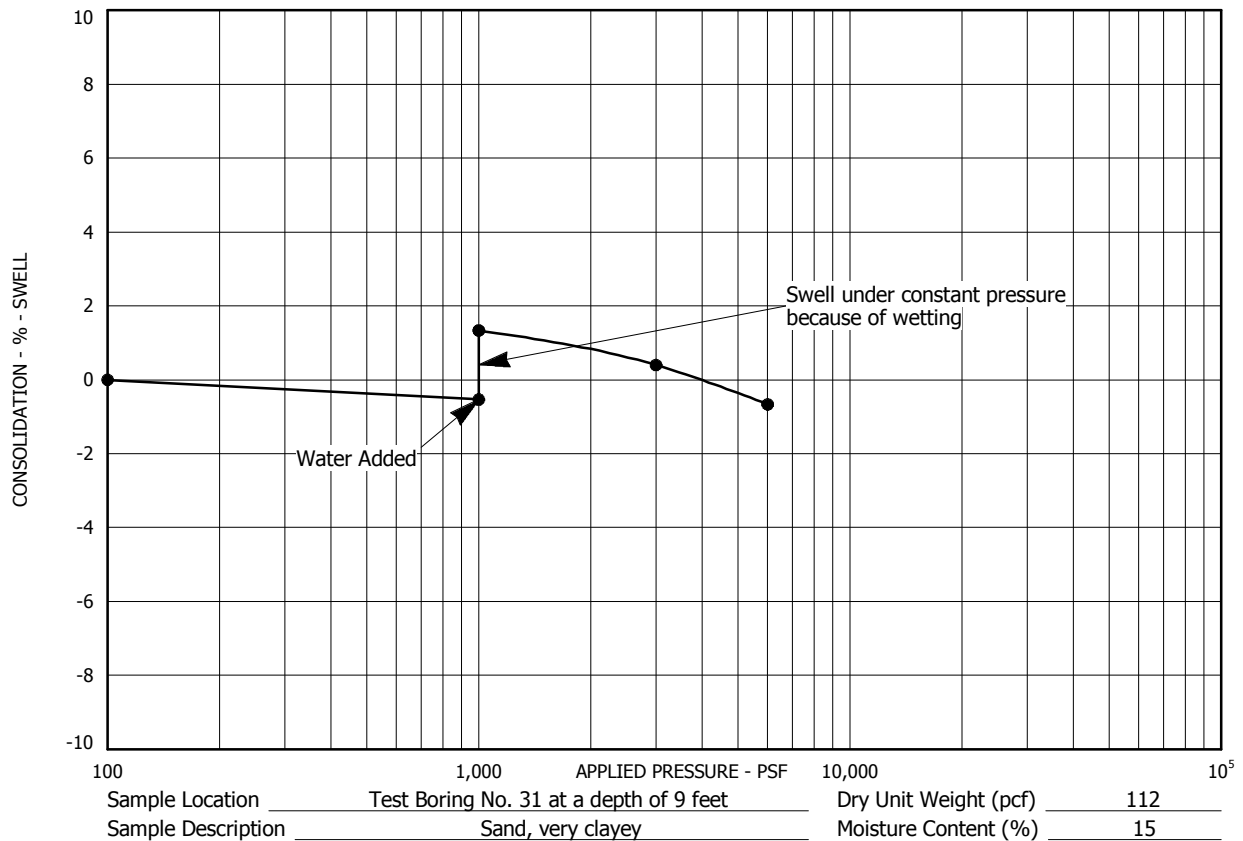
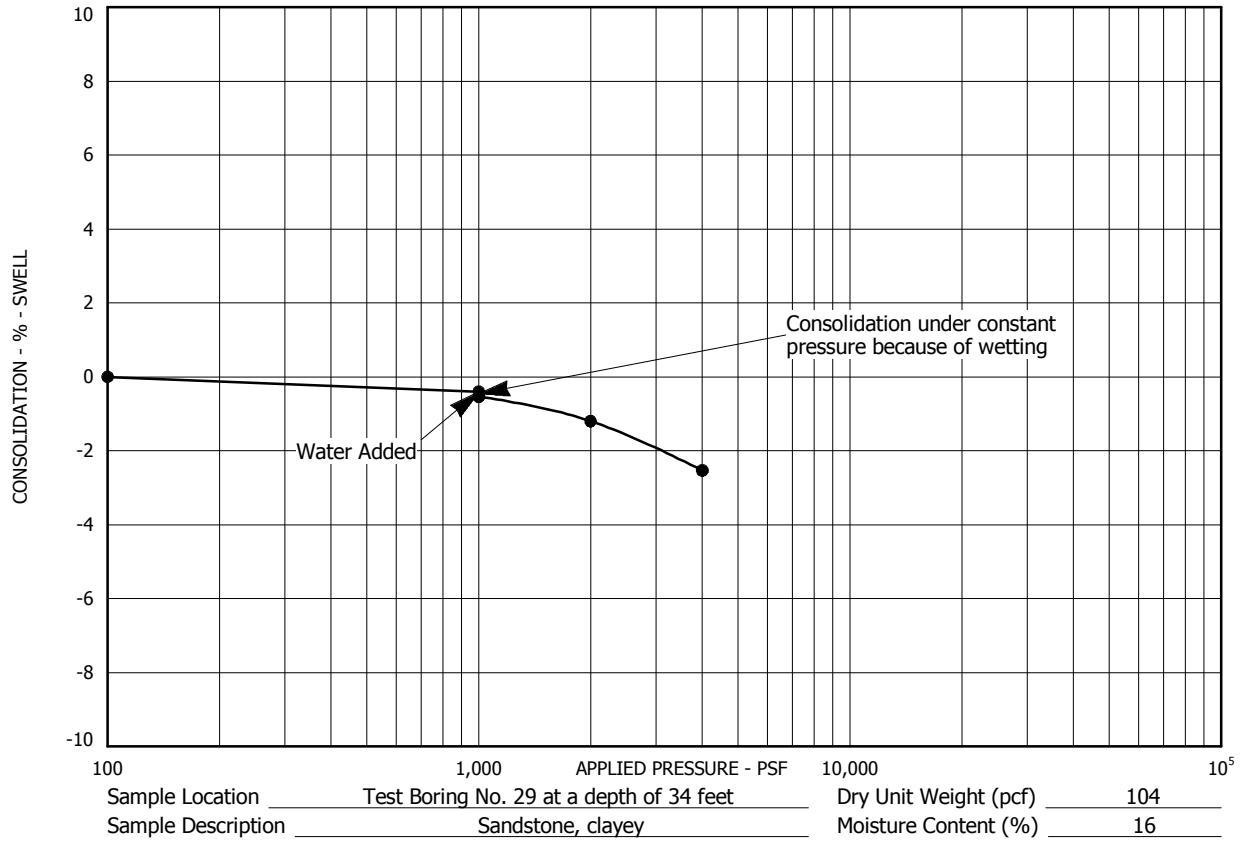
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 37



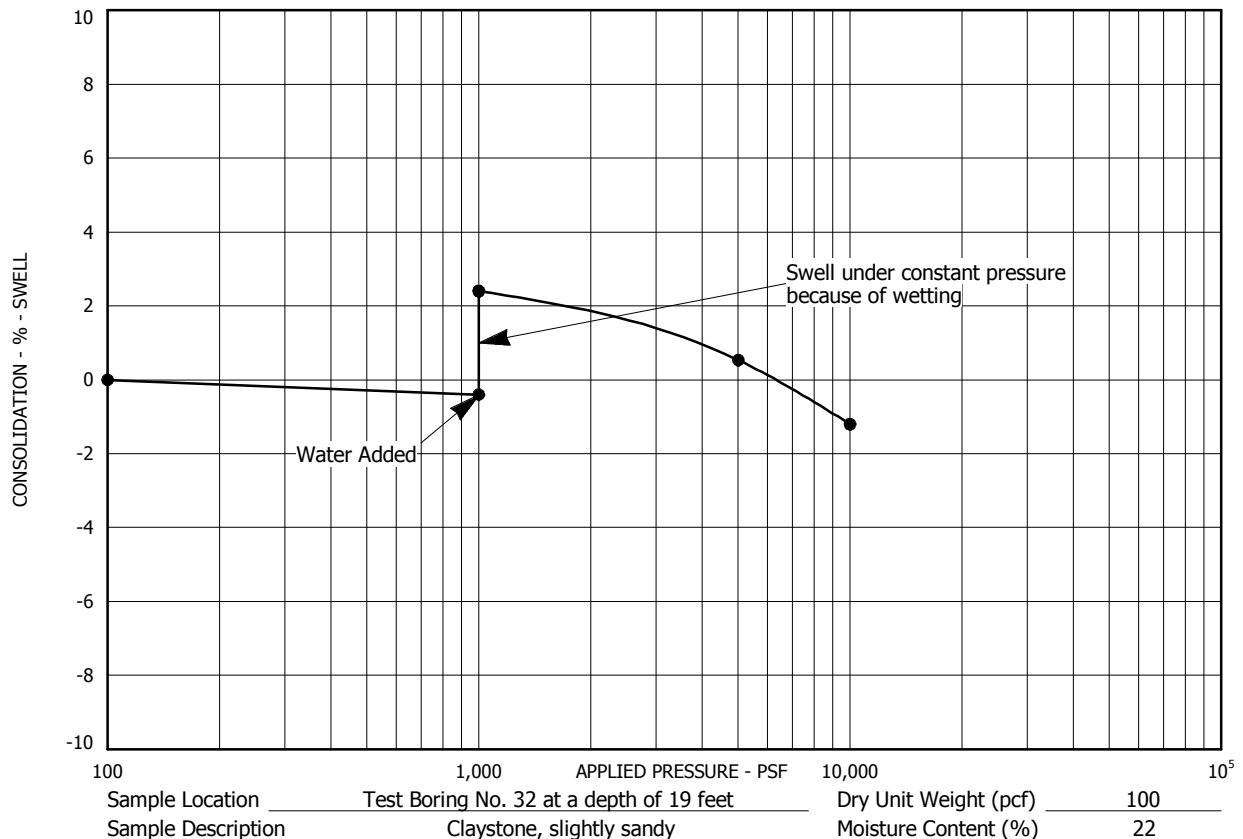
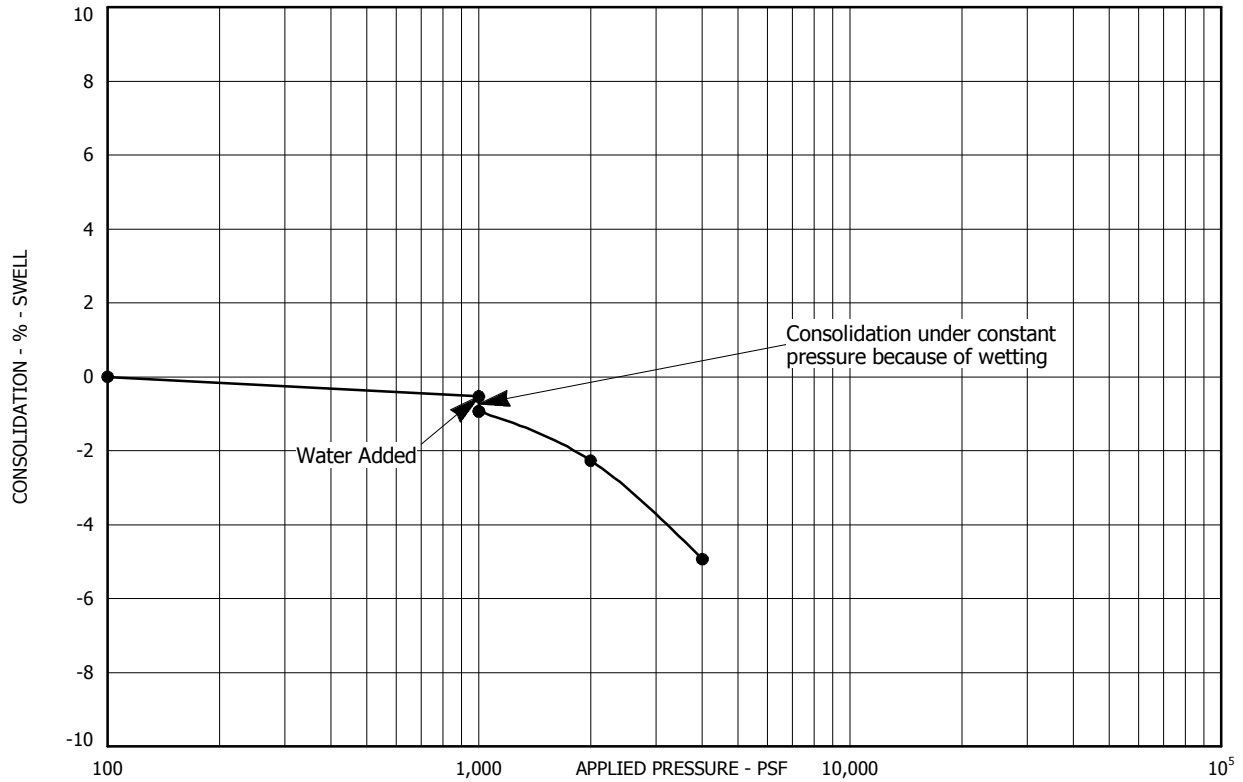
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 38



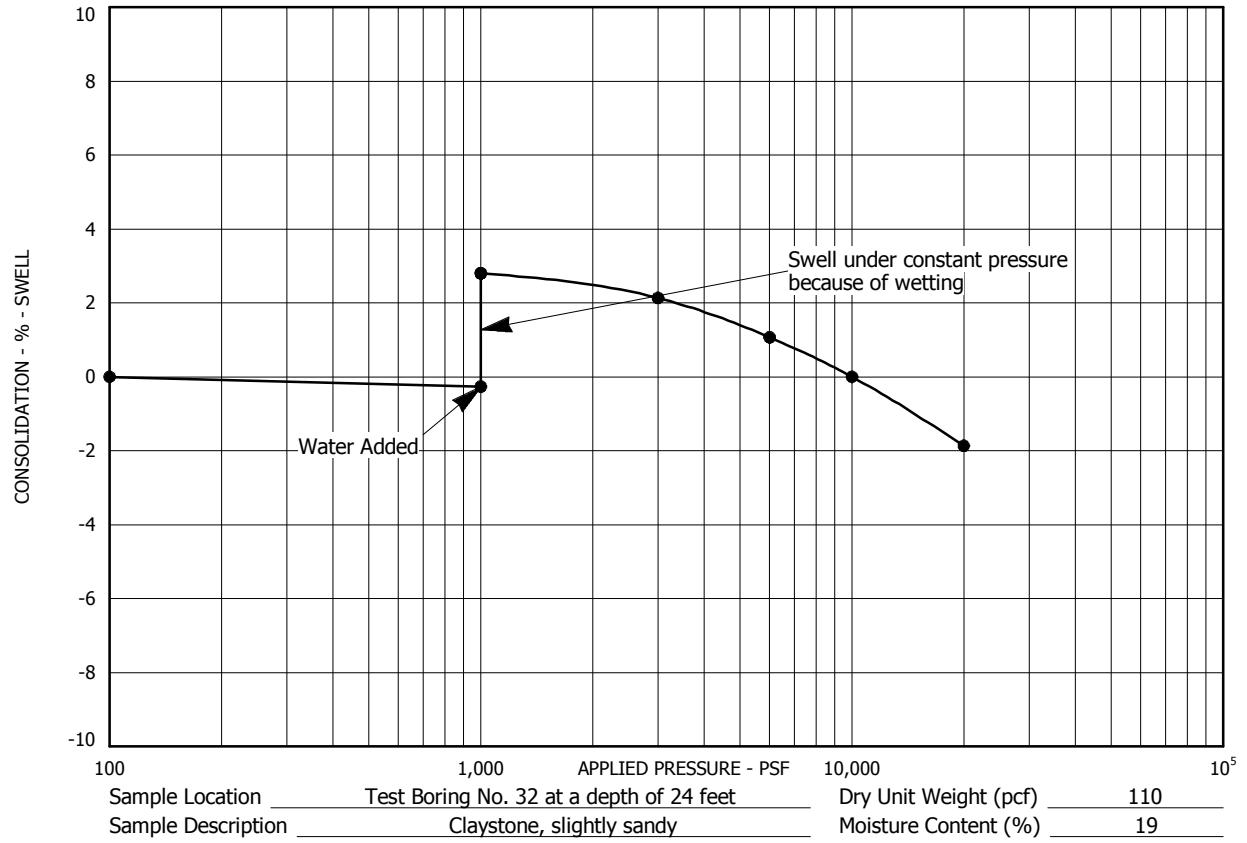
SWELL - CONSOLIDATION TEST RESULTS

FIGURE 39

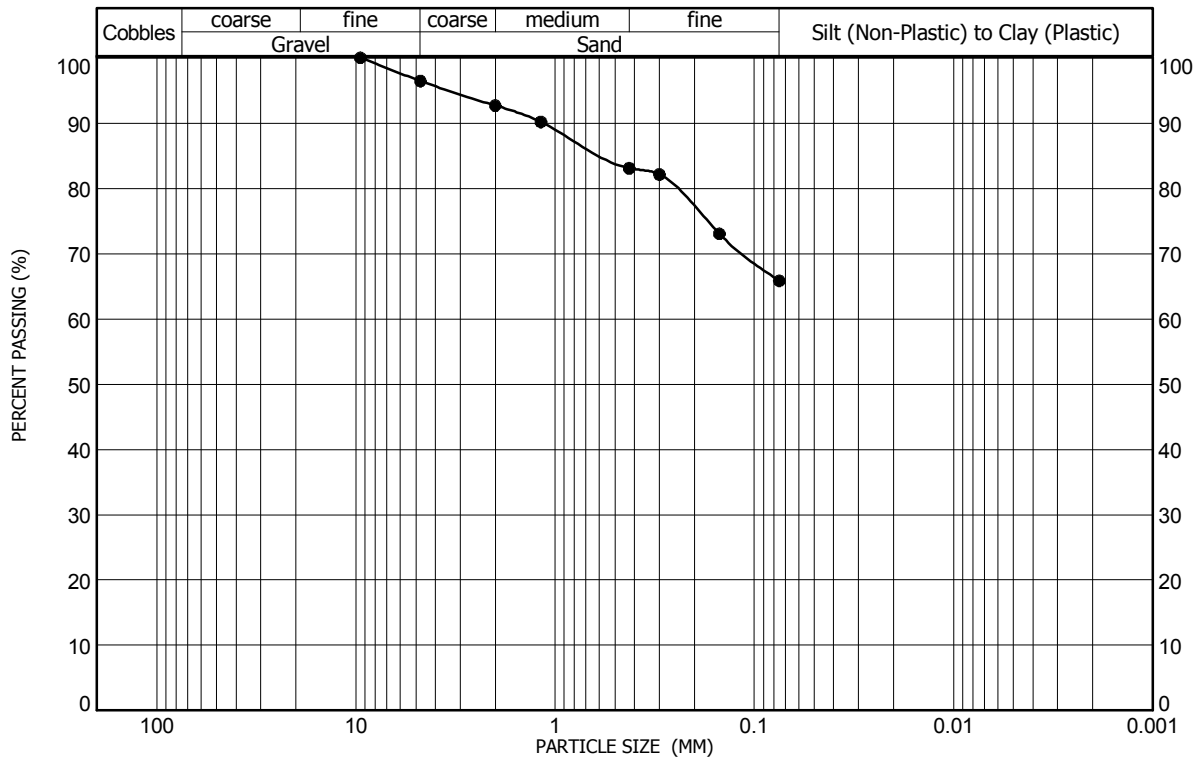


SWELL - CONSOLIDATION TEST RESULTS

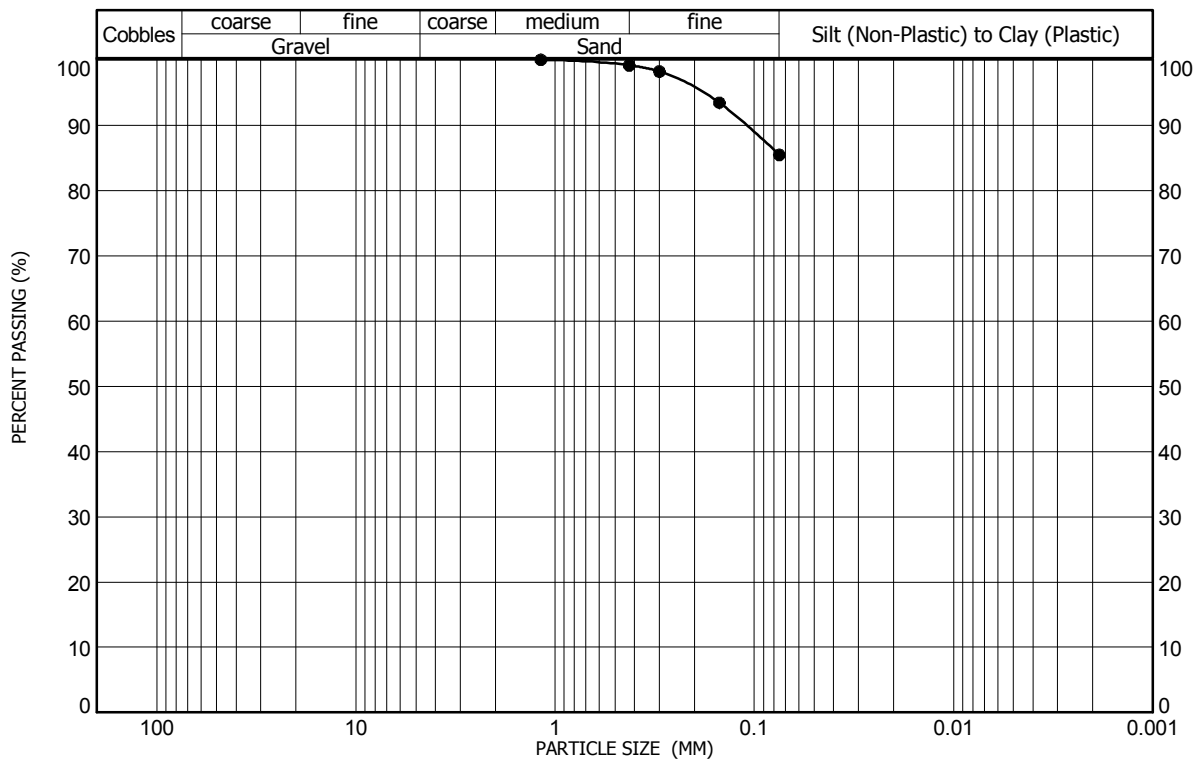
FIGURE 40



SWELL - CONSOLIDATION TEST RESULTS
FIGURE 41



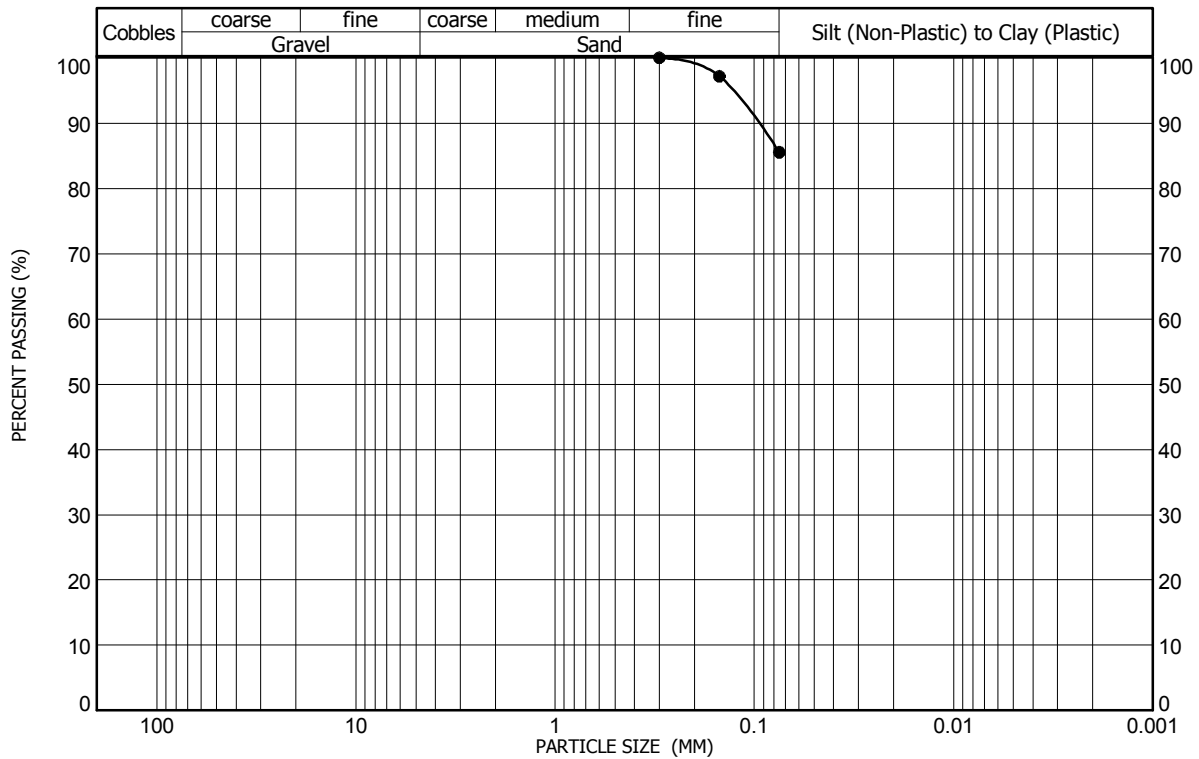
Sample Location _____ Test Boring No. 1 at a depth of 4 feet Gravel (%) 4 Liquid Limit 58
 Sample Description _____ Clay, very sandy, trace gravel Sand (%) 31 Plasticity Index 38
 Classification _____ A-7-6(23), SANDY FAT CLAY(CH) Clay/Silt (%) 66



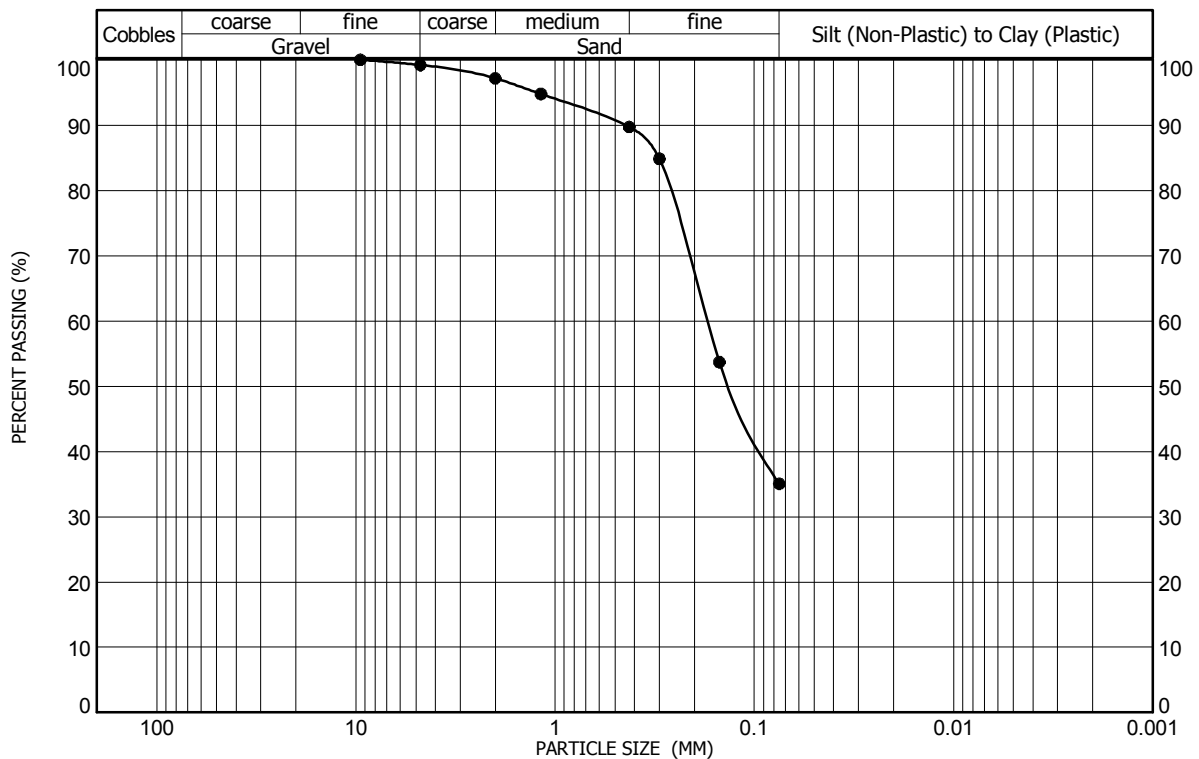
Sample Location _____ Test Boring No. 1 at a depth of 24 feet Gravel (%) 0 Liquid Limit 46
 Sample Description _____ Clay, sandy Sand (%) 15 Plasticity Index 26
 Classification _____ A-7-6(23), LEAN CLAY(CL) Clay/Silt (%) 85

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 42



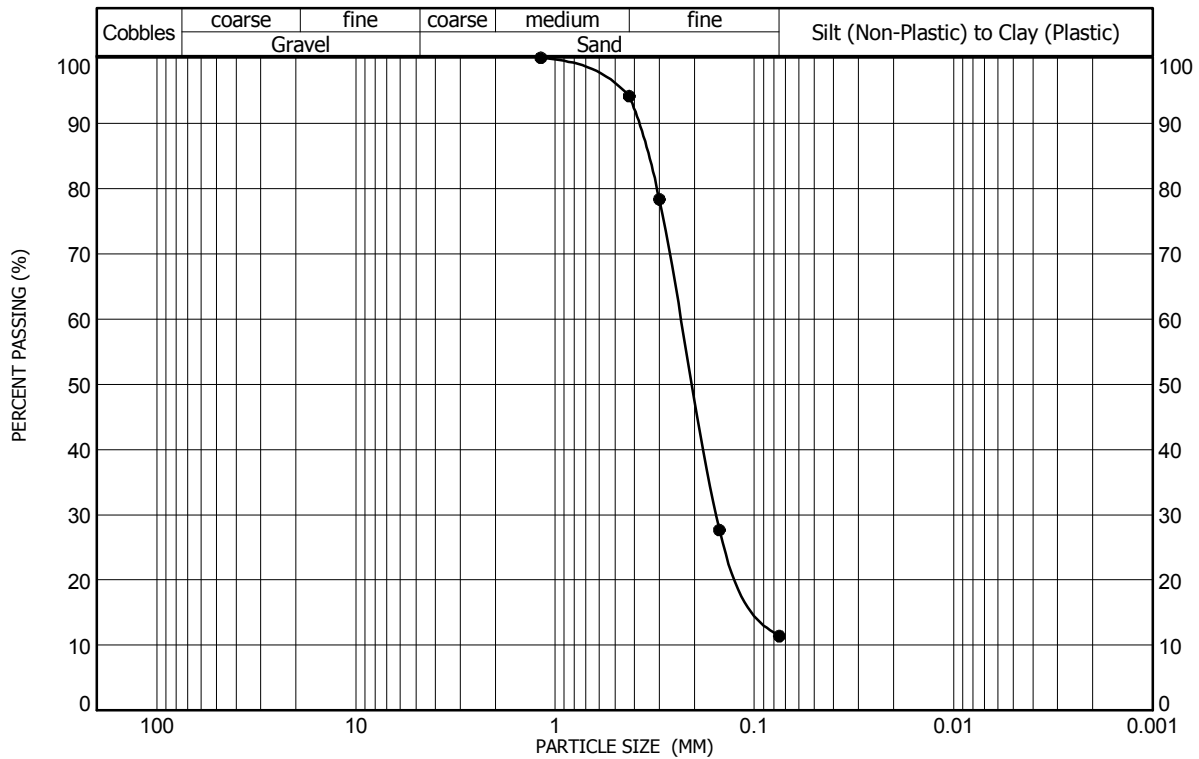
Sample Location _____ Test Boring No. 2 at a depth of 9 feet Gravel (%) 0 Liquid Limit 43
Sample Description _____ Clay, slightly sandy Sand (%) 14 Plasticity Index 22
Classification _____ A-7-6(19), LEAN CLAY(CL) Clay/Silt (%) 86

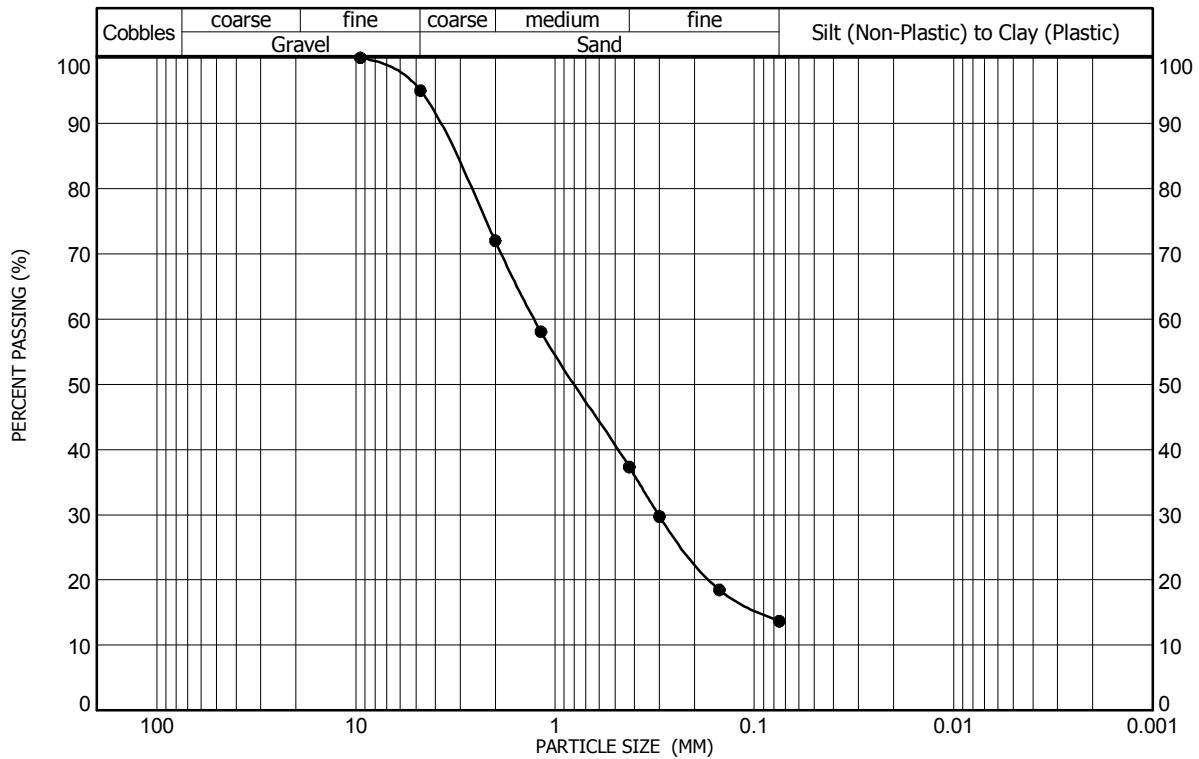


Sample Location _____ Test Boring No. 3 at a depth of 24 feet Gravel (%) 1 Liquid Limit NV
Sample Description _____ Sand, very silty, trace gravel Sand (%) 64 Plasticity Index NP
Classification _____ A-2-4(0), SILTY SAND(SM) Clay/Silt (%) 35

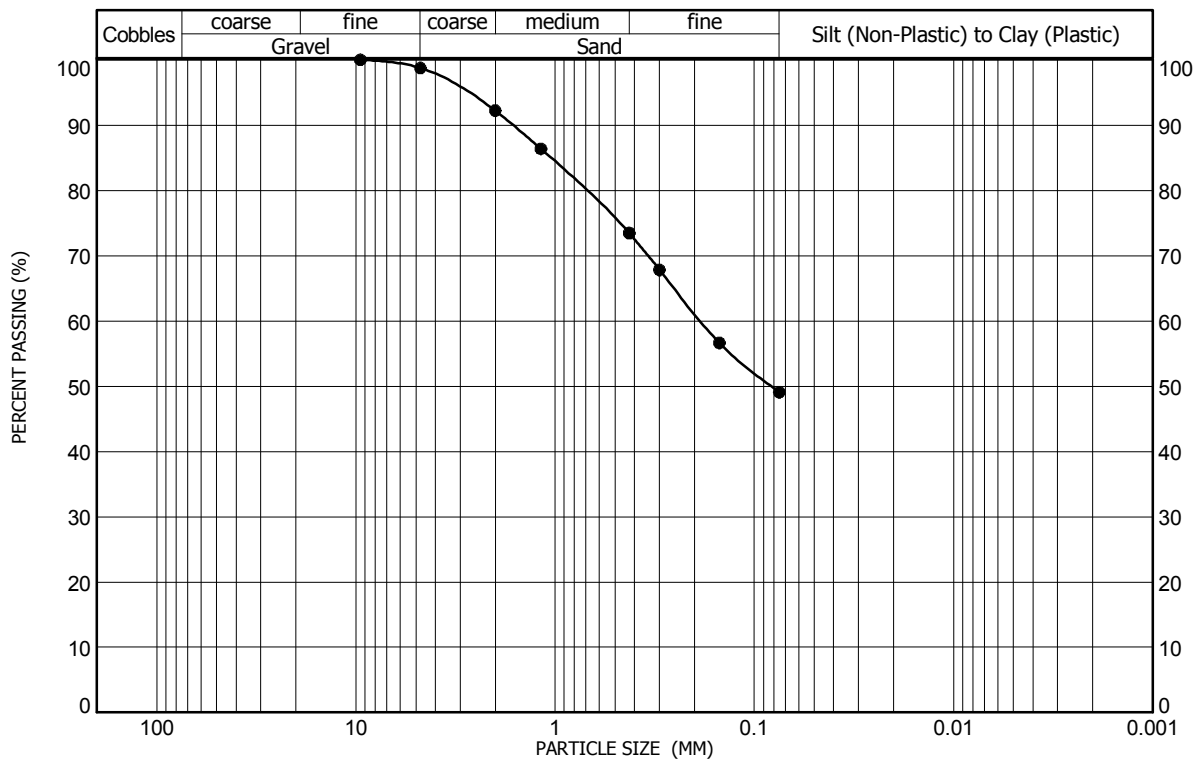
GRADATION AND ATTERBERG TEST RESULTS

FIGURE 43





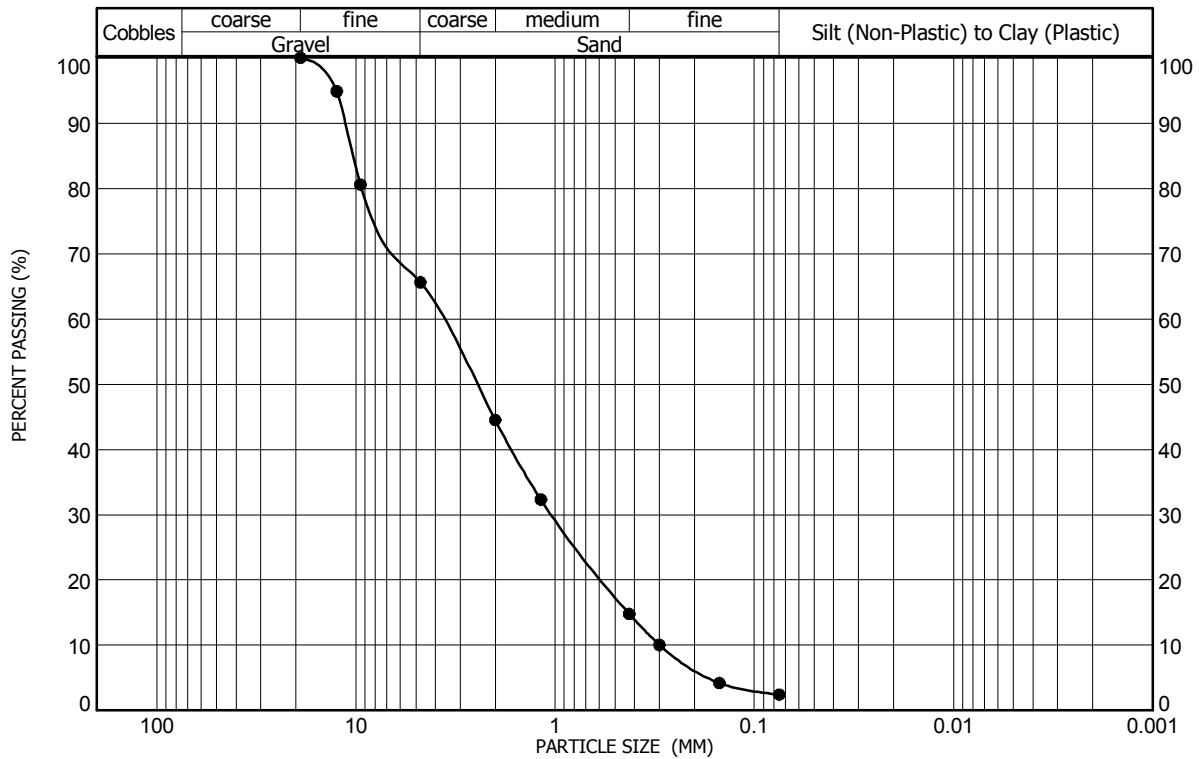
Sample Location _____ Test Boring No. 5 at a depth of 4 feet Gravel (%) 5 Liquid Limit 28
Sample Description Sand, slightly clayey, slightly gravelly Sand (%) 81 Plasticity Index 12
Classification A-2-6(0), CLAYEY SAND(SC) Clay/Silt (%) 14



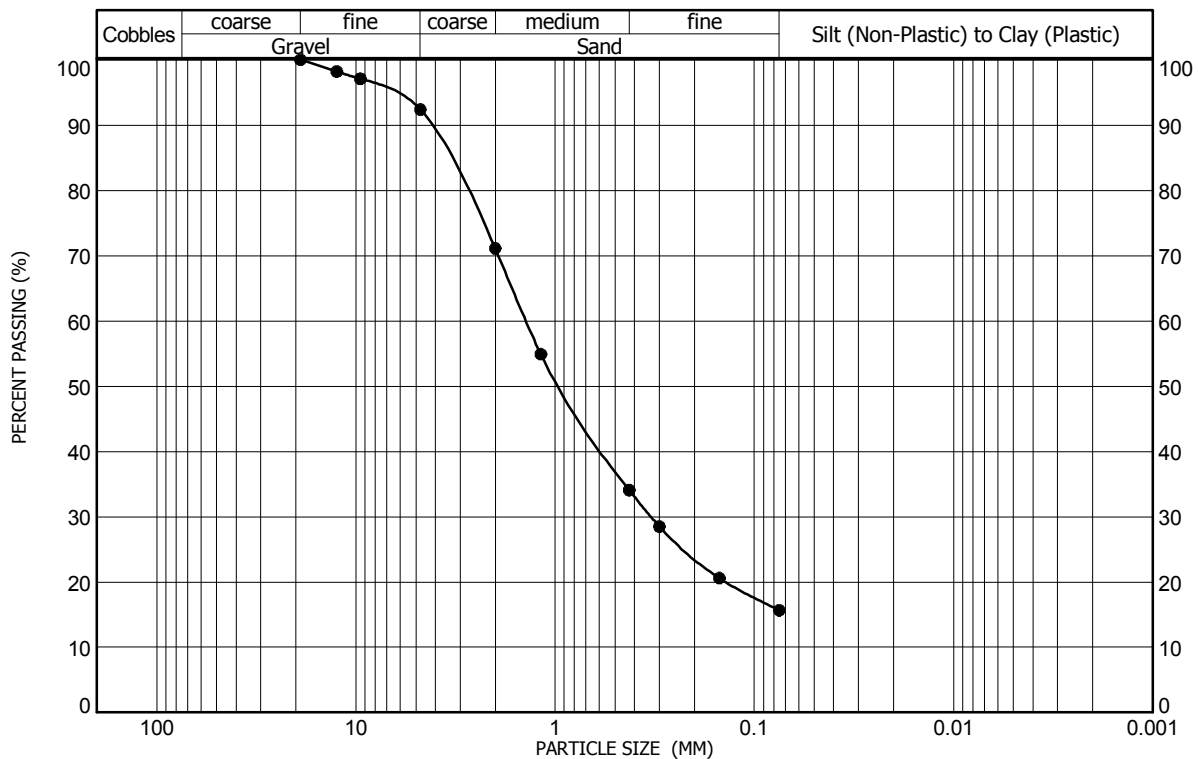
Sample Location _____ Test Boring No. 7 at a depth of 4 feet Gravel (%) 1 Liquid Limit 36
Sample Description Sand, very clayey, trace gravel Sand (%) 50 Plasticity Index 19
Classification A-6(6), CLAYEY SAND(SC) Clay/Silt (%) 49

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 45



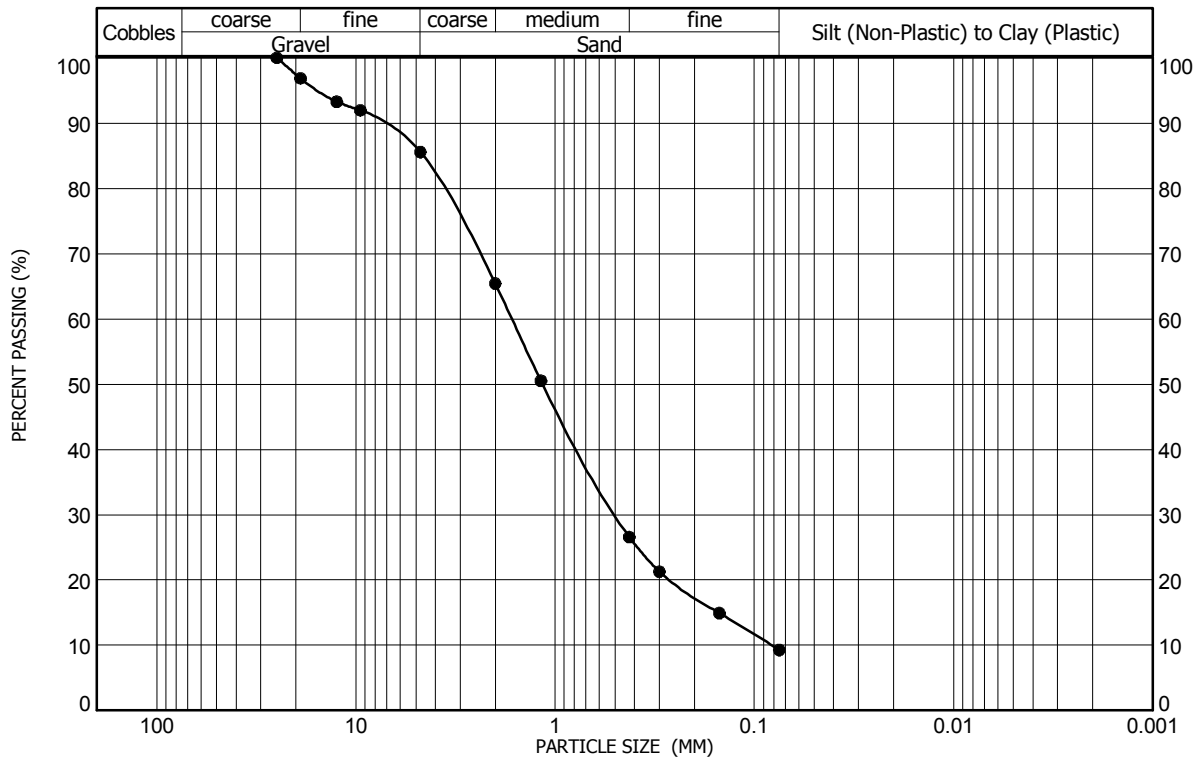
Sample Location _____ Test Boring No. 7 at a depth of 34 feet Gravel (%) 34 Liquid Limit NV
 Sample Description _____ Sand, gravelly, trace silt Sand (%) 63 Plasticity Index NP
 Classification A-1-a(0), POORLY GRADED SAND with GRAVEL(SP) Clay/Silt (%) 2



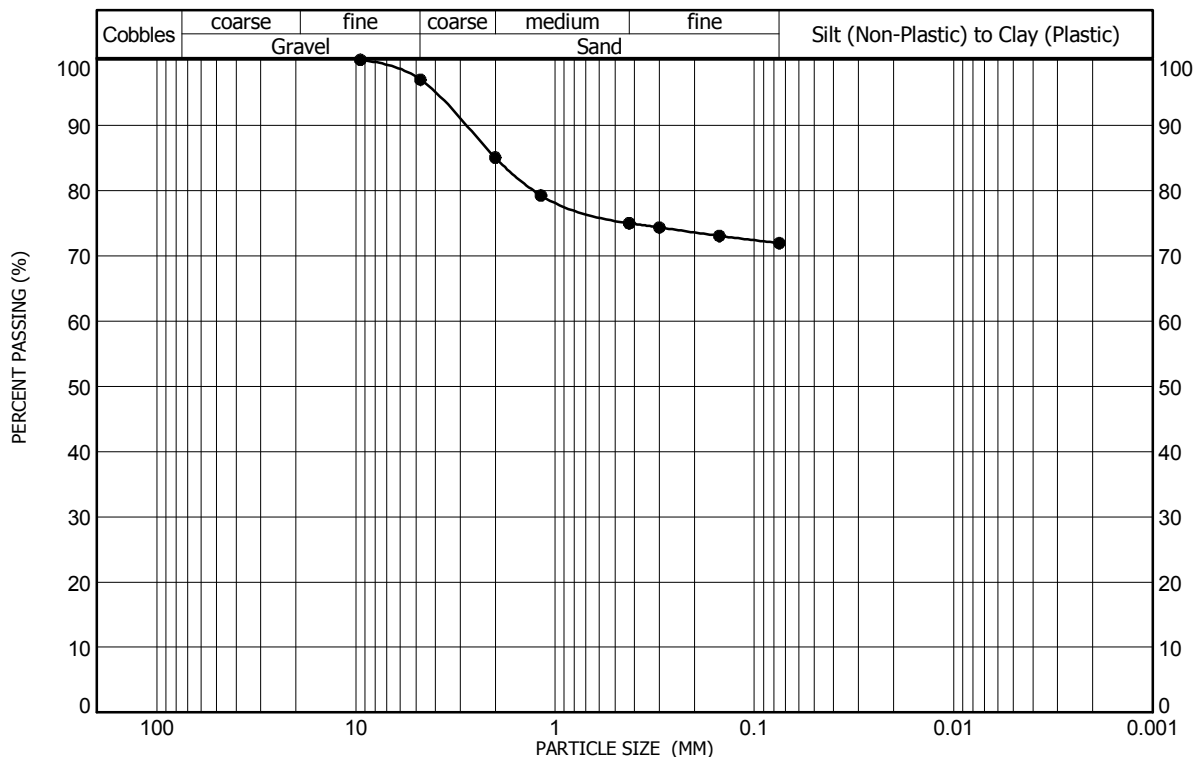
Sample Location _____ Test Boring No. 8 at a depth of 9 feet Gravel (%) 8 Liquid Limit 24
 Sample Description _____ Sand, clayey, slightly gravelly Sand (%) 77 Plasticity Index 8
 Classification A-2-4(0), CLAYEY SAND(SC) Clay/Silt (%) 16

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 46



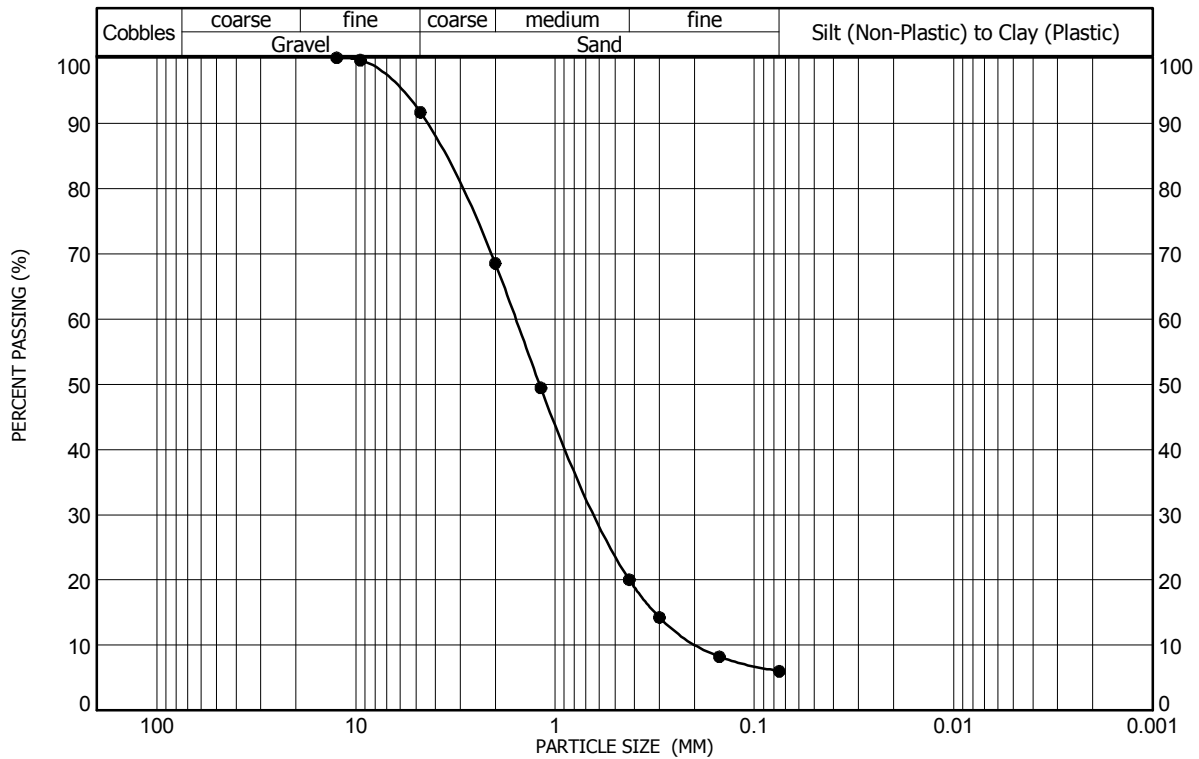
Sample Location _____ Test Boring No. 8 at a depth of 24 feet Gravel (%) 14 Liquid Limit NV
 Sample Description Sand, slightly gravelly, slightly silty Sand (%) 76 Plasticity Index NP
 Classification A-1-b(0), WELL-GRADED SAND with SILT(SW-SM) Clay/Silt (%) 9



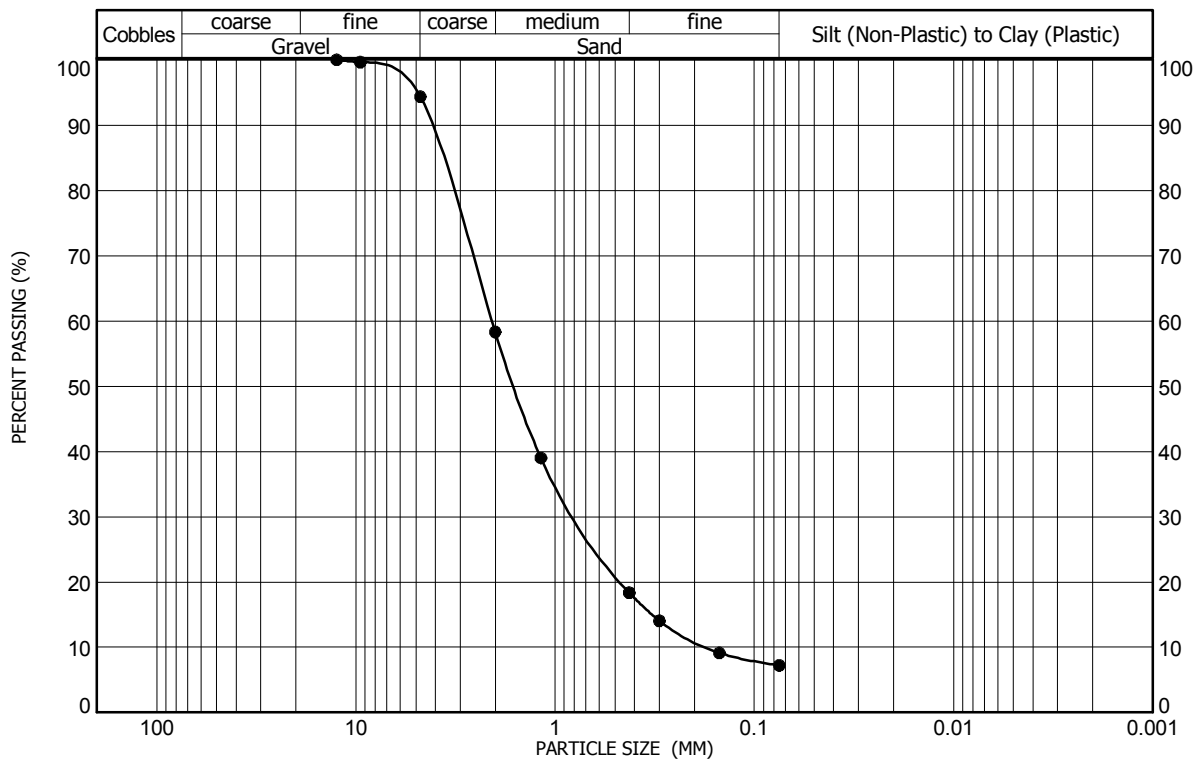
Sample Location _____ Test Boring No. 9 at a depth of 4 feet Gravel (%) 3 Liquid Limit 56
 Sample Description Clay, sandy, trace gravel Sand (%) 25 Plasticity Index 37
 Classification A-7-6(26), FAT CLAY with SAND(CH) Clay/Silt (%) 72

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 47



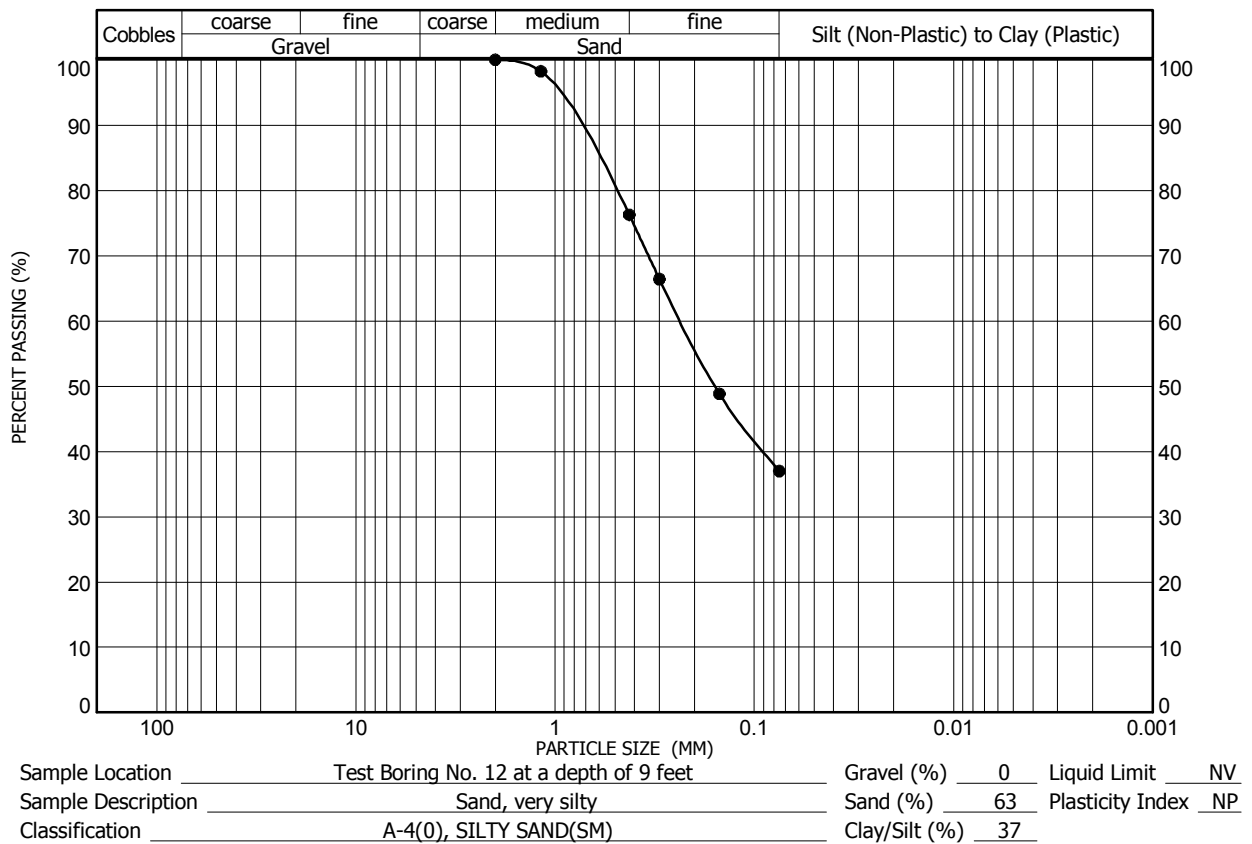
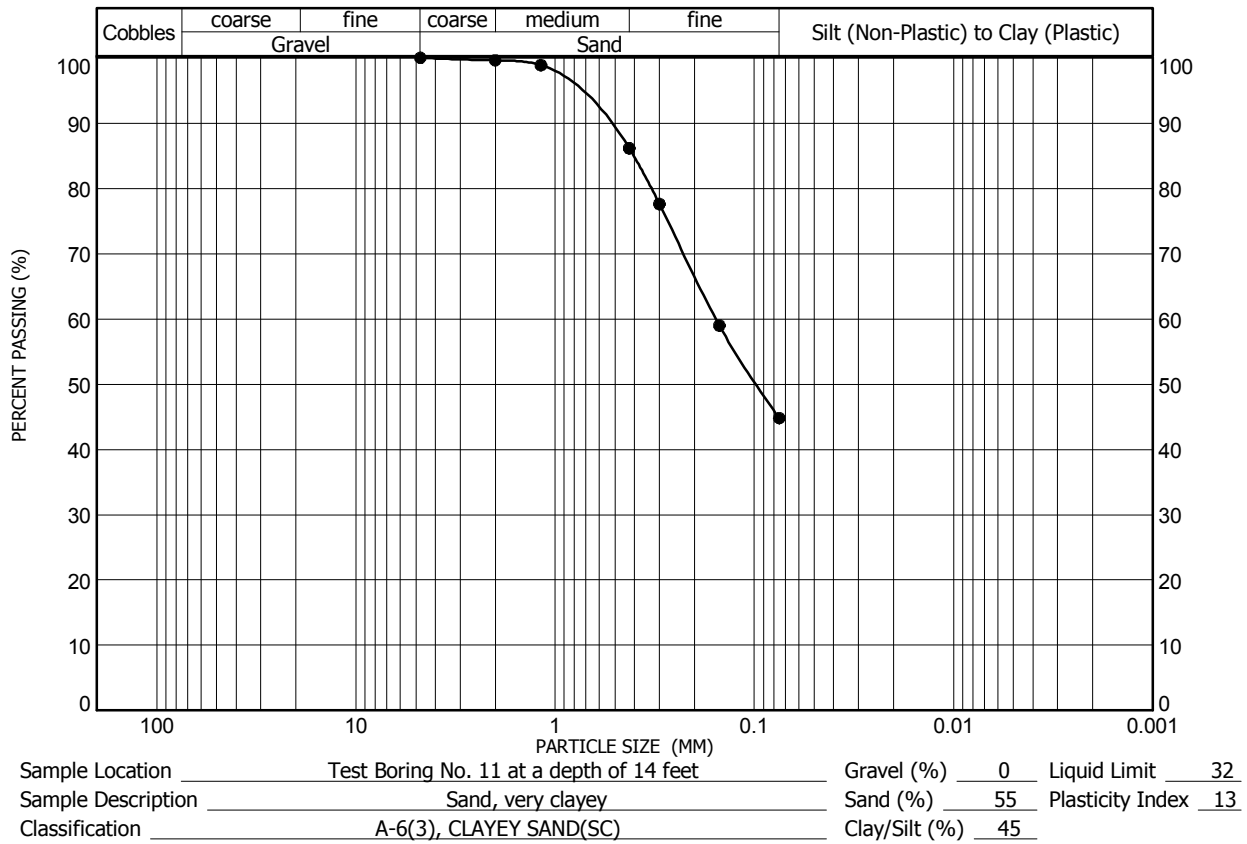
Sample Location _____ Test Boring No. 10 at a depth of 9 feet Gravel (%) 8 Liquid Limit 25
Sample Description Sand, slightly gravelly, slightly silty Sand (%) 86 Plasticity Index 5
Classification A-1-b(0), WELL-GRADED SAND with SILTY CLAY(SW-SC) Clay/Silt (%) 6



Sample Location _____ Test Boring No. 10 at a depth of 19 feet Gravel (%) 6 Liquid Limit NV
Sample Description Sand, slightly gravelly, slightly silty Sand (%) 87 Plasticity Index NP
Classification A-1-b(0), WELL-GRADED SAND with SILT(SW-SM) Clay/Silt (%) 7

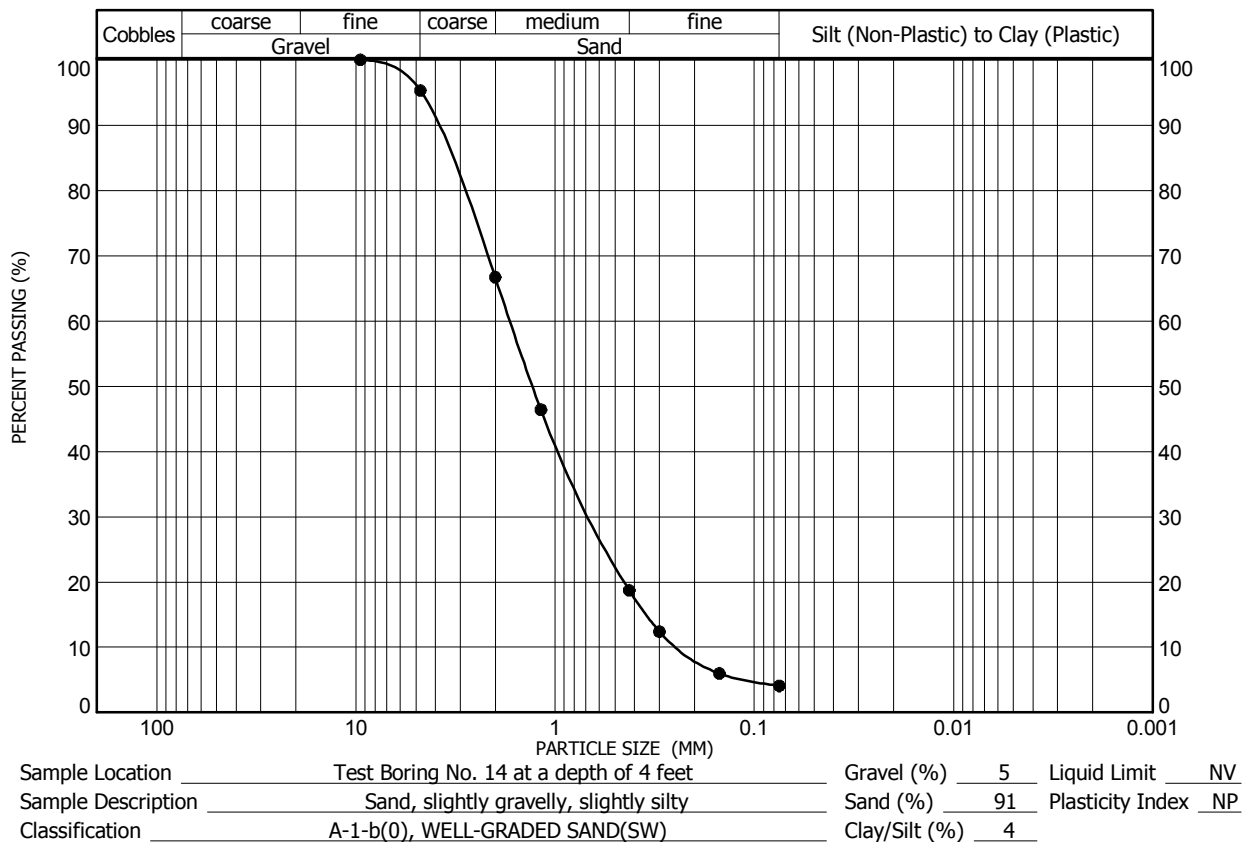
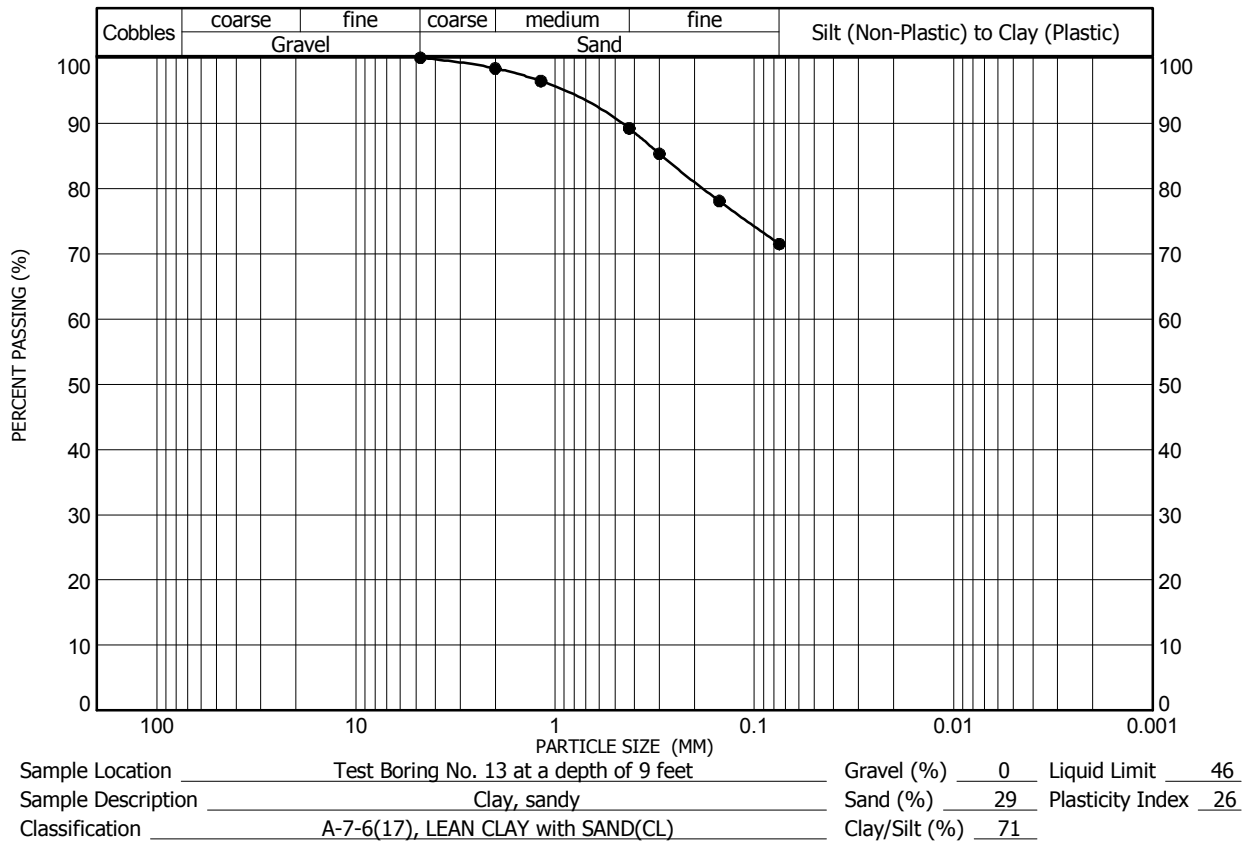
GRADATION AND ATTERBERG TEST RESULTS

FIGURE 48



GRADATION AND ATTERBERG TEST RESULTS

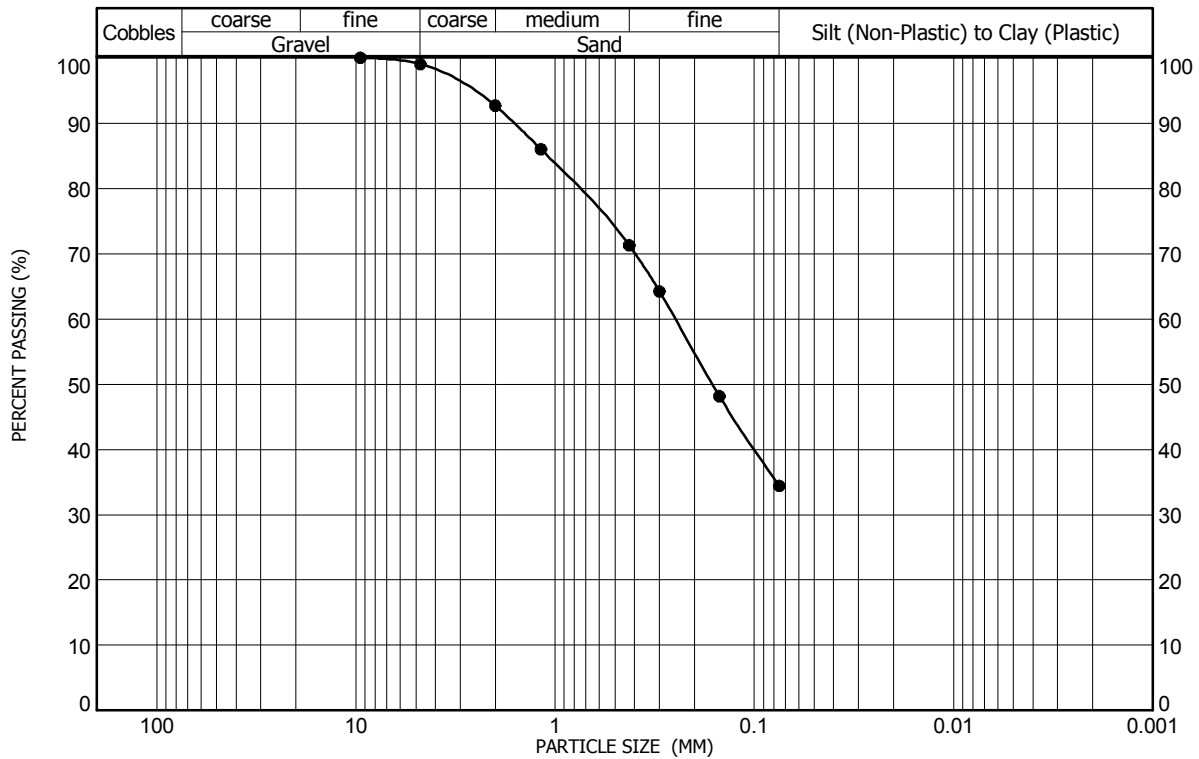
FIGURE 49



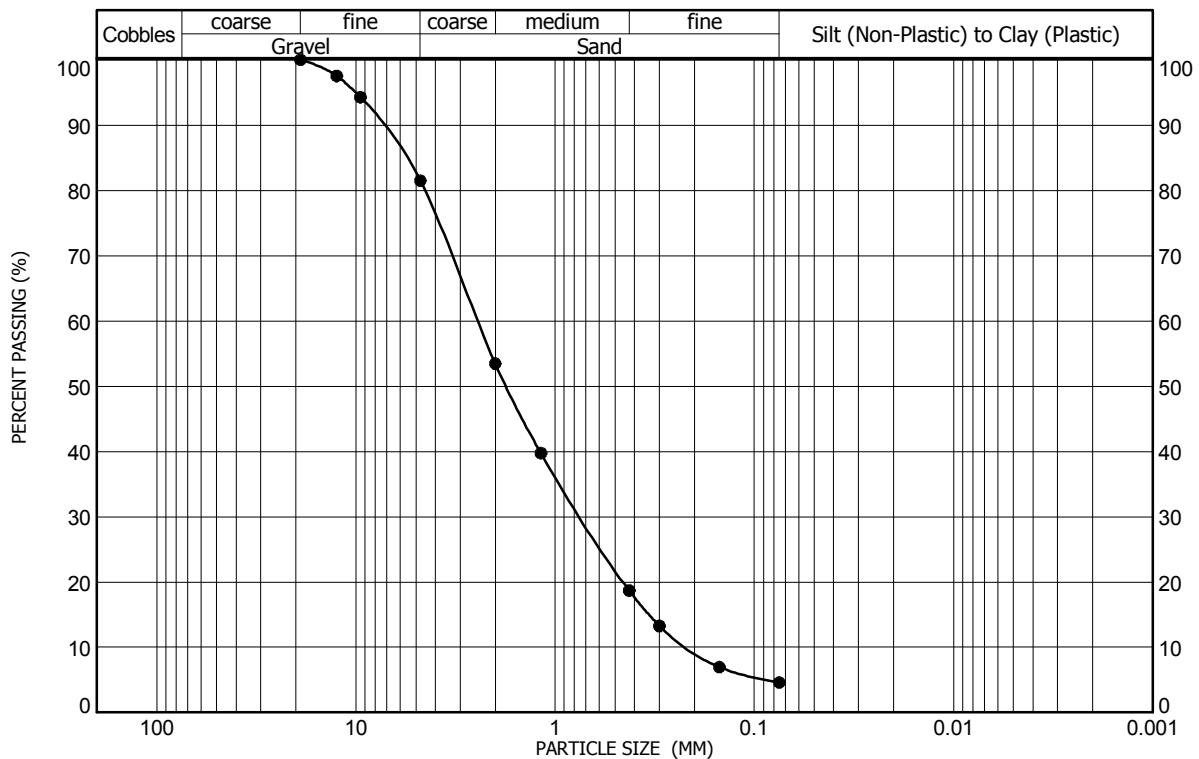
GRADATION AND ATTERBERG TEST RESULTS

FIGURE 50

PROJECT NO. 165963



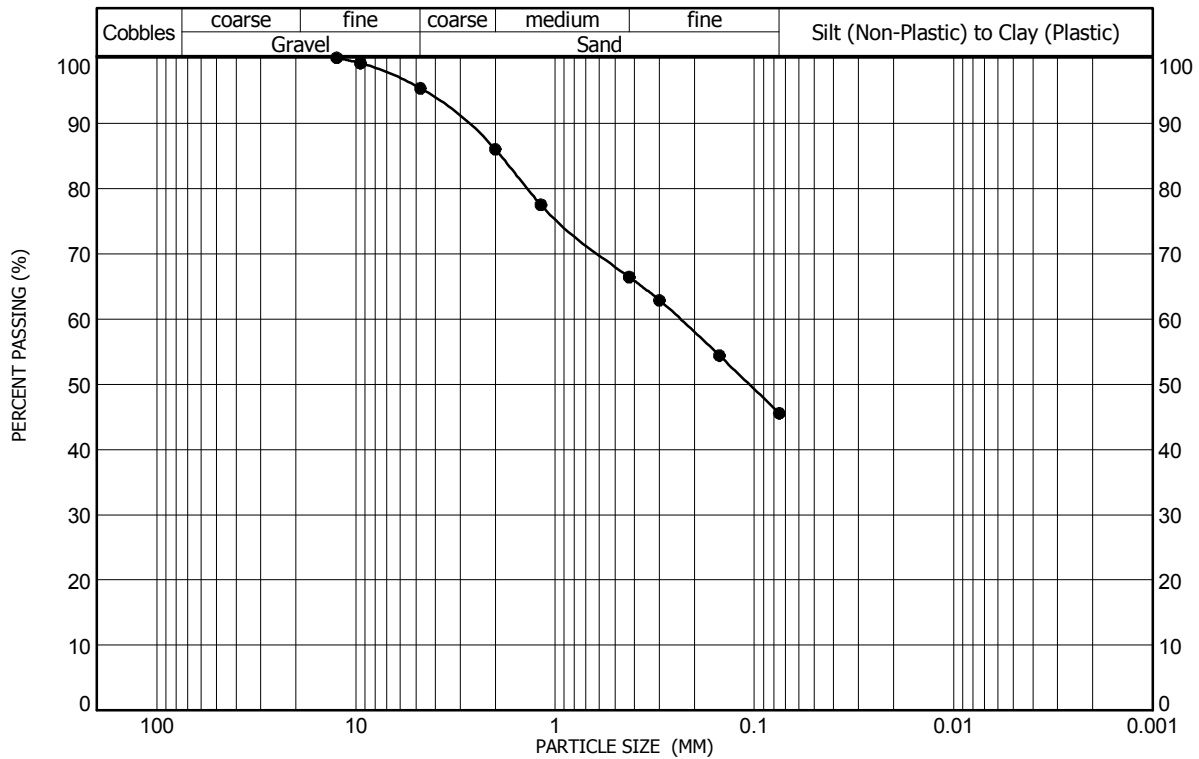
Sample Location _____ Test Boring No. 15 at a depth of 9 feet Gravel (%) 1 Liquid Limit 27
 Sample Description _____ Sand, very clayey, trace gravel Sand (%) 65 Plasticity Index 10
 Classification _____ A-2-4(0), CLAYEY SAND(SC) Clay/Silt (%) 34



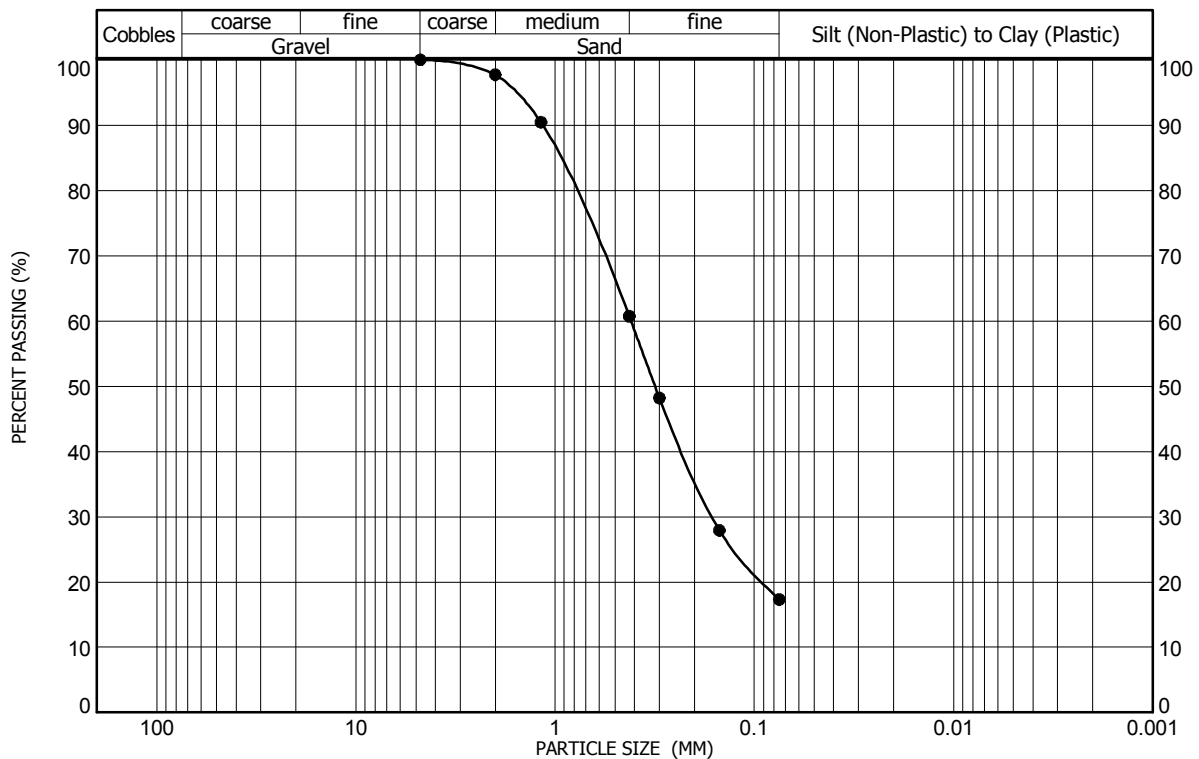
Sample Location _____ Test Boring No. 16 at a depth of 14 feet Gravel (%) 19 Liquid Limit NV
 Sample Description _____ Sand, gravelly, slightly silty Sand (%) 77 Plasticity Index NP
 Classification _____ A-1-b(0), WELL-GRADED SAND with GRAVEL(SW) Clay/Silt (%) 5

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 51



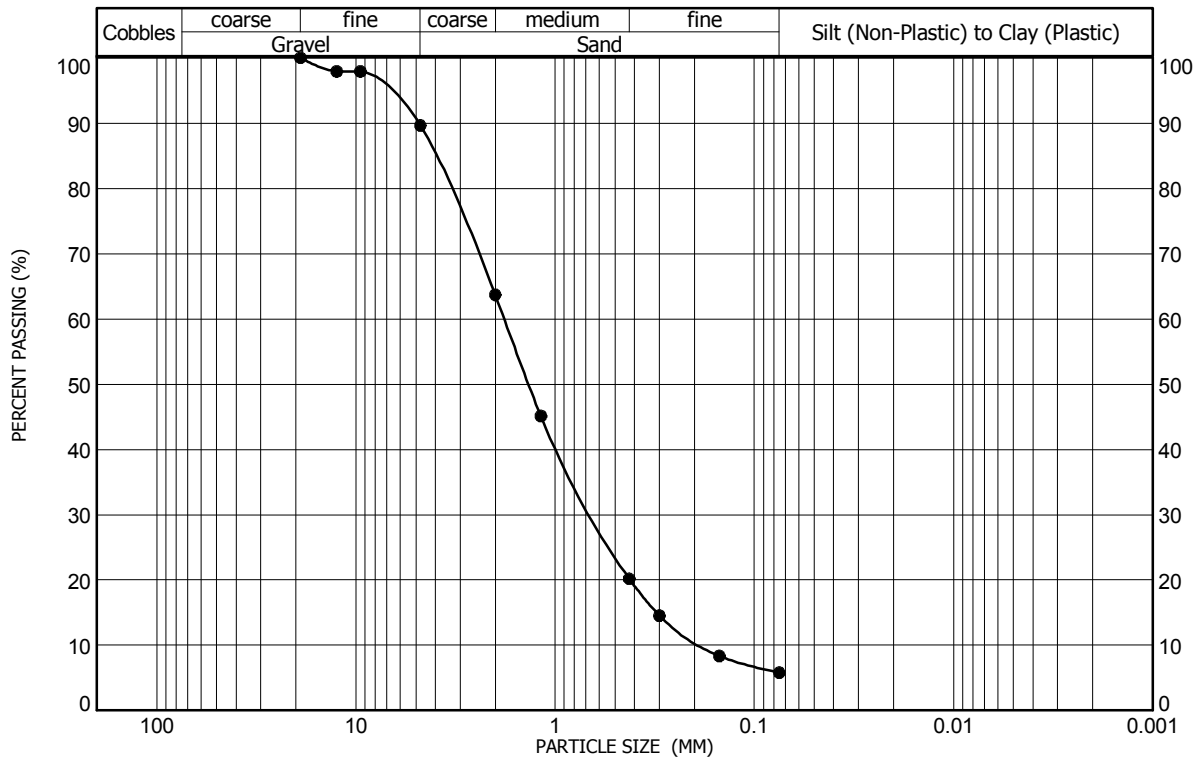
Sample Location _____ Test Boring No. 17 at a depth of 9 feet Gravel (%) 5 Liquid Limit 33
 Sample Description _____ Sand, very clayey, slightly gravelly Sand (%) 50 Plasticity Index 15
 Classification _____ A-6(3), CLAYEY SAND(SC) Clay/Silt (%) 46



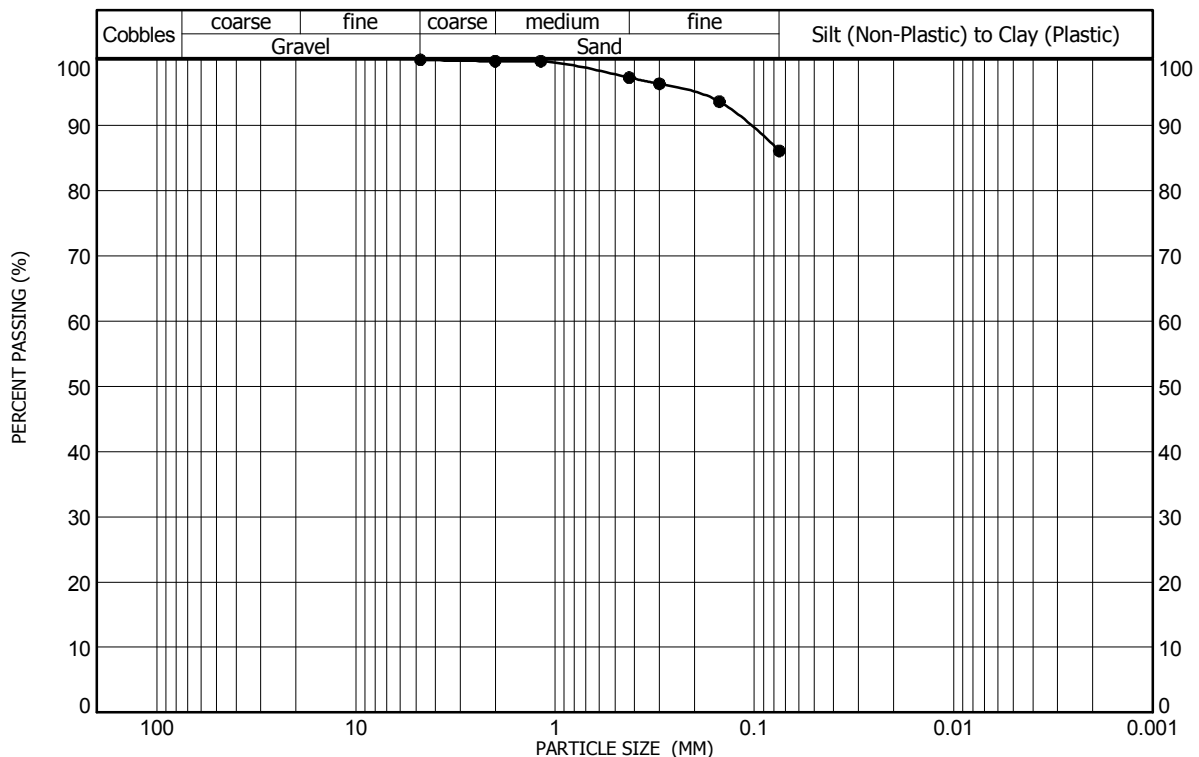
Sample Location _____ Test Boring No. 18 at a depth of 4 feet Gravel (%) 0 Liquid Limit 22
 Sample Description _____ Sand, clayey Sand (%) 83 Plasticity Index 6
 Classification _____ A-2-4(0), SILTY, CLAYEY SAND(SC-SM) Clay/Silt (%) 17

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 52



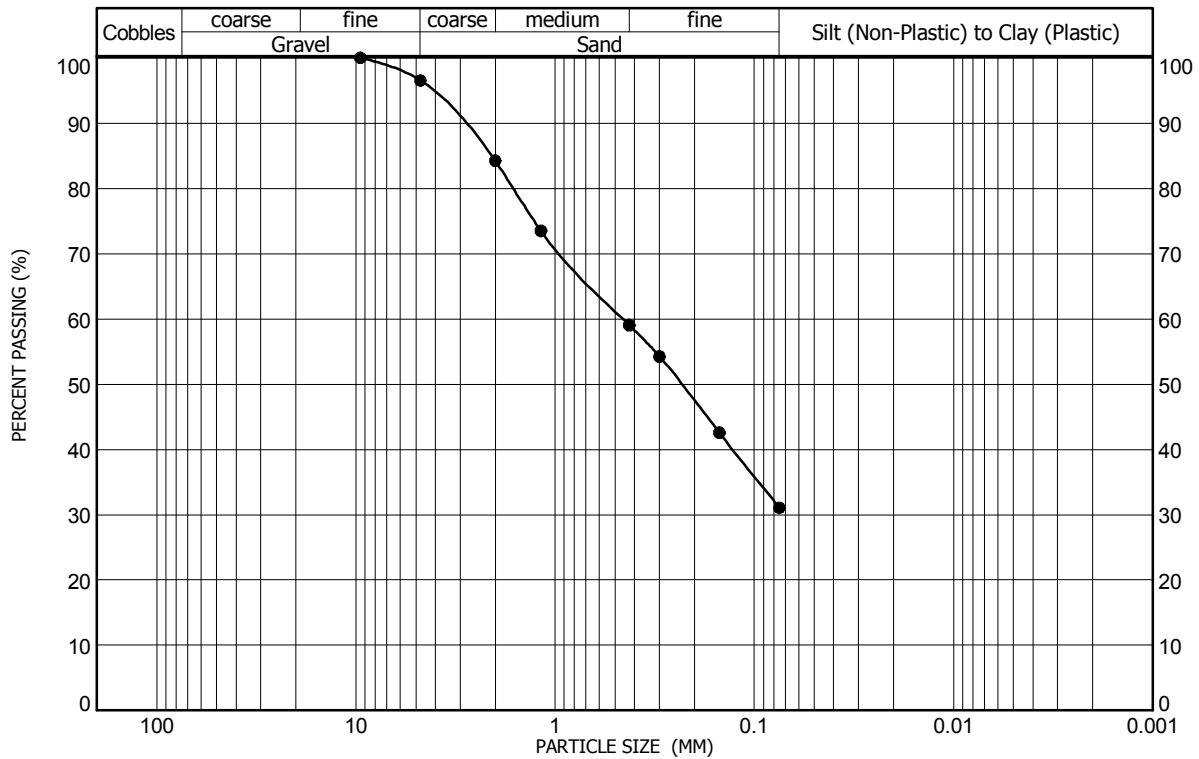
Sample Location _____ Test Boring No. 22 at a depth of 9 feet Gravel (%) 10 Liquid Limit NV
Sample Description _____ Sand, slightly gravelly, slightly silty Sand (%) 84 Plasticity Index NP
Classification _____ A-1-b(0), WELL-GRADED SAND with SILT(SW-SM) Clay/Silt (%) 6



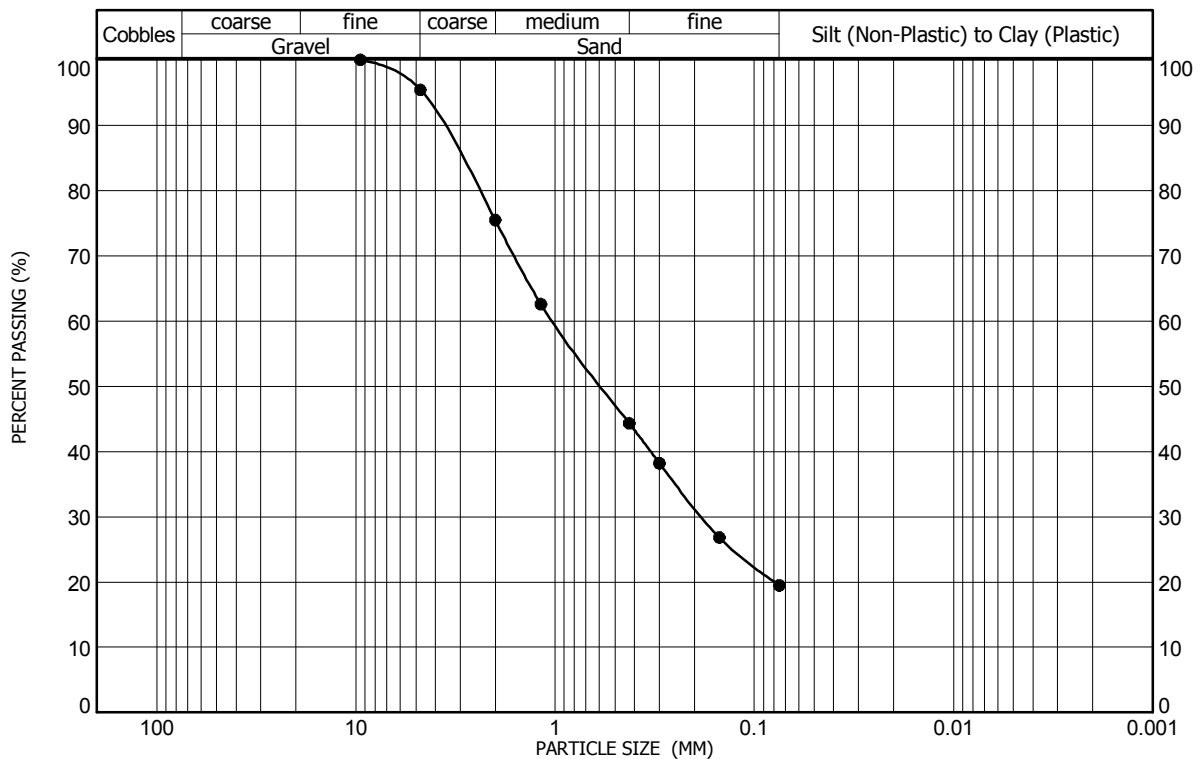
Sample Location _____ Test Boring No. 24 at a depth of 14 feet Gravel (%) 0 Liquid Limit 44
Sample Description _____ Clay, slightly sandy Sand (%) 14 Plasticity Index 24
Classification _____ A-7-6(21), LEAN CLAY(CL) Clay/Silt (%) 86

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 53



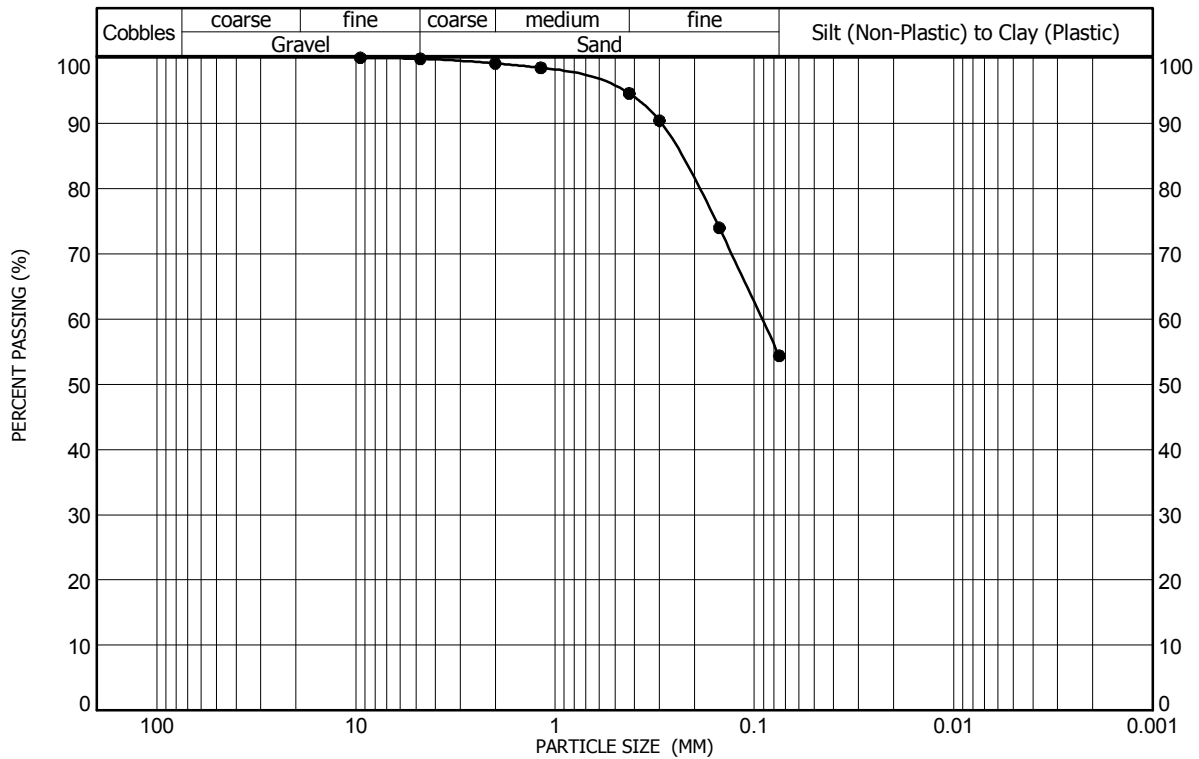
Sample Location _____ Test Boring No. 25 at a depth of 4 feet Gravel (%) 3 Liquid Limit NV
 Sample Description Sand, very silty, trace gravel Sand (%) 65 Plasticity Index NP
 Classification A-2-4(0), SILTY SAND(SM) Clay/Silt (%) 31



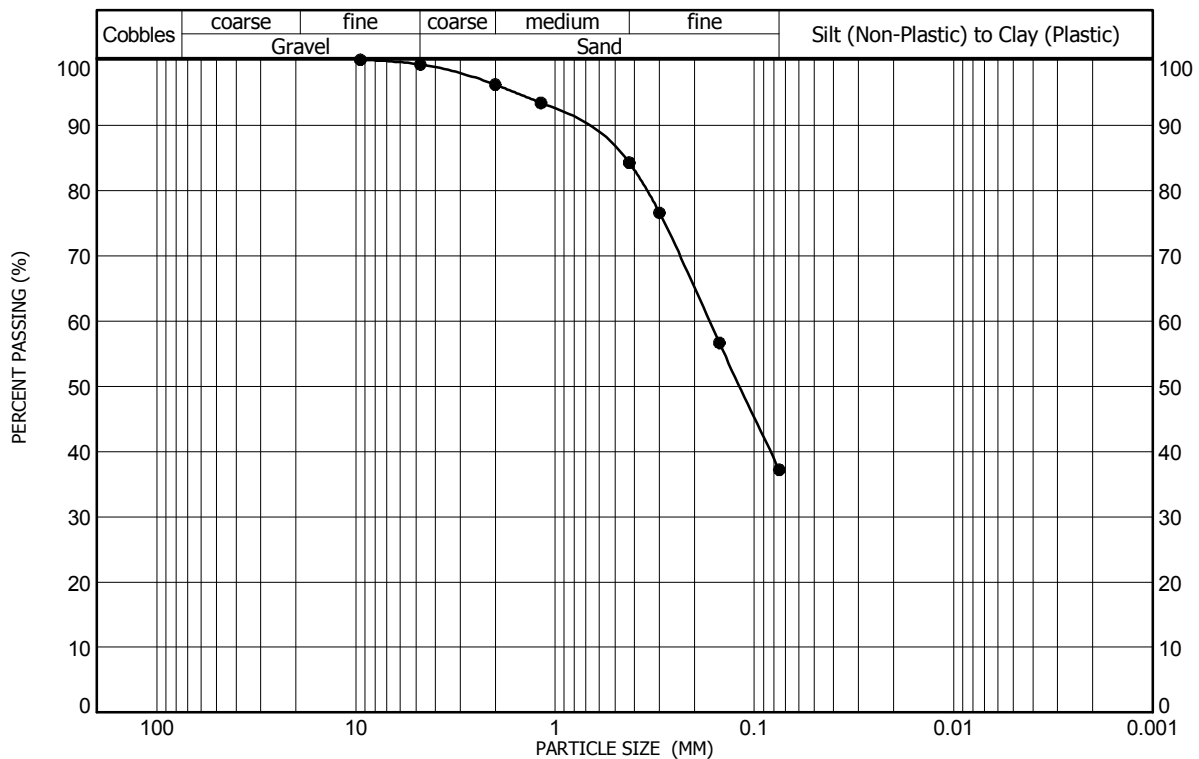
Sample Location _____ Test Boring No. 25 at a depth of 19 feet Gravel (%) 5 Liquid Limit 26
 Sample Description Sand, clayey, slightly gravelly Sand (%) 76 Plasticity Index 7
 Classification A-2-4(0), SILTY, CLAYEY SAND(SC-SM) Clay/Silt (%) 19

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 54



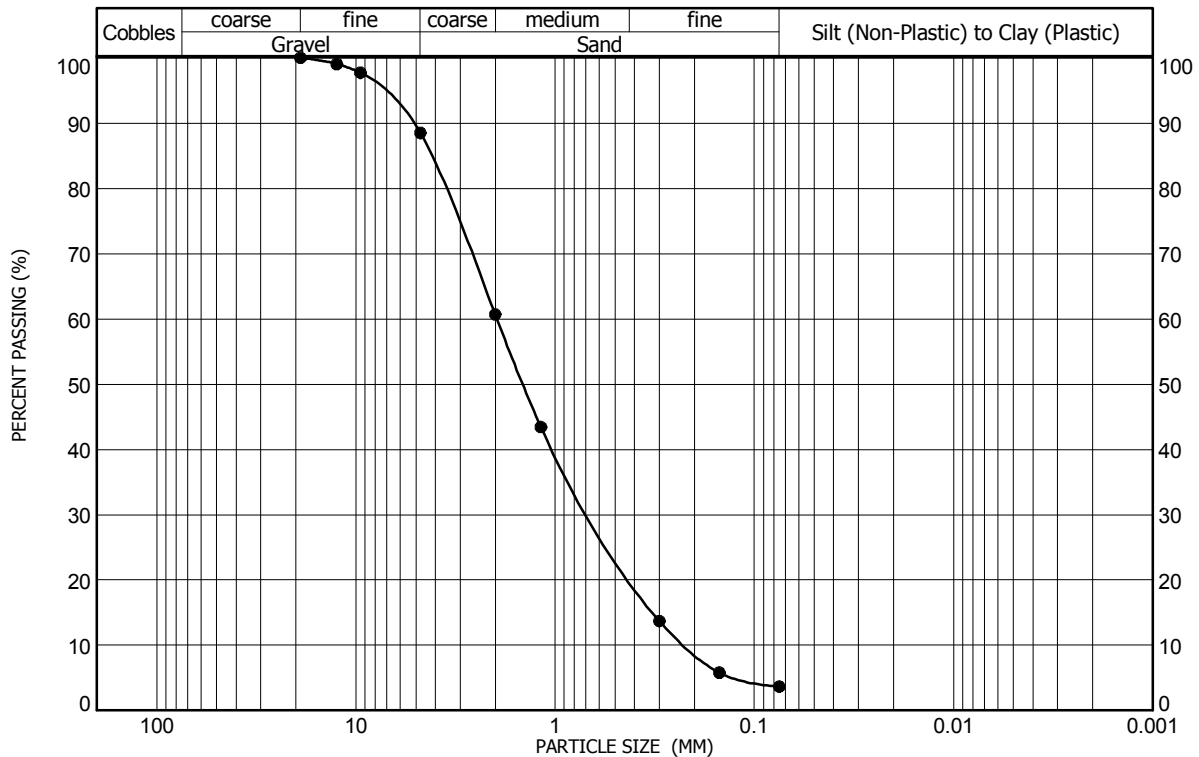
Sample Location _____ Test Boring No. 27 at a depth of 19 feet Gravel (%) 0 Liquid Limit 39
 Sample Description _____ Clay, very sandy Sand (%) 45 Plasticity Index 20
 Classification _____ A-6(8), SANDY LEAN CLAY(CL) Clay/Silt (%) 54



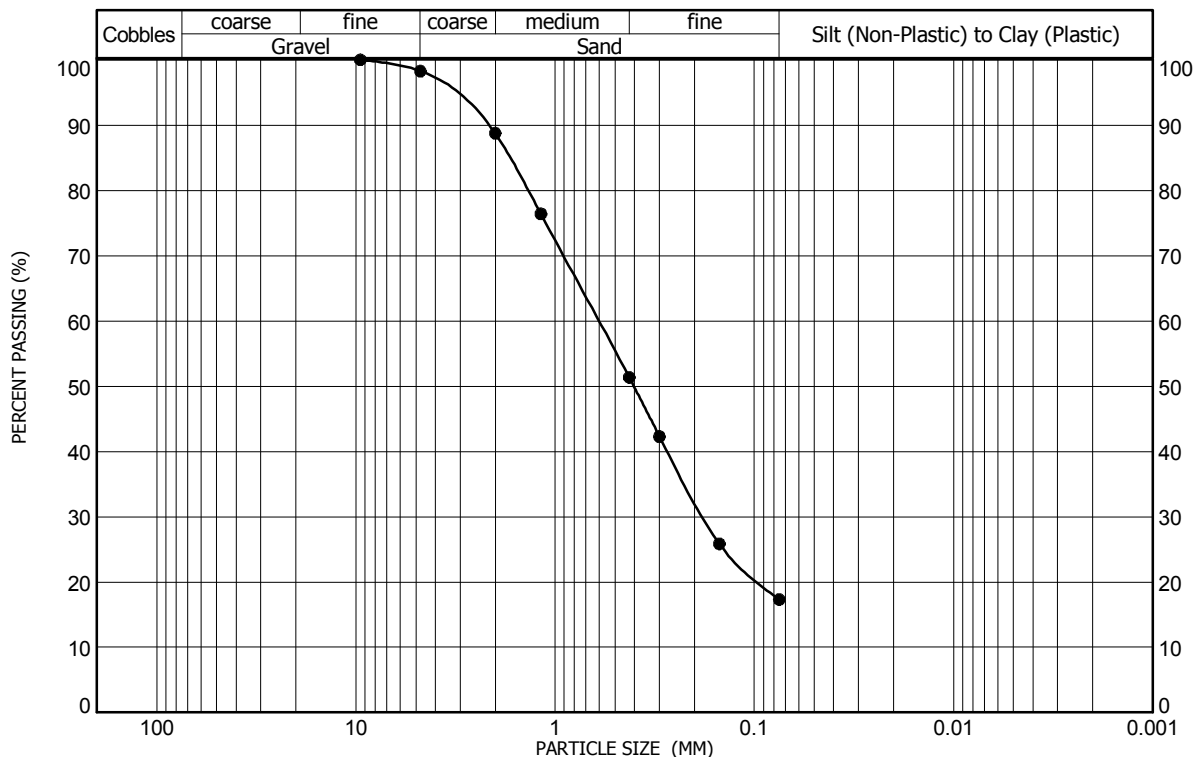
Sample Location _____ Test Boring No. 28 at a depth of 4 feet Gravel (%) 1 Liquid Limit 31
 Sample Description _____ Sand, very clayey, trace gravel Sand (%) 62 Plasticity Index 12
 Classification _____ A-6(1), CLAYEY SAND(SC) Clay/Silt (%) 37

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 55



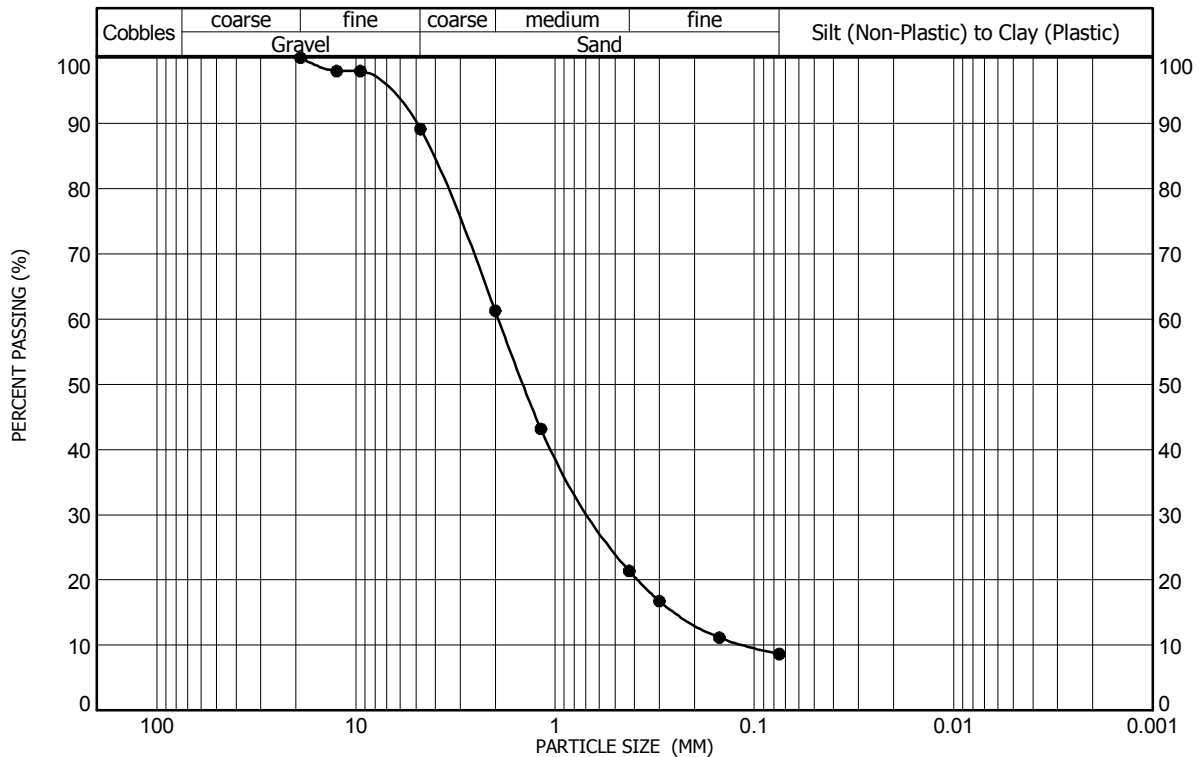
Sample Location _____ Test Boring No. 28 at a depth of 14 feet Gravel (%) 12 Liquid Limit NV
 Sample Description Sand, slightly gravelly, trace silt Sand (%) 85 Plasticity Index NP
 Classification A-1-b(0), POORLY GRADED SAND(SP) Clay/Silt (%) 4



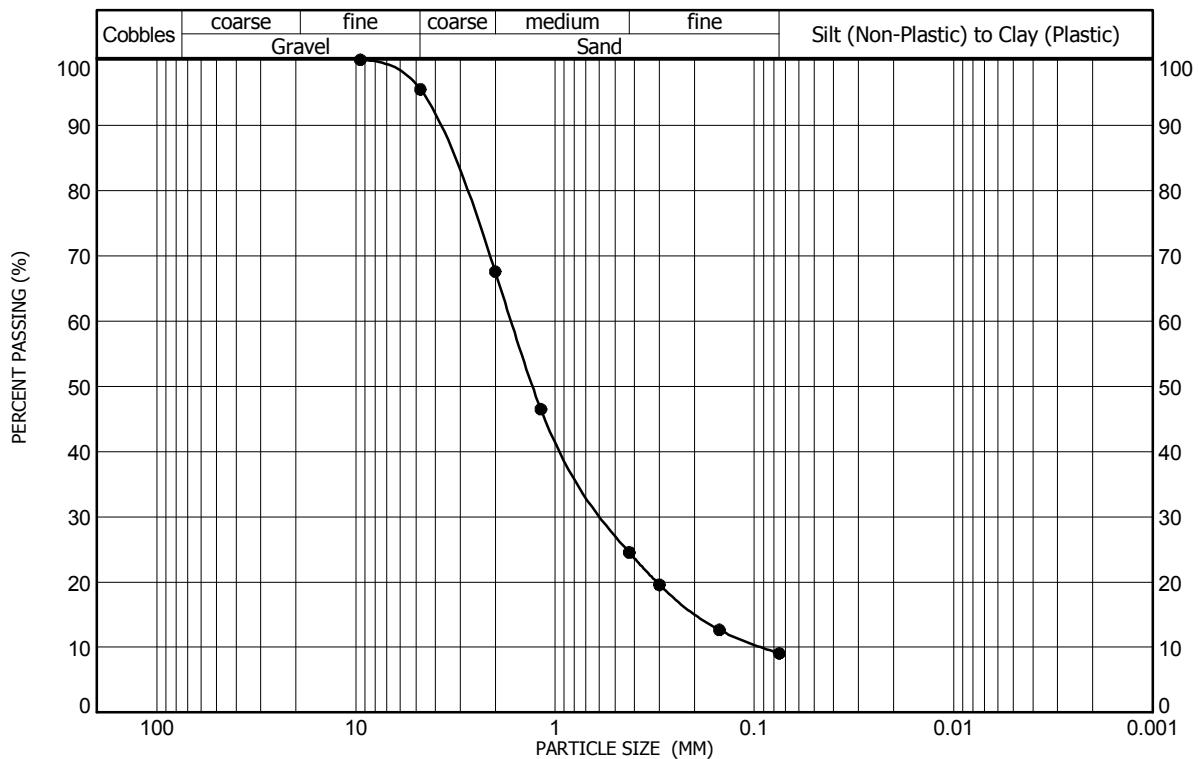
Sample Location _____ Test Boring No. 29 at a depth of 19 feet Gravel (%) 2 Liquid Limit 27
 Sample Description Sand, clayey, trace gravel Sand (%) 81 Plasticity Index 10
 Classification A-2-4(0), CLAYEY SAND(SC) Clay/Silt (%) 17

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 56



Sample Location _____ Test Boring No. 30 at a depth of 9 feet Gravel (%) 11 Liquid Limit 26
Sample Description Sand, slightly gravelly, slightly clayey Sand (%) 80 Plasticity Index 7
Classification A-2-4(0), WELL-GRADED SAND with SILTY CLAY (SW-SC) Clay/Silt (%) 9

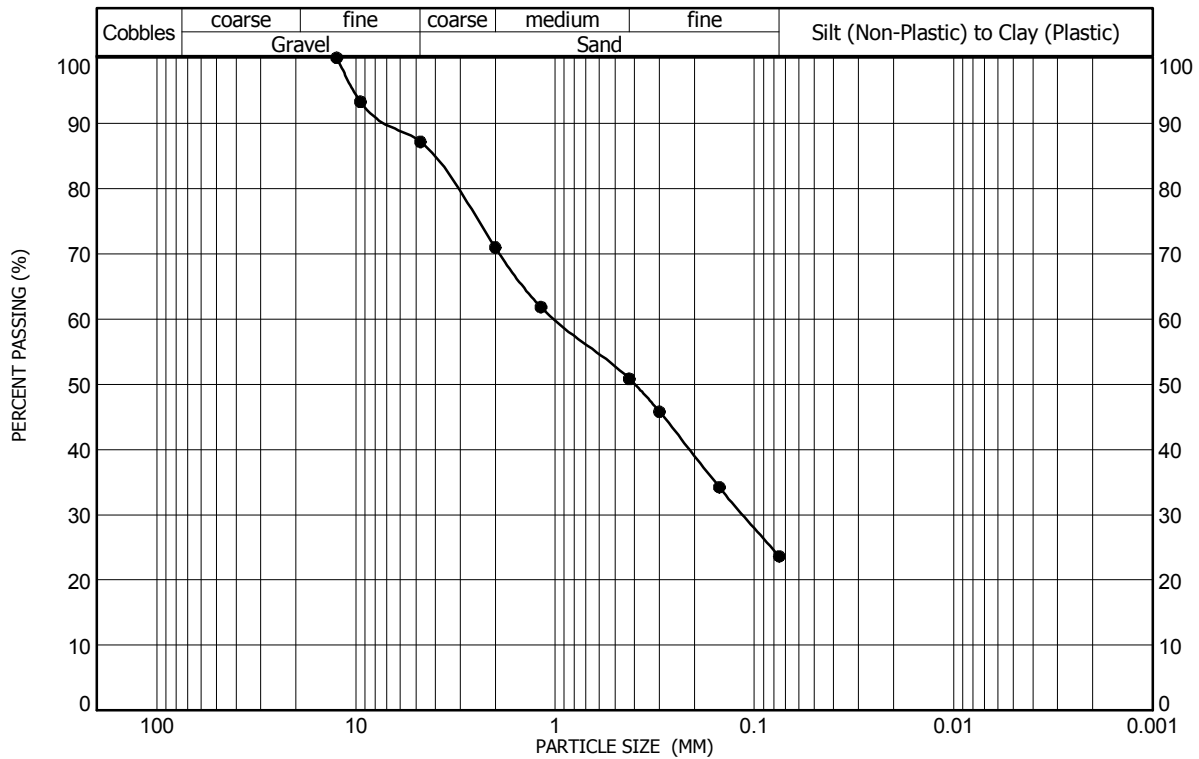


Sample Location _____ Test Boring No. 30 at a depth of 24 feet Gravel (%) 5 Liquid Limit NV
Sample Description Sand, slightly silty, slightly gravelly Sand (%) 86 Plasticity Index NP
Classification A-1-b(0), WELL-GRADED SAND with SILT (SW-SM) Clay/Silt (%) 9

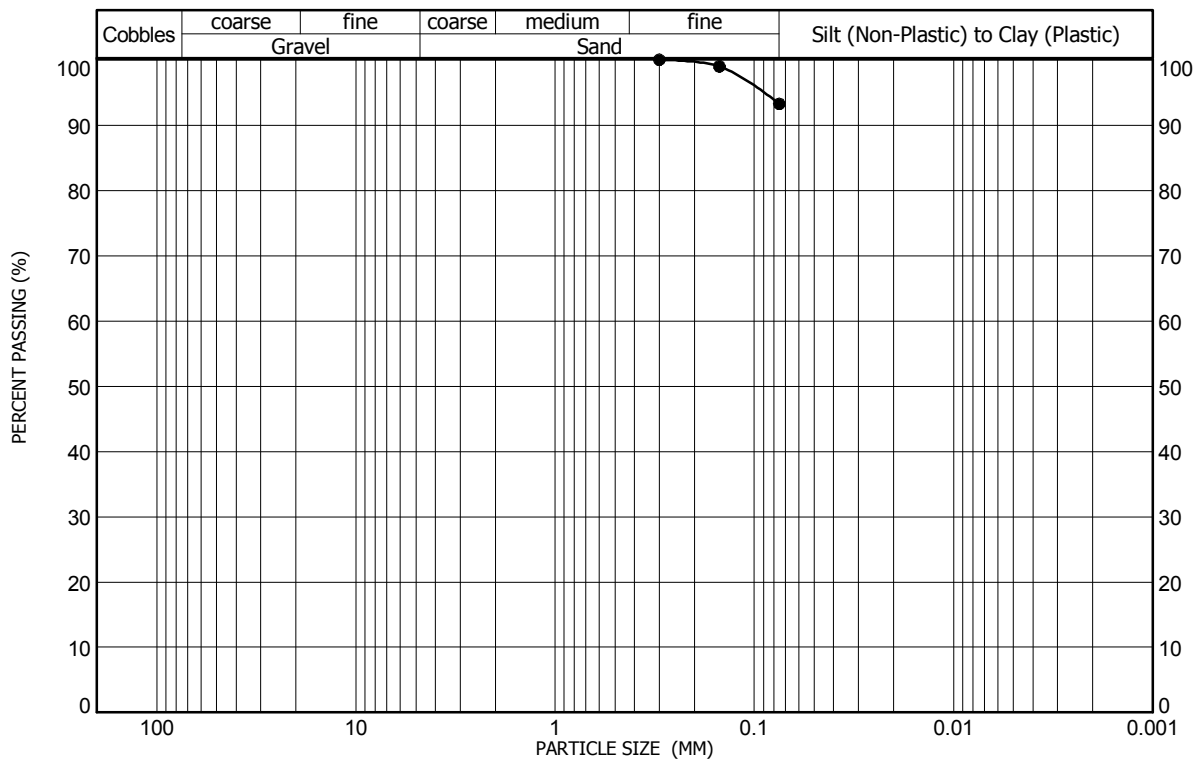
GRADATION AND ATTERBERG TEST RESULTS

FIGURE 57

PROJECT NO. 165963



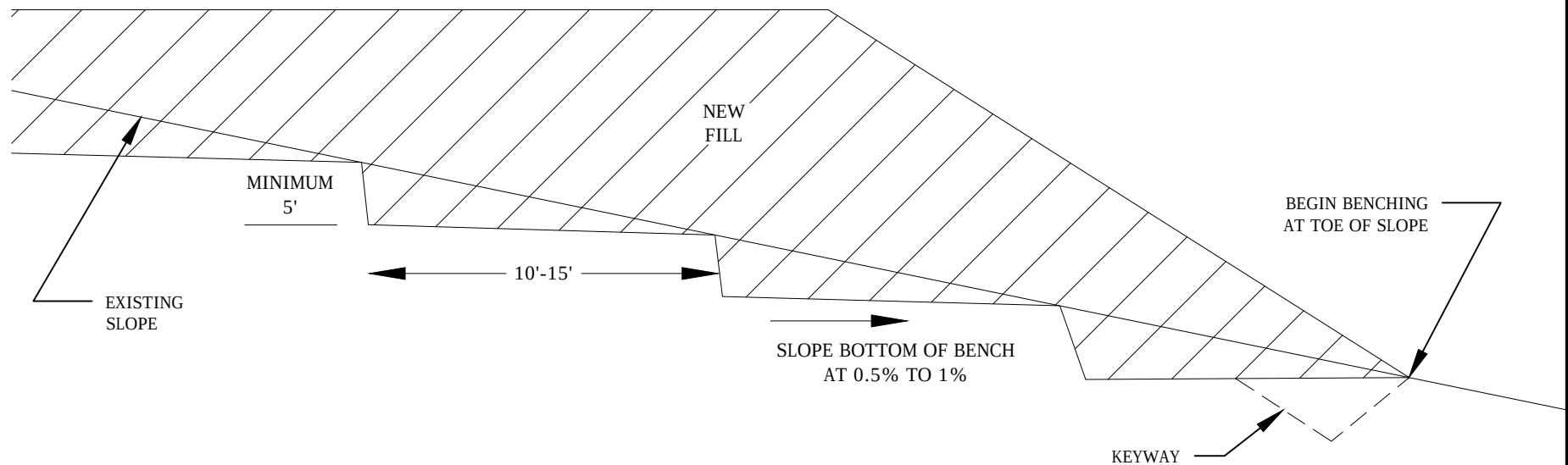
Sample Location _____ Test Boring No. 31 at a depth of 14 feet Gravel (%) 13 Liquid Limit NV
Sample Description _____ Sand, silty, slightly gravelly Sand (%) 64 Plasticity Index NP
Classification _____ A-2-4(0), SILTY SAND(SM) Clay/Silt (%) 24



Sample Location _____ Test Boring No. 32 at a depth of 19 feet Gravel (%) 0 Liquid Limit 54
Sample Description _____ Claystone, slightly sandy Sand (%) 7 Plasticity Index 35
Classification _____ A-7-6(35), FAT CLAY(CH) Clay/Silt (%) 93

GRADATION AND ATTERBERG TEST RESULTS

FIGURE 58



NOTES:

1. BENCHING REQUIRED WHEN EXISTING SLOPE IS 5 : 1 (HORIZONTAL : VERTICAL) OR STEEPER
2. CONTINUE BENCHING UNTIL NATURAL SLOPE FLATTEN OR SLOPE DAYLIGHTS
3. DRAINS MAY BE REQUIRED IF GROUND WATER IS ENCOUNTERED.
4. ADDITIONAL CUTTING BACK OF SOME SLOPES MAY BE REQUIRED BY GEOTECHNICAL ENGINEER IF SLOPE INSTABILITY IS NOTED.
5. A KEYWAY MAY BE REQUIRED BY GEOTECHNICAL ENGINEER DEPENDING UPON SLOPE CONFIGURATION.

NOTE: NOT TO SCALE

A.G. Wassenaar
Geotechnical and Environmental Consultants **Inc.**

GENERALIZED
BENCHING
DETAIL

PROJECT NO. 165963
FIGURE 59

TABLE I
SUMMARY OF LABORATORY TEST RESULTS
March 8, 2017

Project Number 165963
The Meadows, Filing 19
Castle Rock, Colorado
1 of 6

Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) ¹	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg		pH	R (ohm*cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
								Liquid Limit	Plasticity Index				
1	4	Clay, very sandy, trace gravel	103	15	6.4	7,900	66	58	38				
1	9	Clay, very silty	84	18	0.0	NA							
1	19	Clay, very silty	88	34	0.0	NA							
1	24	Clay, sandy		39			85	46	26				
2	4	Clay, sandy	92	19	4.4	5,000							
2	9	Clay, slightly sandy	103	15	5.7	10,300	86	43	22				
2	19	Clay, sandy	76	43	-0.7	NA							
3	4	Clay, sandy	91	27	2.0	5,000							
3	9	Sand, clayey											
3	24	Sand, very silty, trace gravel		28			35	NV	NP				
4	4	Clay, sandy	90	17	3.1	3,800							
4	9	Sand, slightly silty		3			11	NV	NP				
4	14	Clay, sandy	101	17	0.7	1,600							
4	19	Sand, slightly silty, slightly gravelly		5			10	NV	NP				
5	4	Sand, slightly clayey, slightly gravelly		4			14	28	12				
5	9	Clay, sandy	108	14	7.9	13,200							
6	4	Clay, sandy	97	24	4.0	10,800							

TABLE I
SUMMARY OF LABORATORY TEST RESULTS
March 8, 2017

Project Number 165963
The Meadows, Filing 19
Castle Rock, Colorado
2 of 6

Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) ¹	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg		pH	R (ohm*cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
								Liquid Limit	Plasticity Index				
6	14	Clay, sandy	90	34	-0.3	NA							
7	4	Sand, very clayey, trace gravel	117	8	6.1	13,000	49	36	19				
7	14	Clay, sandy	83	32	0.0	NA							
7	19	Clay, sandy	77	39	-0.1	NA							
7	34	Sand, gravelly, trace silt		9			2	NV	NP				
8	4	Clay, sandy	93	5	-2.3	NA							
8	9	Sand, clayey, slightly gravelly		4			16	24	8				
8	24	Sand, slightly gravelly, slightly silty		10			9	NV	NP				
9	4	Clay, sandy, trace gravel		16			72	56	37				
9	9	Clay, sandy								7.4	978	<100	0.0041
9	24	Clay, sandy	84	36	-0.5	NA							
10	9	Sand, slightly gravelly, slightly silty		4			6	25	5				
10	19	Sand, slightly gravelly, slightly silty		5			7	NV	NP				
11	9	Sand, very clayey	107	13	-0.8	NA							
11	14	Sand, very clayey		19			45	32	13				
11	24	Sand, very clayey	97	21	-0.8	NA							
12	9	Sand, very silty		12			37	NV	NP				

TABLE I
SUMMARY OF LABORATORY TEST RESULTS
March 8, 2017

Project Number 165963
The Meadows, Filing 19
Castle Rock, Colorado
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Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) ¹	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg		pH	R (ohm*cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
								Liquid Limit	Plasticity Index				
12	14	Sand, clayey	104	14	0.0	NA							
12	24	Clay, sandy	90	29	-0.1	NA							
12	34	Clay (weathered claystone), sandy	84	36	0.3	1,700							
13	4	Clay, sandy								7.8	1,779	<100	0.0002
13	9	Clay, sandy	113	15	4.0	10,400	71	46	26				
13	19	Clay, sandy	96	28	0.0	NA							
14	4	Sand, slightly gravelly, slightly silty		1			4	NV	NP				
14	9	Sand, very clayey	113	10	-0.7	NA							
14	24	Clay, sandy	80	39	-0.1	NA							
15	9	Sand, very clayey, trace gravel		8			34	27	10				
15	14	Clay, sandy	115	12	-0.3	NA							
15	34	Clay (weathered claystone), sandy	90	32	-0.1	NA							
16	14	Sand, gravelly, slightly silty		2			5	NV	NP				
16	19	Clay, sandy	84	35	-0.1	NA							
17	9	Sand, very clayey, slightly gravelly		20			46	33	15				
17	19	Clay, sandy	90	29	-0.5	NA							
17	34	Clay, sandy	81	37	-0.1	NA							

TABLE I
SUMMARY OF LABORATORY TEST RESULTS
March 8, 2017

Project Number 165963
The Meadows, Filing 19
Castle Rock, Colorado
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Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) ¹	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg		pH	R (ohm*cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
								Liquid Limit	Plasticity Index				
18	4	Sand, clayey		3			17	22	6				
18	14	Sand, clayey	112	14	-0.3	NA							
18	19	Sand, clayey	117	13	0.0	NA							
19	4	Sand, very clayey	104	21	4.5	8,200							
19	14	Clay, sandy	80	37	-0.8	NA							
19	19	Clay, sandy	82	39	-0.1	NA							
20	4	Clay, sandy	105	12	1.6	2,800							
20	19	Clay, sandy	92	28	0.0	NA							
20	24	Sand, very clayey	106	15	-0.5	NA							
21	4	Clay, sandy	106	13	7.1	15,700							
21	14	Clay, sandy	89	32	0.4	1,600							
21	24	Clay, sandy	94	26	0.4	2,000							
22	9	Sand, slightly gravelly, slightly silty		1			6	NV	NP				
22	24	Clay, sandy	91	31	-0.5	NA							
22	34	Clay, sandy	90	32	-0.4	NA							
23	9	Clay, sandy								7.5	1,739	<100	0.0009
23	14	Clay, sandy	103	19	1.3	3,300							

TABLE I
SUMMARY OF LABORATORY TEST RESULTS
March 8, 2017

Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) ¹	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg		pH	R (ohm*cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
								Liquid Limit	Plasticity Index				
24	4	Clay, sandy	96	14	2.8	3,900							
24	14	Clay, slightly sandy	82	36	-0.5	NA	86	44	24				
24	24	Clay, sandy	90	28	-0.3	NA							
25	4	Sand, very silty, trace gravel		3			31	NV	NP				
25	19	Sand, clayey, slightly gravelly		7			19	26	7				
25	34	Clay, sandy	81	39	0.0	NA							
26	4	Sand, very clayey	112	9	5.5	12,600							
26	9	Clay, sandy	110	12	-0.3	NA							
26	14	Claystone, silty	104	21	2.1	7,700							
26	19	Claystone, silty	109	18	3.3	12,600							
27	4	Clay, sandy	100	17	5.6	7,300							
27	14	Clay, sandy	85	32	-0.3	NA							
27	19	Clay, very sandy	101	21	-0.4	NA	54	39	20				
28	4	Sand, very clayey, trace gravel		7			37	31	12				
28	14	Sand, slightly gravelly, trace silt		2			4	NV	NP				
28	24	Clay, sandy	97	19	-0.4	NA							
29	9	Clay, sandy								7.4	1,653	<100	0.0002

TABLE I
SUMMARY OF LABORATORY TEST RESULTS
March 8, 2017

Project Number 165963
The Meadows, Filing 19
Castle Rock, Colorado
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Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) ¹	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg		pH	R (ohm*cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
								Liquid Limit	Plasticity Index				
29	14	Clay, sandy	102	22	-0.3	NA							
29	19	Sand, clayey, trace gravel		8			17	27	10				
29	34	Sandstone, clayey	104	16	-0.1	NA							
30	9	Sand, slightly gravelly, slightly clayey		5			9	26	7				
30	24	Sand, slightly silty, slightly gravelly		4			9	NV	NP				
31	9	Sand, very clayey	112	15	1.9	5,500							
31	14	Sand, silty, slightly gravelly		6			24	NV	NP				
31	19	Clay, sandy	94	28	-0.4	NA							
32	4	Clay, very sandy, gravelly	102	6									
32	19	Claystone, slightly sandy	100	22	2.8	7,300	93	54	35				
32	24	Claystone, slightly sandy	110	19	3.1	11,000							

¹ Indicates Percent Swell or Consolidation (-) when wetted under a 1,000 psf load.

NA - Not Applicable
NV - No Value
NP - Nonplastic

APPENDIX

SPECIFICATIONS FOR PLACEMENT OF STRUCTURAL FILL

GENERAL

The Geotechnical Engineer, as the Client's representative, should observe fill placement and conduct tests to determine if the material, method of placement, and compaction are in reasonable compliance with the specifications. Specifications presented in this Appendix are general in nature. They should be used except where specifically superseded by those presented in the attendant geotechnical study.

For the purpose of this specification, structural areas include those areas that will support constructed appurtenances (e.g., foundations, slabs, flatwork, pavements, etc.) and fill embankments or slopes that support significant fills or constructed appurtenances. Structural areas will be as defined by the Geotechnical Engineer.

FILL MATERIAL

Fill material should consist of on or off-site soils which are relatively free of vegetable matter and rubble. Off-site materials should be evaluated by the Soil Engineer prior to importation. No organic, frozen, perishable, rock greater than 6 inches, or other unsuitable material should be placed in the fill. For the purpose of this specification, cohesive soil should be defined as a mixture of clay, sand, and silt with more than 35% passing a U. S. Standard #200 sieve and a Plasticity Index of at least 11. These materials will classify as an A-6 or A-7 by the AASHTO Classification system. Granular soils should be all materials which do not classify as cohesive.

PREPARATION OF NATURAL GROUND

Vegetation, organic topsoil, any existing fill and any other deleterious materials should be removed from the fill area. The area to be filled should then be scarified, moistened if necessary, and compacted in the manner specified below prior to placement of subsequent layers of fill.

PLACEMENT OF FILL MATERIAL

The materials should be delivered to the fill in a manner which will permit a well and uniformly compacted fill. Before compacting, the fill material should be properly mixed and spread in approximately horizontal layers not greater than 8 inches in loose thickness.

MOISTURE CONTROL

While being compacted, the material should contain uniformly distributed moisture for compaction. The Contractor should be required to add moisture to the materials if, in the opinion of the Geotechnical Engineer, proper and uniform moisture is not being obtained for compaction. If the fill materials are too wet for proper compaction, aerating and/or mixing with drier materials may be required.

APPENDIX

SPECIFICATIONS FOR PLACEMENT OF STRUCTURAL FILL

Page 2

MOISTURE CONTROL (*continued*)

Moisture content should be controlled as a percentage deviation from optimum. Optimum moisture content is defined as the moisture content corresponding to the maximum density of a laboratory compacted sample performed according to ASTM D698 for cohesive soils or ASTM D1557 for granular soils. The moisture content specifications for the various areas are as follows:

	<u>Cohesive Soils</u>	<u>Granular Soils</u>
1. Beneath Structural Areas:	0 to +4%	-2 to +2%
2. Beneath Non-Structural Areas:	-3 to +3%	-3 to +3%
3. Moisture Treated Fill:	0 to +4%	-2 to +2%

COMPACTION

When the moisture content and conditions of each layer spread are satisfactory, it should then be compacted. Moisture-density tests should be performed on typical fill materials to determine the maximum density. Field density tests must then be made to determine fill compaction. The compaction standard to be utilized in determining the maximum density is ASTM D698 for cohesive soils or ASTM D1557 for granular soils. The following compaction specifications should be followed for each area:

1. Beneath Structural Areas:	95% of Maximum Dry Density
2. Beneath Non-Structural Areas:	90% of Maximum Dry Density
3. Moisture Treated Fill:	95% of Maximum Dry Density

Note: In areas where fill depths exceed 20 feet, additional compaction considerations will be required to reduce fill settlement. We recommend any fill placed within 20 feet of final subgrade elevation be compacted as required above, and that deeper fills be compacted to 100% of maximum dry density at a moisture content of ± 2 percent of optimum moisture content.

If the structural fill contains less than 10 percent passing the No. 200 sieve, it may be necessary to control compaction based on relative density (ASTM D2049). If this is the case, then compaction around the structures and beneath slabs should be to at least 70% relative density, and compaction beneath foundations and pavements should be to at least 80% relative density.

Any mention of essentially full-time testing and observation does not mean A. G. Wassenaar, Inc. (AGW) will accept responsibility for future fill performance. AGW shall not be responsible for constant or exhaustive inspection of the work, the means and methods of construction or the safety procedures employed by Client's contractor. Performance of construction observation services does not constitute a warranty or guarantee of any type, since even with diligent observation, some construction defects, deficiencies or omissions in the Contractor's work may occur undetected. Client shall hold its contractor solely responsible for the quality and completion of the project, including construction in accordance with the construction documents. Any duty hereunder is for the sole benefit of the Client and not for any third party, including the contractor or any subcontractor.

APPENDIX C

December 15, 2003

**ENVIRONMENTAL ASSESSMENT/HABITAT
CONSERVATION PLAN
FOR A PORTION
OF THE MEADOWS PROPERTY
DOUGLAS COUNTY, COLORADO**

Prepared for:

**United States Fish and Wildlife Service
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215**

Submitted by: Castle Rock Development Company

Prepared by:

**Athabasca Consulting, Inc.
Kaplan Kirsch & Rockwell L.L.P.**

December 15, 2003

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1.0 INTRODUCTION

The applicants, Castle Rock Development Company and Castle Rock Land Co. (together, "CRDC"), are planning to develop a commercial site on a portion of The Meadows community in Douglas County, Colorado (Figure 1, Vicinity Map). The total planning area (the "EA/HCP Property") is approximately 480 acres and is located just west of Interstate Highway 25, within the corporate boundaries of the Town of Castle Rock (Figure 2, EA/HCP Property). The EA/HCP Property straddles East Plum Creek drainage and is entirely contained within two major railway lines, with the exception of one small parcel. An existing bridge spans East Plum Creek and carries The Meadows Parkway as it crosses the EA/HCP Property on the southern (upstream) portion of the EA/HCP Property.

In accordance with the Endangered Species Act of 1973, as amended ("Act"), CRDC has applied for a section 10(a)(1)(B) incidental take permit ("ITP") from the U.S. Fish and Wildlife Service ("Service"). The requested permit would be valid for 30 years and authorize certain activities and resulting disturbances to, or loss of habitat that may result in take of, Preble's meadow jumping mouse ("Preble's") (*Zapus hudsonius preblei*), a federally-listed threatened species. Take is defined as conduct that actually or attempts to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a species. Harm in the definition of "take" in the Act means an act that actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Incidental take means any prohibited take that is incidental to, and not the purpose of, conducting otherwise legal activities.

This combined Environmental Assessment and Habitat Conservation Plan ("EA/HCP") provides the required National Environmental Policy Act ("NEPA") documentation for issuance of the ITP and a habitat conservation plan ("HCP") that describes how the proposed action would avoid, minimize, and mitigate the potential impacts to Preble's.

The purpose of the HCP process and the issuance of an ITP is to describe and authorize the underlying activities that result in take.

1.1 Background

The EA/HCP Property historically was a part of a working ranch until it was acquired by a master planned community developer in 1984. The EA/HCP Property originally was zoned by the Town of Castle Rock as part of The Meadows P.U.D. in 1984 (Ordinance 84-48), which P.U.D. was amended by an Amended Preliminary PD Plan for The Meadows dated September 1986 (Ordinance 86-42) (Figure 3-A) ("Third Amended PD Plan"). (The Town of Castle Rock Zoning Code now refers to planned unit developments as "planned developments" or "PDs"). The zoning for the EA/HCP Property was further amended in April 2003 at the request of the Applicants (the "Fourth Amended PD Plan") in a manner that reduced the density of development in The Meadows overall and made the zoning for the EA/HCP Property consistent with this HCP (See Figure 3-B).

In 1997, Castle Rock Land Co., LLC, a Colorado limited liability company, purchased The Meadows with the intent of having the property developed in accordance with the approved PD Plan. Castle Rock Development Company is authorized by Castle Rock Land Co. to process land use and other applications related to development of The Meadows and will acquire property at The Meadows prior to development. Castle Rock Land Co. and Castle Rock Development Company are applying for an ITP jointly and are referred to together as "CRDC" in this EA/HCP. CRDC has expended significant planning, legal, biological, engineering, and infrastructure dollars that relied on constructing residential, commercial, industrial, and office buildings within the framework of the approved PD Plan.

The Preble's was listed on May 13, 1998, as a threatened species by the Service. Since the listing, CRDC has sought the Service's advice and concurrence on all potential impacts to Preble's that may result from the development of the approved PD Plan. In June 1999, CRDC received concurrence from the Service that development of those

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portions of The Meadows other than the EA/HCP Property would not directly or indirectly affect Preble's or Preble's habitat. The area that is the EA/HCP Property did not receive concurrence from the Service and has been included in the ITP application and this EA/HCP.

Since the concurrence letter, CRDC has been actively participating in the formulation of the Douglas County sub-area regional planning process for Preble's. CRDC has attended meetings, made public statements in support of the planning efforts, reviewed draft documents, and reviewed and provided comments on the draft preserve maps. CRDC also has coordinated its ITP permit activities with Douglas County so that CRDC can design an individual EA/HCP that is consistent with the objectives of the County's sub-area regional plan.

For over three years, CRDC has been working with the Service to develop a plan that would minimize and avoid impacts to Preble's, and mitigate disturbance to Preble's habitat within the parameters of the Act. A variety of development plans and multiple avoidance, minimization, and mitigation strategies were discussed. The EA/HCP reflects those discussions.

1.2 Description of Requested Permit Activity

Development of the EA/HCP Property would involve four types of uses as shown on Figure 3. First, the Parcels designated as "COI" on Figure 3-B would be developed with office, commercial, and industrial uses as set forth on the Fourth Amended PD Plan. (Under the Third Amended PD Plan, almost all of Parcels IV-3 and IV-4, as shown on Figure 3-A, was designated for commercial development. Except for a small portion of Parcel IV-3 which would be dedicated as a road right of way, both of these parcels would be dedicated as open space as part of the mitigation in the HCP). Second, a total of 20 water wells (including well construction, pipe installation and operation, and maintenance) would be drilled over a period of 20 years to serve the entire Meadows community, with only two to three wells being developed at any one time. Sixteen of the

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twenty wells would be located within the riparian corridor, each permanently occupying a 40 ft. x 40 ft. area. The location and pumping rates for the wells are dictated by a water decree that was approved by the Colorado District Court, Water Division No. 1 (Case No. 85CW480, filed 1985). Third, a proposed trail system approximately two miles long would be built within the riparian corridor of the EA/HCP Property to serve as an upstream and downstream extension of the existing Town of Castle Rock trail system. The permanent trail would be approximately eight feet wide and would be improved with concrete.

Finally, an underground sanitary sewer line would be constructed within the Northeasterly portions of the COI Parcels located on the Southwesterly side of East Plum Creek, consisting of an 8" underground main, an above ground lift station, and a 24" underground main. Portions of these sewer facilities would be located in the uplands portion of the habitat Protection Zone (defined in Section 4.1 below) for the Preble's used in this EA/HCP.

With the exception of the water well development and trail development, virtually all proposed development will occur outside the riparian portion of the Protection Zone.

1.3 Permittees

The ITP would authorize the incidental take of Preble's by CRDC related to development of the EA/HCP Property. In addition, the ITP would cover the employees, agents, contractors, and licensees of CRDC. Activities by any of the above listed persons or entities related to the project and covered by this EA/HCP will not violate the prohibitions under 50 C.F.R. sec. 13.25 against permitted transfers. CRDC accepts and agrees to adhere to the requirements and conditions of the ITP and of this EA/HCP for implementing and managing the mitigation plan contained herein.

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1.4 Applicant's Qualifications

CRDC is not disqualified under any of the factors listed under 50 C.F.R. sec. 13.21.

1.5 Term

The duration of the requested ITP is 30 years from the date of issuance. This time frame will allow CRDC to take Preble's, either directly or through disturbances of actual or potential Preble's habitat, within the geographical boundaries identified in the requested permit over that period for those activities covered in this EA/HCP. After expiration of the ITP, any "take" within the geographic boundaries covered by the requested permit will require reauthorization by the Service, either through a subsequent permit application under section 10(a)(1)(B) of the Act for an incidental take or through other procedures adopted by the Service under section 4(d) of the Act. However, the terms and conditions contained in the EA/HCP shall not expire and shall be subject to the enforcement authority of section 11(b) of the Act.

1.6 Other Conditions

The ITP and the EA/HCP contained herein shall be subject to the conditions listed under 50 C.F.R. sec. 13.21(e).

ENVIRONMENTAL ASSESSMENT

2.0 PURPOSE AND NEED FOR ACTION

CRDC seeks the ITP to allow for the incidental take of Preble's, which has been documented to occur in the surrounding area. The implementation regulations for section 10(a)(1)(B) of the Act, as provided by 50 CFR 17.22, specify the criteria by which a permit allowing the incidental take of listed species pursuant to otherwise lawful activities may be obtained. The purpose for issuing the ITP and implementing the

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EA HCP is to authorize incidental take, including the potential disturbance to and loss of habitat potentially used by Preble's, during the permit duration for the construction of commercial office space, well structures, trail, and other related activities on the EA/HCP Property.

CRDC's need in requesting the ITP is to carry out the activities specified in Section 1.2 on the EA/HCP Property in compliance with the Act. The needs and goals of the Service are: (1) to insure that incidental taking resulting from the proposed development will be minimized and mitigated to the maximum extent practicable and will not appreciably reduce the likelihood of the survival and recovery of this listed species in the wild; and (2) to ensure compliance with the Act, NEPA, and other applicable Federal laws and regulations. This EA is intended to evaluate the environmental impacts of the issuance of the ITP and alternatives to the project.

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Vegetation

The EA/HCP Property is located in the foothills transition zone between the grasslands of the eastern Colorado plains and ponderosa pine forests to the west. The EA/HCP Property consists of two distinct vegetative communities: (1) the East Plum Creek drainage; and (2) upland areas on the eastern and western sides of the East Plum Creek drainage. The East Plum Creek drainage is a riparian corridor with a perennial stream meandering through dense to moderately dense interspersions of open grassy areas and woody vegetation, such as ponderosa pine (*Pinus ponderosa*), various willows (*Salix* spp.), alder (*Alnus tenuifolia*), dogwood (*Cornus* spp.), plains cottonwood (*Populus sargentii*), coyote willow (*Salix exigua*), and Gambel oak (*Quercus gambelii*). Shrub species, such as western snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), grass species such as bluestem (*Schizachyrium* spp.), and sedges (*Carex* spp.) all occur within the riparian corridor. The Colorado Natural Heritage Program ("CNHP") catalogs this habitat as *Salix Exigua*-Mesic Graminoid type.

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Adjacent upland sites are described by the presence of western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), smooth brome (*Bromus inermis*), yucca (*Campestris spp.*), and prickly pear cactus (*Opuntia phaeacantha*). Very few shrubs or trees exist in the upland areas.

Non-native plant species, such as cheat grass (*Bromus tectorum*) and Russian knapweed (*Acroptilon repens*), have invaded much of Douglas County and are significant components to the upland vegetation bordering East Plum Creek.

3.2 Wildlife

No animal surveys specifically designed to determine numbers and distribution of species within the EA/HCP Property appear to have been conducted. Species that have been observed or whose sign has been observed on the EA/HCP Property include great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), American goldfinch (*Carduelis tristis*), western bluebird (*Sialia currucoides*), common flicker (*Colaptes auratus*), belted kingfisher (*Ceryle alcyon*), great blue heron (*Ardea herodias*), cedar waxwing (*Bombycilla cedrorum*), horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), and red-winged blackbird (*Agelaius phoeniceus*). Some common riparian nesting bird species include the yellow warbler (*Dendroica petechia*), northern oriole (*Icterus galbula bullockii*), song sparrow (*Melospiza melodia*), and spotted sandpiper (*Actitis macularia*).

Mammals that may use riparian habitat and/or adjacent upland habitat along East Plum Creek include mule deer (*Odocoileus hemionus*), muskrat (*Ondatra zibethicus*), desert cottontail (*Sylvilagus audubonii*), red fox (*Microtus pennsylvanicus*), coyote (*Canis latrans*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), and deer mouse (*Peromyscus maniculatus*).

3.3 Threatened or Endangered Species

There is no evidence that any threatened or endangered species other than Preble's regularly utilize the EA/HCP Property as habitat.

Four federally-threatened or endangered terrestrial animal species are listed by the CNHP as potentially occurring in Douglas County. They are the bald eagle (*Haliaeetus leucocephalus*), Mexican spotted owl (*Strix occidentalis lucida*), Preble's, and the Pawnee montane skipper (*Hesperia leonardus Montana*). Currently there is no regularly known presence of bald eagles or Mexican spotted owls on the EA/HCP Property. The Pawnee montane skipper butterfly occurs in Douglas County but only within South Platte Canyon, no further south than the town of Deckers, and not below 6,200 feet (CNHP, 2001).¹

The Colorado state endangered plains sharp-tailed grouse (*Tympanuchus phasianellus jamesi*) is listed by CNHP as occurring in Douglas County. The grouse is a shrub-prairie ecotone species historically occurring along the foothills or along stream courses in the plains. There is no evidence that the sharp-tailed grouse exists on or uses the EA/HCP Property.

In 1999, the existence of a burrowing owl (*Athene cunicularia*) in a prairie dog colony decimated by sylvatic plague was confirmed 1 mile west of the EA/HCP Property (SWCA, 1999). Under state law, only the bird and not the prairie dog colony is protected. Since the owl is a migratory bird, it only inhabits areas such as The Meadows from early March to mid October at which time it flies south to warmer climates. According to the Colorado Division of Wildlife ("CDOW"), nesting habitat (prairie dog towns) can be destroyed while the owl is away from November 1st to February 28th. Construction during any other time of the year would require a survey to determine the presence of nesting owls. Should no owls be identified in the project area, the site would

¹ All referenced documents are available for review at the United States Fish and Wildlife Service, Ecological Services Field Office, 755 Parfet Street, Suite 361, Lakewood, CO.

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be cleared for construction. If owls are found, construction will be limited to the area outside of the 0.5 mile perimeter around the nest in accordance with state recommendations. No raptor nests, besides that of the burrowing owl, have been identified on the site; therefore, the impact to raptors is anticipated to be low to non-existent.

The Service requires surveys for the federally-threatened Ute ladies' tresses orchid (*Spiranthes diluvialis*) prior to disturbance within riparian areas, wet meadows, or flood plains along perennial tributaries of the South Platte River from the Front Range east to the town of Brush in Morgan County. This includes East Plum Creek. However, according to CNHP, the threatened Ute ladies' tresses orchid has not been identified in Douglas County (CNHP, 2001). Further, a survey of the EA/HCP Property in 1999 did not identify the Ute ladies' tresses orchid on the site (ERM, 2002a). The federally-listed Colorado butterfly (*Gaura neomexicana coloradensis*) is recorded as occurring in Douglas County but has not been documented since 1942 (CNHP, 2001).

Four species of fish are listed as Colorado state-threatened, endangered, or of concern: (1) the northern redbelly dace (*Phoxinus eos*), listed as endangered; (2) the common shiner (*Notropis cornutus*), listed as threatened; (3) the brassy minnow (*Hybognathus hankinsoni*), listed as threatened; and (4) the Iowa darter (*Etheostoma exile*), listed as of concern. There is no evidence of any of these species occurring anywhere in East Plum Creek running through or adjacent to the EA/HCP Property (CDOW, 2001).

The black-tailed prairie dog (*Cynomys ludovicianus*) was petitioned to be listed as an endangered species in March 1999. A black-tailed prairie dog town had been located over a mile from the EA/HCP Property, but was decimated by sylvatic plague (letter from Gary Hartzell, Tri-County Health Department, to Trent Miller (October 2, 1998) (see Attachment C). While the status of black-tailed prairie dog's locations and populations is currently unknown, the black-tailed prairie dogs could potentially return to the area in the future.

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The return of the black-tailed prairie dog could lead to the arrival of the black-footed ferret (*Mustela nigripes*). The black-footed ferret was listed as federally endangered in 1967 and is associated with the black-tailed prairie dog as a predator. The diets of black-footed ferrets consist almost exclusively of prairie dogs. However, a colony of black-tailed prairie dogs must be active and occupy at least 60 acres to support a black-footed ferret. Currently, no black-footed ferrets are known to exist in the area.

In March 2003, the northern pocket gopher was the subject of a listing petition for northern Douglas County. This species has never been reported on The Meadows property. Further, based on site visits and examination of soil maps and the soil requirements for the northern pocket gopher, this species is not expected on The Meadows.

Preble's is a closely related subspecies to other jumping mice commonly found in Colorado. Preble's is known to occur only in several places along the Front Range of Colorado and in only a few locations in Wyoming. On May 13, 1998, the Service listed Preble's as threatened under the Act.

Preble's is known to occur along East Plum Creek within the Town of Castle Rock. The Meadows lies within an area where Preble's presence has been documented. In Colorado and Wyoming, Preble's appears to inhabit areas below 7,600 feet in elevation, associated with moist lowlands with dense vegetation. Recent survey data indicates that Preble's may inhabit areas up to 7,600 and 8,000 feet in Colorado and Wyoming, respectively (Plage, 1999). Such areas include moist grassy fields, vegetation along streams, ponds, marshes, wetlands, riparian areas, and irrigation canals and ditches, as well as areas with rank herbaceous vegetation where tall shrubs provide adequate cover. Preble's also have been found in woody vegetation such as willows, ponderosa pine, alder, dogwood, birch, and Gambel oak. Additionally, Preble's are associated with indigenous and introduced mature dense tall grass species such as little bluestem and cheat grass. Loss of habitat has been attributed to the destruction of riparian corridors and the impounding of wetland areas from suburban development. According to the federal listing, Preble's is not found

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in highly disturbed areas, landscaped and maintained lawns, irrigation ditches with no vegetation channels where water is diverted underground, and sites that are maintained as cropland.

Regularly utilized habitat for Preble's is found within many riparian areas adjacent to Plum Creek, from its headwaters downstream towards its confluence with the South Platte River near Chatfield Reservoir. This includes East and West Plum Creeks. In areas along East Plum Creek (the approximate eastern boundary of The Meadows), biologists have trapped Preble's approximately one mile south of The Meadows, and approximately 3.25 miles north of The Meadows at the confluence of East and West Plum Creeks. Habitat types, including vegetation and cover, found at the general locations of the above-mentioned trapping sites, also are present at The Meadows. While suitable habitat exists along the entire East Plum Creek Corridor where it flows through The Meadows, no trapping has occurred along this stretch of the creek.

3.4 Wetlands

CRDC has no plans to conduct activities that would impact wetlands within the EA/HCP Property. Areas subject to jurisdiction under section 404 of the Clean Water Act include those areas that fall at or below "the plane of ordinary high water" of these waterways as defined by 33 CFR §323.2. Wetlands, adjacent to the creek, exist on the EA/HCP Property that meet the definition as defined by the criteria established in the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual (ERM, 2002a). However, these wetlands are small and scattered within the riparian area of the EA/HCP Property and CRDC plans to avoid them during construction of the water wells and associated piping. If planned activities would result in impacts to "waters," then CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

3.5 Geology/Soils

The site of The Meadows is underlain by sedimentary units of the upper Tertiary (Paleocene/Oligocene) age Castle Rock Conglomerate Member, of the Dawson Formation. This unit consists of claystones, siltstones, and light colored arkosic conglomerates, sandstones and gravels. Additionally, limestones, lignites and coals occur throughout the 300-1400 foot thickness of the unit (Chase/ McConaghy USGS Publication I-731, 1972). Alluvial material within drainages, including Plum Creek, is of Pleistocene and Holocene age (post Piney Creek). The geologic formations are highly permeable and often contain low levels of organic material. These conditions result in highly erodible, poorly vegetated soil.

The site of The Meadows contains the Larkson, Newlan, and Sampson soil Series according the U.S. Soil Conservation Service "Soil Survey of the Castle Rock Area, Colorado, 1977" publication.

3.6 Land Use

The EA/HCP Property is currently vacant land that is part of The Meadows master planned community. See Figures 2 and 3. The EA/HCP Property originally was zoned by the Town of Castle Rock as part of The Meadows P.U.D. in 1984 (Ordinance 84-48). The P.U.D. was amended by the Third Amended Preliminary PD Plan for The Meadows in September 1986 (Ordinance 86-42). The Third Amended PD Plan separates the EA/HCP Property into Parcels IV-1 through IV-8, as shown on Figure 3-A, as well as three unnamed open space parcels. The Third Amended PD Plan, as shown on Figure 3-A, designates Parcels IV-1 (102.0 acres), IV-2 (57.3 acres), IV-3 (25.5 acres) and IV-4 (11.1 acres) for industrial uses, which may include a wide variety of industrial uses identified in the Town of Castle Rock Zoning Code. Parcels IV-5 (30.9 acres), IV-6 (19.6 acres) and IV-7 (7.8 acres) are designated for office uses. A total of 243.7 acres of land on four parcels are designated as open space (only one, Parcel IV-8, is designated by parcel number).

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In September 2000, CRDC submitted an application for the Fourth Amended PD Plan, which was approved by the Town of Castle Rock in April 2003. The amendment changed the land use designations of the Parcels IV-1, IV-2, IV-5 and IV-6 to COI – commercial, office and industrial. This designation permits various light industrial and commercial uses on all of those parcels. While the revised zoning allows for more flexibility in developing the EA/HCP Property, it did not increase the total acreages of the development parcels or reduce open space.

3.7 Cultural Resources

The Office of Archaeology and Historic Preservation of the Colorado Historical Society has conducted a search of the Colorado Inventory of Cultural Resources using a legal description that is larger than, but encompassing, the EA/HCP Property. That search identified 9 sites (SDA.921.1, SDA.922.1, SDA.941, SDA.946, SDA.947, SDA.950, SDA.953, SDA.954 and SDA.955) and 9 surveys (DA.CH.9R19, DA.CH.R10, DA.CH.R11, DA.CH.R17, DA.CH.R24, DA.CH.R3, DA.EP.R1, MC.CH.R92, and MC.CH.R96) on the property included within the search. Two of the sites, the Denver and Rio Grande Railroad and the Atchison, Topeka and Santa Fe Railroad, were found to be adjacent to the EA/HCP Property (ERM 2002). A cultural resource survey of the EA/HCP Property concluded that the activities covered in the EA/HCP are not expected to affect the railroads (ERM 2002). The other seven sites were located outside and away from the EA/HCP Property and would not be affected by the proposed action. The cultural resource survey did not locate any other cultural resources that could be affected within the EA/HCP Property (ERM 2002).

3.8 Air Quality

Castle Rock is located in the Denver metropolitan attainment/maintenance areas for ozone, particulate matter smaller than 10 microns and carbon monoxide. The area is in attainment of all other National Ambient Air Quality Standards.

3.9 Water Resources and Water Quality

The riparian area associated with East Plum Creek winds through the easternmost part of The Meadows tract. Highly erosive soils have allowed the creek to pick its own course though the area, as is evident by the changing water channels. Sediments are transported naturally due to rainfall. Over time, the creek has eroded away enough soil to create the benches that sit over the present day creek. In more recent times, the creek has been relegated to changing courses within the area below the bench. This area along the creek bottom is dominated by plant species that depend on a year-round water source. Moving further away from the creek, up towards the top of the first bench and the bottom of the second, ponderosa pine becomes established. On the second bench, the riparian community ceases to exist.

Water quality on the proposed development site is presently considered to be good (personal communication, Eric Oppelt, Colorado Water Quality Control Division, May 13, 2002).

4.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section presents details of the proposed action and the reasonably practicable alternatives that have been considered. The alternatives include: (1) Proposed (Preferred) Action; (2) Alternate Site Design Based on Third Amended PD Plan; (3) Alternative Site Location; (4) Wait on a Regional 10 (A)(1)(B) Permit; and (5) No Action. The environmental consequences of these various alternatives are presented below in Section 5.0.

4.1 Methodology for Selection and Analysis of Alternatives

One of CRDC's objectives in developing the EA/HCP Property has been to protect the highest quality Preble's habitat in the most contiguous and complete fashion possible.

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Accordingly, as described in the EA/HCP, before determining the location and extent of development of the EA/HCP Property, CRDC analyzed three methods for delineating Preble's habitat, assessing take, and establishing avoidance, minimization, and mitigation strategies. The three methods were: (1) the initial draft section 4(d) rule regarding impacts to Preble's habitat; (2) the current unofficial policy utilized by the Service to determine Preble's habitat protection zones; and (3) a method similar to the one proposed by Douglas County in its draft sub-area Regional EA/HCP to determine Preble's habitat protection zones.

The three methods delineate three different zones of habitat protection for Preble's and assess take based on whether activities occur within or outside of the defined zone. First, the initial proposed 4(d) rule for Preble's, issued by the Service on December 4, 1998, attempted to establish Preble's habitat as being located 300 feet beyond the outside edge of the contiguous wetlands corridor in areas presumed to be occupied or probable habitat for Preble's. That protection zone, as it applies to the EA/HCP Property, is identified in Figure 4. Second, the current, unofficial Service protocol for Preble's establishes potential Preble's habitat as 300 feet beyond the outside edge of the 100-year floodplain. That protection zone, as it applies to the EA/HCP Property, is identified in Figure 5. Third, Douglas County has proposed in its draft sub-area Regional EA/HCP, that Preble's habitat would be located up to 100 feet beyond the outside edge of the contiguous riparian corridor. That protection zone (referred to in this EA/HCP as the Protection Zone), as it applies to the EA/HCP Property, is identified in Figure 6.

These three methods were evaluated with the goal of choosing the method that would delineate habitat and assess take in a manner that protects the highest quality habitat in the most contiguous and complete fashion possible. Accordingly, use of the section 4(d) rule as originally proposed in 1998, was rejected because it would allow significant destruction of riparian vegetation on the EA/HCP Property and would reduce the width of habitat and impair the viability of Preble's along this stretch of East Plum Creek corridor.

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A final special 4(d) rule was issued in May 2001 and will be in effect for 36 months. This rule defines conditions under which rodent control, agricultural operations, landscape maintenance, and other activities that could result in incidental take of Preble's are allowed. An amendment to the final special 4(d) rule was proposed on August 2001 and includes a range-wide exemption for noxious weed control and a limited exemption for customary ditch (man-made) maintenance activities. However, neither the final special 4(d) rule nor its proposed amendment establishes a definition of Preble's habitat.

The two other methods—the 100-year floodplain (plus 300 feet) method and the riparian corridor (plus 100 feet) method—were compared to determine which one had the highest potential to protect viable Preble's habitat. The Protection Zone will protect more potentially high quality riparian Preble's habitat (174.73 acres in the 100-year floodplain (plus 300 feet) methodology versus 188.12 acres in the riparian corridor (plus 100 feet) method), because riparian corridor vegetation sometimes extends outside of the 100-year floodplain protection zone and could be destroyed. Conversely, the areas not protected by the riparian corridor (plus 100 feet) method would be in open, grassy areas and usually separated from the riparian corridors by steep slopes. These areas are of lower potential value to the Preble's. Therefore, the riparian corridor (plus 100 feet) method was chosen as the method to delineate habitat and assess take because it was determined to protect higher quality vegetation in a more contiguous and complete fashion. CRDC then used this method to determine the extent and location of development on the EA/HCP Property.

4.2 Description of Alternatives

4.2.1 Alternative 1- Proposed (Preferred) Action

The proposed action is the issuance of a permit under section 10(a)(1)(B) of the Act to authorize the incidental take of Preble's during the development of the EA HCP Property as described in Section 1.2 and the HCP. To the greatest extent possible, development under this alternative would avoid disturbance of property that is located within the

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Protection Zone that is designated by the riparian corridor (plus 100 feet) methodology. In addition, this alternative would implement the mitigation plan that is described in the HCP. As more fully described in the HCP, that mitigation plan includes: (1) revegetation of areas within the Protection Zone that are temporarily disturbed by development in Parcel A and Parcel B as shown on Exhibit 3-B; (2) revegetation of all areas within the Protection Zone that are temporarily disturbed due to well or trail construction, using best management practices; (3) elimination of cattle grazing; (4) dedication of 42.85 acres of developable uplands for open space; (5) enhancement of an additional 10 acres of existing open space; and (6) providing instructions to construction personnel regarding protection of Preble's habitat.

4.2.2 Alternative 2 – Alternative Site Design Based Third Amended PD Plan

Under this alternative, CRDC would seek an incidental take permit to develop the EA/HCP Property in accordance with the Third Amended PD Plan for The Meadows, without attempting to minimize on-site disturbance to potential Preble's habitat. The sewer line would not be removed to avoid the riparian portion of the Protection Zone and the office, commercial, and industrial parcels would be developed without regard to the riparian corridor (plus 100 feet) line. The mitigation plan described in the HCP would not be implemented, therefore, no additional open space would be dedicated within the EA/HCP Property. Revegetation would occur only within the areas of temporary disturbance and cattle would continue grazing on the EA/HCP Property. Offsite mitigation would be necessary under this alternative because the development plans would cause fragmentation of the existing riparian corridor. However, offsite mitigation could be cost prohibitive and similar habitat is potentially unobtainable; therefore, this alternative is considered infeasible.

4.2.3 Alternative 3 – Alternative Site Location

Under this alternative, CRDC would seek an alternative site to develop the offices and other uses contemplated in Alternative 2 and to construct the water well facilities and

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sewer line to serve the Meadows community. However, the intent of CRDC is to provide water and sewer services to other property at The Meadows and to develop the EA/HCP Property in accordance with its overall development plans for The Meadows. There is no other location on The Meadows' property where sufficient water could be extracted or where sewer facilities could be placed to provide the required water and sewer service. The decree allowing the alluvial wells allows withdrawal only at the sites covered by the EA/HCP. Connection of existing Town of Castle Rock trails also drives the location of the proposed trails. Furthermore, it would not be economically practical for CRDC to purchase other property, even if it were available, to locate these facilities and development. Therefore, an alternative that involves another site location was determined to be impracticable.

Also, the EA/HCP Property is located within an active commercial area, and most of the vegetation on the site has been impacted by cattle grazing. Using an alternate site could result in a more pristine location being impacted. Moreover, the site's proximity to areas that can be enhanced to the benefit of Preble's creates an opportunity to increase quantity and quality of habitat for Preble's and other wildlife.

4.2.4 Alternative 4 – Wait on a Regional 10(A)(1)(B) Permit

Under this alternative, CRDC would wait for Douglas County to obtain a regional 10(A)(1)(B) permit from the Service and would develop the EA/HCP Property in accordance with the process and development regulations set forth in that permit. Douglas County currently is working to prepare a regional EA/HCP related to Preble's. However, there is no certainty as to whether and when such a regional EA/HCP would be completed and approved by the Service. Because of CRDC's timetables for development of The Meadows and the need to serve other property at the Meadows with water and sewer services, it was considered to be impracticable to wait for completion of the regional EA HCP to develop the EA HCP Property.

4.2.5 Alternative 5 – No Action

Under this alternative, CRDC would not develop the EA/HCP Property and the Service would not process an application for an ITP.

5.0 ENVIRONMENTAL CONSEQUENCES / ECOLOGICAL ASSESSMENT

The objective of the following environmental consequences analysis and ecological assessment is to evaluate the ecological effects of the various alternatives described in Section 4.0 above. The objective of the assessment is to identify whether any of those alternatives, in conjunction with any proposed mitigation activities, would have any significant impact on Preble's and other factors.

5.1 Alternative 1 – Proposed (Preferred) Action

5.1.1 Onsite Impacts

Although disturbances resulting from the development and construction on the EA/HCP Property will disturb vegetation onsite and reduce habitat for wildlife, including the potential destruction and degradation of Preble's habitat, implementation of the Alternative 1 is expected to offset such impacts and improve habitat for Preble's and other riparian-dependent wildlife.

5.1.1.1 Vegetation

Within the Protection Zone, Alternative 1 would remove or alter permanently a total of 8.64 acres of vegetation, and would temporarily alter an additional 24.87 acres of vegetation.

Within the portion of the Protection Zone that is riparian, 3.04 acres of permanent and 22.72 additional acres of temporary disturbance to vegetation will occur. These

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disturbances are related to water well construction and the extension of the existing trail system. During installation of each water well, a maximum of 200 ft. x 200 ft. of disturbance would occur. Some additional disturbances will occur in installing the water delivery system. All of these areas will be revegetated. Following installation of the water wells and revegetation of the temporarily disturbed areas, 40 ft. x 40 ft. of permanent disturbance would remain per water well. Of the twenty proposed water wells, a maximum of two to three wells and associated infrastructure would be constructed at a given time over a twenty-year period. Sanitary sewer lines would not be included within the riparian vegetation as proposed in Alternative 2.

Within the upland portion of the Protection Zone, a total of 5.59 acres of permanent and a total of 2.15 additional acres of temporary disturbance to vegetation will occur as a result of developing Parcels A and B. These two parcels lie within upland areas and are composed mainly of non-native heavily grazed grasses. However, Alternative 1 would modify existing approved plans and remove a large majority of all other development from the Protection Zone.

The quality of habitat within the upland zones is very low. The uplands are sparsely vegetated, with areas of 25% to 50% bare ground evident. Vegetation consists mostly of grasses and forbs less than 15 inches tall. Available grasses are sparse, but occasionally form small, thick bunches which could be valuable to the mouse as nesting sites. These areas are not considered optimal Preble's habitat.

Both the riparian and upland areas are currently exposed to cattle grazing, an activity that would be discontinued within the Protection Zone at the time of construction under this alternative. The absence of cattle grazing would enhance the establishment and proliferation of the native vegetation to be planted within the temporarily disturbed areas and the 10 acres in which CRDC will enhance existing vegetation as part of the HCP (see Section 6.5.2(3)). Additionally, the quality of habitat within the entire Protection Zone would be increased significantly through the discontinuation of cattle grazing. Increasing

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the quality of existing Preble's habitat could actually improve the viability of the riparian corridor beyond that of pre-development conditions.

5.1.1.2 Wildlife

Wildlife within those areas planned for development would largely be displaced to adjacent areas during the construction process. Such displacement could result in increased competition for breeding, nesting, and foraging habitat, as well as cover, in adjacent undisturbed habitat.

Within the Protection Zone, restoration identified in the HCP will replace 24.87 acres of temporarily disturbed vegetation. The 24.87 acres of temporarily disturbed vegetation and the 8.64 acres of permanently disturbed vegetation within the Protection Zone, will be mitigated through the dedication of 42.85 acres of open space plus an additional 10 acres of enhancement of existing open space, as well as the improvement of all of the open space through the removal of cattle. This will result in a total of 52.85 acres of mitigation, as well as the habitat improvement throughout the property resulting from the removal of the cattle. The 42.85 acres of new permanently dedicated open space will be in addition to the 237.49 acres of existing open space already included in the Third Amended PD Plan.

Within the areas that are outside the riparian corridor but within the Protection Zone, grassland specialists such as the horned lark may be displaced by proposed development. Undetermined effects associated with the promotion of urban wildlife species and human activities associated with the planned development may result in the decline of more specialized species in general.

5.1.1.3 Threatened or Endangered Species

5.1.1.3.1 Assessment of Take of Preble's

Preble's has been trapped above and below the EA/HCP Property along East Plum Creek. Based on results of previous Preble's surveys, the Service has determined that Preble's does occur within the riparian corridor along East Plum Creek, in the vicinity of the project.

Areas within the Protection Zone may be described as suitable foraging, breeding, and/or hibernating habitat for Preble's. The further the distance away from that zone, the potential for Preble's to regularly occur declines. Reasons for this decline are related to increased predation and decreased food source for Preble's.

Preble's habitat is primarily composed of broad, well-vegetated areas (SWCA, 1999). Higher quality habitat is typically found in broad, extensive drainage systems (riparian area extends at least 75 feet from the waters edge) that contain wetland herbaceous and shrub vegetation with very little bare ground. Higher quality habitat is found near open water and associated with wet meadows. Soils range from mesic to hydric. This habitat usually supports thickets of 4- to 7-foot tall coyote willow interspersed with other woody species such as peachleaf willow (*Salix amygdaloides*), western snowberry, alder, narrowleaf cottonwood (*Populus angustifolia*), and plains cottonwood (*Populus deltoids*). Adjacent slopes may contain dense interspersions of shrubby thickets, herbaceous patches, and grassy areas. Adjacent upland shrubs can include western snowberry, chokecherry, and Gambel oak, but species composition is variable throughout the range of the mouse. It is likely that Preble's habitat is not driven by the diversity of plant species, but by the density of riparian vegetation.²

² 67 Fed. Reg. 47,154 (July 17, 2002) (Proposed Designation of Critical Habitat for the Preble's).

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Moderate to lower quality habitat consists of densities of herbaceous vegetation and shrubs below approximately 75% cover. Bare ground may be between 25% and 50%, with mesic soil conditions. Adjacent upland slopes may be more open with very little shrub cover and some areas of dense grasses interspersed with patches of bare ground.

Sixty-percent of the riparian corridor within the EA/HCP Property consists of moderate to lower quality habitat. The discontinuation of cattle grazing on the EA/HCP Property could greatly improve these areas of lesser quality Preble's habitat. This improved habitat quality within the riparian corridor would provide increased viability and contiguity of the riparian corridor, potentially beyond pre-development conditions.

Development within the EA/HCP Area under Alternative 1 would permit development of approximately 199.25 acres of the total 479.59 acres in the plan area. However, Alternative 1 is only expected to result in permanent take of approximately 8.64 acres and additional temporary take of approximately 24.87 acres within the riparian corridor (plus 100 feet).

Of the acreage of take, 3.04 acres will be disturbed permanently and 22.72 acres will be disturbed temporarily within the riparian vegetation due to construction and use of the water well system and trail. Construction of the water wells and associated infrastructure would be such that a maximum of two to three wells would be constructed at a given time over a twenty-year period. In addition to phasing water well construction, project plans would further minimize disturbance by insuring that access roads necessary to install water wells follow existing trails whenever possible. These access roads would not be paved as they would in Alternative 2. The minimum amount of vegetation necessary for trucks to access the water well sites during construction would be removed and/or altered.

In addition, encroachment of noise and activity within close proximity to Preble's activity, introduction or increase of predator species (jays, magpies, and domestic cats), and increase of species that may compete with Preble's for resources (deer mice and other small rodents) are potential indirect impacts of adjacent development. To minimize

potential noise and activity disturbance, development activities within the riparian vegetation will be initiated between October and April, when Preble's is known to be hibernating. To minimize any potential for indirect impacts from increased predator species and increased populations of species that may compete with the Preble's for resources due to development, all trash receptacles within the EA/HCP Property will have tight-fitting lids and routine rodent control within buildings in the EA/HCP Property will be conducted.

A total of 5.59 acres will be disturbed permanently and an additional 2.15 acres will be disturbed temporarily within the upland areas of the Protection Zone due to development on Parcels A and B. Although development within Parcels A and B may impact some habitat occurring within the 100-foot set back, no development within these parcels would extend into the riparian corridor. Consequently, disturbances within Parcels A and B would not impact riparian vegetation.

5.1.1.3.2 Assessment of Take of Other Listed Species

No take is anticipated for any other federally-listed or proposed species within the Protection Zone. The EA/HCP Property has been evaluated for the presence of the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of potential use of the EA/HCP Property by Preble's, there is no evidence of any other threatened or endangered species on the EA/HCP Property. Thus, there appears to be little chance of onsite impacts to listed species other than Preble's.

5.1.1.4 Wetlands

Areas subject to section 404 of the Clean Water Act jurisdiction are limited to the existing East Plum Creek and adjacent riparian corridor. Runoff into this area is to be treated according to local regulations and the Environmental Protection Agency ("EPA") standards for nonpoint-source pollution and sedimentation prevention. Wetlands do exist on the EA/HCP Property that meet the definition as defined by the criteria established in

the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual. A wetlands and riparian corridor delineation study was conducted on East Plum Creek within the EA/HCP Property (ERM, 2002a). However, these wetlands are small and scattered within the riparian area of the EA/HCP Property and CRDC plans to avoid them during construction of the water wells and associated piping. If planned activities would result in impacts to "waters," then CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

5.1.1.5 Geology/Soils

No significant geologic alterations are anticipated from the proposed project. Some surface soil alterations will result from the proposed development. Best management practices will be utilized to attenuate any sediment transport during construction.

5.1.1.6 Land Use

Current and past land use trends in the vicinity of the EA/HCP Property are toward commercial use. The Town of Castle Rock Master Plan contemplates that the EA/HCP Property will be used for commercial purposes. In accordance with the Master Plan, the Town of Castle Rock has approved zoning for the entire Meadows development, which contemplates commercial use on the EA/HCP Property. Further, the portions of the EA/HCP Property that would be used for commercial purposes are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Location of the proposed water wells, sewer line and trail would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town of Castle Rock has anticipated and planned for commercial development on the EA/HCP Property and it is consistent with nearby development, Alternative 1 is not expected to have a significant impact on land use.

5.1.1.7 Cultural Resources

No impact to cultural resources is expected as a result of the project (ERM, 2002). To the extent that any cultural resources are identified during project development, CRDC would take appropriate steps to insure that any impacts to such resources are avoided or minimized to the greatest extent practicable.

5.1.1.8 Air Quality

The proposed development may contribute to increased local automobile traffic, which may increase traffic noise and exhaust emissions in the immediate area. A temporary increase of dust emissions and noise are expected during construction activities.

The Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current Regional Transportation Plan ("RTP") and Transportation Improvement Plan ("TIP") of the Denver Regional Council of Governments ("DRCOG"). DRCOG assessed conformity of the RTP and TIP with the State Implementation Plan ("SIP") for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because the project is included in the RTP and TIP, and because the RTP and TIP are in conformity with the SIP for carbon monoxide and particulate matter, the project is not expected to violate applicable air quality standards. Therefore, Alternative 1 is not expected to result in significant onsite impacts on air quality.

5.1.1.9 Water Resources and Water Quality

Surface waters would be directed to appropriate sedimentation facilities, consistent with Town of Castle Rock Public Works Regulations (effective Oct. 1998, reprinted Feb. 1999) stormwater requirements. During construction, best management practices would be utilized, including silt fences and rock berms, to capture and contain sediment transport. Access roads required for the construction of the water wells will follow the

existing trails and open areas wherever possible. The water delivery system will be installed along access roads to further minimize any permanent disturbance. Best management practices will ensure erosion and sediment transport will not be significantly increased during construction activities. Following construction, best management practices will be utilized to ensure the success of revegetated areas.

Sanitary sewer lines would be installed in upland zones, outside of the Protection Zone. Impacts due to maintenance, potential spills, and leaching would be away from the East Plum Creek bed and outside of the riparian corridor.

All proposed buildings would utilize best management practices to channel and detain runoff, as required by the Town of Castle Rock, including sediment traps that catch a high proportion of total suspended solids. Subsurface groundwater resources would be slightly altered by the construction of impervious cover in the form of roadways and building foundations. There could be an increase in sediment loading and other pollutants in surface water runoff; however, these increases would be mitigated by existing and planned sedimentation controls as required by the Town of Castle Rock.

5.1.2 Offsite Impacts

The proposed action will not result in any significant offsite impacts.

5.1.2.1 Vegetation

No offsite impacts to vegetation are expected due to the proposed development.

5.1.2.2 Wildlife

The proposed development plan may result in the reduction of overall habitat available to local offsite wildlife species. However, mitigation included in the HCP not only would

offset such habitat reduction, but also may increase the amount of quality habitat available to wildlife species.

Offsite impacts to wildlife include displacement of some species from proposed development areas, possible increase of generalist species, possible introduction and /or increase of predator species, and the reduction in overall habitat available to wildlife. Wildlife utilizing the subject lots would largely be displaced to adjacent areas, which could result in increased competition for nesting, foraging, and breeding habitat, as well as cover in general.

Urban development often results in increases in generalist species, or species that are successful within a wide range of habitats including human impacted areas. Increases in species that are habitat generalist (e.g., crows, jays, and deer mice) often occur at the expense of species with narrower habitat requirements. Possible introduction and/or increase of predators such as house cats, crows, and jays can have an impact on wildlife communities, particularly nesting birds.

5.1.2.3 Threatened or Endangered Species

Offsite impacts pertaining to endangered species may include a reduction in overall foraging and hibernation habitat for Preble's. However, implementation of the mitigation plan described in the HCP will minimize and mitigate potential onsite impacts, and may actually increase the amount of quality habitat available to Preble's.

5.1.2.4 Wetlands

Existing and proposed onsite sedimentation controls will minimize the amount of sediment introduced into downstream areas. No offsite impacts to wetlands are expected. However, if planned activities would result in offsite impacts to wetlands, CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

5.1.2.5 Geology/Soils

No offsite impacts to geologic or soil resources are expected to occur.

5.1.2.6 Land Use

No significant offsite impacts to existing or proposed land uses are expected to occur as a result of the proposed action.

5.1.2.7 Cultural Resources

No offsite impacts to cultural resources are expected.

5.1.2.8 Air Quality

Vehicle emissions and noise may increase slightly due to an increase in the number of vehicles in the area. The local increase may have minor effects on offsite air quality. However, the Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because the project is in the RTP and TIP, and because the RTP and TIP are in conformity with the SIP for carbon monoxide and particulate matter, the project is not expected to violate applicable air quality standards. Therefore, Alternative 1 is not expected to result in significant offsite impacts on air quality.

5.1.2.9 Water Resources and Water Quality

Offsite surface and groundwater resources are not expected to be impacted by this activity. Proposed water quality control devices are discussed in the onsite impacts

sections. Existing offsite water quality conditions are expected to be maintained by these control devices.

In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the proposed action should not result in a significant impact to water quality or quantity on East Plum Creek or groundwater resources.

In addition, utilizing stormwater runoff facilities to detain runoff prior to entering East Plum Creek would attenuate increases in water flow associated with increased impervious cover.

5.1.3 Cumulative Impacts Analysis

5.1.3.1 Vegetation

The proposed action would result in the permanent disturbance of 3.04 acres of riparian vegetation and 5.59 acres of upland vegetation. In addition to 8.63 acres of permanent disturbance, the proposed action also would result in the temporary disturbance of an additional 22.72 acres of riparian vegetation and 2.15 acres of upland vegetation. The 33.51 acres of temporarily and permanently disturbed vegetation would contribute to the cumulative disturbance of these vegetation types in Douglas County from development and other land use projects. However, at least 24.87 acres would be revegetated within the Protection Zone. Approximately 42.85 acres of Preble's habitat would be dedicated to an appropriate entity (approved by the Service) and set aside as open space, as further described in the HCP. In addition, ten acres of existing open space will undergo

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vegetation enhancement and all areas of the Protection Zone will experience improved vegetation conditions through removal of grazing cattle.

The Fourth Amended PD plan, as approved by the town of Castle Rock, identified a location for a potential future bridge approximately one mile Northwest of the existing Meadows Parkway Bridge as generally shown on Figure 3-B (the "Proposed Access Road"). If built, the Proposed Access Road would be built by the Town as a Town project, and CRDC would be required to fund a share of the construction costs. At this time it is not known if the Proposed Access Road will be built, and no final alignment or design for the proposed Access road has been developed. However, a preliminary analysis conducted by CRDC indicates that if the Proposed Access Road is built, it could have a potential permanent impact within the Protection Area of as much as 2.23 acres, and a potential temporary impact within the Protection Area of as much as 3.87 acres. These potential permanent and temporary impacts on the Protection Area are not addressed by this EA/HCP, and if the Town determines to move forward with construction of the Proposed Access road, it will be required to either pursue an amendment of this HCP, or process a separate HCP for the project. Construction of the Proposed Access Road would not be necessitated by anything in this HCP or an ITP based on it, nor would the Proposed Access road affect any of the areas of new dedicated open space or vegetation enhancement under this HCP.

While the uncertainties associated with a Proposed Access Road make it not reasonably foreseeable at this time, it would not be expected to contribute to any significant cumulative impacts. Because construction of the Proposed Access Road within the protection Area would require approval of either a new or amended HCP by the Service, avoidance, minimization and mitigation, significant cumulative impacts to vegetation and Preble's habitat is not expected.

5.1.3.2 Wildlife

The proposed action would contribute to a cumulative reduction of habitat for some wildlife species when added to impacts from development and other land uses in Douglas County. Wildlife species better adapted to urban and suburban habitat (generalists) may increase and exacerbate displacement of species intolerant to development, which may locally decrease. However, because a viable riparian corridor would be enhanced and maintained through mitigation, the overall cumulative effect is more likely positive for wildlife. Therefore, no significant cumulative impacts to wildlife species in Douglas County or the region are expected.

5.1.3.3 Threatened or Endangered Species

The proposed action may contribute to take of Preble's and/or its habitat in the region when added to section 10(a)(1)(B) incidental take permits that may be issued by the Service for other projects. However, any Preble's take or habitat loss that may occur in the short term by loss of riparian and upland habitat may be offset by increasing the quality of riparian habitat through mitigation. This could result in an increase in the number of Preble's on the EA/HCP Property.

5.1.3.4 Wetlands

No cumulative impacts to wetlands are anticipated. However, if any planned activities would result in cumulative impacts to wetlands, CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

5.1.3.5 Geology and Soils

No significant cumulative impacts to geology and soils would occur as a result of the proposed action.

5.1.3.6 Land Use

The proposed action contributes to the conversion of undeveloped land to developed land in the Town of Castle Rock. However, such development has been contemplated by the Town of Castle Rock in its Master Plan and land use approvals, as well as by DRCOG in its regional planning documents. Such additional development in the area of the Meadows would be consistent with and in proximity to development that has taken place or will take place regardless of the proposed federal action. The portions of the EA/HCP Property that would be used for commercial purposes are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Location of the proposed water wells, sewer line and trail would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town has anticipated and planned for development on The Meadows property, the development would exceed open space requirements in the Amended PD Plan, and the Town has planned for it to be consistent with nearby development, Alternative 1 is not expected to have significant cumulative impacts on land use.

5.1.3.7 Cultural Resources

The proposed development, due to its limited scope, would not result in cumulative impacts to cultural resources.

5.1.3.8 Air Quality

The proposed action will contribute to limited degradation of air quality in the Castle Rock area due to a slight increase in vehicle exhaust emissions. Continued development of the area could result in a cumulative impact on air quality. The Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that

emissions from motor vehicles were within limits set by the SIP for attainment. Because the project is included in the RTP and TIP, and because the RTP and TIP are in conformity with the SIP for carbon monoxide and particulate matter, the project is not expected to violate applicable air quality standards. Therefore, Alternative 1 is not expected to result in significant cumulative impacts on air quality.

5.1.3.9 Water Resources and Water Quality

The proposed action will cause some change in existing water quality. This change should not result in a significant cumulative impact to area water quality due to the limited size of the EA/HCP Property and proposed structures to minimize pollution from runoff. In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the proposed action should not result in a significant cumulative impact to water quality or quantity on East Plum Creek or groundwater resources.

5.2 Alternative 2 – Alternative Site Design Based on Third Amended PD Plan

5.2.1 Onsite Impacts

Disturbances resulting from the development and construction of the EA/HCP Property under this alternative will destroy vegetation onsite and reduce habitat for wildlife. This alternative is expected to cause potential destruction and degradation of Preble's habitat of 56.15 acres permanently and an additional 31.50 acres temporarily.

5.2.1.1 Vegetation

Under Alternative 2, significant grading operations and land development activities would occur within the Protection Zone. Within that zone, this alternative would remove or alter permanently a total of 56.15 acres of vegetation and would temporarily alter an additional 31.50 acres of vegetation.

In Alternative 2, temporary as well as permanent disturbances will occur within the Protection Zone. Initially, a 200 ft. x 200 ft. area would be disturbed to construct each water well. Paved and/or gravel roads would be installed wherever access is not possible by means of the existing trail. After initial construction, each water well would occupy 40 ft. x 40 ft. The habitat temporarily disturbed as a result of the installation of 20 water wells would be revegetated. Mitigation would occur offsite, so that the existing onsite riparian corridor would be fragmented under this alternative. Cattle grazing would not be eliminated under this alternative, so there would be less opportunity for enhancement of existing vegetation.

In addition to the construction of water wells, office, and industrial development plans, wastewater lines would account for additional disturbance within the riparian corridor. These disturbances would include the removal and/or significant alteration of shrubs and trees from the riparian corridor.

The upland areas to be altered within the Protection Zone are composed mainly of non-native heavily grazed grasses and would undergo permanent impact from the development. These upland zones are considered potential Preble's hibernating and/or foraging habitat. Permanent impacts would result from development within parcels IV-1, IV-2, IV-4, IV-5, IV-6, and IV-8.

5.2.1.2 Wildlife

Wildlife within those areas planned for development would largely be displaced to adjacent areas during the construction process. Such displacement could result in increased competition for breeding, nesting, and foraging habitat, as well as cover, in adjacent undisturbed habitat. Within the upland areas, grassland specialists such as the horned lark may be completely displaced by proposed development. Undetermined effects associated with the promotion of urban wildlife species and human activities associated with the planned development may result in the decline of more specialized species in general.

5.2.1.3 Threatened or Endangered Species

5.2.1.3.1 Assessment of Take of Preble's

Preble's has been trapped above and below The Meadows along East Plum Creek. Based on the results of previous Preble's surveys, the Service has determined that Preble's does occur within the riparian corridor along East Plum Creek, in the vicinity of the project.

Areas within the Protection Zone may be described as suitable breeding, nesting, foraging and/or hibernating habitat for Preble's. The further the distance away from that zone, the potential for Preble's to regularly occur declines. Reasons for this decline are related to increased predation and decreased food source for Preble's (SWCA, 1999).

Preble's habitat is primarily composed of broad, well-vegetated areas. Higher quality habitat typically is found in broad, extensive drainage systems (riparian area extends at least 75 feet from the waters edge) that contain wetland herbaceous and shrub vegetation with very little bare ground. Higher quality habitat is found near open water and associated with wet meadows. Soils range from mesic to hydric. This habitat usually supports thickets of 4 to 7-foot tall coyote willow interspersed with other woody species such as peachleaf willow (*Salix amygdaloides*), western snowberry, alder, narrowleaf

cottonwood (*Populus angustifolia*), and plains cottonwood (*Populus deltoids*). Adjacent slopes may contain dense interspersions of shrubby thickets, herbaceous patches, and grassy areas. Adjacent upland shrubs can include western snowberry, chokecherry, and Gambel oak, but species composition is variable throughout the range of the mouse. It is likely that Preble's habitat is not driven by the diversity of plant species, but by the density of riparian vegetation.

Moderate to lower quality habitat consists of densities of both the herbaceous vegetation and shrubs below approximately 75% cover. Bare ground may be between 25% and 50% with mesic soil conditions. Open water typically consists of a narrow creek with a narrow riparian area. Adjacent upland slopes may be more open with very little shrub cover and some areas of dense grasses interspersed with patches of bare ground.

The Third Amended PD Plan would permit development of approximately 256.3 acres of the total 479.59 acres in the plan area. Using the riparian corridor (plus 100 feet) method as a measure, Alternative 2 would result in permanent take of approximately 56.15 acres and an additional temporary take of approximately 31.50 acres due to construction of water wells and associated infrastructure, sanitary sewer lines, the trail, development drainage, and a lift station. The temporarily disturbed areas would be revegetated and the permanently disturbed areas would require offsite mitigation due to unavailability of onsite undeveloped land. Encroachment of noise and activity within close proximity to Preble's activity, introduction or increase of predator species (jays, magpies, and domestic cats), and increase of species that may compete with Preble's for resources (deer mice and other small rodents) are potential indirect impacts of adjacent development.

Sixty-percent of the riparian corridor within the EA HCP Property consists of moderate to lower quality habitat. Since this alternative would not include the discontinuance of cattle grazing, it is unlikely that any of this habitat would be improved over time.

5.2.1.3.2 Assessment of Take of Other Listed Species

No take is anticipated for any other federally-listed or proposed species within the Protection Zone. The EA/HCP Property has been evaluated for the presence of the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of potential use of the EA/HCP Property by Preble's, there is no evidence of any other threatened or endangered species on the EA/HCP Property. Thus, there appears to be little chance of onsite impacts to listed species other than Preble's.

5.2.1.4 Wetlands

Areas subject to section 404 of the Clean Water Act jurisdiction are limited to the existing East Plum Creek and adjacent riparian corridor. Runoff into this area is to be treated according to local regulations and EPA standards for nonpoint-source pollution and sedimentation prevention. Wetlands do exist on the EA/HCP Property that meet the definition as defined by the criteria established in the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual. A wetlands and riparian corridor delineation study was conducted on East Plum Creek within the EA/HCP Property to determine the best crossing location with the least environmental impacts (ERM, 2002a). If planned activities would result in impacts to "waters," CRDC would seek authorization from U.S. Army Corps of Engineers prior to conducting such activities.

5.2.1.5 Geology/Soils

No significant geologic alterations are anticipated from Alternative 2. Best management practices will be utilized to attenuate any sediment transport during construction. Some surface soil alterations will result from the proposed development.

5.2.1.6 Land Use

Current and past land use trends in the vicinity of the EA/HCP Property are toward commercial use. The Town of Castle Rock Master Plan contemplates that the EA/HCP Property will be used for commercial purposes. In accordance with the Master Plan, the Town of Castle Rock previously approved the Third Amended Preliminary PD Plan for the entire Meadows development, which contemplates commercial use on the EA/HCP Property. Further, the portions of the EA/HCP Property that would be used for commercial purposes under the Third Amended PD Plan are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Proposed water wells, sewer line, trail and other improvements would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town of Castle Rock has anticipated and planned for commercial development on the EA/HCP Property and it is consistent with nearby development, Alternative 2 is not expected to have a significant impact on land use.

5.2.1.7 Cultural Resources

No impact to cultural resources is expected as a result of Alternative 2 (ERM, 2002). To the extent that any cultural resources are identified during project development, CRDC would take appropriate steps to insure that any impacts to such resources are avoided or minimized to the greatest extent practicable.

5.2.1.8 Air Quality

Alternative 2 may contribute to increased local automobile traffic. This may increase traffic noise and exhaust emissions in the immediate area. A temporary increase of dust emissions and noise are expected during construction activities. However, the Meadows development was taken into account in the population forecasts for Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity

of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because development of the EA/HCP Property in accordance with Alternative 2 was included in the population forecasts in the RTP and TIP, and those plans are in conformity with the SIP for carbon monoxide and particulate matter, Alternative 2 is not expected to violate applicable air quality standards. Therefore, Alternative 2 is not expected to result in significant onsite impacts on air quality.

5.2.1.9 Water Resources and Water Quality

Surface waters will be directed to appropriate sedimentation facilities, consistent with Town of Castle Rock Public Works Regulations (effective Oct. 1998, reprinted Feb. 1999) stormwater requirements. During construction, best management practices would be utilized, including silt fences and rock berms to capture and contain sediment transport. Access roads required for the construction of the water wells will be paved and/or gravel except wherever existing trails are available. When possible, water pipes will be installed along roads to further decrease any permanent disturbance. Best management practices will ensure erosion and sediment transport will not be significantly increased during construction activities.

Sanitary sewer lines would gravity flow into the riparian corridor where a lift station would direct waste water to a water treatment plant downstream. Potential impacts to water quality within the Preble's habitat include maintenance issues, potential spills, and leaching.

All proposed buildings would utilize best management practices to channel and detain runoff, as required by the Town of Castle Rock, including sediment traps that catch a high proportion of total suspended solids. Subsurface groundwater resources will be slightly altered by the construction of impervious cover in the form of roadways and building foundations. There could be an increase in sediment loading and other pollutants in surface water runoff; however, these increases would be mitigated by

existing and planned sedimentation controls as required by the Town of Castle Rock. In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the alternative should not result in a significant impact to water quality or quantity on East Plum Creek or groundwater resources.

5.2.2 Offsite Impacts

Significant offsite impacts are not anticipated under this Alternative.

5.2.2.1 Vegetation

No offsite impacts to vegetation are expected due to proposed development.

5.2.2.2 Wildlife

Alternative 2 may result in the reduction of overall habitat available to local offsite wildlife species. Offsite impacts to wildlife include displacement of some species from proposed development areas, possible increase of generalist species, possible introduction and/or increase of predator species, and the reduction in overall habitat available to wildlife. Wildlife utilizing the subject lots would largely be displaced to adjacent areas, which could result in increased competition for nesting, foraging, and breeding habitat, as well as cover in general.

Urban development often results in increases in generalist species, or species that are successful within a wide range of habitats including human impacted areas. Increases in species that are habitat generalist (crows, jays, deer mice) often occur at the expense of

species with narrower habitat requirements. Possible introduction and/or increase of predators such as house cats, crows, and jays can have an impact on wildlife communities, particularly nesting birds. Therefore, the wildlife community of the offsite property could be impacted.

5.2.2.3 Threatened or Endangered Species

Offsite impacts pertaining to endangered species may include a reduction in overall nesting, foraging and hibernation habitat for Preble's.

5.2.2.4 Wetlands

Existing and proposed onsite sedimentation controls would minimize the amount of sediment introduced into downstream areas. No offsite impacts to wetlands are expected to occur.

5.2.2.5 Geology/Soils

No offsite impacts to geologic or soil resources are expected to occur.

5.2.2.6 Land Use

No offsite impacts to existing or proposed land uses are expected to occur as a result of the proposed action, except insofar as some existing habitat would be preserved or enhanced as offsite mitigation.

5.2.2.7 Cultural Resources

No offsite impacts to cultural resources are expected.

5.2.2.8 Air Quality

Vehicle emissions and noise may increase slightly due to an increase in the number of vehicles in the area. The local increase may have minor effects on regional air quality. However, the Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because development of the EA/HCP Property in accordance with Alternative 2 was included in the population forecasts in the RTP and TIP, and those plans are in conformity with the SIP for carbon monoxide and particulate matter, Alternative 2 is not expected to violate applicable air quality standards. Therefore, Alternative 2 is not expected to result in significant offsite impacts on air quality.

5.2.2.9 Water Resources and Water Quality

Offsite surface and groundwater resources are not expected to be impacted by this activity. Proposed water quality control devices are discussed in the onsite impacts sections. Existing offsite water quality conditions are expected to be maintained by these control devices.

In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the alternative should not result in a significant cumulative impact to water quality or quantity on East Plum Creek or groundwater resources.

5.2.3.4 Wetlands

No cumulative impacts to wetlands are anticipated. However, with any unexpected cumulative impacts to wetlands, CRDC would seek authorization from the U.S Army Corps of Engineers prior to conducting such activities.

5.2.3.5 Geology and Soils

No significant cumulative impacts to geology and soils would occur as a result of the proposed action.

5.2.3.6 Land Use

Current and past land use trends in the vicinity of the EA/HCP Property are toward commercial use. The Town of Castle Rock Master Plan contemplates that the EA/HCP Property will be used for commercial purposes. In accordance with the Master Plan, the Town of Castle Rock previously approved the Third Amended PD Plan for the entire Meadows development, which contemplates commercial use on the EA/HCP Property. Further, additional development in the Meadows would be consistent with and in proximity to development that has taken place or will take place regardless of the proposed federal action. The portions of the EA/HCP Property that would be used for commercial purposes are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Location of the proposed water wells, sewer line and trail would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town of Castle Rock has anticipated and planned for development on The Meadows property, the development would meet or exceed open space requirements in the Third Amended PD Plan, and the Town has planned for it to be consistent with nearby development. Alternative 2 would not be expected to have significant cumulative impacts on land use.

5.2.3.7 Cultural Resources

The proposed action will not result in cumulative impacts to cultural resources.

5.2.3.8 Air Quality

The proposed action will contribute to limited degradation of air quality in the Castle Rock area due to a slight increase in vehicle exhaust emissions. Continued development of the area could result in a cumulative impact on air quality. The Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because development of the EA/HCP Property in accordance with Alternative 2 was included in the population forecasts in the RTP and TIP, and those plans are in conformity with the SIP for carbon monoxide and particulate matter, Alternative 2 is not expected to violate applicable air quality standards. Therefore, Alternative 2 is not expected to result in significant cumulative impacts on air quality.

5.2.3.9 Water Resources and Water Quality

The proposed action will cause some change in existing water quality. This change should not result in a significant cumulative impact to area water quality due to the limited size of the EA/HCP Property and existing and proposed structures to minimize pollution from runoff.

In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and

non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the alternative should not result in a significant impact to water quality or quantity on East Plum Creek or groundwater resources.

5.3 Alternative 3 – Alternative Site Location

The intent of CRDC is to provide water and sewer services to other property at The Meadows and to develop the EA/HCP Property in accordance with its overall development plans for The Meadows. There is no other location on The Meadows' property where sufficient water could be extracted or where sewer facilities could be placed to provide the required water and sewer service. The decree allowing the alluvial wells allows withdrawal only at the sites covered by the EA/HCP. Connection of existing Town of Castle Rock trails also drives the location of the proposed trails. Furthermore, it would not be economically practical for CRDC to purchase other property, even if it were available, to locate these facilities and development. Therefore, an alternative that involves another site location was determined to be impracticable.

Also, the EA/HCP Property is located within an active commercial area, and most of the vegetation on the site has been impacted by cattle grazing. Using an alternate site could result in a more pristine location being impacted. Moreover, the site's proximity to areas that can be enhanced to the benefit of Preble's creates an opportunity to increase quantity and quality of habitat for Preble's and other wildlife.

5.4 Alternative 4 – Wait On a Regional 10(A)(1)(B) Permit

Douglas County currently is working to prepare a regional EA/HCP related to Preble's. However, there is no certainty as to when or whether such a regional EA/HCP would be completed and approved by the Service. Because of CRDC's timetables for development of The Meadows and the need to serve other property at the Meadows with water and sewer services, it was considered to be impracticable to wait for completion of the regional EA/HCP to develop the EA/HCP Property.

5.5 Alternative 5 – No Action

This alternative would not result in near-term disturbance of the portions of the EA/HCP Property proposed for development, nor the potential take of Preble's. However, it would not meet CRDC's objectives to provide water and sewer services to other property at The Meadows and to provide commercial or industrial development on the EA/HCP Property.

In addition, as the owner of the EA/HCP Property, CRDC is responsible for economic maintenance of the EA/HCP Property, including taxes and upkeep. The sale of the EA/HCP Property for purposes other than development is not economically feasible. Given the expenses already incurred by CRDC for the development of the EA/HCP Property, CRDC will suffer tremendous losses if prevented from developing the EA/HCP Property. Accordingly, this alternative was not considered to be practicable.

5.6 List of Preparers

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Sarah Rockwell, John Putnam, Kaplan Kirsch & Rockwell L.L.P.

James B. Borgel, Steiner, Darling & Hutchinson, L.L.P.

5.7 List of Agencies, Organizations and Persons Contacted

Aquatic & Wetlands Company

Bishop Brogden Associates, Inc., Water Consultants

City of Castle Rock

Colorado Division of Wildlife

Colorado Natural Heritage Program

Colorado Historical Society, Office of Archaeology and Historic Preservation

Denver Regional Council of Governments

Douglas County Open Space Attorney: Deb Freeman, Trout & Raley

December 15, 2003

Douglas County Open Space Director: Brooke Fox

Douglas County Regional EA/HCP Consultant: Steve Dougherty, ERO

Rocky Mountain Consultants

SWCA, Inc.

United States Fish and Wildlife Service: Kathleen Linder

United States Department of the Interior, Office of the Solicitor: Thomas Graf

December 15, 2003

**HABITAT CONSERVATION PLAN
FOR A PORTION
OF THE MEADOWS PROPERTY
DOUGLAS COUNTY, COLORADO**

Prepared for:

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Colorado Field Office
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Submitted by: Castle Rock Development Company

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December 15, 2003

6.0 HABITAT CONSERVATION PLAN

This section contains CRDC's proposed HCP related to the development of the portion of The Meadows community (Figure 1) that lies within and adjacent to Preble's habitat and is identified in Figure 2 (the "EA/HCP Property"). The goals of this HCP are to avoid and minimize impacts to Preble's habitat for the purposes of maintaining a viable Preble's habitat corridor. When Preble's habitat impacts were unavoidable, the mitigation strategy was designed to offset those disturbances and continue to maintain the viability of the Preble's habitat corridor. The proposed mitigation measures would actually improve the viability of the Preble's habitat corridor compared to existing conditions.

6.1 Methodology

Three methods were analyzed to determine the best way to delineate Preble's habitat, assess take, and establish avoidance, minimization, and mitigation strategies. The three methods were: (1) the initial draft Section 4(d) rule regarding impacts to Preble's habitat; (2) the current unofficial policy utilized by the Service to determine Preble's habitat protection zones; and (3) a method similar to the one proposed by Douglas County in its draft sub-area regional habitat conservation plan to determine Preble's habitat protection zones.

The three methods delineate three different zones of habitat protection for Preble's. First, the initial proposed 4(d) rule for Preble's, issued by the Service on December 4, 1998, attempted to establish Preble's habitat being located 300 feet beyond the outside edge of the contiguous wetlands corridor in areas presumed to be occupied or probable habitat for Preble's. That protection zone, as it applies to The Meadows, is identified in Figure 4. Second, the current, unofficial Service protocol for Preble's establishes potential Preble's habitat as 300 feet beyond the outside edge of the 100-year floodplain. That protection zone, as it applies to The Meadows, is identified in Figure 5. Third, Douglas County has proposed in its sub-area regional habitat conservation plan, that Preble's habitat would be

up to 100 feet beyond the outside edge of the contiguous riparian corridor. That Protection Zone, as it applies to The Meadows, is identified in Figure 6.

In analyzing these three methods, CRDC sought to choose the method that would delineate habitat and assess take in a manner that protects the highest quality habitat in the most contiguous and complete fashion possible. Accordingly, use of the draft Section 4(d) rule was rejected because it would allow significant destruction of riparian vegetation on the EA/HCP Property and would reduce the width of habitat and impair the viability of Preble's along this stretch of East Plum Creek corridor.

The two other methods—the 100-year floodplain (plus 300 feet) method and the riparian corridor (plus 100 feet) method—were compared to determine which one had the highest potential to protect viable Preble's habitat. The Protection Zone will protect more potentially high quality riparian Preble's habitat (174.73 acres in the 100-year floodplain (plus 300 feet) methodology versus 188.12 acres in the riparian corridor (plus 100 feet) method), because riparian corridor vegetation sometimes extends outside of the 100-year floodplain protection zone and could be destroyed. Conversely, the areas not protected by the riparian corridor (plus 100 feet) method would be in open, grassy areas and usually separated from the riparian corridors by steep slopes. These areas are of lower potential value to the Preble's. Therefore, the riparian corridor (plus 100 feet) method was chosen as the method to delineate habitat and assess take because it was determined to protect higher quality vegetation in a more contiguous and complete fashion.

6.2 Description of Project Activities

Selection of the riparian corridor (plus 100 feet) method caused CRDC to alter the development plans approved for the EA/HCP Property by the Town of Castle Rock to avoid and minimize impacts to habitat to the maximum extent possible. Accordingly, development of the EA/HCP Property would involve four types of uses as shown on Figure 3-B and Figure 7. First, the COI Parcels shown on Exhibit 3-B would be developed with office, commercial and industrial uses. Second, a total of twenty water

with very little bare ground. Higher quality habitat is found near open water and associated with wet meadows. Soils range from mesic to hydric. This habitat usually supports thickets of 4 to 7-foot tall coyote willow interspersed with other woody species such as peachleaf willow (*Salix amygdaloides*), western snowberry, alder, narrowleaf cottonwood (*Populus angustifolia*), and plains cottonwood (*Populus deltoides*). Adjacent slopes may contain dense interspersions of shrubby thickets, herbaceous patches, and grassy areas. Adjacent upland shrubs can include western snowberry, chokecherry, and Gambel oak, but species composition is variable throughout the range of the mouse. It is likely that Preble's habitat is not driven by the diversity of plant species, but by the density of riparian vegetation.

Moderate to lower quality habitat consists of densities of herbaceous vegetation and shrubs below approximately 75% cover. Bare ground may be between 25% and 50% with mesic soil conditions. Open water typically consists of a narrow creek with a narrow riparian area. Adjacent upland slopes may be more open with very little shrub cover and some areas of dense grasses interspersed with patches of bare ground.

Sixty-percent of the riparian corridor within the EA/HCP Property consists of lower to moderate quality habitat. The discontinuation of cattle grazing on the EA/HCP Property could greatly improve these areas of lesser quality Preble's habitat. This improved habitat quality within the riparian zone would provide increased viability and contiguity of the riparian corridor, potentially beyond pre-development conditions.

Adjacent upland sites are described by the presence of western wheatgrass, blue grama, smooth brome, yucca, and prickly pear cactus. Non-native plant species, such as cheat grass and Russian knapweed, have invaded much of Douglas County and are significant components to the upland vegetation bordering East Plum Creek. Virtually no shrubs or trees exist in the upland areas. The potential for suitable Preble's habitat within the uplands (beyond the 100-foot setback) is low to non-existent.

6.4 Determination of Incidental Take

Preble's presence has been established through state, federal and private trapping efforts upstream and downstream from the EA/HCP Property. In the areas along the East Plum Creek (the approximate east boundary of The Meadows), biologists have trapped Preble's approximately one mile south of The Meadows, and approximately 3.25 miles north of The Meadows at the confluence of East and West Plum Creeks. Habitat types, including vegetation and cover, found at the general locations of the above-mentioned trapping sites, also are present at The Meadows.

Construction activities will occur primarily in the daytime, when Preble's generally is not engaged in foraging and other activities that might bring it to the sites at The Meadows. Therefore, no direct take of individual Preble's by pursuit, hunting, shooting, wounding, killing, trapping, capturing, or collecting is anticipated as a result of the office, commercial, industrial or other development. Nevertheless, areas disturbed by development of the EA/HCP Property may constitute Preble's habitat. Thus, some modification or degradation of Preble's habitat may occur as a result of activity associated with completion of office, commercial, industrial or other development of the EA/HCP Property. Although not the intended purpose of the project, such potential harm of Preble's is prohibited as an unlawful take under section 9 of the Act and 50 CFR §17.3. The incidental take permit will allow for the destruction or degradation of any Preble's habitat included within the property disturbed as a result of completion of the project.

Almost all development would be located outside of the Protection Zone, thereby avoiding take of potential Preble's habitat to the greatest extent possible. However, a few activities would occur within the Protection Zone, resulting in a total of 8.63 acres of permanent habitat disturbance and an additional 24.87 acres of temporary habitat disturbance (Figure 7). First, Parcels A and B as described on Exhibit 3-B would be developed in the uplands area but within the 100-foot setback of the Protection Zone. Development of Parcels A & B would permanently disturb a total of 5.59 acres of habitat

and would temporarily disturb an additional 2.15 acres of habitat. However, development of Parcels A & B would not remove any riparian vegetation, except for a small trickle channel that would control the rate of stormwater runoff. The remaining development of Parcels A and B will be outside of the Protection Zone. Second, development of water wells, water delivery system and trail would occur within the riparian vegetation and result in 3.04 acres of permanent disturbance to Preble's habitat and an additional 22.72 acres of temporary disturbance. Initially, construction of each water well will disturb 200 ft. x 200 ft. within the riparian zone. Upon completion of each water well, 40 ft. x 40 ft. of permanent disturbance will remain.

6.5 Mitigation Plan

This section identifies the steps that CRDC would undertake to minimize any impacts on Preble's habitat, restore all areas of temporary disturbance and offset permanent impacts to habitat. As stated above, take would result from development of Parcels A and B (and associated wastewater and drainage improvements) on the upland areas but within the Protection Zone and development of a water delivery system and extension of the existing trail system within the riparian area. A total of 8.63 acres of permanent and an additional 24.87 acres of temporary disturbance of Preble's habitat would result from development of the EA/HCP Property. Development of the Parcels A and B and associated infrastructure would result in 5.59 acres of permanent and an additional 2.15 acres of temporary take. Development of the water system and trail system would result in 3.04 acres of permanent and an additional 22.72 acres of temporary take.

The following mitigation strategy has been developed to ensure that the take identified above will be incidental and that a viable Preble's habitat corridor will be maintained along East Plum Creek. To mitigate for the areas of temporary and permanent disturbance, 24.87 acres would be restored, and 52.85 acres will be set aside as mitigation (42.85 acres of additional open space plus an additional 10 acres of enhancement). Also, the discontinuation of cattle grazing on the EA/HCP Property will improve the quality of existing vegetation. This mitigation strategy, to the maximum extent practicable, will

minimize and mitigate the impacts of any incidental taking associated with development of the EA/HCP Property and will not appreciably reduce the likelihood of the survival and recovery of the species in the wild. Mitigation planning to offset take would be reviewed and authorized by the Service before implementing.

6.5.1 Minimization and Restoration

The CRDC will take the following steps to minimize the impacts from temporary and permanent disturbance to the Protection Zone and restore all temporary disturbances:

(1) Development of Parcels A and B (identified on Figure 7)

- (a) CRDC will revegetate areas that would be disturbed temporarily as a result of development of the trickle channel to provide drainage for Parcel B, as shown in Figure 7. Such revegetation will be accomplished consistent with the Restoration Plan provisions of Section 6.5.1(6).
- (b) CRDC will segregate the buildings within Parcels A and B from the riparian areas with barriers (which may include landscaping, fencing or berms) along the perimeter of the areas of permanent disturbance identified in Figure 7 and will revegetate any areas of temporary disturbance with native vegetation (i.e. grasses and shrubs) to minimize any indirect impacts from building within the Protection Zone. Such revegetation will be accomplished consistent with the Restoration Plan provisions of Section 6.5.1(6).
- (c) CRDC will cause all construction to be initiated between October 15 and April 30 of any year to minimize and avoid impacts to the Preble's.

(2) Development of Water Wells, Water Delivery System and Sewer System within the Protection Zone.

- (a) CRDC will only develop a maximum of three water wells at any time.
- (b) CRDC will insure that access to the well sites would be from existing concrete trails wherever possible. Where existing concrete trails are not available, access would be limited to essential vehicles.
- (c) CRDC will not pave any new well site access roads.
- (d) CRDC will maintain two-track vehicle access to the wells to allow essential operation and maintenance of the wells. CRDC will minimize the use of permanent fill for access roads to the extent possible, but may use fill when necessary to maintain year-round access and minimize erosion.
- (e) Wherever possible, CRDC will insure that access routes and water pipe installation would avoid highest densities of Preble's habitat.
- (f) CRDC will revegetate all areas of temporary disturbance. Such revegetation will be accomplished pursuant to the Restoration Plan provisions of Section 6.5.1(6).
- (g) CRDC will insure that all water system development occurs between October 15 and April 30 of any year. Development outside of this season may occur only when necessary to protect human health and safety.

(h) Development of no well site will result in the permanent removal or displacement of more than 1/10 acre of woody riparian vegetation or wetlands.

(i) Redrills of wells originally drilled under this HCP are a permitted activity under the HCP so long as all minimization and mitigation measures required in this HCP are undertaken and are completed before the ITP expires.

(3) Operation and Maintenance of Well System

(a) Following installation of the well system, CRDC will assign responsibility for operation and maintenance of the well system to the Town of Castle Rock.

(b) CRDC will comply with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, requiring that any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows.

(4) Construction and Maintenance of Trail Facilities within the Protection Zone

(a) CRDC will insure that all trail development activities occur between October 15 and April 30 to minimize impacts to the Preble's.

(b) The temporary and permanent loss of woody riparian vegetation will be minimized by utilizing existing trail routes for maintenance and by

designing trail extensions in efforts to avoid woody riparian vegetation.

- (c) Trail alignment will be designed to have minimal impact on the riparian zone. The alignment will be submitted to the Service for review and approval.
 - (d) Trail heads, parking areas, restrooms and other associated trail facilities will not occur within the Protection Zone.
 - (e) Trail width will not exceed 10 feet within the Protection Zone.
 - (f) CRDC will provide conspicuous signs at all trailheads indicating that recreational trail use must be limited to daylight hours.
 - (g) CRDC will provide conspicuous signs at all trailheads indicating that pets must be confined to trails and required to be on a leash of 8 feet or less at all times.
 - (h) Trails will be maintained to avoid erosion, sedimentation or other threats to habitat.
- (5) EA HCP Property Development Outside Protection Zone.

CRDC will install barriers, which may include landscaping, fencing or berms, between Preble's habitat and development outside of the Protection Zone to segregate anthropogenic activities from Preble's habitat.

(6) Revegetation Requirements

At least 30 days prior to undertaking any development within the Protection Zone that will involve temporary disturbances to vegetation, CRDC will submit a plan for revegetation of such disturbances (the "Restoration Plan") to the Service. The Restoration Plan(s) will contain a complete description of the steps CRDC will take to revegetate areas of temporary disturbance. The Restoration Plan(s) will meet the criteria and objectives for mitigation in Appendix A to the HCP, including species mix.

(7) Additional Best Management Practices for Activities in the EA/HCP Property

- (a) All disturbance associated with construction will be the minimum necessary.
- (b) All temporarily disturbed areas will be returned to preconstruction grades as much as reasonably possible.
- (c) Disturbance to woody riparian vegetation within the riparian zone will be minimized.
- (d) Any excess material brought on to any maintenance or construction site will be removed from the site following completion of construction or repair.
- (e) Use of temporary access roads will not exceed 200 days per calendar year. Temporary access roads may be reused for subsequent repairs, maintenance, and rehabilitation. The 200 day limit shall not apply to emergency access necessitated by threats to human health, safety, or the environment (e.g., sewer line leaks,

fires, injury, water main breaks, gas line leaks, or hazardous material spills).

- (f) All construction and maintenance personnel operating within the Permit Area will be provided with written and oral instructions on minimization and avoidance strategies to protect the Preble's, including relevant requirements of the Conservation Plan by a biologist or CRDC representative familiar with this EA/HCP and Preble's habitat within the EA/HCP Property. A biologist familiar with this EA/HCP and knowledgeable on Preble's ecology will monitor construction activities.

6.5.2 Habitat Enhancement

Because avoidance, minimization and restoration will not eliminate all impacts to habitat within the EA/HCP Property, CRDC will take the following steps to offset any permanent impacts and enhance the overall Preble's habitat within the EA/HCP Property. These steps will significantly improve Preble's habitat from existing conditions by improving the quality of and connections among Preble's habitat.

(1) Elimination of Cattle Grazing

Prior to development in the Protection Zone, CRDC will eliminate all cattle grazing in the Protection Zone (188.12 acres), as well as in the 42.85 acres of additional mitigation area identified in Figure 9.

(2) Dedication of Land for Open Space

CRDC will dedicate as permanent open space the property designated as open space in the Meadows Third Amendment PD Plan. See Figure 3-A. CRDC will further dedicate as permanent open space approximately 42.85 acres of open

space and developable uplands adjacent to the Protection Zone, identified on Figure 9, to minimize impacts from the development and enhance the viability of Preble's habitat in East Plum Creek by enlarging the width of undeveloped land along the drainage. Prior to development of the EA/HCP Property after issuance of the ITP, CRDC will execute a deed restriction or conservation easement, with the Service as a third-party beneficiary to ensure that this property will remain open space.

(3) Enhancement of Vegetation

Prior to commencing construction activities within Parcels A and B, or for new trail development or water well development within the Protection Zone, CRDC will initiate enhancement of approximately 10 acres of vegetation near Parcels A and B adjacent to the Meadows Parkway bridge to offset any direct or indirect permanent impacts resulting from the development of Parcels A and B, trail development or water well development within the Protection Zone. The 10-acre area for enhancement is shown in Figure 10. CRDC will submit a plan for vegetation enhancement of these 10 acres (the "Vegetation Enhancement Plan") to the Service for review and approval at least 60 days prior to commencing construction activities within Parcels A and B, or for new trail development or water well development within the Protection Zone. The Vegetation Enhancement Plan will contain a complete description of the steps proposed to be taken to enhance vegetation for the benefit of the Preble's. The Vegetation Enhancement Plan will meet the criteria and objectives for mitigation included in Appendix A to the HCP, including species mix. Revegetation and vegetation recovery resulting from elimination of cattle grazing shall be creditable towards meeting vegetation enhancement criteria and objectives. The Service will make all reasonable efforts to approve or deny the Vegetation Enhancement Plan within 30 days of receipt, and include detailed reasons for any denial. CRDC may submit drafts of the Vegetation Enhancement Plan to the Service prior to formal submittal.

6.6 Biological Goals and Objectives – Achieving Mitigation Plan Success

The biological goals and objectives of the mitigation plan and this EA/HCP for both restoration and enhancement activities are: (1) to avoid and minimize disturbance to Preble's habitat wherever possible; (2) to mitigate as much or more habitat for Preble's as the amount of potential habitat disturbed; and (3) to ensure population viability by maintaining habitat contiguity. The mitigation plan outlined in Section 6.5 above should be sufficient to achieve these biological goals and objectives. The mitigation plan is designed to ensure an adequate number of acres of habitat in a certain configuration, so that a viable corridor is maintained. Criteria for mitigation success are identified in Appendix A to this HCP and will be specifically defined in the Vegetation Enhancement Plan and Restoration Plan(s).

Revegetation required by this mitigation plan would follow commencement of construction in Parcels A and B, or of the water wells or trails, whichever comes first. CRDC would revegetate 100% of the area available for such revegetation in the restoration and enhancements areas to reestablish habitat. The revegetation will be such that if 70% or more of the vegetation planted survives and becomes established, sufficient habitat will have been restored and enhanced to meet the goals and objectives of this EA/HCP. Thus, the mitigation plan will have achieved success when 70% of the revegetated area is established with a mixture of the species listed in Appendix A.

6.6.1 Monitoring and Adaptive Management

6.6.1.1 Success Monitoring

Success will be monitored annually in the summer by CRDC for the first five-year period following implementation of mitigation described in any Vegetation Enhancement Plan or Restoration Plan. CRDC will be responsible for reseeding in order to achieve success, if success is not achieved by the end of the first five-year period. Monitoring will

continue for five years or until success is achieved, whichever is longer. Success will be measured by the use of photo point analysis and vegetation plots using statistically significant sample areas of each of the mitigation areas. The same sample areas will be used for all monitoring analysis. In conjunction with annual success monitoring, CRDC will submit simple, annual compliance reports to the Service regarding the implementation and success of this EA/HCP. Such reports also will detail any new disturbance of areas covered by the ITP during the preceding year. The Service shall have the right to visit and inspect the EA/HCP Property to insure compliance of this EA/HCP pursuant to 50 CFR § 13.21 (e)(1).

6.6.1.2 Adaptive Management

Because of its dependence on biological, climatic and other variable processes, the precise degree of vegetation enhancement attained through the mitigation plan involves some uncertainty. Accordingly, if success, as defined in each Vegetation Enhancement Plan or Restoration Plan, has not been achieved by the end of the monitoring period, CRDC will use alternative measures as part of a process of adaptive management to achieve success. Such alternative methods may include:

- i. Planted herbaceous vegetation may be replaced with material of the same species obtained from a nursery;
- ii. In the event that a second attempt of herbaceous planting does not succeed, plug transplants of adjacent native vegetation cover may be removed from any natural area and seeded with a native seed mix of the same species. A maximum of 10% of the vegetation cover may be removed from any natural area and seeded with a native seed mix of the same species;
- iii. If necessary, seeded areas may be reseeded to the standards indicated in the relevant Vegetation Enhancement and/or Restoration Plan(s); and
- iv. If necessary due to climatic conditions, supplemental watering would be undertaken.

6.6.1.3 Compliance Monitoring

All management, maintenance, and monitoring activities of the proposed mitigation procedures during the first five-year period (or until success as defined above is achieved) would be conducted by CRDC or its successor owners. Once the five-year period expires and success as defined above has been achieved, CRDC would retain the option of managing and maintaining the enhancement activities on all mitigated areas. However, CRDC would likely convey long term management of the areas to the Town of Castle Rock or another entity approved by the Service or utilize a conservation easement for the permanent maintenance, management, and monitoring of the areas. Proposed beneficiaries of the easement include: Douglas County Board of County Commissioners, Town of Castle Rock, and Douglas County Land Board. The Service will expressly allow CRDC to assign responsibility for any necessary monitoring, management, and maintenance activities to one or more of the above listed proposed beneficiaries.

6.6.2 Funding

Conservation planning requires sufficient funding be made available to implement the EA/HCP. CRDC will provide such funds as may be necessary to carry out its obligations under the EA/HCP. CRDC should notify the Service if CRDC's funding resources have materially changed, including a discussion of the nature of the change.

CRDC will further ensure that funding is available to meet its obligations under the Permit and the EA/HCP through accounts sufficient for this purpose. The account may be a trust account, irrevocable letter of credit, insurance or surety bond. Such accounts will contain provisions naming FWS as a beneficiary and allowing FWS to draw upon the account, if CRDC fails to undertake any of its mitigation obligations under this HCP, to the extent necessary to ensure that mitigation identified in this HCP is provided. Prior to disturbing any area in the Protection Zone for office, water well, water delivery system or trail development, CRDC will place or secure funds in an account sufficient to cover all

anticipated costs of monitoring and ensuring success of the Vegetation Enhancement Plan, as defined in Section 6.5.2(3). Such account will contain provisions to ensure that sufficient funds are available to ensure mitigation success as defined in the Vegetation Enhancement Plan. Such an account may also serve as security for other public entities, such as the Town of Castle Rock, so long as there are provisions sufficient to ensure adequate funding for the monitoring and mitigation success of the Vegetation Enhancement Plan. Such funding mechanisms will be maintained by CRDC for five years from the initiation of the mitigation under the Vegetation Enhancement Plan or until success is achieved as defined in the Vegetation Enhancement Plan.

Prior to causing any temporary disturbance in any area within the Protection Zone, CRDC will place or secure funds in an account sufficient to cover anticipated costs of implementing the relevant Restoration Plan pursuant to Section 6.5.1(6). Such account(s) will contain provisions to ensure that sufficient funds are available to ensure mitigation success as defined in the Restoration Plan(s). Such account(s) may also serve as security for other public entities, such as the Town of Castle Rock, so long as there are provisions sufficient to ensure adequate funding for mitigation success of the Restoration Plan. Each such funding mechanism will be maintained by CRDC for five years from the initiation of the mitigation activities under the Restoration Plan or until success is achieved as defined in the Restoration Plan(s).

6.6.3 Foreseeable Events

No significant impact to success of the mitigation plan is likely from foreseeable events such as a 500-year flood. Wildlife browsing on new plantings, particularly by mule deer and beaver will be prevented, if necessary, by putting wire cylinders and fencing around the susceptible vegetation. Additionally, revegetation will be biased towards plants unaffected by wildlife browsing. With respect to a 500-year flood, the types of planting contemplated by this mitigation plan, once established, should survive such a flood. If such a flood occurs prior to the conclusion of the first five-year period and destroys

significant portions of the plantings, success would be as defined in Section 6.6.1.1 above.

Owners of property surrounding the area covered by the EA/HCP, including both riparian and upland, are subject to all the requirements of the Act, which should adequately protect the biological integrity of the area that is revegetated.

6.6.4 Unforeseen Events

Reserves for future activities established as part of the account described in Section 6.6.2 above should be sufficient to provide for any necessary replanting in the event of any unforeseen circumstances. In the event of any unforeseen circumstances that interfere with success, CRDC will submit to the Service a supplemental Vegetation Enhancement Plan or Restoration Plan. Upon approval by the Service, the unforeseen circumstances will be remedied to the extent practicable by the means identified in the relevant Restoration Plan or Vegetation Enhancement Plan. In the event of unforeseen events, the Service shall not require the commitment of additional land or financial compensation beyond the level of mitigation otherwise provided in this EA/HCP, recognizing that the mitigation provided herein is adequate to provide for the conservation of Preble's. If additional mitigation measures are subsequently deemed by the Service to be necessary to provide for the conservation of Preble's, the obligation for such measures shall not rest with CRDC, unless CRDC consents to such measures.

The EA/HCP Property is not proposed for critical habitat designation. No additional requirements will be imposed on CRDC or the EA/HCP Property as a result of any such designation.

6.7 Amendment Procedure

It is necessary to establish a procedure whereby the Section 10(a)(1)(B) permit can be amended. However, it is important that the cumulative effect of the amendments will not

jeopardize any endangered species or other species of concern. Amendments must be evaluated based on their effect on the habitat as a whole. The Service must be consulted and agree on all proposed amendments.

6.7.1 Amendments to Development Plans

It is acknowledged that upon written request of CRDC, the local agency having land use regulatory jurisdiction over the EA/HCP Property is authorized in accordance with applicable law to approve amendments to development plans for the Property which do not result in the disturbance, degradation, destruction or take of any Preble's or other federally-listed threatened or endangered species habitat that is not contemplated to be taken as a consequence of the issuance of the ITP and the development of the Property and which do not alter the conditions set forth in this EA/HCP.

6.7.2 Minor Amendments to EA/HCP

Minor amendments involve routine administrative revisions or changes to the operation and management program and do not diminish the level or means of mitigation. Such minor amendments include corrections in land ownership, minor revisions to surveys, property descriptions, monitoring or reporting protocols, and minor changes in the boundaries of mitigation areas that result in no net loss of mitigation and do not otherwise alter the effectiveness of the EA/HCP. Such minor amendments do not alter the terms of the ITP. Upon the written request of CRDC, the Service is authorized to approve minor amendments to this EA/HCP, if the amendments do not conflict with the primary purpose of the EA/HCP as stated in Section 6.6 above.

6.7.3 All Other Amendments

All other amendments will be considered an amendment to the section 10(a)(1)(B) permit, subject to any other procedural requirements of federal law or regulation which may be applicable to the amendments of such a permit.

References:

Note: All referenced documents are available for review at the United States Fish and Wildlife Service, Ecological Services Field Office, 755 Parfet Street, Suite 361, Lakewood, CO.

Spackman, S. June 29, 2001. Personal Communication. Colorado Natural Heritage Program.

Chase, G.H. and McConaghy, J.A. 1972. USGS Publication I-731.

Environmental Resources Management. 2002. Limited Class II Archeological Reconnaissance Survey Habitat Conservation Plan Area.

Environmental Resources Management. 2002a. Wetlands Delineation within the Habitat Conservation Plan Area, The Meadows. Castle Rock, Colorado.

Nesler, D. July 9, 2001. Personal Communication. Colorado Division of Wildlife.

SWCA, Inc. Environmental Consultants and Stoecker, R. December 1999. Preble's Meadow Jumping Mouse Habitat Rating System.

Town of Castle Rock Public Works Regulations (effective Oct. 1998, reprinted Feb. 1999).

U.S. Soil Conservation Service. 1977. Soil Survey of the Castle Rock Area, Colorado.

APPENDIX A

Mitigation Plan Requirements, Criteria and Objectives

This appendix identifies the requirements, criteria and objectives of the mitigation plan for The Meadows pursuant to the Habitat Conservation Plan ("HCP"). The HCP proposes mitigation measures as compensation for unavoidable direct and indirect disturbances to Preble's habitat that will result from development of the site. The HCP would require that CRDC develop and initiate a Vegetation Enhancement Plan to mitigate permanent impacts associated with proposed development in the Protection Zone by enhancing vegetation on 10 acres of the HCP Property ("Enhancement Area") identified in Figure 10. The HCP also would require CRDC to develop and implement Restoration Plans to mitigate temporary impacts associated with development in the Protection Zone, including water well development, trail development, and office parcel development. CRDC will initiate the Restoration Plans associated with development of the water wells and associated utilities at the time each water well or group of water wells is installed.

The mitigation plan proposes to improve Preble's habitat in the Enhancement Area by removing livestock grazing, enhancing low-quality habitat, and conserving the existing high quality habitat within the East Plum Creek floodplain meadow and adjacent upland habitat. The areas that will be temporarily disturbed will be restored to the preexisting quality of habitat or better. Within the Protection Zone, 43.3 acres of developable uplands will be set aside as open space to mitigate for these temporary impacts. This open space is in addition to the 237.49 acres of existing open space already included in the Amended PD Plan. Because the wells will be installed as needed (maximum of three in any one given year over a period of several years), areas temporarily impacted by this activity will be restored as each individual well or group of wells is drilled. The ultimate goals of the proposed measures are to avoid, minimize, and mitigate any effects caused by the proposed Project.

1. Enhancement

The goal of the Vegetation Enhancement Plan will be to create a continuous and contiguous area of Preble's habitat connecting existing areas of non-contiguous Preble's habitat of high quality. See Section 6.3 of the EA HCP. Habitat is defined for purposes of this mitigation plan as: (1) a continuous area along the riparian corridor; (2) with ground cover provided by grasses, forbs, and shrubs; and (3) providing sources of food for the Preble's.

Enhancement activities will involve improving areas that are currently low- or moderate-quality Preble's habitat that would either benefit directly from improved habitat or in the expansion of dispersal routes and travel corridors. Enhancement opportunities exist within riparian upland transition zones to benefit Preble's habitat, water quality, and other wildlife by providing important ecotone habitat.

The Vegetation Enhancement Plan will increase Preble's habitat by utilizing native plant species management practices to control weeds and enhance plant community health. Exclusion of cattle will be used to improve Preble's habitat in the Enhancement Area. Minor grading and slope stabilization will be conducted within the stream corridor.

Disturbed, barren, or poorly diverse areas will be revegetated utilizing native seed mix and vegetation planting. The Vegetation Enhancement Plan will include a complete description of the revegetation plan based on the species found in Table 1. The goal of the Vegetation Enhancement Plan is to establish at least 75 percent ground cover (i.e. high quality Preble's habitat) utilizing native grasses, forbs, and shrubs. As indicated in the proposed designation of critical habitat, Preble's abundance is likely driven by the density of riparian vegetation rather than species diversity. Therefore, seeding and planting efforts will be designed to create a dense combination of native grasses, forbs, and shrubs in order to provide high quality Preble's habitat. If vegetation of the same species identified in Table 1 exists within the Enhancement Area at the time of the submission of the Vegetation Enhancement Plan, for example due to exclusion of cattle, CRDC may reduce the planting and seeding to reflect the extent of vegetation already in place.

Within 30 days of completion of the mitigation, as-built plans will be submitted to the Service. The as-built plans shall include final updated plans and specifications, photographs of completed work, number of each species planted, fertilizer used and dosage rates, dates planted and fertilized, and orientation of planting rows or description of plant groupings and spacing. Locations of photographs must be documented and plotted for replication during monitoring sessions.

2. Livestock Exclusion

Cattle are attracted to, and tend to loaf in, riparian areas, regardless of the availability or abundance of upland forage. Overgrazing of riparian vegetation makes stream banks more vulnerable to the destabilizing effects of livestock trampling and the erosive force of water, exposes soils to drying out by wind and sunlight, reduces water storage capacity of the riparian area, reduces shade and thereby increases stream water temperature, encourages invasion of undesirable plants, speeds up runoff, and reduces filtration of sediment necessary for building stream banks, wet meadows, and floodplains (EPA, 1993).

Over time, the presence of cattle within the riparian corridor of East Plum Creek has constricted the growth of vegetation and limited the quality and quantity of Preble's habitat. Within the Enhancement Area, CRDC will remove livestock as the initial stage of mitigation and will not reintroduce grazing activities. Exclusion of cattle will likely result in a significant improvement to the vegetative communities at the site. It is anticipated that these efforts will eventually lead to a successive state of healthy Preble's habitat within the East Plum Creek corridor.

Significant mitigation value can be achieved through the removal of cattle from the East Plum Creek riparian corridor. The benefits of cattle removal shall be considered in the Vegetation Enhancement Plan to be submitted by CRDC prior to any office parcel, new trail or water well development. To document the increase in mitigation value, the Vegetation Enhancement Plan, with input from the Service, shall identify the quantity and quality of Preble's habitat anticipated after a five-year period without livestock grazing on the site and account for such improvements in determining the extent of necessary supplemental plantings and seeding. The mitigation value would be documented before initiation of construction. Early removal of cattle from the mitigation areas, if applicable, shall also be considered in determining the extent of plantings and seeding necessary to meet the biological objectives of the Vegetation Enhancement Plan. An inventory of the habitat characteristics will be conducted to identify the percentages of ground cover and canopy, soil quality and composition, and the hydrology of the defined areas.

3. Restoration

Restoration will occur within areas that are temporarily disturbed due to the installation of alluvial wells, water lines, access roads, and extension of the existing trail system. After initial installation of the water wells, access roads will be used for maintenance. Access roads will undergo re-growth of native grasses, except to the extent that permanent fill may be required in some locations to provide year-round access and prevent erosion. The overall footprint required for the installation of each well is not to exceed 200 ft. x 200 ft. However, Restoration Plans will identify the precise area required for the trucks and machinery necessary to install each well within the footprint to avoid and minimize destruction of Preble's habitat to the maximum extent practicable. The permanent impact of each well is 40 ft. x 40 ft. The permanent impacts for the sixteen wells proposed within the Protection Zone total 0.59 acres, which will be mitigated by the 10 acres of enhancement.

An inventory of Preble's habitat characteristics will be conducted prior to any disturbance to identify the percentage of ground and canopy cover, soil quality and composition, and the hydrology of defined area. The inventory will include photographic documentation and be utilized as baseline data for restoration.

The temporarily disturbed areas due to the installation of the water lines, office development and the trail system will be restored. The Restoration Plan(s) shall include a depiction of the expected areas of disturbance, the inventory of habitat characteristics and specific plans for restoration (including planting and seeding plans). Restoration of the temporarily disturbed areas will involve the replanting of disturbed vegetation on the site and reconnection of any upstream or downstream connector routes that may have been interrupted. The replanting of disturbed vegetation will be equivalent to the preexisting species composition and densities. Restoration will be such that if 70 percent of the revegetation survive and become established, the temporarily disturbed areas will be restored to their preexisting vegetative composition and densities. Survival rates higher than 70 percent will yield a greater density of vegetation than previously existed. In

Pesticide Use

Application of pesticides (including herbicides) to control noxious plants, etc., may be necessary. Various inorganic insecticides with controlled application rates may be effective in controlling these plants without causing significant harm to other flora and fauna. Any use of these types of pesticides (including herbicides) will be conducted in coordination with the Service and other applicable agencies.

Pruning

All containerized and transplanted trees and shrubs will be cultivated and pruned as needed to remove dead or degraded plant material. Pruning will take place before or immediately after planting and as necessary (as identified during subsequent monitoring sessions) to maintain the health of the plant.

Wildlife Exclosures

Upon signs of wildlife depredation (presence of waterfowl, beaver activity or grazed vegetation) wildlife exclosure fencing or other measures shall be implemented immediately to protect the vegetation.

5. Achieving and Determining Success

Success criteria are intended to allow for the inherent variability of native habitat restoration and creation projects, provided that the end result is the creation of habitat that supports the life requisites of Preble's.

The techniques that will be utilized to achieve success will include a watering schedule, a pruning methodology to maintain health and habitat of the plants, control of weed and noxious plants, and the implementation of exclosures or other methods to protect from wildlife depredation.

Vegetation Enhancement Plan

The goal of the Vegetation Enhancement Plan will be to create a continuous and contiguous area of Preble's habitat connecting existing areas of non-contiguous Preble's habitat of high quality. See Section 6.3 of the EA HCP. Habitat is defined for purposes of this mitigation plan as: (1) a continuous area along the riparian corridor; (2) with ground cover of more than 75 percent provided by grasses, forbs, and shrubs; and (3) providing sources of food for the Preble's. The dominant herbaceous species shall consist of species specified in the Table 1, and the planted areas shall be relatively free of weeds and exotic, invasive species (i.e., less than 5 %).

Table 1: Riparian Zone Species List

Scientific Name	Common Name	Indicator Status
Herbaceous Species		
Grasses		
<i>Achnatherum hymenoides</i>	Indian ricegrass	FACU
<i>Andropogon gerardii</i>	big bluestem	FACU
<i>Andropogon hallii</i> var. Hack	sand bluestem	UPL
<i>Boutelous curtipendula</i>	side-oats grama	N/A
<i>Boutelous gracilis</i>	blue grama	N/A
<i>Calamovilfa longifolia</i>	prairie sandreed	FACU
<i>Elymus canadensis</i>	Canada wildrye	FACU
<i>Elymus lanceolatus</i> <i>dasystachyum</i>	thickspike wheatgrass	N/A
<i>Elymus elymoides</i>	bottlebrush squirreltail	N/A
<i>Festuca arizonica</i>	pinegrass	N/A
<i>Festuca longifolia</i>	hard fescue	FACU
<i>Koeleria macrantha</i>	prairie junegrass	N/A
<i>Panicum virgatum</i>	switchgrass	FAC
<i>Pascopyrum smithii</i>	western wheatgrass	N/A
<i>Poa secunda</i> (sandbergii)	Sandberg bluegrass	N/A
<i>Schizachyrium scoparium</i>	little bluegrass	UPL
<i>Sorghastrum nutans</i>	yellow Indian grass	N/A
<i>Sporobolus cryptandrus</i>	sand dropseed	N/A
<i>Stipa comata</i>	needle and thread	N/A
<i>Stipa viridula</i>	green needlegrass	N/A
Forbs		
<i>Achillea lanulosa</i>	western yarrow	FACU
<i>Liatris punctata</i>	dotted gayfeather	FACU
<i>Linum lewisii</i>	blue flax	UPL
<i>Oenothera pallida</i>	white evening primrose	N/A
<i>Ratibida columnifera</i>	prairie coneflower	N/A
<i>Rudbeckia hirta</i>	black-eyed susan	FACU
Riparian Wetland Species		
<i>Carex atrata</i>	black sedge	FACW
<i>Carex lanuginosa</i>	wooly sedge	OBL
<i>Carex nebrascensis</i>	Nebraska sedge	OBL
<i>Carex vulpinoidea</i>	fox sedge	FACW
<i>Carex hystericina</i>	porcupine sedge	OBL
<i>Distichlis spicata</i>	inland saltgrass	OBL
<i>Glyceria striata</i>	mannagrass	OBL
<i>Elymus elymoides</i>	bottlebrush squirreltail	FACU
<i>Juncus balticus</i>	Baltic rush	FACW
<i>Juncus confusus</i>	Colorado rush	FAC-
<i>Panicum virgatum</i>	switchgrass	FAC

<i>Sporobolus airoides</i>	alkali sacaton	FAC
<i>Triglochin maritimum</i>	Arrowgrass	OBL
Woody Species		
Trees		
<i>Acer negundo</i>	boxelder	FAC FACW
<i>Alnus incana</i>	thinleaf alder	FACW
<i>Betula occidentalis</i>	water birch	FACW
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	UPL
<i>Pinus ponderosa</i>	ponderosa pine	UPL
<i>Populus angustifolia</i>	narrowleaf cottonwood	FACU
<i>Populus deltoides</i>	plains cottonwood	FAC
<i>Populus tremuloides</i>	aspen	FAC
Shrubs		
<i>Prunus americana</i>	American Plum	FACU
<i>Prunus virginiana</i>	chokecherry	FACU
<i>Quercus gambelii</i>	Gambel Oak	UPL
<i>Rhus trilobata</i>	oakleaf sumac	UPL
<i>Ribes aureum</i>	golden currant	FACW
<i>Ribes cereum</i>	wax currant	UPL
<i>Rosa woodsii</i>	Wood's Rose	FACU
<i>Salix amygdaloides</i>	peachleaf willow	OBL
<i>Salix exigua</i>	coyote willow	OBL
<i>Salix monitecola</i>	mountain willow	OBL
<i>Symphoricarpos occidentalis</i>	common snowberry	UPL

Table 2: Upland Zone Species

Scientific Name	Common Name	Indicator Status
Herbaceous Species		
Grasses		
<i>Achnatherum hymenoides</i>	Indian ricegrass	FACU
<i>Andropogon gerardii</i>	big bluestem	FACU
<i>Andropogon hallii</i> var. Hack	sand bluestem	UPL
<i>Boutelous curtipendula</i>	side-oats grama	N/A
<i>Boutelous gracilis</i>	blue grama	N/A
<i>Calamovilfa longifolia</i>	prairie sandreed	FACU
<i>Elymus canadensis</i>	Canada wildrye	FACU
<i>Elymus lanceolatus</i> <i>dasystachyum</i>	thickspike wheatgrass	N/A
<i>Elymus elymoides</i>	bottlebrush squirreltail	N/A
<i>Festuca arizonica</i>	pinegrass	N/A
<i>Festuca longifolia</i>	hard fescue	FACU
<i>Koeleria macrantha</i>	prairie junegrass	N/A
<i>Panicum virgatum</i>	switchgrass	FAC
<i>Pascopyrum smithii</i>	western wheatgrass	N/A
<i>Poa secunda</i> (sandbergii)	Sandberg bluegrass	N/A
<i>Schizachyrium scoparium</i>	little bluegrass	UPL
<i>Sorghastrum nutans</i>	yellow Indian grass	N/A
<i>Sporobolus cryptandrus</i>	sand dropseed	N/A
<i>Stipa comata</i>	needle and thread	N/A
<i>Stipa viridula</i>	green needlegrass	N/A
Forbs		
<i>Achillea lanulosa</i>	western yarrow	FACU
<i>Liatris punctata</i>	dotted gayfeather	FACU
<i>Linum lewisii</i>	blue flax	UPL
<i>Oenothera pallida</i>	white evening primrose	N/A
<i>Ratibida columnifera</i>	prairie coneflower	N/A
<i>Rudbeckia hirta</i>	black-eyed susan	FACU
Woody Species		
Trees		
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	UPL
<i>Pinus ponderosa</i>	ponderosa pine	UPL
<i>Populus angustifolia</i>	narrowleaf cottonwood	FACU
<i>Populus deltoides</i>	plains cottonwood	FAC
<i>Populus tremuloides</i>	aspen	FAC
Shrubs		
<i>Prunus americana</i>	American Plum	FACU
<i>Prunus virginiana</i>	chokecherry	FACU

December 15, 2003

<i>Quercus gambelii</i>	Gambel Oak	UPL
<i>Rhus trilobata</i>	oakleaf sumac	UPL
<i>Ribes cereum</i>	wax currant	UPL
<i>Rosa woodsii</i>	Wood's Rose	FACU
<i>Symphoricarpos occidentalis</i>	common snowberry	UPL

DECLARATION OF USE RESTRICTIONS

THIS DECLARATION OF USE RESTRICTIONS (this "Declaration") is made as the date set forth below next to the signature of Declarant, as hereinafter defined, by and between **CASTLE ROCK LAND CO., LLC**, a Colorado limited liability company, whose address is 3033 East First Avenue, Suite 410, Denver, Colorado 80206, (hereinafter referred to as "Declarant") for the benefit of the **UNITED STATES FISH AND WILDLIFE SERVICE** (hereinafter referred to as "Service").

RECITALS

This Declaration is made with respect to the following facts:

WHEREAS, Declarant is the owner of certain real property located within the Town of Castle Rock, County of Douglas, State of Colorado (the "Property"); and

WHEREAS, the Preble's meadow jumping mouse ("PMJM") is listed as a threatened species under the United States Endangered Species Act ("ESA"). The ESA prohibits the unlawful take of PMJM; and

WHEREAS, Declarant anticipates that it will undertake certain activities on the Property which may impact PMJM habitat. As a result, Declarant has applied for and received from the Service an Incidental Take Permit under Section 10 of the ESA (the "Incidental Take Permit"); and

WHEREAS, the Habitat Conservation Plan approved by the Service in granting the Incidental Take Permit (the "HCP") requires that the temporary and permanent impacts of Declarant's activities within the Property be mitigated by (a) maintaining that portion of the Property which is more particularly described in Exhibit A, attached hereto and incorporated herein (the "Open Space Property") as open space; and (b) by adhering to the mitigation measures which are more particularly described in the HCP; and

WHEREAS, the HCP requires Declarant, prior to the development of any portion of the Property, to execute a deed restriction or conservation easement, with the Service as a beneficiary, to ensure that the Open Space Property shall remain as open space consistent with the terms and conditions of the HCP; and

WHEREAS, Declarant desires to establish the Restrictions, as hereinafter defined, on the Open Space Property, consistent with and in accordance with the terms and provisions of the

Incidental Take Permit and the HCP, as hereinafter set forth.

DECLARATION

NOW, THEREFORE, Declarant hereby declares that from and after the date of this Declaration, the Open Space property shall be owned, held, transferred, conveyed, sold, leased, rented, hypothecated, encumbered, used, occupied, maintained, altered and improved at all times subject to the Restrictions set forth in this Declaration, which are declared to be a part of, pursuant to, and in furtherance of a common and general plan for the improvement and development of the Open Space Property. The provisions of this Declaration are imposed as equitable servitudes upon the Open Space Property, and are intended to and shall run with the land and shall bind, be charged upon, and inure to the benefit of the Service, its successors and assigns.

RESTRICTIONS

I. Use Limitations.

Subject to the conditions and limitations set forth below, the Open Space Property shall be perpetually maintained in a scenic, natural or open condition, and shall be used only for purposes consistent with such limitation, including but not limited to the Permitted Uses and Practices set forth below. The Service shall have the right from time to time, upon reasonable prior written notice to Declarant and in a manner that will not unreasonably interfere with Declarant's use of the Open Space Property in a manner that is consistent with this Declaration, to enter upon the Open Space Property to inspect the Open Space Property and to enforce its rights under this Declaration.

II. Permitted Uses and Practices. Declarant shall have the right to use the Open Space Property for any use that is consistent with the foregoing obligation to maintain the Open Space Property in a scenic, natural or open condition. Without limiting the generality of the foregoing, Declarant shall further have the following specific retained rights with respect to the use of the Open Space Property:

2.1 Any and all uses of the Open Space Property permitted under the HCP, as amended from time to time, or as otherwise approved by the Service.

2.2 Maintenance, repair, replacement, removal and use of all fences, roads, trails and structures existing on the Open Space Property as of the date of this Declaration, substantially in their present condition and not to exceed their existing permanent footprint.

2.3 Installation, maintenance, repair, removal, relocation, and replacement of existing

drainage facilities and underground utility mains, lines and facilities for the purpose of providing utility services and drainage to or through the Open Space Property.

2.4 Weed control through the application of agrochemicals, including but not limited to fertilizers and biocides, but only in those amounts and with the frequency of application necessary to accomplish suppression of noxious weeds and maintenance or enhancement of PMJM habitat. Declarant shall have the right to control all noxious weeds on the Open Space Property according to the provisions of Title 35 of the Colorado Revised Statutes and/or any rules and regulations promulgated by the Commissioner of Agriculture of the State of Colorado, by the Board of County Commissioners of Douglas County, Colorado, or the Town Council of the Town of Castle Rock Colorado, or any other governmental agency having jurisdiction over the Open Space Property.

2.5 Control of predatory and problem animals by the use of techniques that will control specific animals or species which have caused or are likely to cause damage to the Open Space Property, provided that any such control techniques shall have no material adverse effect on the biological integrity of the Open Space Property as habitat for the PMJM.

2.6 Passive recreation, other than that permitted within the conditions identified within the Section 10(a) Incidental Take Permit, shall be permitted as long as those activities will have no material adverse effect on the biological integrity of Open Space Property as PMJM habitat.

2.7 Any use approved by the Town Council of the Town of Castle Rock and Service.

III. Prohibited Uses.

3.1 Except as otherwise provided in the HCP or the Incidental Take Permit, no alterations will occur in the Open Space Property that would have a material adverse impact on the biological integrity of the Open Space Property as PMJM habitat, including, but not limited to: (a) dumping or placing of soil, or other material, such as trash, on the Open Space Property; (b) mowing, removal or destruction of vegetation, except as otherwise set forth in Section 2.4, above; (c) excavation of soil; and (d) activities detrimental to flood control, water conservation or erosion control.

3.2 Free roaming pets, including but not limited to domestic cats and dogs, are prohibited on the Open Space Property.

IV. Enforcement.

4.1 The Service shall have the right to enforce the Restrictions set forth in this Declaration. The right of enforcement shall include only the right to bring an action for equitable

relief, including, without limitation, any action to enjoin any violation or specifically enforce the Restriction or other provision of this Declaration.

V. TERM

5.1 This Declaration shall be perpetual in duration.

VI. MISCELLANEOUS

6.1 This Declaration shall be binding upon Declarant and its successors in interest to the Open Space Property. The terms "Declarant" and "Service", whenever used herein, and any pronouns used in place thereof, shall mean and include the above-named Declarant and Declarant's successors, assigns and lessees, and the above-named Service and its successors and assigns, respectively.

6.2 If any provision of this Declaration or the application thereof to any person or circumstance is found to be invalid, the remainder of the provisions of this Declaration and the application of such provisions to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

6.3 This Declaration may be modified only by an instrument in writing, duly executed by the Service and the then current owner or owners of the entirety of the Open Space Property.

IN WITNESS WHEREOF, the Declarant has caused this Declaration to be duly executed this __ day of _____, 200 ____.

CASTLE ROCK LAND CO., LLC
a Colorado limited liability company

By: _____
Title: _____

STATE OF COLORADO

)

Attachment A
December 15, 2003

_____) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of _____, 200__, by
_____ as _____ of Castle Rock Land Co., LLC, a
Colorado limited liability company.

Witness my hand and official seal.

(S E A L)

Notary Public

My Commission Expires:

Attachment A
December 15, 2003

EXHIBIT A
Description of Open Space Property

(This form of LC is provided to the US Fish and Wildlife Service for informational purposes only. The funding mechanism to be provided by applicant at the time of construction may vary from this form of LC. Applicant's obligations to provide funding in the event that it should fail to undertake any of its mitigation obligations under the EA/HCP are more specifically addressed in Section 6.6.2 of the EA/HCP)

**Proposed Letter of Credit Form
Environmental Assessment/Habitat Conservation Plan for a Portion of the
Meadows Property, Douglas County, Colorado**

Standby Credit: _____

Date: _____

Beneficiaries:

United States Fish and Wildlife Service

Town of Castle Rock
100 North Wilcox St
Castle Rock, Colorado 80104

Applicant:
Castle Rock Development Company
3033 East First Avenue, Suite 410
Denver, Colorado 80206

Gentlemen:

We hereby issue our irrevocable credit no. _____ in your favor for the account of
Castle Rock Development Company for an amount or amounts not to exceed
_____ (\$_____.00) available by your drafts at sight on
_____. effective _____ and expiring at our counters on _____.

Funds under this credit are available against drafts mentioning our credit number.

The below mentioned documents must be presented at sight on or before the expiry
date on this instrument in accordance with the terms and conditions of this letter of
credit.

Attachment B
December 15, 2003

Your signed and dated statement, reading as follows: "Castle Rock Development Company is in default of its mitigation obligations under the Environmental Assessment/Habitat Conservation Plan for a Portion of the Meadows Property, Douglas County, Colorado (the "EA/HCP")."

We engage with you that drafts drawn under and in conformity with the terms of this credit will be duly honored on presentation if presented on or before the expiry date. The original letter of credit must accompany the documents required under this credit.

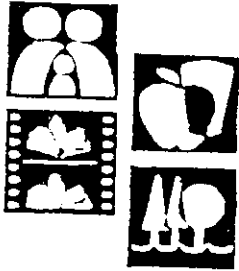
It is a condition to this credit that it shall be automatically renewed for additional periods of one (1) year from the present or any future expiration date unless at least sixty days prior to such expiration period we notify you, in writing, that we elect to not renew this letter of credit for such additional periods. Upon receipt of that notice you have the right to draw against the amount available under this credit by presentation of your clean sight draft, without any accompanying statement.

This credit is subject to the Uniform Customs and Practices for Documentary Credits (1993 revision), International Chamber of Commerce Publication 500.

Please address all correspondence regarding this letter of credit to the attention of our letter of credit unit, trade service group, mentioning our reference number as it appears above.

Very truly yours,
Name of Bank

Authorized Signer



Tri-County Health Department

Serving Adams, Arapahoe and Douglas Counties

Chris J. Went, M.P.H., Ph.D.
Executive Director

October 2, 1998

SWCA Inc., Environmental Consultants
Attn: Trent A. Miller
1155 Sherman Street, Suite 215
Denver, CO 80203

RE: Prairie Dog Die-Off
Meadows Subdivision

Dear Mr. Miller:

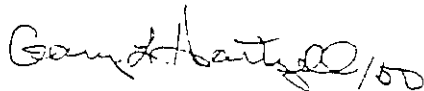
On August 10, 1998, this department received a complaint concerning a possible prairie dog die-off in the Meadows Subdivision in Douglas County. An investigation was conducted that same day, thus confirming the complaint. Staff members did not see any activity at any prairie dog burrows throughout the community.

Fleas were collected at selected burrow entrances and submitted to CDC for plague testing. On August 21, we were notified that the flea pool was positive for plague.

During the interim between investigation and confirmation, representatives of this department notified residents, posted the sites as possible plague presence, and dusted the burrows.

I hope this letter will assist you. If I can be of further assistance, please call this office.

Sincerely,



Gary L. Hartzell
Environmental Health Field Supervisor

GLH/bd

enc: CDC confirmation

Fifty years of working to **50** improve the public's health

101 Third Street ☐ Castle Rock, Colorado 80104-2428
303-663-7650 ☐ FAX 303-688-8870

DECLARATION OF USE RESTRICTIONS

THIS DECLARATION OF USE RESTRICTIONS (this "Declaration") is made as the date set forth below next to the signature of Declarant, as hereinafter defined, by and between **CASTLE ROCK LAND CO., LLC**, a Colorado limited liability company, whose address is 3033 East First Avenue, Suite 410, Denver, Colorado 80206, (hereinafter referred to as "Declarant") for the benefit of the **UNITED STATES FISH AND WILDLIFE SERVICE** (hereinafter referred to as "Service").

RECITALS

This Declaration is made with respect to the following facts:

WHEREAS, Declarant is the owner of certain real property located within the Town of Castle Rock, County of Douglas, State of Colorado (the "Property"); and

WHEREAS, the Preble's meadow jumping mouse ("PMJM") is listed as a threatened species under the United States Endangered Species Act ("ESA"). The ESA prohibits the unlawful take of PMJM; and

WHEREAS, Declarant anticipates that it will undertake certain activities on the Property which may impact PMJM habitat. As a result, Declarant has applied for and received from the Service an Incidental Take Permit under Section 10 of the ESA (the "Incidental Take Permit"); and

WHEREAS, the Habitat Conservation Plan approved by the Service in granting the Incidental Take Permit (the "HCP") requires that the temporary and permanent impacts of Declarant's activities within the Property be mitigated by (a) maintaining that portion of the Property which is more particularly described in Exhibit A, attached hereto and incorporated herein (the "Open Space Property") as open space; and (b) by adhering to the mitigation measures which are more particularly described in the HCP; and

WHEREAS, the HCP requires Declarant, prior to the development of any portion of the Property, to execute a deed restriction or conservation easement, with the Service as a beneficiary, to ensure that the Open Space Property shall remain as open space consistent with the terms and conditions of the HCP; and

WHEREAS, Declarant desires to establish the Restrictions, as hereinafter defined, on the Open Space Property, consistent with and in accordance with the terms and provisions of the Incidental Take Permit and the HCP, as hereinafter set forth.



45011380

Declaration.jbb.091704.doc

DECLARATION

NOW, THEREFORE, Declarant hereby declares that from and after the date of this Declaration, the Open Space property shall be owned, held, transferred, conveyed, sold, leased, rented, hypothecated, encumbered, used, occupied, maintained, altered and improved at all times subject to the Restrictions set forth in this Declaration, which are declared to be a part of, pursuant to, and in furtherance of a common and general plan for the improvement and development of the Open Space Property. The provisions of this Declaration are imposed as equitable servitudes upon the Open Space Property, and are intended to and shall run with the land and shall bind, be charged upon, and inure to the benefit of the Service, its successors and assigns.

RESTRICTIONS

I. Use Limitations.

Subject to the conditions and limitations set forth below, the Open Space Property shall be perpetually maintained in a scenic, natural or open condition, and shall be used only for purposes consistent with such limitation, including but not limited to the Permitted Uses and Practices set forth below. The Service shall have the right from time to time, upon reasonable prior written notice to Declarant and in a manner that will not unreasonably interfere with Declarant's use of the Open Space Property in a manner that is consistent with this Declaration, to enter upon the Open Space Property to inspect the Open Space Property and to enforce its rights under this Declaration.

II. Permitted Uses and Practices. Declarant shall have the right to use the Open Space Property for any use that is consistent with the foregoing obligation to maintain the Open Space Property in a scenic, natural or open condition. Without limiting the generality of the foregoing, Declarant shall further have the following specific retained rights with respect to the use of the Open Space Property:

2.1 Any and all uses of the Open Space Property permitted under the HCP, as amended from time to time, or as otherwise approved by the Service.

2.2 Maintenance, repair, replacement, removal and use of all fences, roads, trails and structures existing on the Open Space Property as of the date of this Declaration, substantially in their present condition and not to exceed their existing permanent footprint.

2.3 Installation, maintenance, repair, removal, relocation, and replacement of existing drainage facilities and underground utility mains, lines and facilities for the purpose of providing utility services and drainage to or through the Open Space Property substantially in their present condition. The foregoing notwithstanding, the planned sanitary sewer line that is located in the northwesterly portion of the area subject to the HCP, as generally depicted in Figure 7 of the HCP, shall be deemed an existing utility for purposes of this Section 2.3, provided that at the time such line is constructed, any disturbance to the Open Space Property shall be restored, using

native vegetation, to the grade and condition it was in immediately prior to said construction except as may be necessary to accommodate any above ground appurtenances associated with the sewer line (such as, by way of example but not limitation, manholes), substantially in accordance with the provisions of the HCP.

2.4 Weed control through the application of agrochemicals, including but not limited to fertilizers and biocides, but only in those amounts and with the frequency of application necessary to accomplish suppression of noxious weeds and maintenance or enhancement of PMJM habitat. Declarant shall have the right to control all noxious weeds on the Open Space Property according to the provisions of Title 35 of the Colorado Revised Statutes and/or any rules and regulations promulgated by the Commissioner of Agriculture of the State of Colorado, by the Board of County Commissioners of Douglas County, Colorado, or the Town Council of the Town of Castle Rock Colorado, or any other governmental agency having jurisdiction over the Open Space Property.

2.5 Control of predatory and problem animals by the use of techniques that will control specific animals or species which have caused or are likely to cause damage to the Open Space Property, provided that any such control techniques shall have no adverse effects on the biological integrity of the Open Space Property as habitat for the PMJM.

2.6 Passive recreation, other than that permitted within the conditions identified within the Section 10(a) Incidental Take Permit, shall be permitted as long as those activities will have no adverse effects on the biological integrity of the Open Space Property as PMJM habitat.

2.7 Any use approved by the Town Council of the Town of Castle Rock and Service.

III. Prohibited Uses.

3.1 Except as otherwise provided in the HCP or the Incidental Take Permit, no alterations will occur in the Open Space Property that would have a material adverse impact on the biological integrity of the Open Space Property as PMJM habitat, including, but not limited to: (a) dumping or placing of soil, or other material, such as trash, on the Open Space Property; (b) mowing, removal or destruction of vegetation, except as otherwise set forth in Section 2.4, above; (c) excavation of soil; and (d) activities detrimental to flood control, water conservation or erosion control.

3.2 Free roaming pets, including but not limited to domestic cats and dogs, are prohibited on the Open Space Property.

IV. Enforcement.

4.1 The Service shall have the right to enforce the Restrictions set forth in this Declaration. The right of enforcement shall include only the right to bring an action for equitable relief, including, without limitation, any action to enjoin any violation or specifically enforce the Restrictions or other provisions of this Declaration.

V. TERM

5.1 This Declaration shall be perpetual in duration. The foregoing notwithstanding, in the event that the PMJM is removed from the list of threatened or endangered species under the ESA as a result of a final determination by the Service that the PMJM was listed as a threatened or endangered species as a result of erroneous information, the Service shall execute a termination and release of this Declaration and thereafter this Declaration shall terminate and be of no further force and effect.

VI. MISCELLANEOUS

6.1 This Declaration shall be binding upon Declarant and its successors in interest to the Open Space Property. The terms "Declarant" and "Service", whenever used herein, and any pronouns used in place thereof, shall mean and include the above-named Declarant and Declarant's successors, assigns and lessees, and the above-named Service and its successors and assigns, respectively.

6.2 If any provision of this Declaration or the application thereof to any person or circumstance is found to be invalid, the remainder of the provisions of this Declaration and the application of such provisions to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

6.3 This Declaration may be modified only by an instrument in writing, duly executed by the Service and the then current owner or owners of the entirety of the Open Space Property.

IN WITNESS WHEREOF, the Declarant has caused this Declaration to be duly executed this 15th day of October, 200 4.

CASTLE ROCK LAND CO., LLC
a Colorado limited liability company

By: [Signature]
Title: AUTHORIZED AGENT

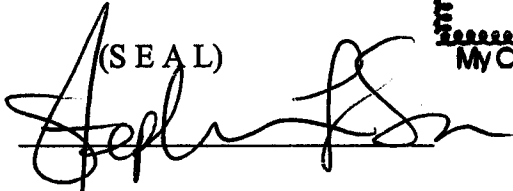
STATE OF COLORADO

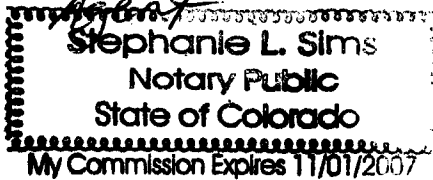
City & COUNTY OF Denver

) ss.

The foregoing instrument was acknowledged before me this 15th day of Oct, 2004, by JOHN FOX as Authorized of Castle Rock Land Co., LLC, a Colorado limited liability company.

Witness my hand and official seal.

(S E A L)

My Commission Expires: _____



Notary Public

EXHIBIT A
Description of Open Space Property

LEGAL DESCRIPTION – HCP PROPERTY, North Conservation Parcel

07/29/2004

A TRACT OF LAND BEING A PART OF SECTIONS 21, 27 AND 28, ALL IN TOWNSHIP 7 SOUTH, RANGE 67 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO, BEING DESCRIBED AS FOLLOWS:

“COMMENCING” AT THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER OF SAID SECTION 27 AND CONSIDERING THE SOUTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 27 TO BEAR SOUTH 89°35'47" EAST, WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO; THENCE NORTH 87°17'19" EAST, A DISTANCE OF 2536.30 FEET TO A POINT ON THE NORTHERLY LINE OF THE FINAL PLAT OF MEADOWS PARKWAY – PHASE 1, A SUBDIVISION RECORDED AT RECEPTION NUMBER 8722230 IN THE RECORDS OF THE OFFICE OF THE CLERK AND RECORDER OF DOUGLAS COUNTY, SAID POINT BEING THE “POINT OF BEGINNING”; THENCE NORTH 57°32'36" WEST, A DISTANCE OF 230.00 FEET; THENCE NORTH 33°22'11" WEST, A DISTANCE OF 125.00 FEET; THENCE NORTH 02°30'52" EAST, A DISTANCE OF 170.00 FEET; THENCE NORTH 72°04'47" WEST, A DISTANCE OF 124.00 FEET; THENCE NORTH 51°43'40" WEST, A DISTANCE OF 85.00 FEET; THENCE NORTH 06°54'05" WEST, A DISTANCE OF 245.00 FEET; THENCE SOUTH 85°51'08" WEST, A DISTANCE OF 170.00 FEET; THENCE SOUTH 70°40'55" WEST, A DISTANCE OF 225.00 FEET; THENCE NORTH 88°57'28" WEST, A DISTANCE OF 165.00 FEET; THENCE NORTH 56°53'43" WEST, A DISTANCE OF 129.00 FEET; THENCE SOUTH 75°34'34" WEST, A DISTANCE OF 266.00 FEET TO A POINT ON A LINE LYING 150 FEET NORTHEASTERLY OF AND PARALLEL WITH THE NORTHEASTERLY LINE OF THE ATCHISON, TOPEKA, AND SANTA FE RAILROAD COMPANY RIGHT-OF-WAY; THENCE NORTHWESTERLY ALONG SAID PARALLEL LINE THE FOLLOWING FIVE (5) COURSES:

- 1) NORTH 38°13'09" WEST, A DISTANCE OF 233.00 FEET TO A POINT OF CURVE;
- 2) ALONG THE ARC OF A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 15°20'13", A RADIUS OF 2110.08 FEET, AN ARC LENGTH OF 564.83 FEET AND A CHORD WHICH BEARS NORTH 45°53'15" WEST, A DISTANCE OF 563.14 FEET;
- 3) NORTH 53°33'22" WEST, A DISTANCE OF 554.92 FEET;
- 4) NORTH 00°13'23" EAST, A DISTANCE OF 61.98 FEET;
- 5) NORTH 53°33'08" WEST, A DISTANCE OF 1551.00 FEET;

THENCE NORTH 01°08'53" EAST, A DISTANCE OF 76.00 FEET; THENCE NORTH 05°52'33" WEST, A DISTANCE OF 172.00 FEET; THENCE NORTH 06°06'04" EAST, A DISTANCE OF 122.00 FEET; THENCE NORTH 44°50'46" EAST, A DISTANCE OF 145.00 FEET; THENCE NORTH 07°52'08" EAST, A DISTANCE OF 210.00 FEET; THENCE NORTH 60°56'36" EAST, A DISTANCE OF 284.00 FEET; THENCE SOUTH 56°52'32" EAST, A DISTANCE OF 230.00 FEET; THENCE NORTH 00°12'16" WEST, A DISTANCE OF 175.00 FEET; THENCE NORTH 41°35'21" WEST, A DISTANCE OF 209.00 FEET; THENCE NORTH 47°47'53" WEST, A DISTANCE OF 429.00 FEET; THENCE NORTH 55°12'07" WEST, A DISTANCE OF 382.00 FEET; THENCE NORTH 75°59'53" WEST, A DISTANCE OF 378.00 FEET; THENCE SOUTH 89°06'14" WEST, A DISTANCE OF 103.00 FEET; THENCE NORTH 51°24'10" WEST, A DISTANCE OF 200.00 FEET; THENCE NORTH 79°06'42" WEST, A DISTANCE OF 203.00 FEET; THENCE NORTH 45°57'31" WEST, A DISTANCE OF 107.00 FEET; THENCE SOUTH 82°52'07" WEST, A DISTANCE OF 175.00 FEET; THENCE NORTH 83°23'48" WEST, A DISTANCE OF 200.00 FEET; THENCE SOUTH 80°09'19" WEST, A DISTANCE OF 127.00 FEET; THENCE NORTH 65°54'35" WEST, A DISTANCE OF 204.00 FEET; THENCE NORTH 39°23'39" WEST, A DISTANCE OF 75.00 FEET; THENCE NORTH 29°12'35" WEST, A DISTANCE OF 163.00 FEET; THENCE NORTH 58°23'48" WEST, A DISTANCE OF 208.00 FEET; THENCE NORTH 89°42'32" WEST, A DISTANCE OF 184.00 FEET; THENCE SOUTH 11°04'57" EAST, A DISTANCE OF 136.00 FEET; THENCE SOUTH 52°28'23" EAST, A DISTANCE OF 158.00 FEET; THENCE SOUTH 29°08'51" EAST, A DISTANCE OF 101.00 FEET; THENCE SOUTH 32°21'08" WEST, A DISTANCE OF 90.00 FEET; THENCE NORTH 71°04'38" WEST, A DISTANCE OF 100.00 FEET; THENCE NORTH 50°16'06" WEST, A DISTANCE OF 212.00 FEET; THENCE NORTH 74°05'41" WEST, A DISTANCE OF 420.00 FEET; THENCE NORTH 36°52'19" WEST, A DISTANCE OF 220.00 FEET; THENCE NORTH 72°32'27" WEST, A DISTANCE OF 110.00 FEET; THENCE NORTH 42°04'32" WEST, A DISTANCE OF 125.00 FEET; THENCE NORTH 88°46'53" WEST, A DISTANCE OF 137.00 FEET; THENCE NORTH 52°46'29" WEST, A DISTANCE OF 150.00 FEET; THENCE NORTH 87°47'50" WEST, A DISTANCE OF 175.00 FEET; THENCE SOUTH 64°07'45" WEST, A DISTANCE OF 137.00 FEET; THENCE NORTH 74°35'56" WEST, A DISTANCE OF 125.00 FEET; THENCE NORTH 49°51'51" WEST, A DISTANCE OF 124.00 FEET; THENCE NORTH 62°13'18" WEST, A DISTANCE OF 185.00 FEET; THENCE NORTH 44°53'54" WEST, A DISTANCE OF 245.00 FEET TO THE WEST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 21, SAID LINE BEING ALSO THE WESTERLY BOUNDARY OF THE MEADOWS PRELIMINARY PD SITE PLAN AS RECORDED AT RECEPTION NUMBER 2003102969, SAID DOUGLAS COUNTY RECORDS; THENCE NORTH 00°03'54" EAST, ALONG SAID WEST LINE, A DISTANCE OF 641.96 FEET; THENCE SOUTHEASTERLY ALONG THE NORTHERLY BOUNDARY OF SAID MEADOWS PRELIMINARY PD SITE PLAN THE FOLLOWING ELEVEN (11) COURSES:

- 1) SOUTH 60°22'56" EAST, A DISTANCE OF 668.40 FEET;
- 2) SOUTH 79°15'48" EAST, A DISTANCE OF 672.68 FEET;
- 3) SOUTH 40°30'26" EAST, A DISTANCE OF 248.39 FEET;

- 4) SOUTH 58°58'36" EAST, A DISTANCE OF 210.95 FEET;
- 5) SOUTH 23°14'24" EAST, A DISTANCE OF 412.31 FEET;
- 6) SOUTH 57°40'16" EAST, A DISTANCE OF 166.43 FEET;
- 7) SOUTH 89°42'27" EAST, A DISTANCE OF 820.06 FEET;
- 8) SOUTH 75°03'22" EAST, A DISTANCE OF 528.87 FEET;
- 9) NORTH 83°35'05" EAST, A DISTANCE OF 382.10 FEET;
- 10) SOUTH 87°31'45" EAST, A DISTANCE OF 394.09 FEET;
- 11) NORTH 00°11'49" EAST, A DISTANCE OF 420.11 FEET;

THENCE NORTH 89°55'06" EAST, A DISTANCE OF 52.00 FEET; THENCE SOUTH 43°09'04" EAST, A DISTANCE OF 130.00 FEET; THENCE SOUTH 71°16'35" EAST, A DISTANCE OF 183.00 FEET; THENCE SOUTH 45°01'32" EAST, A DISTANCE OF 146.00 FEET; THENCE SOUTH 65°44'40" EAST, A DISTANCE OF 154.00 FEET; THENCE SOUTH 41°36'57" EAST, A DISTANCE OF 95.00 FEET; THENCE SOUTH 71°26'37" EAST, A DISTANCE OF 141.00 FEET; THENCE SOUTH 54°36'05" EAST, A DISTANCE OF 125.00 FEET; THENCE SOUTH 43°19'44" EAST, A DISTANCE OF 180.00 FEET; THENCE SOUTH 32°58'54" EAST, A DISTANCE OF 155.00 FEET; THENCE SOUTH 32°58'54" EAST, A DISTANCE OF 145.00 FEET; THENCE SOUTH 06°57'15" WEST, A DISTANCE OF 120.00 FEET; THENCE SOUTH 25°43'49" EAST, A DISTANCE OF 218.00 FEET; THENCE SOUTH 61°17'22" EAST, A DISTANCE OF 115.00 FEET; THENCE SOUTH 30°39'27" EAST, A DISTANCE OF 130.00 FEET; THENCE SOUTH 12°40'46" EAST, A DISTANCE OF 153.00 FEET; THENCE SOUTH 05°52'05" WEST, A DISTANCE OF 135.00 FEET; THENCE SOUTH 74°42'58" EAST, A DISTANCE OF 230.00 FEET; THENCE SOUTH 50°49'58" EAST, A DISTANCE OF 90.00 FEET; THENCE SOUTH 34°32'50" EAST, A DISTANCE OF 200.00 FEET; THENCE SOUTH 12°57'55" EAST, A DISTANCE OF 136.00 FEET; THENCE SOUTH 61°19'32" EAST, A DISTANCE OF 250.00 FEET; THENCE SOUTH 86°03'31" EAST, A DISTANCE OF 280.00 FEET TO THE EASTERLY BOUNDARY OF SAID MEADOWS PRELIMINARY PD SITE PLAN; THENCE SOUTH 22°33'50" WEST, ALONG SAID EASTERLY BOUNDARY, A DISTANCE OF 48.00 FEET; THENCE SOUTH 40°45'13" EAST, CONTINUING ALONG SAID EASTERLY BOUNDARY, A DISTANCE OF 121.90 FEET; THENCE SOUTH 22°06'47" EAST, A DISTANCE OF 105.00 FEET; THENCE NORTH 89°10'30" EAST, A DISTANCE OF 122.00 FEET; THENCE SOUTH 61°37'45" EAST, A DISTANCE OF 107.00 FEET; THENCE SOUTH 32°04'12" EAST, A DISTANCE OF 118.00 FEET; THENCE SOUTH 03°55'26" EAST, A DISTANCE OF 92.00 FEET; THENCE SOUTH 63°27'10" EAST, A DISTANCE OF 84.00 FEET; THENCE SOUTH 26°39'10" WEST, A DISTANCE OF 96.00 FEET; THENCE SOUTH 55°24'54" EAST, A DISTANCE OF 201.00 FEET; THENCE SOUTH 59°17'52" EAST, A DISTANCE OF 180.00 FEET; THENCE SOUTH 76°19'19" EAST, A DISTANCE OF 110.00 FEET; THENCE NORTH 59°53'10" EAST, A DISTANCE OF 105.00 FEET; THENCE NORTH 19°17'57" EAST, A DISTANCE OF 158.00 FEET TO A NON-TANGENT POINT OF CURVE ON SAID EASTERLY BOUNDARY OF THE MEADOWS PRELIMINARY PD SITE PLAN; THENCE ALONG SAID EASTERLY BOUNDARY, SOUTHEASTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 06°16'36", A RADIUS OF 7615.00 FEET, AN ARC LENGTH OF 834.21 FEET AND A CHORD WHICH BEARS SOUTH 35°58'52" EAST, A DISTANCE OF 833.79 FEET TO A POINT TANGENT; THENCE CONTINUING ALONG SAID EASTERLY BOUNDARY, SOUTH 32°50'34" EAST, A DISTANCE OF 1049.02 FEET TO THE NORTHERLY LINE OF SAID FINAL PLAT OF MEADOWS PARKWAY - PHASE 1; THENCE ALONG SAID NORTHERLY LINE THE FOLLOWING THREE (3) COURSES:

- 1) SOUTH 48°34'15" WEST, A DISTANCE OF 12.51 FEET TO A POINT OF CURVE;
- 2) ALONG THE ARC OF A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 16°08'57", A RADIUS OF 2072.94 FEET, AN ARC LENGTH OF 584.27 FEET AND A CHORD WHICH BEARS SOUTH 40°29'47" WEST, A DISTANCE OF 582.34 FEET;
- 3) SOUTH 32°25'19" WEST, A DISTANCE OF 300.40 FEET TO THE "POINT OF BEGINNING".

CONTAINING 215.911 ACRES OR 9,405,087 SQUARE FEET, MORE OR LESS.

DRAFT

LEGAL DESCRIPTION – HCP PROPERTY, South Conservation Parcel

07/29/04

A TRACT OF LAND BEING A PART OF THE SOUTH HALF OF SECTION 27, TOGETHER WITH A PART THE EAST HALF OF SECTION 34, ALL IN TOWNSHIP 7 SOUTH, RANGE 67 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO, BEING DESCRIBED AS FOLLOWS:

“COMMENCING” AT THE SOUTHWEST CORNER OF THE SOUTHWEST QUARTER OF SAID SECTION 27 AND CONSIDERING THE SOUTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 27 TO BEAR SOUTH 89°35'47" EAST, WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO; THENCE NORTH 89°06'02" EAST, A DISTANCE OF 2657.03 FEET TO A POINT ON THE SOUTHERLY LINE OF THE FINAL PLAT OF MEADOWS PARKWAY – PHASE 1, A SUBDIVISION RECORDED AT RECEPTION NUMBER 8722230 IN THE RECORDS OF THE OFFICE OF THE CLERK AND RECORDER OF DOUGLAS COUNTY, SAID POINT BEING THE “POINT OF BEGINNING”; THENCE ALONG SAID SOUTHERLY LINE, NORTH 32°25'19" EAST, A DISTANCE OF 300.40 FEET TO A POINT OF CURVE; THENCE CONTINUING ALONG SAID SOUTHERLY LINE, ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 15°51'54", A RADIUS OF 1927.00 FEET, AN ARC LENGTH OF 533.58 FEET AND A CHORD WHICH BEARS NORTH 40°21'16" EAST, A DISTANCE OF 531.88 FEET TO THE EASTERLY BOUNDARY OF THE MEADOWS PRELIMINARY PD SITE PLAN, RECORDED AT RECEPTION NUMBER 2003102969 IN THE RECORDS OF THE OFFICE OF THE CLERK AND RECORDER OF DOUGLAS COUNTY; THENCE ALONG SAID EASTERLY BOUNDARY THE FOLLOWING TEN (10) COURSES:

- 1) SOUTH 32°50'34" EAST, A DISTANCE OF 14.89 FEET;
- 2) SOUTH 57°09'26" WEST, A DISTANCE OF 25.00 FEET;
- 3) SOUTH 32°50'34" EAST, A DISTANCE OF 854.16 FEET TO A POINT OF CURVE;
- 4) ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 10°58'22", A RADIUS OF 5680.00 FEET, AN ARC LENGTH OF 1087.78 FEET AND A CHORD WHICH BEARS SOUTH 27°21'23" EAST, A DISTANCE OF 1086.12 FEET;
- 5) SOUTH 21°52'12" EAST, A DISTANCE OF 260.35 FEET;
- 6) SOUTH 22°34'33" EAST, A DISTANCE OF 138.49 FEET;
- 7) SOUTH 70°11'40" WEST, A DISTANCE OF 911.40 FEET;
- 8) SOUTH 28°23'43" EAST, A DISTANCE OF 1183.73 FEET TO THE SOUTH LINE OF THE NORTHEAST QUARTER OF SAID 34;
- 9) SOUTH 89°57'44" EAST, ALONG SAID SOUTH LINE OF THE NORTHEAST QUARTER, A DISTANCE OF 34.23 FEET;
- 10) SOUTH 00°50'08" EAST, A DISTANCE OF 828.39 FEET TO A NON-TANGENT POINT OF CURVE ON THE EASTERLY LINE OF THE ATCHISON, TOPEKA AND SANTA FE RAILROAD COMPANY RIGHT-OF-WAY;

THENCE ALONG SAID EASTERLY RIGHT-OF-WAY LINE THE FOLLOWING THREE (3) COURSES:

- 1) NORTHWESTERLY ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 01°45'25", A RADIUS OF 1482.69 FEET, AN ARC LENGTH OF 45.46 FEET AND A CHORD WHICH BEARS NORTH 30°43'32" WEST, A DISTANCE OF 45.46 FEET TO A POINT TANGENT;
- 2) NORTH 31°36'15" WEST, A DISTANCE OF 2035.83 FEET TO A POINT OF CURVE;
- 3) ALONG THE ARC OF A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 03°40'43", A RADIUS OF 5779.65 FEET, AN ARC LENGTH OF 371.09 FEET AND A CHORD WHICH BEARS NORTH 33°26'37" WEST, A DISTANCE OF 371.03 FEET TO A NON-TANGENT POINT;

THENCE SOUTH 62°01'30" EAST, A DISTANCE OF 155.00 FEET; THENCE NORTH 76°57'11" EAST, A DISTANCE OF 31.00 FEET; THENCE NORTH 21°31'15" WEST, A DISTANCE OF 185.00 FEET; THENCE NORTH 13°10'33" WEST, A DISTANCE OF 149.00 FEET; THENCE NORTH 23°03'59" EAST, A DISTANCE OF 133.00 FEET; THENCE NORTH 47°19'06" EAST, A DISTANCE OF 107.00 FEET; THENCE NORTH 70°02'08" EAST, A DISTANCE OF 170.00 FEET; THENCE NORTH 33°11'33" WEST,

A DISTANCE OF 200.00 FEET; THENCE NORTH 13°11'46" WEST, A DISTANCE OF 125.00 FEET; THENCE NORTH 48°33'31" WEST, A DISTANCE OF 78.00 FEET; THENCE NORTH 01°01'37" EAST, A DISTANCE OF 70.00 FEET; THENCE NORTH 24°31'23" EAST, A DISTANCE OF 97.00 FEET; THENCE NORTH 03°55'20" WEST, A DISTANCE OF 265.00 FEET; THENCE NORTH 41°37'03" WEST, A DISTANCE OF 280.00 FEET; THENCE NORTH 57°19'53" WEST, A DISTANCE OF 70.00 FEET TO THE **"POINT OF BEGINNING"**. CONTAINING 65.317 ACRES OR 2,845,200 SQUARE FEET, MORE OR LESS.

DRAFT

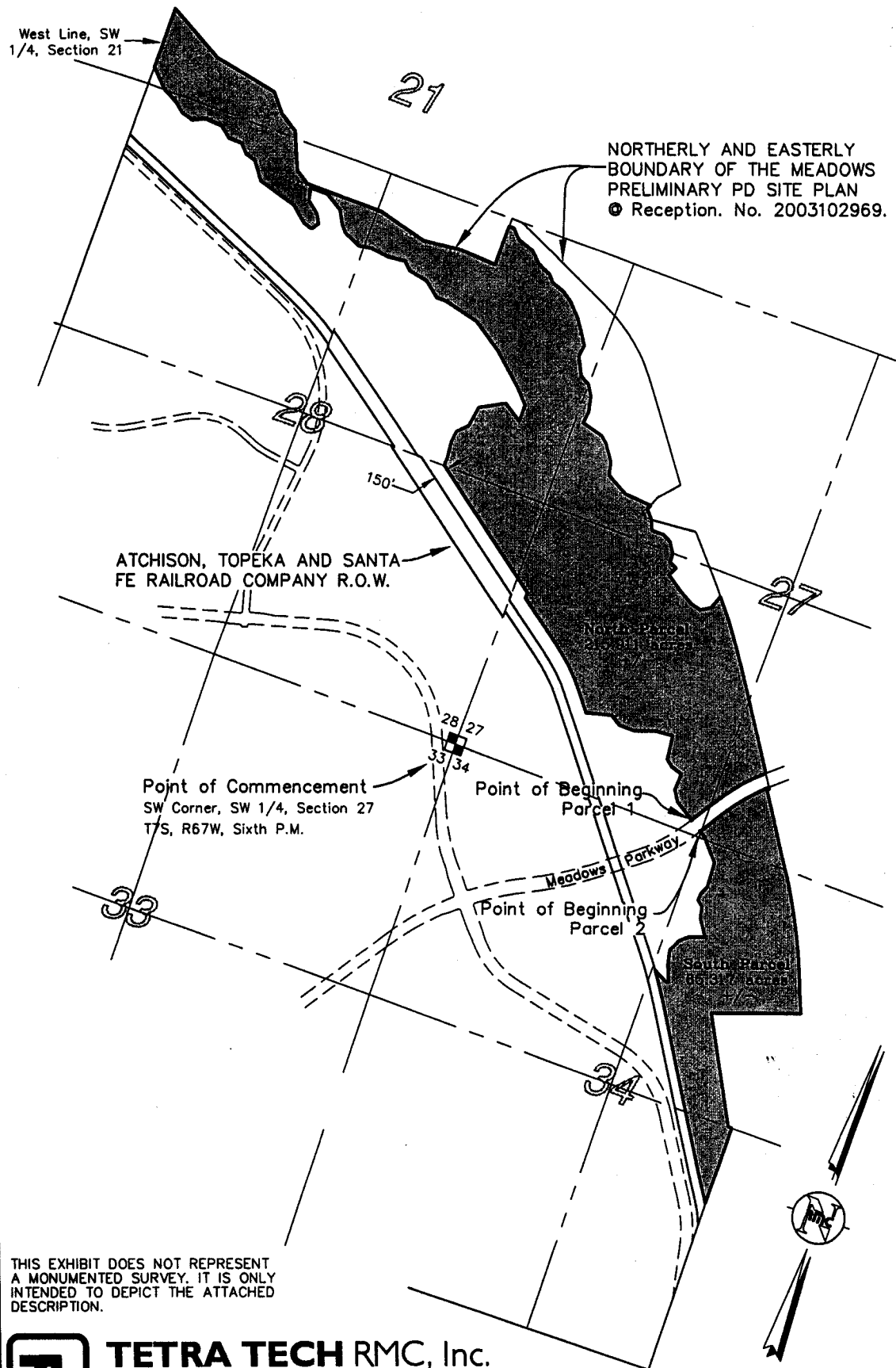
EXHIBIT A

Page 5 of 5

HCP PROPERTY - CONSERVATION TRACTS

West Line, SW
1/4, Section 21

NORTHERLY AND EASTERLY
BOUNDARY OF THE MEADOWS
PRELIMINARY PD SITE PLAN
⊙ Reception. No. 2003102969.



THIS EXHIBIT DOES NOT REPRESENT
A MONUMENTED SURVEY. IT IS ONLY
INTENDED TO DEPICT THE ATTACHED
DESCRIPTION.



TETRA TECH RMC, Inc.

8301 E. Prentice Ave., Suite 101, Greenwood Village, CO. 80111
TEL 303.741.8000 FAX 303.741.8108

Scale: 1" = 1200'

JOB NO. 3572.005.02

DATE: 07-30-2004

REVISED



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: T&E/PMJM/HCP
MS 65412 Lkwd

SEP 28 2005

James Borgel
Hollard & Hart, LLP
555 17th Street, Suite 3200
Denver, Colorado 80202

Dear Mr. Borgel:

The U.S. Fish and Wildlife Service (Service) received your letter of September 20, 2005, regarding the Federal Fish and Wildlife Permit #TE-064965-0 (Revised) (Permit), issued on March 9, 2004, to authorize incidental taking of the Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's), pursuant to section 10(a)(1)(B) of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq), based on the "Final Environmental Assessment/Habitat Conservation Plan for Issuance of an Incidental Take Permit Under Section 10(a)(1)(B) of the ESA for a **Portion of the Meadows**, Douglas County, Colorado" (EA/HCP).

We have reviewed your request for an extension of the ESA section 9 clearance originally dated June 10, 1999, and renewed on June 3, 2002, for "Area B" of the Meadows Project in Castle Rock. Based on the information available to the Service, the Service agrees that a population of Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's), is not likely to be present within the specific subject area. Thus, the Service continues to conclude that development on this site should not have direct adverse affects to Preble's. However, if construction within "Area B" is found to have indirect impacts to East Plum Creek or its associated riparian habitats (for example, through alteration of existing flow regimes, increased erosion or sedimentation), the project would require further consultation with the Service to address adverse impacts to Preble's.

Please note that this renewed clearance is valid for one year from the date of this letter. Should additional information on listed or proposed species become available, this determination may be reconsidered under the ESA. If development has not commenced within one year, please contact the Colorado Field Office to request an additional extension.

On February 2, 2005, Preble's was proposed for delisting in the *Federal Register* (Vol. 70 No. 21 FR 5404). Until a final determination is made, Preble's remains protected as a threatened species under the ESA. If we can be of further assistance, please contact Adam Misztal of my staff at (303) 275-2370.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: Castle Rock Development Company: Chuck Elliott
ACI Consulting: Steve Paulson
DOI/SOL: Thomas Graf
HCP Project file



United States Department of the Interior

OFFICE OF THE SOLICITOR

Rocky Mountain Region
755 Parist Street, Suite 151
Lakewood, CO. 80215
TELE. (303) 231-5353
FAX (303) 231-5363

June 3, 2002

VIA FACSIMILE

John E. Putnam, Esq.
Akin, Gump, Strauss, Hauer & Feld, L.L.P.
1675 Broadway
Suite 2300
Denver, Colorado 80202

Re: ESA Section 9 Clearance on Area B of the Meadows Property, Douglas County, Colorado

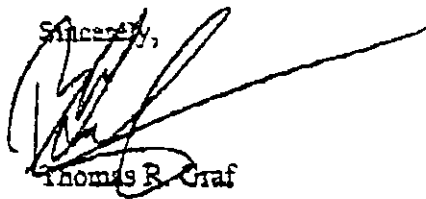
Dear John:

Per your "Request" letter dated May 24, 2002 (enclosed), I am writing to confirm that there has been no change in the U.S. Fish and Wildlife Service's ("Service") concurrence that construction within Area B of the Meadows Development by Castle Rock Development Company would not adversely affect the continued existence of the Preble's Meadow Jumping Mouse ("Mouse"), now protected by the Endangered Species Act. The concurrence with the no adverse-effect finding was first stated in a letter dated June 10, 1999, from LeRoy Carlson of the Service to Stephen Paulson, a consultant to the Castle Rock Development Company. (also enclosed).

Therefore, based on the information available to the Service, Castle Rock Development Company does not need an ESA Section 10 permit to mitigate impacts to the Mouse prior to construction on the aforementioned Area B of the Meadows Property. This clearance is only applicable to Area B; is limited to potential adverse effects on the Mouse; and is subject to change and/or withdrawal in the future if the Mouse is found on Area B prior to completion of the anticipated construction.

Please let me know if need any additional information regarding this matter or regarding the ESA Section 10 permitting process.

Sincerely,

A handwritten signature in black ink, appearing to read 'Thomas R. Graf', with a long horizontal line extending from the end of the signature.

Enclosures

cc: Kathleen Linder



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
755 Parfet Street, Suite 361
Lakewood, Colorado 80215



ES/CO T&E/PMJM
Mail Stop 65412

JUN 10 1999

Mr. Steven D. Paulson
Vice President, SWCA Inc. Environmental Consultants
8461 Turnpike Drive, Suite 100
Westminster, Colorado 80030

Re: Request for Section 9 Clearance on Area B of The Meadows Property, Douglas County, Colorado

Dear Mr. Paulson:

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), we have reviewed your letter dated April 20, 1999, regarding the above referenced project.

Castle Rock Development Company owns approximately 3.989 acres in Castle Rock, Douglas County, Colorado. This parcel has been zoned for over 13,000 dwelling units with additional area proposed for commercial, office, and industrial uses. Currently, there are approximately 1,500 platted lots within the property. The property is crossed by East Plum Creek, as well as 3 intermittent tributaries to East Plum Creek. East Plum Creek supports riparian vegetation that may provide suitable habitat or a migration corridor for the federally-listed Preble's meadow jumping mouse (PMJM) (*Zapus hudsonius preblei*). Your letter indicates that no potentially suitable habitat exists within or adjacent to the 3 intermittent tributaries to East Plum Creek.

The Service is responsible for administering the Endangered Species Act of 1973 as amended (Act). Section 9 of the Act prohibits the "take" (e.g., harm, harass, pursue, injure, kill) of Federally listed wildlife species. "Harm" (i.e., "take") is further defined to include habitat modification or degradation where it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. "Take" can only be permitted pursuant to the pertinent language and provisions in Section 7 and Section 10(a) or exempted through a special rule under section 4(d) of the Act.

On behalf of Castle Rock Development Company, SWCA Inc. has submitted the attached letter for Service consideration. The Meadows Development has been conceptually divided into the following three different areas:

Area A is roughly 473 acres in size and is located between the existing rights-of-way for the Atchison, Topeka, and Santa Fe Railroad and the Denver and Rio Grande Railroad. Area A

contains potentially suitable habitat for the PMJM and has been designated as "Potential Mouse Protection Area" (PMPA) in the Service's proposed Special 4(d) Rule regarding this species.

Area B is the subject area of this request and is approximately 3.506 acres in size. It is located west of the Atchison, Topeka, and Santa Fe Railroad. Your letter states that no suitable habitat exists within Area B, including the 3 intermittent drainages that feed East Plum Creek.

Area C is approximately 10 acres in size and lies to the east of the Denver and Rio Grande Railroad. A portion of Area C also lies within the designated PMPA for East Plum Creek.

The Service prefers to assess a complete plan for a property rather than view partial plans or phases on a piecemeal basis. An irreversible commitment of resources to Area B may preclude certain other future options on the site. Clearance of development within Area B as related to take under the Act does not constitute any guarantee or promise of future development within either Areas A or C. Development within these areas may require the preparation of a habitat conservation plan. Therefore, prior to any action on Area B, you should consider evaluation of your entire property in regards to PMJM and the Act. Development options consistent with a future Douglas County or City of Castle Rock habitat conservation plan should also be investigated.

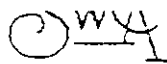
Notwithstanding the above, the Service concurs that construction within Area B of The Meadows Development, as proposed and discussed in your April 20, 1999 letter, will have no direct impacts to the PMJM or its habitat. Thus, the Service concurs that the proposed project should not adversely affect the continued existence of the PMJM. However, if construction within Area B is found to have indirect impacts to East Plum Creek or its associated riparian habitats (i.e. changes in hydrology, increase runoff flow, increased erosion or sedimentation, or non-point-source pollution), the project would require further consultation with the Service and the development of a habitat conservation plan to address adverse impacts to the PMJM.

The Service appreciates the opportunity to review and comment on the proposed project. The Service is willing to work with you and the project applicant to ensure that future project impacts are adequately addressed. If you have any questions, please contact Kathieen Linder of this office at (303) 275-2370.

Sincerely,

A handwritten signature in black ink, appearing to read "LeRoy W. Carlson". The signature is fluid and cursive, with the first name being the most prominent.

LeRoy W. Carlson
Colorado Field Supervisor



20 April 1999

Ms. Kathleen Linder
United States Fish and Wildlife Service
Colorado Field Office
PO Box 25486, DFC
Denver, CO 80225-0207

**RE: REQUEST FOR SECTION 9 CLEARANCE ON AREA B OF THE MEADOWS
PROPERTY, CASTLE ROCK, DOUGLAS COUNTY, COLORADO**

INTRODUCTION

On behalf of Castle Rock Development Company, we request written acknowledgment from the U.S. Fish and Wildlife Service (USFWS) that planned development activities within a portion (Area B) of The Meadows community located in the Town of Castle Rock, Douglas County, Colorado will not constitute "take" of the Preble's meadow jumping mouse (*Zapus hudsonius Preblei*) (PMJM) as described in Section 9 of the Endangered Species Act of 1973, as amended.

SWCA Inc., Environmental Consultants (SWCA) conducted site visits and reviewed all available relevant information to determine if PMJM exists on Area B, to identify any suitable PMJM habitat, and to assess whether proposed development activities could result in "take" of PMJM. Results of those site visits and data search have been previously discussed in two separate meetings between SWCA, representatives of The Meadows, and USFWS on 18 February and 17 March 1999.

PROJECT DESCRIPTION

The Meadows lies in a geographic area known as the Palmer Divide, which is an area of rising hills extending perpendicular to the Rampart Range. East Plum Creek originates near the Divide and drains through The Meadows property. The Palmer Divide is considered a transition zone between the grasslands of the eastern Colorado plains and the ponderosa pine (*Pinus ponderosa*) forests to the west.

The topography of the area consists of rolling hills highlighted by significant rock outcrops. The eastern and northern portions of The Meadows are dominated by rolling hills covered by various grasses and other herbaceous vegetation. Topography of the western portion of the property is greater in relief and the vegetative community converts from a grassland ecosystem to a community dominated by Gambel oak (*Quercus gambelii*), various shrubs, and ponderosa pine. The riparian area of East Plum Creek differs significantly from that of other areas of the property in vegetative species composition. Vegetation along the creek is dominated by species adapted for moist/wet conditions such as coyote willow (*Salix exidua*) and narrowleaf cottonwood (*Populus angustifolia*). As expected, slopes to the creek are drier and species composition in those area converts from wetland type species to a ponderosa pine/Gambel oak complex. Photographs of the property can be found as an attachment in Appendix A.

The Meadows property consists of approximately 3.989 acres and has been zoned for over 13,000 dwelling units with additional area proposed for commercial, office, and industrial uses. Currently, there are approximately 1,500 platted lots within the property. As shown in



Appendix A. The Meadows development has been conceptually divided into three different areas (see preliminary P.D. site plan within Appendix A). Each area is discussed below.

Area A

Area A is roughly 473 acres in size and is located between the existing rights-of-way for the Atchison, Topeka, and Santa Fe Railroad and the Denver and Rio Grande Railroad. Area A contains the "Potential Mouse Protection Area" (PMPA) on the property as specified in the proposed Section 4(d) regulations regarding the PMJM. Little, if any, of Area A has been defined as a "Mouse Protection Area" (MPA).

Area B

Area B is the subject area of this request and is approximately 3,506 acres in size. It is located west of the Atchison, Topeka, and Santa Fe Railroad. This area contains no PMJM habitat and lies entirely outside of any PMPA or MPA.

Area C

Area C is approximately 10 acres in size and lies to the east of the Denver and Rio Grande Railroad. A small portion of Area C has been delineated as PMPA.

FINDINGS

Site visits, conducted by biologists permitted by USFWS to conduct PMJM trapping, identified no "suitable" PMJM habitat within Area B including the three small, intermittent drainages that cross Area B and eventually feed East Plum Creek, which is a designated PMPA.

The data search was supervised by individuals with extensive experience with issues related to Section 9 "take" issues, Section 7 Consultation, and Section 10(a) incidental take permitting. The data search determined that no PMJM have been located on Area B and that no MPAs nor PMPAs have been delineated on Area B. As a result, we request release of Area B of The Meadows property under Section 9 of the ESA based upon the following reasons.

1) Physical Setting

Area B is located on uplands in the western portion of The Meadows property. Vegetation within Area B differs significantly from that of known PMJM habitat and no areas of the tract have been identified as MPAs or PMPAs. Vegetation on large portions of the tract have been colonized by an alien invasive plant, the diffuse knapweed (*Centraurea diffusa*). Vegetation on remaining portions of the tract consists of short, disturbed, extensively grazed grasses with no drainages supporting the willow/riparian vegetation requisite for PMJM. Portions of the tract have also been previously developed. Accordingly, it is highly unlikely that Area B offers suitable PMJM habitat.

2) Barriers to Dispersal

In addition, we do not believe that Area B offers the potential for PMJM dispersal from known MPAs or PMPAs due to the high number of natural and human-induced barriers between East Plum Creek and Area B. Fragmentation such as real estate development, highway construction, and grazing, was listed in the Federal Register¹ as a major cause of habitat isolation. Area B is located on uplands and away from MPAs or PMPAs. Portions of the tract have also been previously developed and most infrastructures, including roads such as Santa Fe Drive, storm sewers, and riprap, are already in place. Area B, which lies to the west of Area A, is separated from Area A by the Atchison, Topeka, and Santa Fe Railroad, thus likely precluding PMJM movement into Area B. Also, vegetation on portions of Area A consists mainly of upland grasses which has been extensively grazed thus, do not offer the protective shelter necessary for dispersing PMJM to other areas, even if habitat for PMJM did exist elsewhere in the vicinity. The lack of suitable habitat on Area B also acts as a barrier to dispersing PMJM from known PMPAs. Therefore, the lack of proper vegetative sheltering, the presence of the railway, and the presence of existing development offer significant barriers to PMJM dispersal and further indicates that Area B does not offer significant resources to PMJM.

3) Proposed Activities

Proposed development activities within Area B should be compatible with off-site populations of PMJM, because all elements of proposed development, including stormwater runoff, are subject to strict plan approvals. All of the existing and proposed residential units within The Meadows property lie within Area B. Future allowable uses within this area are shown on the attached Meadows Preliminary PD Site Plan in Appendix A. These uses include single-family residential, multi-family residential, commercial, open space, schools, parks, and related types of uses. All development within this area will be subject to regulation by the Town of Castle Rock with regard to drainage and non-point discharges.

The Meadows property has an approved Master Drainage Study for the entire proposed development area, which was approved in 1986. Providing a regional concept for stormwater runoff and detention that is updated as development occurs, the plan establishes, among other things, that developed stormwater runoff rates shall not exceed historic rates as the runoff exits The Meadows property.

The Town of Castle Rock Public Works Regulations Chapters 10 and 11 establish the current criteria for stormwater management. These criteria require that historic flows not be exceeded, that Best Management Practices (BMPs) regarding water quality be utilized, and that erosion protection and sediment controls be included as part of the subdivision approval process. The detention storage throughout the community is designed to maintain 100-year storm runoff rates at historic levels. Many of The Meadows detention ponds were already constructed in advance of development.

Also, both the quality and quantity of runoff on and exiting the property will be maintained, because the design, construction and maintenance of The Meadows storm

¹Final Rule to List the Preble's Meadow Jumping Mouse as a Threatened Species. 63 Federal Register 16,517(May 13, 1998); 50 CFR Part 17.

drainage system is, and will be continue to be, performed in conformance with the Town of Castle Rock's criteria.

Since stormwater runoff rates should not be significantly altered, no significant changes to potential downstream populations of PMJM should occur as a result of the development of Area B.

4) MPAs and PMPAs

Development of the draft Section 4(d) rule identifies activities and areas that would be exempt from incidental take regulations applicable to the PMJM. Thus, in order to provide greater regulatory certainty to property owners and to allow greater focus on habitat areas, MPAs and PMPAs were established which identify areas of habitat and potential habitat. Since no MPAs or PMPAs have been identified within Area B of The Meadows property, it is logical to assume, therefore, that activities within Area B would not constitute "take" under the Endangered Species Act.

5) Restrictions

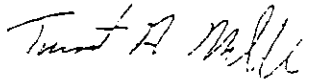
In order to reduce the potential for increased predation upon any possible populations of PMJM in Area A or on adjacent properties, The Meadows has developed covenants prohibiting resident ownership of free-roaming cats (*Felis domesticus*).

CONCLUSIONS

It is the opinion of SWCA that no direct or indirect impacts to PMJM will occur as a result of the planned development of Area B of The Meadows property. No areas of Area B have been delineated as MPAs or PMPAs and the results of field surveys and a review search indicate that no suitable habitat for PMJM exists on or immediately adjacent to Area B. Also, the natural and human-made barriers on and adjacent to Area B preclude the dispersal of PMJM from PMPAs or MPAs through or into Area B. Due to these reasons, and since review of proposed development within Area B appears to be compatible with off-site PMJM populations, we are formally requesting USFWS to release Area B from current and future ESA provisions regarding the PMJM.

We appreciate your review in this matter and urge you to expedite the review as soon as possible. If you have any questions, please feel free to call me at (512) 476-0891.

Sincerely,



FDR

Steven D. Paulson
Vice President

SDP/lss
enclosure

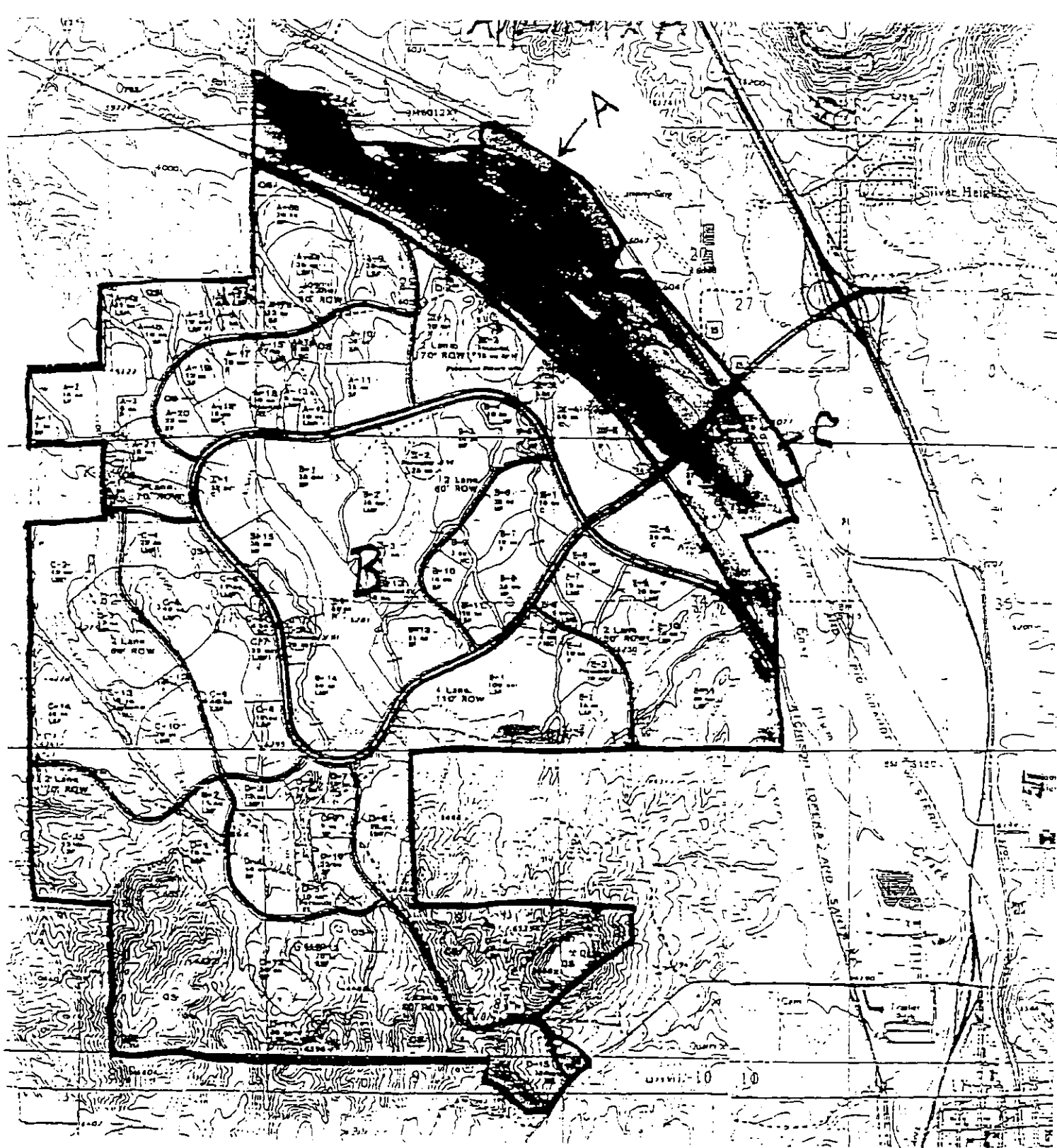
Mr. Paulson

3

Attachment

cc: Dave Weber, CDOW
Reading File
Project File

Reference: KALI Doug Co Meadows.wpd



PRELIMINARY P.D. SITE PLAN

(September 1986) VICINITY MAP

THE MEADOWS - THIRD AMENDMENT

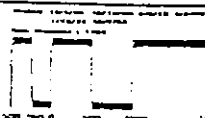
CASTLE ROCK, COLORADO

Owners

Lincoln Savings & Loan Assoc.
5080 South Willow Drive
Suite 2104
Englewood, CO 80111
(303) 773-9977

Planners

Deaton-Warshaw Inc.
1580 17th Street
Suite 325
Denver, CO 80202
(303) 873-6186



LEGEND

- Residential
- Medium and Commercial Centers
- Single Family 1st Class
- Single Family 2nd Class
- Multi-Family 1st Class
- Multi-Family 2nd Class
- Office
- Industrial
- Public and Transportation Center
- Community
- Recreation
- Public Land Conservation areas
- Unimproved & Open Space
- Roads & Interchanges, Arterials & Recreational
- Proposed Open Space Areas
- Proposed J. High School
- Proposed 3rd Street Bridge

LAND USE

- 1st Class - Residential All Purpose
- 2nd Class - Residential All Purpose
- 3rd Class - Residential All Purpose
- 4th Class - Residential All Purpose
- 5th Class - Residential All Purpose
- 6th Class - Residential All Purpose
- 7th Class - Residential All Purpose
- 8th Class - Residential All Purpose
- 9th Class - Residential All Purpose
- 10th Class - Residential All Purpose

LAND USE TABLE

LAND USE	ACRES	PERCENT
Residential	10.11	25.00
Commercial	4.27	10.69
Industrial	2.97	7.35
Office	2.57	6.35
Unimproved & Open Space	19.96	49.59

LAND USE	ACRES	PERCENT
Residential	10.11	25.00
Commercial	4.27	10.69
Industrial	2.97	7.35
Office	2.57	6.35
Unimproved & Open Space	19.96	49.59

TOTAL ACRES	40.44
GROSS DENSITY	2.9 acrs

contains potentially suitable habitat for the PMJM and has been designated as "Potential Mouse Protection Area" (PMPA) in the Service's proposed Special 4(d) Rule regarding this species.

Area B is the subject area of this request and is approximately 3.506 acres in size. It is located west of the Atchison, Topeka, and Santa Fe Railroad. Your letter states that no suitable habitat exists within Area B, including the 3 intermittent drainages that feed East Plum Creek.

Area C is approximately 10 acres in size and lies to the east of the Denver and Rio Grande Railroad. A portion of Area C also lies within the designated PMPA for East Plum Creek.

The Service prefers to assess a complete plan for a property rather than view partial plans or phases on a piecemeal basis. An irreversible commitment of resources to Area B may preclude certain other future options on the site. Clearance of development within Area B as related to take under the Act does not constitute any guarantee or promise of future development within either Areas A or C. Development within these areas may require the preparation of a habitat conservation plan. Therefore, prior to any action on Area B, you should consider evaluation of your entire property in regards to PMJM and the Act. Development options consistent with a future Douglas County or City of Castle Rock habitat conservation plan should also be investigated.

Notwithstanding the above, the Service concurs that construction within Area B of The Meadows Development, as proposed and discussed in your April 20, 1999 letter, will have no direct impacts to the PMJM or its habitat. Thus, the Service concurs that the proposed project should not adversely affect the continued existence of the PMJM. However, if construction within Area B is found to have indirect impacts to East Plum Creek or its associated riparian habitats (ie, changes in hydrology, increase runoff flow, increased erosion or sedimentation, or non-point-source pollution), the project would require further consultation with the Service and the development of a habitat conservation plan to address adverse impacts to the PMJM.

The Service appreciates the opportunity to review and comment on the proposed project. The Service is willing to work with you and the project applicant to ensure that future project impacts are adequately addressed. If you have any questions, please contact Kathieen Linder of this office at (303) 275-2370.

Sincerely,

A handwritten signature in black ink, appearing to read "LeRoy W. Carlson". The signature is fluid and cursive, with the first name "LeRoy" being more prominent and the last name "Carlson" following in a similar style.

LeRoy W. Carlson
Colorado Field Supervisor

**MINOR AMENDMENT TO THE HABITAT CONSERVATION PLAN
FOR A PORTION OF THE MEADOWS PROPERTY**

Douglas County, Colorado

Prepared for:

United States Fish and Wildlife Service
Colorado Field Office
134 Union Boulevard
Lakewood, Colorado 80228

Submitted by:

Castle Rock Development Company
3033 E. First Avenue, Suite 410
Denver, Colorado 80206

Prepared by:

aci consulting
1001 Mopac Circle
Austin, Texas 78746

aci Project No.: 02-10-036A

June 2015

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LIST OF ATTACHMENTS

Attachment 1: The Meadows HCP (2003)
Attachment 2: Minor Amendment and Restoration Plan Covering the Preble’s Meadow Jumping Mouse Protection Zone for the Meadows – Plum Creek Central Well Field Project Production Well Construction (2012)
Attachment 3: Barbara Spagnuolo Letter to USFWS (April 2, 2007)
Attachment 4: Susan Linner Letter to the Town of Castle Rock (April 11, 2007)
Attachment 5: USFWS Concurrence Letter (July 14, 2010)

EXECUTIVE SUMMARY

The U.S. Fish and Wildlife Service (USFWS) issued a 30-year Incidental Take Permit (ITP) (#TE-064965-0) (Revised) to Castle Rock Development Company and Castle Rock Land Co. (CRDC) on February 17, 2004. The permit authorized take of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (PMJM) under activities associated with the construction and use of a portion of The Meadows development owned by CRDC in the Town of Castle Rock, Colorado, and as more fully described in the Environmental Assessment/Habitat Conservation Plan for a Portion of The Meadows Property (Meadows HCP).

CRDC is seeking authorization of a minor amendment to the Meadows HCP. The purpose of the minor amendment is to:

- 1) Identify all activities that have been conducted within the Meadows HCP area by CRDC through 2014 and mitigated as required by the ITP;
- 2) Incorporate into the Meadows HCP certain activities that have been undertaken by the Town of Castle Rock that are mitigated for by the Douglas County Regional HCP (DRHCP); and
- 3) Introduce anticipated activities to be constructed in the future by CRDC and the Town of Castle Rock.

The minor amendment demonstrates that the activities that have already occurred are consistent with the Meadows HCP and ITP, have been properly mitigated and have resulted in significantly fewer impacts than was anticipated in the Meadows HCP. The minor amendment also demonstrates that, the proposed activities will result in no net loss of mitigation, result in fewer impacts than authorized under the original ITP, and do not otherwise alter the effectiveness of the Meadows HCP.

The granting of the minor amendment is consistent with the requirements of Section 6.7 of the Meadows HCP (aci 2003). Further, the minor amendment will not conflict with the primary purpose of the Meadows HCP or its accompanying Environmental Assessment (EA).

The Meadows HCP covers approximately 480 acres. It is located just west of Interstate Highway 25 within the boundaries of the Town of Castle Rock, Douglas County, Colorado (Figure 1). East Plum Creek flows northwest to southeast through the Meadows HCP area.

Multiple construction activities have occurred within the Meadows HCP area since the issuance of the ITP. The ITP authorized 8.63 acres of permanent impacts and 24.87 acres of temporary impacts to occur within the Meadows HCP area. The impact process was created and mitigated for using the Meadows HCP area, however, there have been construction activities conducted pursuant to the DRHCP that have altered the original impacts plan. To date, activities within the scope of the ITP have resulted in 1.724 acres of permanent impacts and 6.491 acres of temporary

impacts. These minimal impacts were mitigated through avoidance, minimization, and mitigation strategies outlined in the Meadows HCP (Attachment 1).

Anticipated future development is proposed to disturb approximately 6.28 acres of permanent impacts and 5.85 acres temporary impacts. Approximately 0.626 acre and 12.341 acres of permanent and temporary impacts, respectively, remain available through the February 2004 ITP.

1.0. INTRODUCTION

The U.S. Fish and Wildlife Service (USFWS) issued a 30-year Incidental Take Permit (ITP) (#TE-064965-0) (Revised) to Castle Rock Development Company and Castle Rock Land Co. (CRDC) on February 17, 2004. The permit authorized take of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (PMJM) under activities associated with the construction and use of a portion of The Meadows development owned by CRDC in the Town of Castle Rock, Colorado, and as more fully described in the Environmental Assessment/Habitat Conservation Plan for a Portion of The Meadows Property (Meadows HCP).

CRDC is seeking authorization of a minor amendment to The Meadows HCP. The minor amendment will not conflict with the primary purpose of the Meadows HCP or its accompanying Environmental Assessment (EA).

1.1. Purpose of Minor Amendment

The granting of the minor amendment is consistent with the requirements of Section 6.7 of the Meadows HCP (aci 2003). The purpose of the minor amendment is to:

- 1) Identify all activities that have been conducted within the Meadows HCP area by CRDC through 2014 and mitigated as required by the ITP;
- 2) Incorporate into the Meadows HCP certain activities that have been undertaken by the Town of Castle Rock that are mitigated for by the Douglas County Regional HCP (DRHCP); and
- 3) Introduce anticipated activities to be constructed in the future by CRDC and the Town of Castle Rock.

1.2. Justification for Minor Amendment

According to Section 6.7 of the Meadows HCP, a minor amendment may involve:

- 1) Routine administrative revisions; or
- 2) Changes to the operation and management program.

These routine administrative revisions or changes to the operation and management program must not diminish the level or means of mitigation. CRDC believes that the items addressed in this minor amendment are routine administrative revisions and/or changes to the operation and management program, and do not diminish the level or means of mitigation. The minor amendment does not alter the terms of the ITP nor does it conflict with the primary purpose of the Meadows HCP.

1.3. Project Area

The Meadows was historically part of a working ranch until 1984 and is located in Castle Rock, Colorado. The Meadows HCP area is approximately 480 acres and is located west of Interstate Highway 25 within the boundaries of the Town of Castle Rock (Figure 1).

1.4. Existing Environment

A description of the Meadows HCP area's vegetation, wildlife, threatened or endangered species (including the PMJM), wetlands, geology/soils, land use, cultural resources, air quality, and water resources and water quality is contained in *Attachment 1: The Meadows HCP (2003)*.

2.0. PROJECT DEVELOPMENT HISTORY

Multiple construction activities have occurred since issuance of the ITP. This section describes those construction activities related to the:

- ITP (2004);
- Meadows HCP (2003);
- Minor Amendment (2012);
- Post ITP activities by the Town of Castle Rock (Town);
- Post ITP activities by CRDC; and
- Future activities.

2.1. Incidental Take Permit Authorized Activities

The ITP identified and authorized four types of potential development within the scope of jurisdiction of the permitted area of the Meadows HCP area (aci 2003):

- 1) "COI" zoned parcels designated for development of commercial, office, and industrial (COI) uses (Figure 3);
- 2) A total of 20 water wells and their associated infrastructure (including well construction, pipe installation and operation, and maintenance), to be drilled over a period of 20 years to serve the entire Meadows community, with only two to three wells being developed at any one time. It was anticipated that 16 of the 20 planned wells would be located within the riparian corridor, each permanently occupying a 40 ft. x 40 ft. area (Figure 4);
- 3) A trail system approximately two miles long within the riparian corridor of the Meadows HCP area to serve as an upstream and downstream extension of the existing Town of Castle Rock trail system. The planned permanent concrete trail would be approximately eight feet wide (Figure 4); and
- 4) An underground sanitary sewer line within the northeastern portions of the COI Parcels A and B located on the southwestern bank of East Plum Creek (Figure 4). The sanitary sewer line consists of an 8-inch underground main, an above ground lift station, and a

24-inch underground main. Portions of these sewer facilities are located in the uplands portion of the PMJM habitat Protection Zone.

The Meadows HCP also anticipated the construction of a bridge across Plum Creek; however the exact location had yet to be determined at the time the ITP was issued (Figure 4). With the exception of the well development, trail development, and potential bridge, all proposed development was to occur outside the riparian portion of the Protection Zone (Figure 5) (aci 2003).

The ITP authorized a total of 8.63 acres of permanent disturbance and an additional 24.87 acres of temporary disturbance of PMJM habitat that would result from development within the Meadows HCP area. Development of the Parcels A and B and associated infrastructure (COI development) would result in 5.59 acres of permanent disturbance and an additional 2.15 acres of temporary disturbance. Development of the water wells system and trail system would result in 3.04 acres of permanent and an additional 22.72 acres of temporary disturbance (aci 2003).

The ITP, together with the Meadow HCP, included information on how to avoid impacts to potential PMJM habitat along East Plum Creek to the maximum extent practicable to maintain habitat contiguity (Attachment 1). The document also described methods to minimize impacts within potential PMJM habitat by re-vegetating and restoring all temporary impacts and mitigation for all permanent impacts by reserving additional land that may contain habitat plus enhancing an additional 10 acres of potential habitat near Meadows Parkway (Figure 2).

2.2. Town of Castle Rock Development Activities

2.2.1. Town Activities Anticipated in the HCP

The following activities have been or are being conducted by the Town of Castle Rock and were anticipated in the Meadows HCP and authorized by the ITP.

Alluvial Wells

As described above, the Meadows HCP anticipated the construction of a total of 20 water wells and their associated infrastructure (including well construction, pipe installation and operation, and maintenance), to be drilled over a period of 20 years to serve the entire Meadows community, with only two to three wells being developed at any one time. It was anticipated that 16 of the 20 planned wells would be located within the riparian corridor, each permanently occupying a 40 ft. x 40 ft. area (Figure 4).

On October 4, 2012, USFWS approved the *Minor Amendment and Restoration Plan Covering the Preble's Meadow Jumping Mouse Protection Zone for the Meadows – Plum Creek Central Well Field Project Production Well Construction*, hereafter referred to as the 2012 Minor Amendment (Attachment 2), which allowed for changes to the well infrastructure plan that was

originally outlined in the Meadows HCP (Spagnuolo and Baker 2012). This well project, identified by the Town as the Plum Creek Central Well Field, was undertaken by the Town and is generally located along East Plum Creek within the Meadows HCP area.

The 2012 minor amendment provided for the following:

- 1) The adjustment of well locations within a 200-foot radius of the decreed well sites identified in the Meadows HCP and the reduction in the number of wells from 20 to seven;
- 2) Modifications of alignments for water lines and access roads associated with well development; and
- 3) A Restoration Plan that mitigated for activities associated with the construction of the alluvial wells.

Preceding the construction of alluvial wells, the Town received permission from CRDC to conduct preliminary site surveys and water quality assessments in the Protection Zone of the Meadows in April 2011. A total of seven potential well locations were identified from the site survey (Spagnuolo and Baker 2012) (Figure 6). The seven wells are situated in two clusters. The northern cluster consists of AL-1, AL-2, AL-8, and AL-9 and the southern cluster consists of AL-16, AL-18, and AL-20. These wells are located within 200 feet of the decreed well sites identified in the Meadows HCP. The overall size of the well was reduced from 40 ft. x 40 ft. to 10 ft. x 10 ft. Impacts associated with these construction activities were significantly less than what was anticipated in the Meadows HCP. Since the Town planned on developing fewer wells, the access routes and water delivery system for the well sites differ from those outlined in the Meadows HCP. Access routes were reduced by 60 percent and infrastructure was reduced by 75 percent. **This reduced the estimated permanent habitat disturbance from well development from 3.04 acres to 1.30 acres and the estimated temporary habitat disturbance from 22.27 acres to 6.07 acres** (Spagnuolo and Baker 2012).

The Town will follow all BMPs as outlined in the 2012 Meadows Minor Amendment (Attachment 2) to minimize any temporary or permanent impacts to PMJM habitat. Measures were taken to minimize impacts from the alluvial well construction by the Town. These measures include limiting vehicular traffic, combining water pipeline and electrical conduit installation into the same trench, and using directionally drilled bores for creek crossings.

On July 14, 2010, USFWS submitted a concurrence letter stating that the Service agreed that the mitigation goals for Meadows HCP were met. An on-site review of the vegetation status that was conducted on July 13, 2010, by Adam Misztal of the Colorado Field Office confirmed that the vegetation conditions met the requirements of the Meadows HCP. This letter is attached as Attachment 5.

Four alluvial wells were constructed by the Town inside of the Protection Zone; therefore, the mitigation for their impacts are identified and authorized under the ITP. Table 1 displays the impacts for the four alluvial wells (Figure 7).

It was anticipated that the three remaining wells contemplated by the 2012 Meadows Minor Amendment would be constructed; however, the Town has determined that wells AL-16, AL-18, and AL-20 will not be developed.

East Plum Creek, Phase 3 Trail System

The East Plum Creek Phase 3 Trail System is located south of Meadows Parkway within the Protection Zone; therefore, these activities will be mitigated for and authorized under the ITP. Table 1 displays the impacts for the trail system (Figure 7). Trail extensions were designed to minimize and avoid impacts to the riparian zone and did not exceed a width of 10 feet within the Protection Zone. Also, erosion control fencing to the east of the trail, between the trail and Area A, was intact; reseeding east and west of the trail was completed.

The Town also developed a trail system, a portion of which is located within CRDC's property. As stated in a letter from the Town of Castle Rock to USFWS on April 2, 2007 (Attachment 3), and in a concurrence letter from USFWS to the Town on April 11, 2007 in response (Attachment 4), any take associated with the Town trail project will be covered by the DRHCP; therefore, impacts to the trail system are not included in the impacts analysis for this project.

2.2.2. Town Activities Not Anticipated by the Meadows HCP

The following activities have been undertaken by the Town but were not anticipated by or shown in the Meadows HCP. These activities were authorized by the DRHCP and have been mitigated through the DRHCP.

North Meadows Extension

The North Meadows Extension (NME) is an extension of North Meadows Drive from the Meadows to U.S. 85 and Interstate 25 (Figure 7). Portions of the NME and its associated drainage system and roads extend into the Developable Area and Additional Mitigation Area (Figure 8) (USFWS 2007). The EA was reviewed by the Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) in March 2001. Required environmental review for the extension resulted in a Finding of No Significant Impact (FONSI) and construction is now underway.

Although the activities for the NME were conducted with the involvement of USFWS, an amendment to the Meadows HCP was not completed for these activities at that time. This minor amendment seeks to address the location of the NME within the Meadows HCP area and account for the impacts that will be mitigated and authorized under the DRHCP. Mitigation concerning the NME includes vegetation restoration, avoidance of woody vegetation and the removal of

woody vegetation, and temporary fencing around areas to not be disturbed (Wilson & Company 2013).

The NME and its associated drainage infrastructure will permanently disturb approximately 9.40 acres of the developable area, 1.21 acres of the open space, and 0.27 acre of the additional mitigation area (CORE 2014) (Figure 8). The Town constructed the NME, which was not an anticipated activity described within the Meadows HCP; therefore, this activity will be identified and authorized under the DRHCP (DRHCP 2006). Table 1 displays the impacts for the NME.

Table 1: The Town's Restoration Activities & Impacts

Activities	Permanent Impacts (acres)	Temporary Impacts (acres)
East Plum Creek Phase 3 Trail System*	1.00	0.60
Four Alluvial Wells*	0.69	2.34
North Meadows Extension**	1.48	5.37
<i>Total</i>	<i>3.17</i>	<i>8.31</i>
<i>Total Mitigated According to ITP</i>	<i>1.69</i>	<i>2.94</i>

*Actions anticipated in the Meadows HCP and mitigated according to the ITP.

**Actions not anticipated in the Meadows HCP and mitigated through DRHCP.

2.3. CRDC Development Activities

2.3.1. CRDC Activities Anticipated by the Meadows HCP

The following activities have been or are being conducted by the CRDC and were anticipated in the Meadows HCP and authorized by the ITP.

10-acre Enhancement Area

The Meadows HCP contemplates that before trail development, water well development, or the development of Parcels A and B (seen in Figure 11), CRDC will initiate enhancement of approximately 10 acres of vegetation adjacent to Meadows Parkway (Figure 2). A *Vegetation Enhancement Plan* for this area will provide a description of all vegetation proposed to enhance the habitat for the PMJM. USFWS has reviewed and submitted a condition of approval for the *Vegetation Enhancement Plan* and its activities.

Cattle Removal

The Meadows HCP also contemplates that prior to development within the Protection Zone; CRDC will remove all cattle grazing within the Protection Zone (188.12 acres), as well as within the Additional Mitigation Area (42.85 acres) (Figure 9). This action has already occurred.

Sanitary Sewer Line

The sanitary sewer line is located mostly within the uplands of the Meadows HCP area (Figure 9). After all construction activities for the sanitary sewer line were completed, the mitigation consisted of returning the site to preconstruction grades and re-vegetating (aci 2005 & 2007). Areas temporarily disturbed during installation of the sewer system and lift station have been re-vegetated with the seed mixture listed in Appendix A of the Meadows HCP with the goal to have at least 70 percent of the re-vegetation to survive and become established. This action has already occurred.

Portions of the sanitary sewer line reach into the Protection Zone and Additional Mitigation Areas; therefore, the mitigation for these impacts are contemplated in the Meadows HCP and authorized under the ITP. Table 2 displays the impacts for the sanitary sewer line.

2.3.2. CRDC Activities Not Anticipated by the Meadows HCP

The following activities have been undertaken by the CRDC but were not anticipated by or shown in the Meadows HCP. The minimization and avoidance strategies of these actions and their mitigation techniques are not defined in the Meadows HCP; however, the impacts of these activities will still be mitigated through the ITP.

Two Deep Water Wells

The A-11 and A-12 deep water well sites are located in the uplands, directly adjacent to the Protection Zone (Figure 9). The temporary disturbance of these two deep water wells was re-vegetated. Construction of the well housing facility is located on property designated for commercial development. The plans for the A-11 well field raw waterline were originally for an open trench along the entire waterline but changed to a directional pipe bore for the portion of the waterline that passed under the 100-year floodplain. The open trench areas at either end of the waterline are located in the upland areas outside of the riparian corridor (aci 2007). The action was coordinated with the USFWS prior to installation.

Although these two wells were not anticipated by the Meadows HCP, portions were constructed inside of the Protection Zone. The mitigation for their impacts has been accounted for in the ITP. Table 2 displays the impacts for the two deep water wells.

Stormwater Outfall

A single trickle channel in Parcel B was constructed to control the rate of stormwater runoff from the upland area (Figure 9). After all construction activities for the stormwater outfall were completed the mitigation consisted of returning the site to preconstruction grades and re-vegetating (aci 2005 & 2007). The action was coordinated with the USFWS prior to installation.

The stormwater outfall was constructed inside of the Protection Zone; therefore, the mitigation for these minimal impacts has been accounted for in the ITP. Table 2 displays the impacts for the stormwater outfall.

Cramer Dairy Farmstead Restoration

Formerly a working dairy farm, the Cramers Dairy Farmstead is located in the uplands near the A-11 deep well site on the eastern boundary of the Protection Zone (Figure 10). Some of the existing structures on the Cramers Dairy Farmstead have been demolished, hazardous materials were removed from the site, and the disturbed area was re-vegetated. The area is considered to be fully restored and functioning, providing additional mitigation within the Meadows HCP area that was not originally anticipated as mitigation. The removal of buildings and hazardous waste associated with the Cramer Dairy Farmstead would restore plantings associated with the *Vegetation Enhancement Plan* (aci 2007). The action was coordinated with the USFWS prior to installation.

Gas Lines

Aquila, Inc. constructed a gas line that was bored underneath the Protection Zone (Figure 9). This activity was not authorized by the ITP; however, CRDC received concurrence from USFWS that the activity was not likely to adversely affect PMJM habitat (aci 2007). Impacts to the gas line were not included in the avoidance and minimization strategy because this construction did not involve the removal of vegetation, and therefore, did not result in any additional impacts to the Meadows HCP area (aci 2007). Table 2 displays the impacts for the gas lines.

Table 2: CRDC's Restoration Activities & Impacts

Activities	Permanent Impacts (acres)	Temporary Impacts (acres)
10-acre Enhancement Area*	Restoration Activity	
Cattle Removal*	Restoration Activity	
Cramer Dairy Restoration**	Restoration Activity	
Deep Well 11 and 12**	0.01	1.71
Gas Lines**	-	-
Sanitary Sewer Line*	0.02	1.641
Stormwater Outfall**	0.004	0.20
<i>Total</i>	<i>0.034</i>	<i>3.551</i>
<i>Total Mitigated by ITP</i>	<i>0.034</i>	<i>3.551</i>

*Actions anticipated in the Meadows HCP and mitigated according to the ITP.

**Actions not anticipated in the Meadows HCP and mitigated according to the ITP.

2.4. Future Development Activities

2.4.1. Activities Anticipated in the Meadows HCP

The following future development activities are addressed in the Meadows HCP. The minimization and avoidance strategies and mitigation techniques for these activities also are defined in the Meadows HCP. The impacts of these activities are authorized under the ITP.

Parcels A and B

To minimize and avoid impacts areas that are disturbed temporarily as a result of development within Parcels A and B will be re-vegetated with the seed mixture listed in Appendix A of the Meadows HCP (Attachment 1) with the goal to have at least 70 percent of the re-vegetation survive and become established. The buildings within Parcels A and B will be separated from the riparian areas with barriers along the parameter of the areas of permanent disturbance. The construction of Parcels A and B will not result in the removal of woody vegetative cover, only grasses will be removed (aci 2003).

CRDC will segregate the buildings within Parcels A and B from the riparian areas with barriers (which may include landscaping, fencing or berms) along the perimeter of the areas of permanent disturbance identified in the Meadows HCP and will re-vegetate any areas of temporary disturbance with native vegetation to minimize any indirect impacts from building within the Protection Zone. Such re-vegetation will be accomplished consistent with the Restoration Plan provisions of Section 6.5.1(6) in the Meadows HCP (aci 2003).

The activities of Parcels A and B will occur inside of the Protection Zone; therefore, the mitigation for these impacts is authorized under the ITP (Figure 11). Table 3 displays the impacts for Parcels A and B and Filing 19 Bridge.

Filing 19 Bridge

Currently, access from the NME to the Meadows Filing 19 Parcel 1 is not possible. Along the parcel boundary, the NME crosses Plum Creek, existing railroad tracks, and Highway 85. The elevation difference between the existing bridge and Parcel 1 restricts access to this parcel. CRDC is requesting to construct Filing 19 Bridge to gain access to Filing 19 Parcel 1.

Three alternatives and one no-build alternative were considered for the location and extent of the Filing 19 Bridge (Figure 12):

- Build Alternative 1 is located just east of the NME and would disturb approximately 3.75 acres of temporary impacts and 1.84 acres of permanent impacts.
- Build Alternative 2 lies in a similar location to Build Alternative 1; however, it would reduce impacts from 3.75 acres of temporary impacts and 1.84 acres of permanent

impacts to approximately 3.70 acres of temporary impacts and approximately 0.69 acre permanent impacts within the Meadows HCP area.

- Build Alternative 3 lies just east of Build Alternative 1 and 2 within the Meadows HCP area, and would temporarily impact approximately 7.12 acres and permanently impact approximately 3.57 acres within the Meadows HCP area.
- The No Build Alternative would abandon the proposed construction for Filing 19 Bridge and would maintain the current existing environment.

Of these alternatives, Build Alternative 2 was considered the preferred alternative because it reduced the amount of impacts within the ITP permitted area.

CRDC is proposing to conduct construction activities related to the construction of Filing 19 Bridge across Plum Creek in the Meadows subdivision. All planned construction will be conducted in accordance with the requirements described in the Meadows HCP. CRDC will comply with all procedures outlined in the Meadows HCP, which include conservation measures, restoration activities, and monitoring and reporting as required. CRDC will also reference the definition and boundary limits of PMJM habitat along East Plum Creek. All construction personnel will be provided with avoidance and minimization strategies to protect PMJM habitat.

CRDC will cause all construction to be initiated between October 15 and April 30 of any year to minimize and avoid impacts to the PMJM. All areas of temporary disturbance will be restored to pre-disturbance grades and re-vegetated with a native grass seed mix approved in the Meadows HCP.

The activities of Filing 19 Bridge were originally identified in the Meadows HCP. The impacts will occur inside of the Protection Zone and the Additional Mitigation Area; however the disturbance will not increase the impacts detailed in the ITP. The mitigation for these impacts are authorized under the ITP (Figure 11). Table 3 displays the impacts for Filing 19 Bridge.

2.4.2. Activities Not Anticipated in the Meadows HCP

The following future development activities are actions that are expected to occur within the Meadows HCP area that have not been addressed within the Meadows HCP. The minimization and avoidance strategies of these actions and their mitigation techniques are not defined in the Meadows HCP and the impacts of these activities are not authorized under the ITP. The impacts of these activities have been mitigated and authorized under the DRHCP.

Future Trail System

The future trail system is located just north of the existing trail north of Meadows Parkway (Figure 11). This activity is considered an unanticipated activity because it was not addressed in the Meadows HCP.

The activities of the future trails will occur inside of the Protection Zone; however, this activity will be identified and authorized under the DRHCP. Table 3 displays the impacts for the future trail system.

Table 3: Anticipated Future Disturbance Covered by ITP

Activities	Permanent Impacts (acres)	Temporary Impacts (acres)
Filing 19 Bridge * (Build Alternative 2 -Preferred)	0.69	3.70
Parcels A and B Development*	5.59	2.15
Trails (Future)**	0.80	1.30
<i>Total</i>	<i>7.08</i>	<i>7.15</i>
Total Mitigated by ITP	6.28	5.85

*Actions anticipated in the Meadows HCP and mitigated according to the ITP.

**Actions not anticipated in the Meadows HCP and mitigated according to the DRHCP.

2.5. Summary of Impacts

The ITP authorized 8.63 acres of permanent habitat disturbance and 24.87 acres of temporary habitat disturbance. To date only 1.724 acres of permanent and 6.491 acres of temporary impacts have occurred. Anticipated future development is proposed to disturb approximately 6.28 acres of permanent impacts and 5.85 acres temporary impacts.

Table 4: Summary of Overall Temporary and Permanent Impacts

	ITP Authorized Impacts (acres)	Current Impacts to Date (acres)	Anticipated Future Impacts (acres)	Total Current & Anticipated Impacts (acres)	Remaining Impacts (acres)
Temporary Impacts	24.87	6.491	5.85	12.341	12.341
Permanent Impacts	8.63	1.724	6.28	8.004	0.626

3.0. CONCLUSION

Castle Rock Development Company and Castle Rock Land Co. (CRDC) are seeking authorization of a minor amendment to the Meadows HCP. The minor amendment will not conflict with the primary purpose of the Meadows HCP or its accompanying Environmental Assessment (EA).

The purpose of the minor amendment is to:

- 1) Identify all activities that have been conducted within the Meadows HCP area by CRDC through 2014 and mitigated as required by the ITP;
- 2) Incorporate into the Meadows HCP certain activities that have been undertaken by the Town of Castle Rock that are mitigated for by the Douglas County Regional HCP (DRHCP); and
- 3) Introduce anticipated activities to be constructed in the future by CRDC and the Town of Castle Rock.

The granting of the minor amendment is consistent with the requirements of Section 6.7 of the Meadows HCP (aci 2003).

Prior to construction activities, CRDC will give notification to USFWS of the proposed activities, provide a plan of action for avoidance, minimization, and mitigation strategies, and provide an annual report of what activities occurred and what mitigation was used.

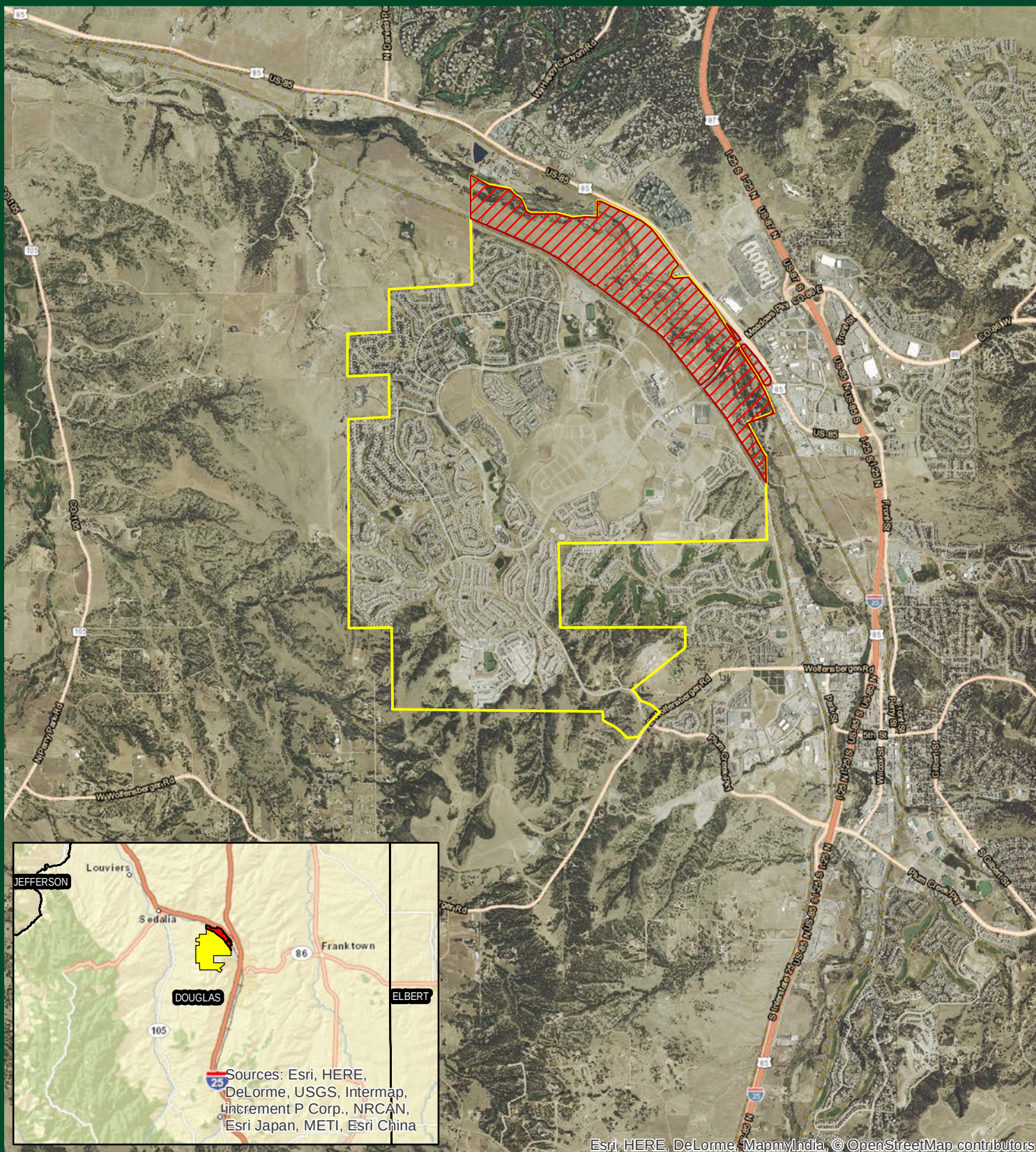
To date, CRDC has restored 24.87 acres of habitat, reserved 52.85 acres of habitat (42.85 acres of additional open space plus 10 acres of enhancement), and discontinued cattle grazing (aci 2007). Temporary impacts were restored using the guidance of the *Vegetation Enhancement Plan* and *Restoration Plan* in the Meadows HCP.

To summarize, the February 2004 ITP authorized 8.63 acres of permanent habitat disturbance and 24.87 acres of temporary habitat disturbance. To date only 1.724 acres of permanent and 6.491 acres of temporary impacts have occurred. Anticipated future development is proposed to disturb approximately 6.28 acres of permanent impacts and 5.85 acres temporary impacts. **The remaining disturbance to the authorized February 2004 ITP Meadows HCP area is 12.341 acres of temporary impacts and 0.626 acres of permanent impacts.**

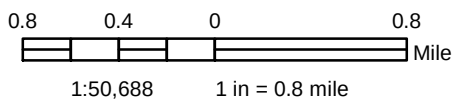
4.0. REFERENCES CITED

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- (aci) aci Consulting. 2005. Annual compliance report for a portion of the meadows property habitat conservation plan: Douglas Co, Colorado. Austin, Texas.
- (aci) aci Consulting. 2007. Annual compliance report for a portion of the meadows property habitat conservation plan: Douglas Co, Colorado. Austin, Texas.
- (CORE) CORE Consultants. 2014. HCP Property – Conservation Area Exhibit: North Meadows Extension Impacts. Created: October 2014.
- (DRHCP) Douglas County and the Town of Castle Rock and Parker. 2006. Habitat Conservation Plan and Environmental Assessment for Douglas County and the Town of Castle Rock and Parker. Douglas County, Colorado.
- Spagnuolo, B. and B. Baker. 2012. Minor amendment and restoration plan covering the Preble's meadow jumping mouse protection zone for the Meadows – Plum Creek central well field project production well construction. Douglas County, Colorado.
- (USFWS) U.S. Fish and Wildlife Service. 2007. East Plum Creek Trail Phase 3 Project, Castle Rock Douglas County, Colorado. Received: April 4, 2007. Susan Linner, Colorado Field Office of the USFWS: Denver, CO.
- Wilson & Company Consultants. 2013. DRHCP North Meadows Extension Site Location & Notes (HCP). Designed: November 11, 2015. Project No.: 2010-03.

FIGURES



This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.

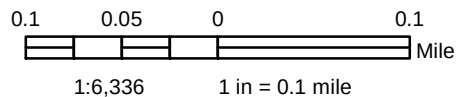


-  EA/HCP Area
-  Meadows Property



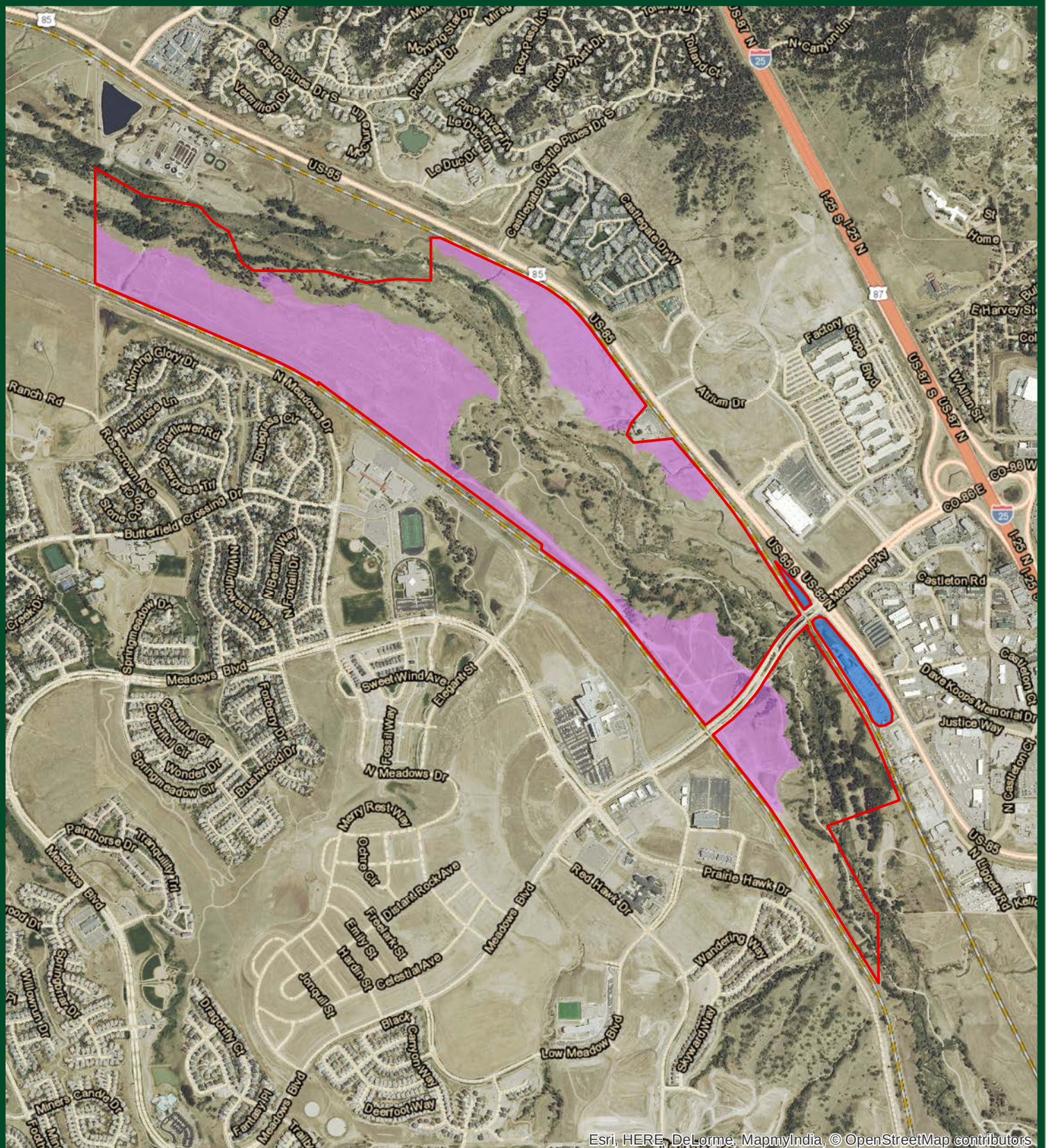


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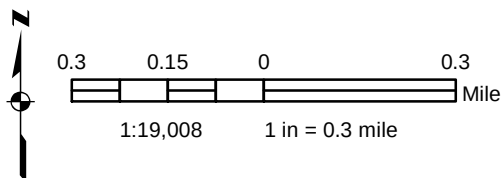


- Habitat Enhancement Area
- EA/HCP Area



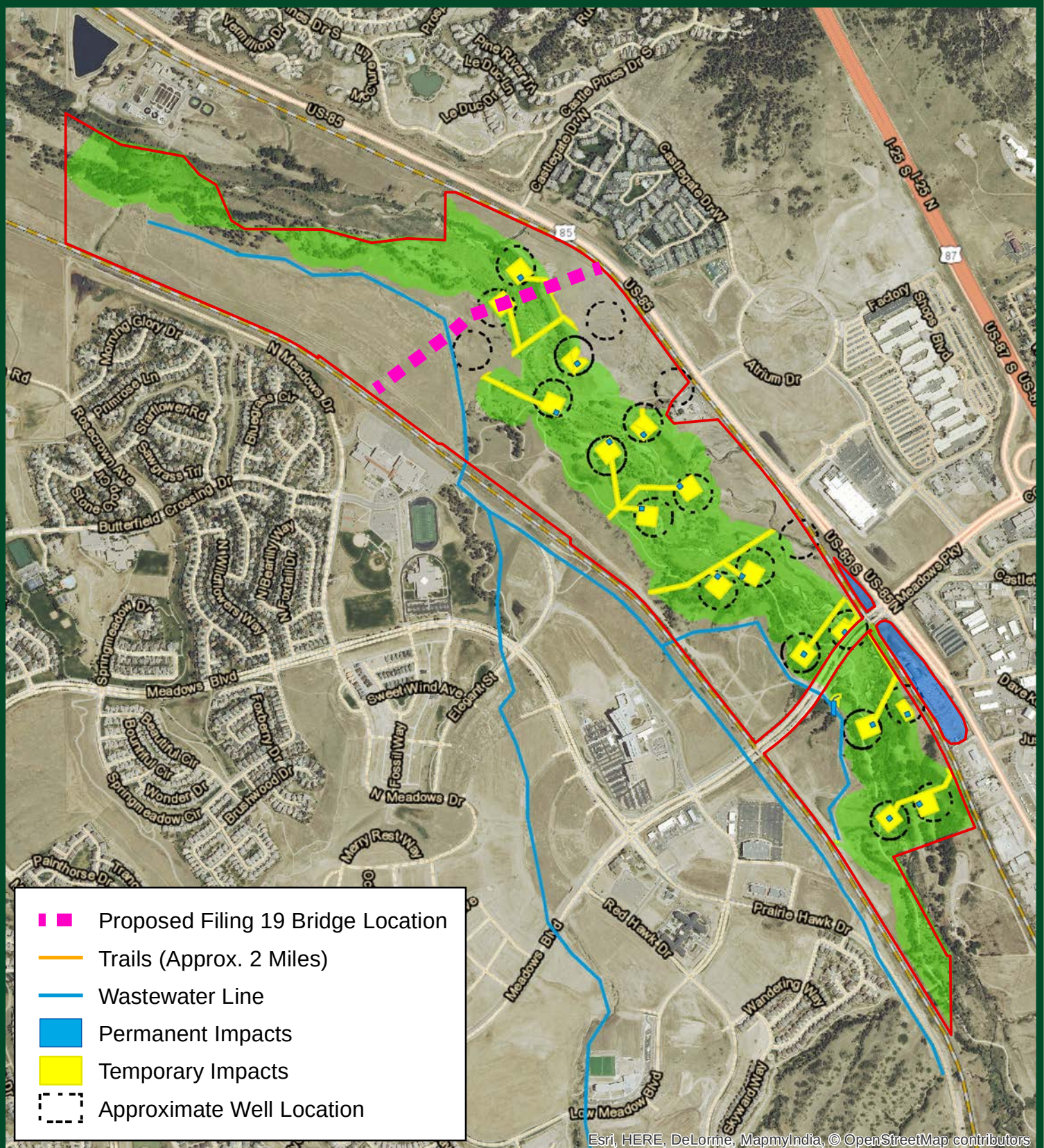


This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



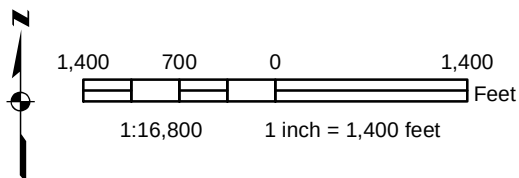
- COI Areas
- Sold Parcels
- EA/HCP Area





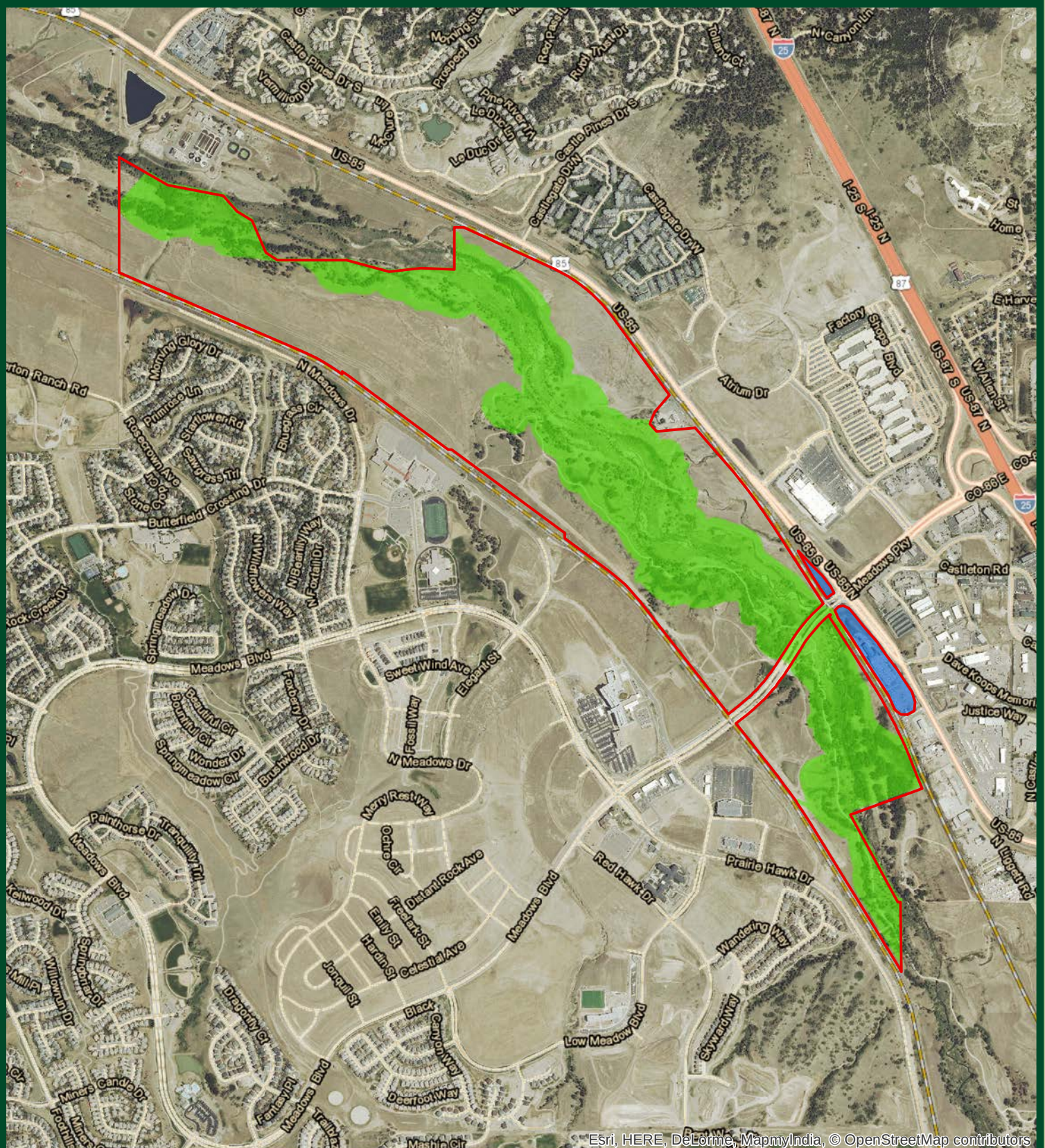
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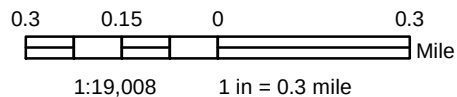


- Protection Zone
- Sold Parcels
- EA/HCP Area



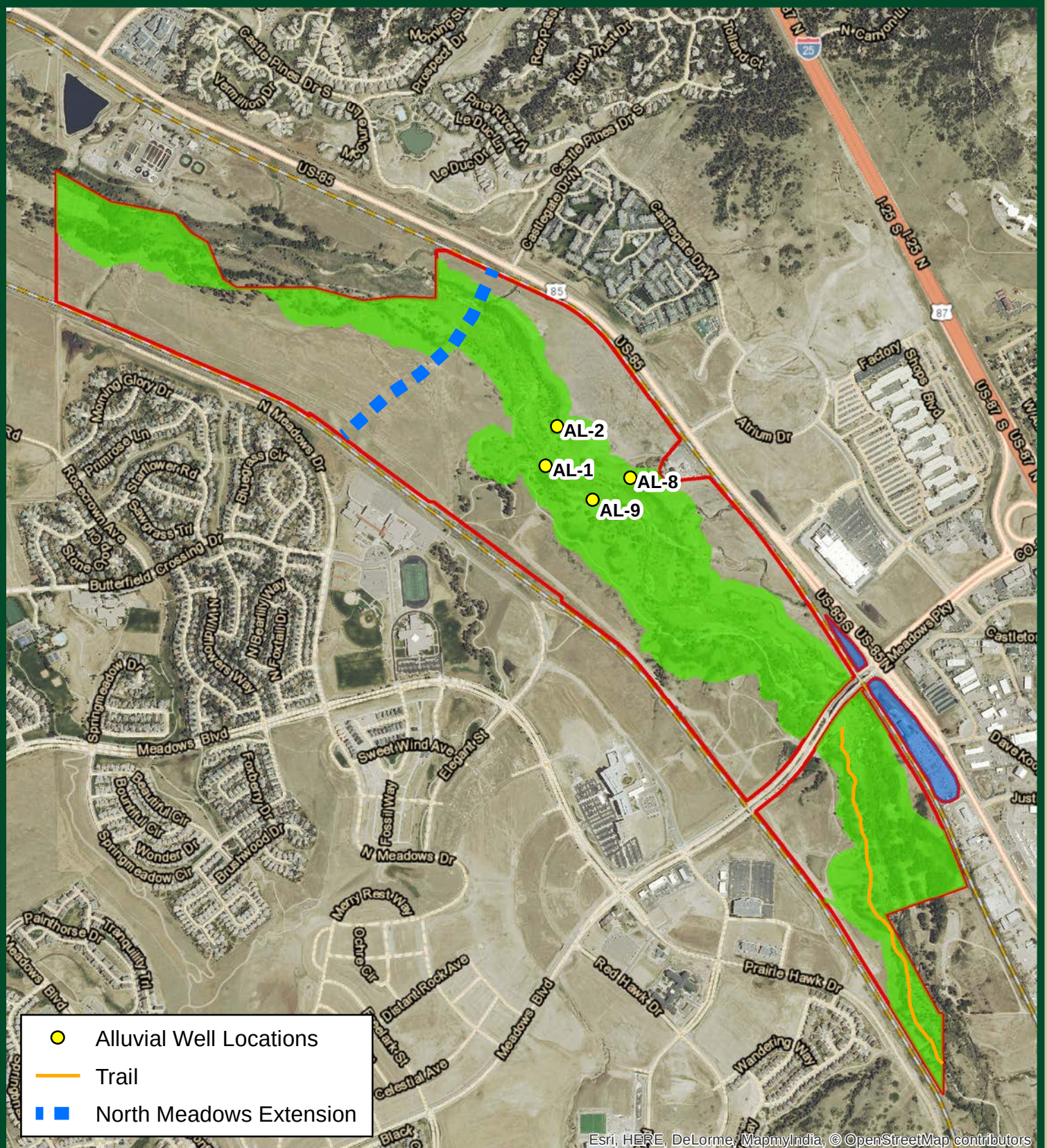


This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.

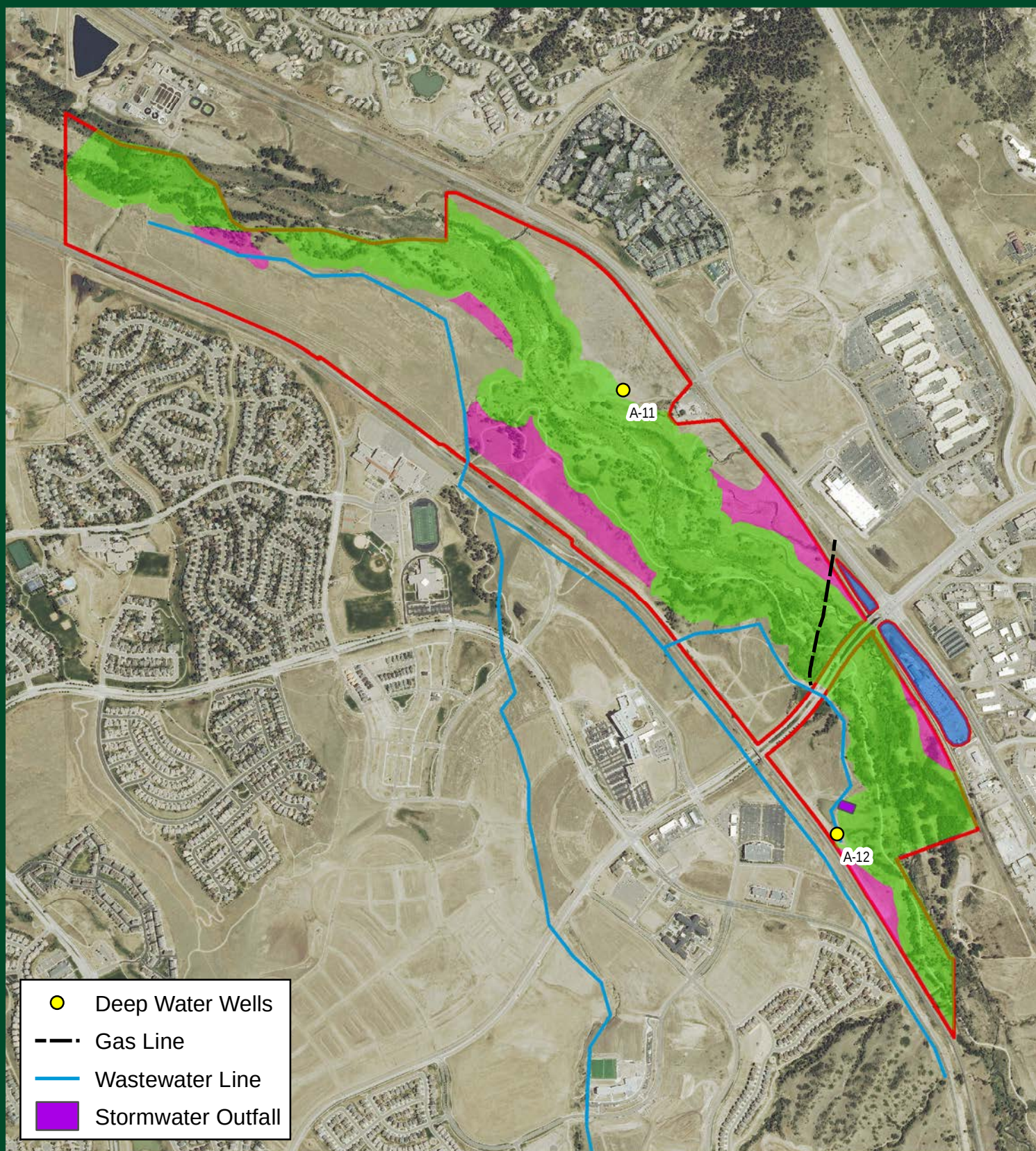


- Protection Zone
- Sold Parcels
- EA/HCP Area



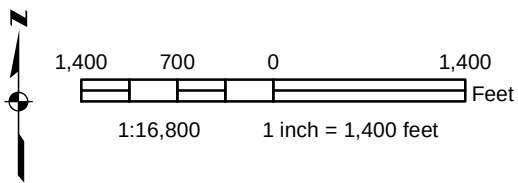


Meadows EA/HCP Minor Amendment
Figure 7: Town Development Activities



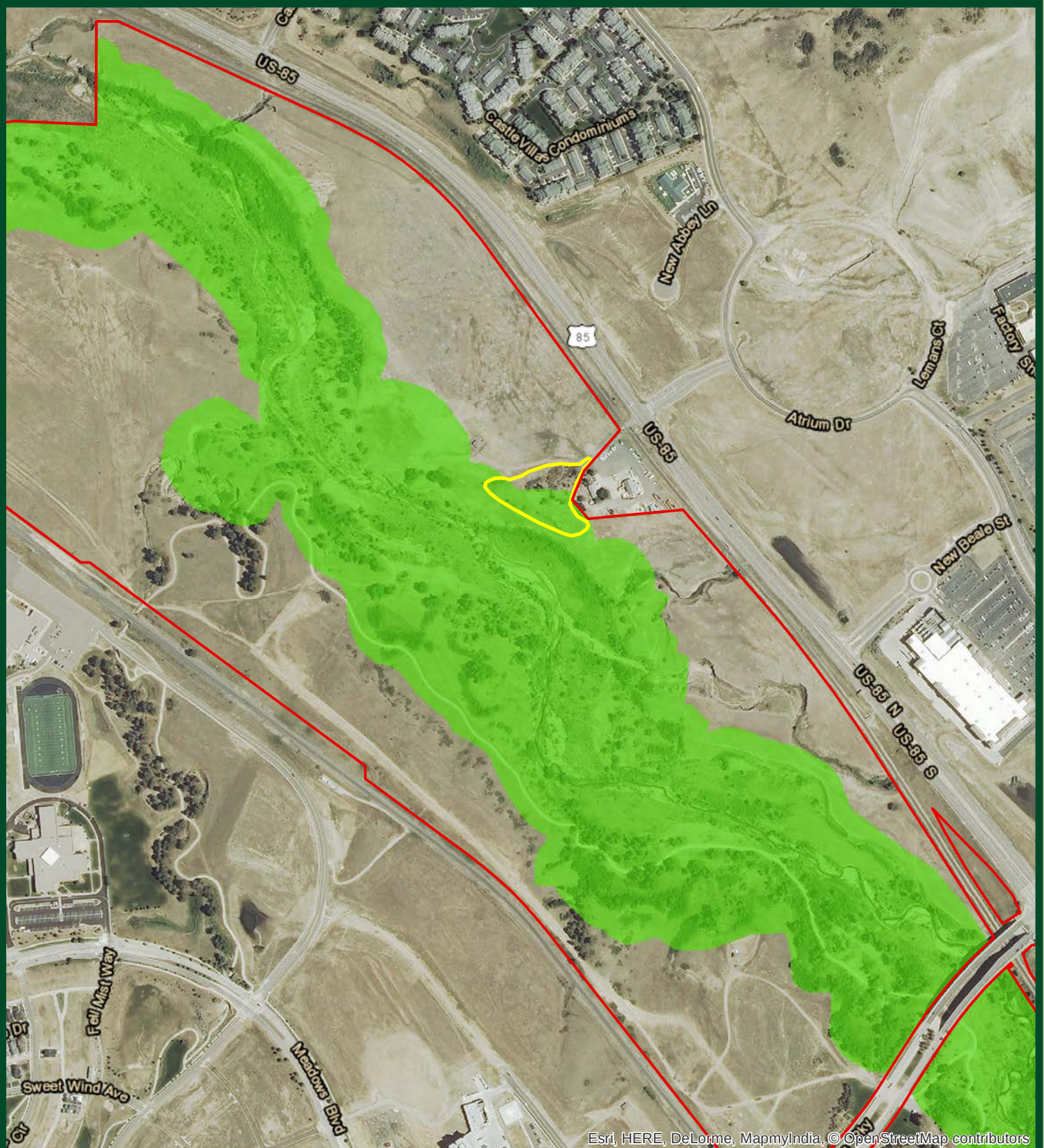
- Deep Water Wells
- - - Gas Line
- Wastewater Line
- Stormwater Outfall

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- Sold Parcels
- Protection Zone
- Additional Mitigation Area
- EA/HCP





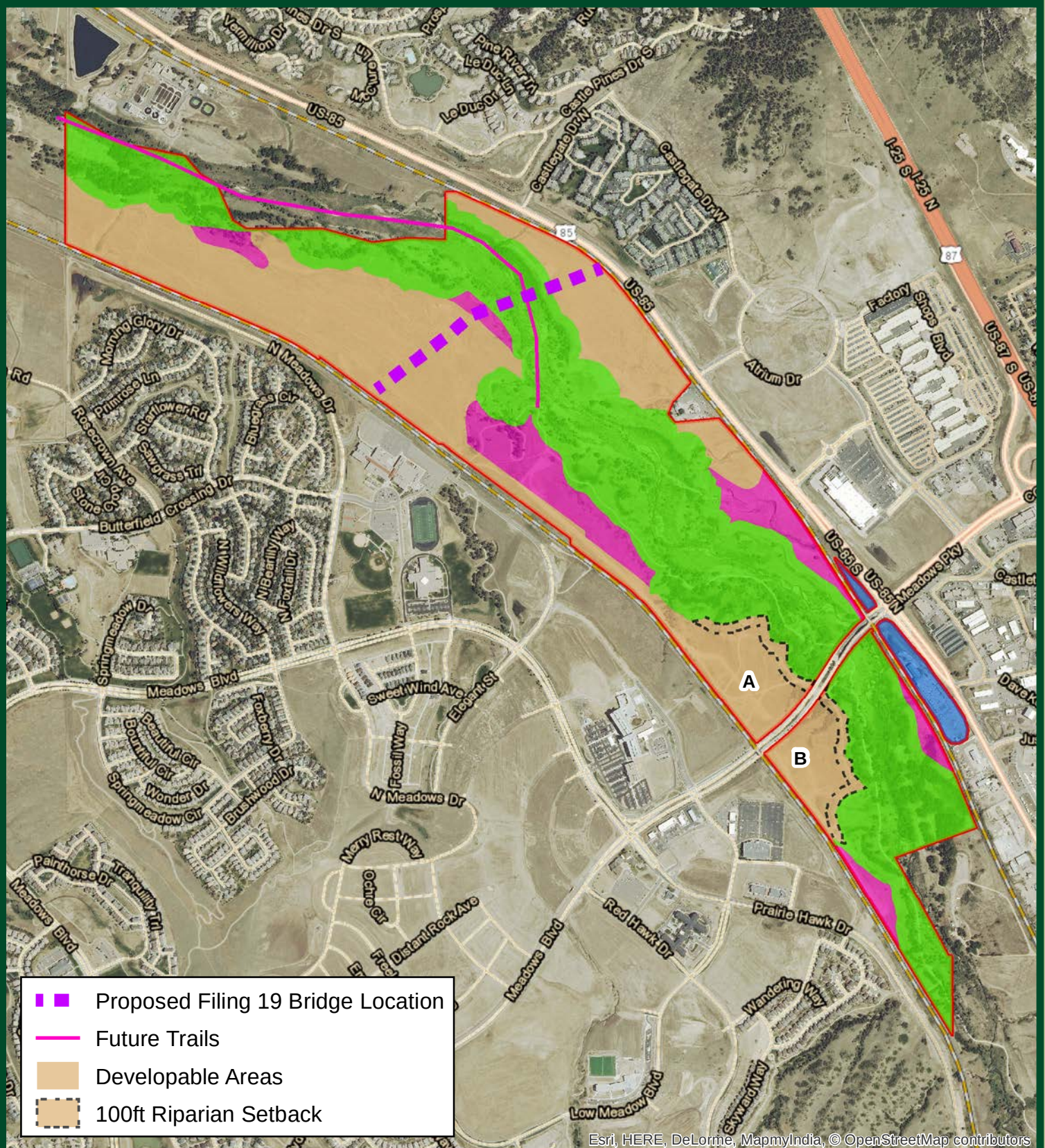
This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



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1:7,800 1 inch = 650 feet

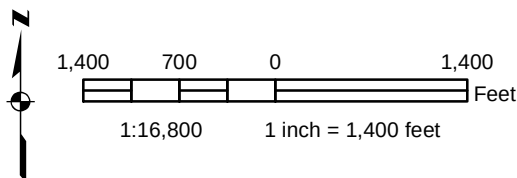
- Cramer Dairy Farmstead
- Protection Zone
- EA/HCP Area





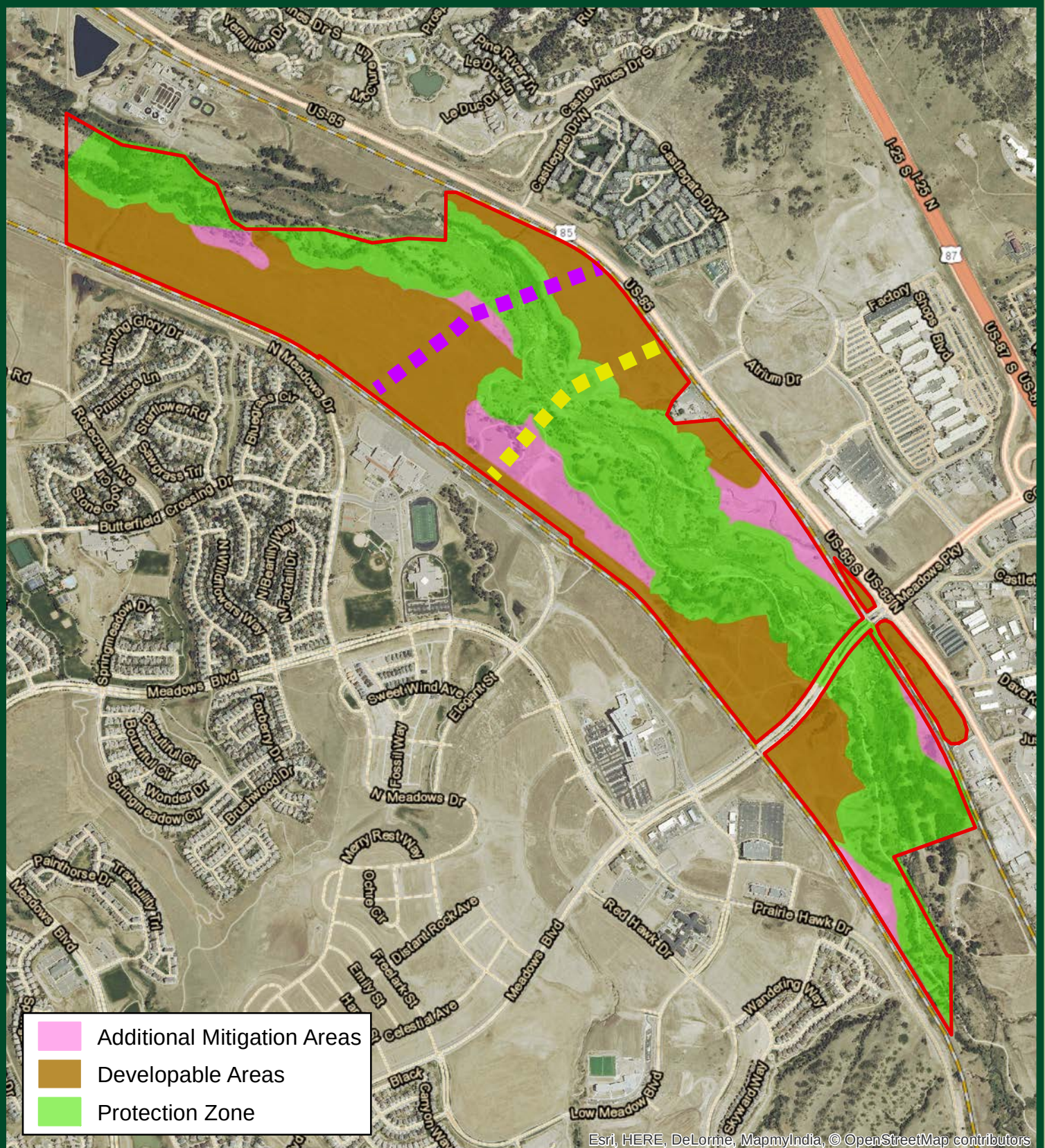
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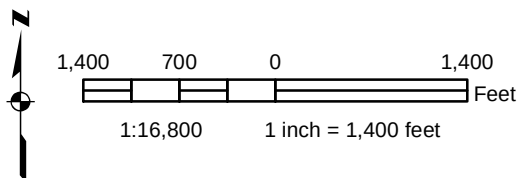


- Sold Parcels
- Protection Zone
- Additional Mitigation Areas
- EA/HCP Area





This map is intended for planning purposes only. All map data should be considered preliminary. All boundaries and designations are subject to confirmation.



- Build Alt. 1 & 2
- Build Alt. 3
- EA/HCP Area



ATTACHMENTS



ATTACHMENT 1

December 15, 2003

**ENVIRONMENTAL ASSESSMENT/HABITAT
CONSERVATION PLAN
FOR A PORTION
OF THE MEADOWS PROPERTY
DOUGLAS COUNTY, COLORADO**

Prepared for:

**United States Fish and Wildlife Service
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215**

Submitted by: Castle Rock Development Company

Prepared by:

**Athabasca Consulting, Inc.
Kaplan Kirsch & Rockwell L.L.P.**

December 15, 2003

December 15, 2003

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1.0 INTRODUCTION

The applicants, Castle Rock Development Company and Castle Rock Land Co. (together, "CRDC"), are planning to develop a commercial site on a portion of The Meadows community in Douglas County, Colorado (Figure 1, Vicinity Map). The total planning area (the "EA/HCP Property") is approximately 480 acres and is located just west of Interstate Highway 25, within the corporate boundaries of the Town of Castle Rock (Figure 2, EA/HCP Property). The EA/HCP Property straddles East Plum Creek drainage and is entirely contained within two major railway lines, with the exception of one small parcel. An existing bridge spans East Plum Creek and carries The Meadows Parkway as it crosses the EA/HCP Property on the southern (upstream) portion of the EA/HCP Property.

In accordance with the Endangered Species Act of 1973, as amended ("Act"), CRDC has applied for a section 10(a)(1)(B) incidental take permit ("ITP") from the U.S. Fish and Wildlife Service ("Service"). The requested permit would be valid for 30 years and authorize certain activities and resulting disturbances to, or loss of habitat that may result in take of, Preble's meadow jumping mouse ("Preble's") (*Zapus hudsonius preblei*), a federally-listed threatened species. Take is defined as conduct that actually or attempts to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a species. Harm in the definition of "take" in the Act means an act that actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Incidental take means any prohibited take that is incidental to, and not the purpose of, conducting otherwise legal activities.

This combined Environmental Assessment and Habitat Conservation Plan ("EA/HCP") provides the required National Environmental Policy Act ("NEPA") documentation for issuance of the ITP and a habitat conservation plan ("HCP") that describes how the proposed action would avoid, minimize, and mitigate the potential impacts to Preble's.

The purpose of the HCP process and the issuance of an ITP is to describe and authorize the underlying activities that result in take.

1.1 Background

The EA/HCP Property historically was a part of a working ranch until it was acquired by a master planned community developer in 1984. The EA/HCP Property originally was zoned by the Town of Castle Rock as part of The Meadows P.U.D. in 1984 (Ordinance 84-48), which P.U.D. was amended by an Amended Preliminary PD Plan for The Meadows dated September 1986 (Ordinance 86-42) (Figure 3-A) ("Third Amended PD Plan"). (The Town of Castle Rock Zoning Code now refers to planned unit developments as "planned developments" or "PDs"). The zoning for the EA/HCP Property was further amended in April 2003 at the request of the Applicants (the "Fourth Amended PD Plan") in a manner that reduced the density of development in The Meadows overall and made the zoning for the EA/HCP Property consistent with this HCP (See Figure 3-B).

In 1997, Castle Rock Land Co., LLC, a Colorado limited liability company, purchased The Meadows with the intent of having the property developed in accordance with the approved PD Plan. Castle Rock Development Company is authorized by Castle Rock Land Co. to process land use and other applications related to development of The Meadows and will acquire property at The Meadows prior to development. Castle Rock Land Co. and Castle Rock Development Company are applying for an ITP jointly and are referred to together as "CRDC" in this EA/HCP. CRDC has expended significant planning, legal, biological, engineering, and infrastructure dollars that relied on constructing residential, commercial, industrial, and office buildings within the framework of the approved PD Plan.

The Preble's was listed on May 13, 1998, as a threatened species by the Service. Since the listing, CRDC has sought the Service's advice and concurrence on all potential impacts to Preble's that may result from the development of the approved PD Plan. In June 1999, CRDC received concurrence from the Service that development of those

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portions of The Meadows other than the EA/HCP Property would not directly or indirectly affect Preble's or Preble's habitat. The area that is the EA/HCP Property did not receive concurrence from the Service and has been included in the ITP application and this EA/HCP.

Since the concurrence letter, CRDC has been actively participating in the formulation of the Douglas County sub-area regional planning process for Preble's. CRDC has attended meetings, made public statements in support of the planning efforts, reviewed draft documents, and reviewed and provided comments on the draft preserve maps. CRDC also has coordinated its ITP permit activities with Douglas County so that CRDC can design an individual EA/HCP that is consistent with the objectives of the County's sub-area regional plan.

For over three years, CRDC has been working with the Service to develop a plan that would minimize and avoid impacts to Preble's, and mitigate disturbance to Preble's habitat within the parameters of the Act. A variety of development plans and multiple avoidance, minimization, and mitigation strategies were discussed. The EA/HCP reflects those discussions.

1.2 Description of Requested Permit Activity

Development of the EA/HCP Property would involve four types of uses as shown on Figure 3. First, the Parcels designated as "COI" on Figure 3-B would be developed with office, commercial, and industrial uses as set forth on the Fourth Amended PD Plan. (Under the Third Amended PD Plan, almost all of Parcels IV-3 and IV-4, as shown on Figure 3-A, was designated for commercial development. Except for a small portion of Parcel IV-3 which would be dedicated as a road right of way, both of these parcels would be dedicated as open space as part of the mitigation in the HCP). Second, a total of 20 water wells (including well construction, pipe installation and operation, and maintenance) would be drilled over a period of 20 years to serve the entire Meadows community, with only two to three wells being developed at any one time. Sixteen of the

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twenty wells would be located within the riparian corridor, each permanently occupying a 40 ft. x 40 ft. area. The location and pumping rates for the wells are dictated by a water decree that was approved by the Colorado District Court, Water Division No. 1 (Case No. 85CW480, filed 1985). Third, a proposed trail system approximately two miles long would be built within the riparian corridor of the EA/HCP Property to serve as an upstream and downstream extension of the existing Town of Castle Rock trail system. The permanent trail would be approximately eight feet wide and would be improved with concrete.

Finally, an underground sanitary sewer line would be constructed within the Northeasterly portions of the COI Parcels located on the Southwesterly side of East Plum Creek, consisting of an 8" underground main, an above ground lift station, and a 24" underground main. Portions of these sewer facilities would be located in the uplands portion of the habitat Protection Zone (defined in Section 4.1 below) for the Preble's used in this EA/HCP.

With the exception of the water well development and trail development, virtually all proposed development will occur outside the riparian portion of the Protection Zone.

1.3 Permittees

The ITP would authorize the incidental take of Preble's by CRDC related to development of the EA/HCP Property. In addition, the ITP would cover the employees, agents, contractors, and licensees of CRDC. Activities by any of the above listed persons or entities related to the project and covered by this EA/HCP will not violate the prohibitions under 50 C.F.R. sec. 13.25 against permitted transfers. CRDC accepts and agrees to adhere to the requirements and conditions of the ITP and of this EA/HCP for implementing and managing the mitigation plan contained herein.

1.4 Applicant's Qualifications

CRDC is not disqualified under any of the factors listed under 50 C.F.R. sec. 13.21.

1.5 Term

The duration of the requested ITP is 30 years from the date of issuance. This time frame will allow CRDC to take Preble's, either directly or through disturbances of actual or potential Preble's habitat, within the geographical boundaries identified in the requested permit over that period for those activities covered in this EA/HCP. After expiration of the ITP, any "take" within the geographic boundaries covered by the requested permit will require reauthorization by the Service, either through a subsequent permit application under section 10(a)(1)(B) of the Act for an incidental take or through other procedures adopted by the Service under section 4(d) of the Act. However, the terms and conditions contained in the EA/HCP shall not expire and shall be subject to the enforcement authority of section 11(b) of the Act.

1.6 Other Conditions

The ITP and the EA/HCP contained herein shall be subject to the conditions listed under 50 C.F.R. sec. 13.21(e).

ENVIRONMENTAL ASSESSMENT

2.0 PURPOSE AND NEED FOR ACTION

CRDC seeks the ITP to allow for the incidental take of Preble's, which has been documented to occur in the surrounding area. The implementation regulations for section 10(a)(1)(B) of the Act, as provided by 50 CFR 17.22, specify the criteria by which a permit allowing the incidental take of listed species pursuant to otherwise lawful activities may be obtained. The purpose for issuing the ITP and implementing the

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EA/HCP is to authorize incidental take, including the potential disturbance to and loss of habitat potentially used by Preble's, during the permit duration for the construction of commercial office space, well structures, trail, and other related activities on the EA/HCP Property.

CRDC's need in requesting the ITP is to carry out the activities specified in Section 1.2 on the EA/HCP Property in compliance with the Act. The needs and goals of the Service are: (1) to insure that incidental taking resulting from the proposed development will be minimized and mitigated to the maximum extent practicable and will not appreciably reduce the likelihood of the survival and recovery of this listed species in the wild; and (2) to ensure compliance with the Act, NEPA, and other applicable Federal laws and regulations. This EA is intended to evaluate the environmental impacts of the issuance of the ITP and alternatives to the project.

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Vegetation

The EA/HCP Property is located in the foothills transition zone between the grasslands of the eastern Colorado plains and ponderosa pine forests to the west. The EA/HCP Property consists of two distinct vegetative communities: (1) the East Plum Creek drainage; and (2) upland areas on the eastern and western sides of the East Plum Creek drainage. The East Plum Creek drainage is a riparian corridor with a perennial stream meandering through dense to moderately dense interspersions of open grassy areas and woody vegetation, such as ponderosa pine (*Pinus ponderosa*), various willows (*Salix spp.*), alder (*Alnus tenuifolia*), dogwood (*Cornus spp.*), plains cottonwood (*Populus sargentii*), coyote willow (*Salix exigua*), and Gambel oak (*Quercus gambelii*). Shrub species, such as western snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), grass species such as bluestem (*Schizachyrium spp.*), and sedges (*Carex spp.*) all occur within the riparian corridor. The Colorado Natural Heritage Program ("CNHP") catalogs this habitat as *Salix Exigua*/Mesic Graminoid type.

Adjacent upland sites are described by the presence of western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), smooth brome (*Bromus inermis*), yucca (*Campestris spp.*), and prickly pear cactus (*Opuntia phaeacantha*). Very few shrubs or trees exist in the upland areas.

Non-native plant species, such as cheat grass (*Bromus tectorum*) and Russian knapweed (*Acroptilon repens*), have invaded much of Douglas County and are significant components to the upland vegetation bordering East Plum Creek.

3.2 Wildlife

No animal surveys specifically designed to determine numbers and distribution of species within the EA/HCP Property appear to have been conducted. Species that have been observed or whose sign has been observed on the EA/HCP Property include great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), American goldfinch (*Carduelis tristis*), western bluebird (*Sialia currucoides*), common flicker (*Colaptes auratus*), belted kingfisher (*Ceryle alcyon*), great blue heron (*Ardea herodias*), cedar waxwing (*Bombycilla cedrorum*), horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), and red-winged blackbird (*Agelaius phoeniceus*). Some common riparian nesting bird species include the yellow warbler (*Densroica petechis*), northern oriole (*Icterus galbula bullockii*), song sparrow (*Melospiza melodia*), and spotted sandpiper (*Actitis macularia*).

Mammals that may use riparian habitat and/or adjacent upland habitat along East Plum Creek include mule deer (*Odocoileus hemionus*), muskrat (*Ondatra zibethicus*), desert cottontail (*Sylvilagus audubonii*), red fox (*Microtus pennsylvanicus*), coyote (*Canis latrans*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), and deer mouse (*Peromyscus maniculatus*).

3.3 Threatened or Endangered Species

There is no evidence that any threatened or endangered species other than Preble's regularly utilize the EA/HCP Property as habitat.

Four federally-threatened or endangered terrestrial animal species are listed by the CNHP as potentially occurring in Douglas County. They are the bald eagle (*Haliaeetus leucocephalus*), Mexican spotted owl (*Strix occidentalis lucida*), Preble's, and the Pawnee montane skipper (*Hesperia leonardus Montana*). Currently there is no regularly known presence of bald eagles or Mexican spotted owls on the EA/HCP Property. The Pawnee montane skipper butterfly occurs in Douglas County but only within South Platte Canyon, no further south than the town of Deckers, and not below 6,200 feet (CNHP, 2001).¹

The Colorado state endangered plains sharp-tailed grouse (*Tympanuchus phasianellus jamesi*) is listed by CNHP as occurring in Douglas County. The grouse is a shrub-prairie ecotone species historically occurring along the foothills or along stream courses in the plains. There is no evidence that the sharp-tailed grouse exists on or uses the EA/HCP Property.

In 1999, the existence of a burrowing owl (*Athene cunicularia*) in a prairie dog colony decimated by sylvatic plague was confirmed 1 mile west of the EA/HCP Property (SWCA, 1999). Under state law, only the bird and not the prairie dog colony is protected. Since the owl is a migratory bird, it only inhabits areas such as The Meadows from early March to mid October at which time it flies south to warmer climates. According to the Colorado Division of Wildlife ("CDOW"), nesting habitat (prairie dog towns) can be destroyed while the owl is away from November 1st to February 28th. Construction during any other time of the year would require a survey to determine the presence of nesting owls. Should no owls be identified in the project area, the site would

¹ All referenced documents are available for review at the United States Fish and Wildlife Service, Ecological Services Field Office, 755 Parfet Street, Suite 361, Lakewood, CO.

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be cleared for construction. If owls are found, construction will be limited to the area outside of the 0.5 mile perimeter around the nest in accordance with state recommendations. No raptor nests, besides that of the burrowing owl, have been identified on the site; therefore, the impact to raptors is anticipated to be low to non-existent.

The Service requires surveys for the federally-threatened Ute ladies' tresses orchid (*Spiranthes diluvialis*) prior to disturbance within riparian areas, wet meadows, or flood plains along perennial tributaries of the South Platte River from the Front Range east to the town of Brush in Morgan County. This includes East Plum Creek. However, according to CNHP, the threatened Ute ladies' tresses orchid has not been identified in Douglas County (CNHP, 2001). Further, a survey of the EA/HCP Property in 1999 did not identify the Ute ladies' tresses orchid on the site (ERM, 2002a). The federally-listed Colorado butterfly (*Gaura neomexicana coloradensis*) is recorded as occurring in Douglas County but has not been documented since 1942 (CNHP, 2001).

Four species of fish are listed as Colorado state-threatened, endangered, or of concern: (1) the northern redbelly dace (*Phoxinus eos*), listed as endangered; (2) the common shiner (*Notropis cornutus*), listed as threatened; (3) the brassy minnow (*Hybognathus hankinsoni*), listed as threatened; and (4) the Iowa darter (*Etheostoma exile*), listed as of concern. There is no evidence of any of these species occurring anywhere in East Plum Creek running through or adjacent to the EA/HCP Property (CDOW, 2001).

The black-tailed prairie dog (*Cynomys ludovicianus*) was petitioned to be listed as an endangered species in March 1999. A black-tailed prairie dog town had been located over a mile from the EA/HCP Property, but was decimated by sylvatic plague (letter from Gary Hartzell, Tri-County Health Department, to Trent Miller (October 2, 1998) (see Attachment C). While the status of black-tailed prairie dog's locations and populations is currently unknown, the black-tailed prairie dogs could potentially return to the area in the future.

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The return of the black-tailed prairie dog could lead to the arrival of the black-footed ferret (*Mustela nigripes*). The black-footed ferret was listed as federally endangered in 1967 and is associated with the black-tailed prairie dog as a predator. The diets of black-footed ferrets consist almost exclusively of prairie dogs. However, a colony of black-tailed prairie dogs must be active and occupy at least 60 acres to support a black-footed ferret. Currently, no black-footed ferrets are known to exist in the area.

In March 2003, the northern pocket gopher was the subject of a listing petition for northern Douglas County. This species has never been reported on The Meadows property. Further, based on site visits and examination of soil maps and the soil requirements for the northern pocket gopher, this species is not expected on The Meadows.

Preble's is a closely related subspecies to other jumping mice commonly found in Colorado. Preble's is known to occur only in several places along the Front Range of Colorado and in only a few locations in Wyoming. On May 13, 1998, the Service listed Preble's as threatened under the Act.

Preble's is known to occur along East Plum Creek within the Town of Castle Rock. The Meadows lies within an area where Preble's presence has been documented. In Colorado and Wyoming, Preble's appears to inhabit areas below 7,600 feet in elevation, associated with moist lowlands with dense vegetation. Recent survey data indicates that Preble's may inhabit areas up to 7,600 and 8,000 feet in Colorado and Wyoming, respectively (Plage, 1999). Such areas include moist grassy fields, vegetation along streams, ponds, marshes, wetlands, riparian areas, and irrigation canals and ditches, as well as areas with rank herbaceous vegetation where tall shrubs provide adequate cover. Preble's also have been found in woody vegetation such as willows, ponderosa pine, alder, dogwood, birch, and Gambel oak. Additionally, Preble's are associated with indigenous and introduced mature/dense/tall grass species such as little bluestem and cheat grass. Loss of habitat has been attributed to the destruction of riparian corridors and the impounding of wetland areas from suburban development. According to the federal listing, Preble's is not found

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in highly disturbed areas, landscaped and maintained lawns, irrigation ditches with no vegetation channels where water is diverted underground, and sites that are maintained as cropland.

Regularly utilized habitat for Preble's is found within many riparian areas adjacent to Plum Creek, from its headwaters downstream towards its confluence with the South Platte River near Chatfield Reservoir. This includes East and West Plum Creeks. In areas along East Plum Creek (the approximate eastern boundary of The Meadows), biologists have trapped Preble's approximately one mile south of The Meadows, and approximately 3.25 miles north of The Meadows at the confluence of East and West Plum Creeks. Habitat types, including vegetation and cover, found at the general locations of the above-mentioned trapping sites, also are present at The Meadows. While suitable habitat exists along the entire East Plum Creek Corridor where it flows through The Meadows, no trapping has occurred along this stretch of the creek.

3.4 Wetlands

CRDC has no plans to conduct activities that would impact wetlands within the EA/HCP Property. Areas subject to jurisdiction under section 404 of the Clean Water Act include those areas that fall at or below "the plane of ordinary high water" of these waterways as defined by 33 CFR §323.2. Wetlands, adjacent to the creek, exist on the EA/HCP Property that meet the definition as defined by the criteria established in the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual (ERM, 2002a). However, these wetlands are small and scattered within the riparian area of the EA/HCP Property and CRDC plans to avoid them during construction of the water wells and associated piping. If planned activities would result in impacts to "waters," then CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

3.5 Geology/Soils

The site of The Meadows is underlain by sedimentary units of the upper Tertiary (Paleocene/Oligocene) age Castle Rock Conglomerate Member, of the Dawson Formation. This unit consists of claystones, siltstones, and light colored arkosic conglomerates, sandstones and gravels. Additionally, limestones, lignites and coals occur throughout the 300-1400 foot thickness of the unit (Chase/ McConaghy USGS Publication I-731, 1972). Alluvial material within drainages, including Plum Creek, is of Pleistocene and Holocene age (post Piney Creek). The geologic formations are highly permeable and often contain low levels of organic material. These conditions result in highly erodible, poorly vegetated soil.

The site of The Meadows contains the Larkson, Newlan, and Sampson soil Series according the U.S. Soil Conservation Service "Soil Survey of the Castle Rock Area, Colorado, 1977" publication.

3.6 Land Use

The EA/HCP Property is currently vacant land that is part of The Meadows master planned community. See Figures 2 and 3. The EA/HCP Property originally was zoned by the Town of Castle Rock as part of The Meadows P.U.D. in 1984 (Ordinance 84-48). The P.U.D. was amended by the Third Amended Preliminary PD Plan for The Meadows in September 1986 (Ordinance 86-42). The Third Amended PD Plan separates the EA/HCP Property into Parcels IV-1 through IV-8, as shown on Figure 3-A, as well as three unnamed open space parcels. The Third Amended PD Plan, as shown on Figure 3-A, designates Parcels IV-1 (102.0 acres), IV-2 (57.3 acres), IV-3 (25.5 acres) and IV-4 (11.1 acres) for industrial uses, which may include a wide variety of industrial uses identified in the Town of Castle Rock Zoning Code. Parcels IV-5 (30.9 acres), IV-6 (19.6 acres) and IV-7 (7.8 acres) are designated for office uses. A total of 243.7 acres of land on four parcels are designated as open space (only one, Parcel IV-8, is designated by parcel number).

In September 2000, CRDC submitted an application for the Fourth Amended PD Plan, which was approved by the Town of Castle Rock in April 2003. The amendment changed the land use designations of the Parcels IV-1, IV-2, IV-5 and IV-6 to COI – commercial, office and industrial. This designation permits various light industrial and commercial uses on all of those parcels. While the revised zoning allows for more flexibility in developing the EA/HCP Property, it did not increase the total acreages of the development parcels or reduce open space.

3.7 Cultural Resources

The Office of Archaeology and Historic Preservation of the Colorado Historical Society has conducted a search of the Colorado Inventory of Cultural Resources using a legal description that is larger than, but encompassing, the EA/HCP Property. That search identified 9 sites (SDA.921.1, SDA.922.1, SDA.941, SDA.946, SDA.947, SDA.950, SDA.953, SDA.954 and SDA.955) and 9 surveys (DA.CH.9R19, DA.CH.R10, DA.CH.R11, DA.CH.R17, DA.CH.R24, DA.CH.R3, DA.EP.R1, MC.CH.R92, and MC.CH.R96) on the property included within the search. Two of the sites, the Denver and Rio Grande Railroad and the Atchison, Topeka and Santa Fe Railroad, were found to be adjacent to the EA/HCP Property (ERM 2002). A cultural resource survey of the EA/HCP Property concluded that the activities covered in the EA/HCP are not expected to affect the railroads (ERM 2002). The other seven sites were located outside and away from the EA/HCP Property and would not be affected by the proposed action. The cultural resource survey did not locate any other cultural resources that could be affected within the EA/HCP Property (ERM 2002).

3.8 Air Quality

Castle Rock is located in the Denver metropolitan attainment/maintenance areas for ozone, particulate matter smaller than 10 microns and carbon monoxide. The area is in attainment of all other National Ambient Air Quality Standards.

3.9 Water Resources and Water Quality

The riparian area associated with East Plum Creek winds through the easternmost part of The Meadows tract. Highly erosive soils have allowed the creek to pick its own course though the area, as is evident by the changing water channels. Sediments are transported naturally due to rainfall. Over time, the creek has eroded away enough soil to create the benches that sit over the present day creek. In more recent times, the creek has been relegated to changing courses within the area below the bench. This area along the creek bottom is dominated by plant species that depend on a year-round water source. Moving further away from the creek, up towards the top of the first bench and the bottom of the second, ponderosa pine becomes established. On the second bench, the riparian community ceases to exist.

Water quality on the proposed development site is presently considered to be good (personal communication, Eric Oppelt, Colorado Water Quality Control Division, May 13, 2002).

4.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section presents details of the proposed action and the reasonably practicable alternatives that have been considered. The alternatives include: (1) Proposed (Preferred) Action; (2) Alternate Site Design Based on Third Amended PD Plan; (3) Alternative Site Location; (4) Wait on a Regional 10 (A)(1)(B) Permit; and (5) No Action. The environmental consequences of these various alternatives are presented below in Section 5.0.

4.1 Methodology for Selection and Analysis of Alternatives

One of CRDC's objectives in developing the EA/HCP Property has been to protect the highest quality Preble's habitat in the most contiguous and complete fashion possible.

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sewer line to serve the Meadows community. However, the intent of CRDC is to provide water and sewer services to other property at The Meadows and to develop the EA/HCP Property in accordance with its overall development plans for The Meadows. There is no other location on The Meadows' property where sufficient water could be extracted or where sewer facilities could be placed to provide the required water and sewer service. The decree allowing the alluvial wells allows withdrawal only at the sites covered by the EA/HCP. Connection of existing Town of Castle Rock trails also drives the location of the proposed trails. Furthermore, it would not be economically practical for CRDC to purchase other property, even if it were available, to locate these facilities and development. Therefore, an alternative that involves another site location was determined to be impracticable.

Also, the EA/HCP Property is located within an active commercial area, and most of the vegetation on the site has been impacted by cattle grazing. Using an alternate site could result in a more pristine location being impacted. Moreover, the site's proximity to areas that can be enhanced to the benefit of Preble's creates an opportunity to increase quantity and quality of habitat for Preble's and other wildlife.

4.2.4 Alternative 4 – Wait on a Regional 10(A)(1)(B) Permit

Under this alternative, CRDC would wait for Douglas County to obtain a regional 10(A)(1)(B) permit from the Service and would develop the EA/HCP Property in accordance with the process and development regulations set forth in that permit. Douglas County currently is working to prepare a regional EA/HCP related to Preble's. However, there is no certainty as to whether and when such a regional EA/HCP would be completed and approved by the Service. Because of CRDC's timetables for development of The Meadows and the need to serve other property at the Meadows with water and sewer services, it was considered to be impracticable to wait for completion of the regional EA/HCP to develop the EA/HCP Property.

4.2.5 Alternative 5 – No Action

Under this alternative, CRDC would not develop the EA/HCP Property and the Service would not process an application for an ITP.

5.0 ENVIRONMENTAL CONSEQUENCES / ECOLOGICAL ASSESSMENT

The objective of the following environmental consequences analysis and ecological assessment is to evaluate the ecological effects of the various alternatives described in Section 4.0 above. The objective of the assessment is to identify whether any of those alternatives, in conjunction with any proposed mitigation activities, would have any significant impact on Preble's and other factors.

5.1 Alternative 1 – Proposed (Preferred) Action

5.1.1 Onsite Impacts

Although disturbances resulting from the development and construction on the EA/HCP Property will disturb vegetation onsite and reduce habitat for wildlife, including the potential destruction and degradation of Preble's habitat, implementation of the Alternative 1 is expected to offset such impacts and improve habitat for Preble's and other riparian-dependent wildlife.

5.1.1.1 Vegetation

Within the Protection Zone, Alternative 1 would remove or alter permanently a total of 8.64 acres of vegetation, and would temporarily alter an additional 24.87 acres of vegetation.

Within the portion of the Protection Zone that is riparian, 3.04 acres of permanent and 22.72 additional acres of temporary disturbance to vegetation will occur. These

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disturbances are related to water well construction and the extension of the existing trail system. During installation of each water well, a maximum of 200 ft. x 200 ft. of disturbance would occur. Some additional disturbances will occur in installing the water delivery system. All of these areas will be revegetated. Following installation of the water wells and revegetation of the temporarily disturbed areas, 40 ft. x 40 ft. of permanent disturbance would remain per water well. Of the twenty proposed water wells, a maximum of two to three wells and associated infrastructure would be constructed at a given time over a twenty-year period. Sanitary sewer lines would not be included within the riparian vegetation as proposed in Alternative 2.

Within the upland portion of the Protection Zone, a total of 5.59 acres of permanent and a total of 2.15 additional acres of temporary disturbance to vegetation will occur as a result of developing Parcels A and B. These two parcels lie within upland areas and are composed mainly of non-native heavily grazed grasses. However, Alternative 1 would modify existing approved plans and remove a large majority of all other development from the Protection Zone.

The quality of habitat within the upland zones is very low. The uplands are sparsely vegetated, with areas of 25% to 50% bare ground evident. Vegetation consists mostly of grasses and forbs less than 15 inches tall. Available grasses are sparse, but occasionally form small, thick bunches which could be valuable to the mouse as nesting sites. These areas are not considered optimal Preble's habitat.

Both the riparian and upland areas are currently exposed to cattle grazing, an activity that would be discontinued within the Protection Zone at the time of construction under this alternative. The absence of cattle grazing would enhance the establishment and proliferation of the native vegetation to be planted within the temporarily disturbed areas and the 10 acres in which CRDC will enhance existing vegetation as part of the HCP (see Section 6.5.2(3)). Additionally, the quality of habitat within the entire Protection Zone would be increased significantly through the discontinuation of cattle grazing. Increasing

the quality of existing Preble's habitat could actually improve the viability of the riparian corridor beyond that of pre-development conditions.

5.1.1.2 Wildlife

Wildlife within those areas planned for development would largely be displaced to adjacent areas during the construction process. Such displacement could result in increased competition for breeding, nesting, and foraging habitat, as well as cover, in adjacent undisturbed habitat.

Within the Protection Zone, restoration identified in the HCP will replace 24.87 acres of temporarily disturbed vegetation. The 24.87 acres of temporarily disturbed vegetation and the 8.64 acres of permanently disturbed vegetation within the Protection Zone, will be mitigated through the dedication of 42.85 acres of open space plus an additional 10 acres of enhancement of existing open space, as well as the improvement of all of the open space through the removal of cattle. This will result in a total of 52.85 acres of mitigation, as well as the habitat improvement throughout the property resulting from the removal of the cattle. The 42.85 acres of new permanently dedicated open space will be in addition to the 237.49 acres of existing open space already included in the Third Amended PD Plan.

Within the areas that are outside the riparian corridor but within the Protection Zone, grassland specialists such as the horned lark may be displaced by proposed development. Undetermined effects associated with the promotion of urban wildlife species and human activities associated with the planned development may result in the decline of more specialized species in general.

5.1.1.3 Threatened or Endangered Species

5.1.1.3.1 Assessment of Take of Preble's

Preble's has been trapped above and below the EA/HCP Property along East Plum Creek. Based on results of previous Preble's surveys, the Service has determined that Preble's does occur within the riparian corridor along East Plum Creek, in the vicinity of the project.

Areas within the Protection Zone may be described as suitable foraging, breeding, and/or hibernating habitat for Preble's. The further the distance away from that zone, the potential for Preble's to regularly occur declines. Reasons for this decline are related to increased predation and decreased food source for Preble's.

Preble's habitat is primarily composed of broad, well-vegetated areas (SWCA, 1999). Higher quality habitat is typically found in broad, extensive drainage systems (riparian area extends at least 75 feet from the waters edge) that contain wetland herbaceous and shrub vegetation with very little bare ground. Higher quality habitat is found near open water and associated with wet meadows. Soils range from mesic to hydric. This habitat usually supports thickets of 4- to 7-foot tall coyote willow interspersed with other woody species such as peachleaf willow (*Salix amygdaloides*), western snowberry, alder, narrowleaf cottonwood (*Populus angustifolia*), and plains cottonwood (*Populus deltoids*). Adjacent slopes may contain dense interspersions of shrubby thickets, herbaceous patches, and grassy areas. Adjacent upland shrubs can include western snowberry, chokecherry, and Gambel oak, but species composition is variable throughout the range of the mouse. It is likely that Preble's habitat is not driven by the diversity of plant species, but by the density of riparian vegetation.²

² 67 Fed. Reg. 47,154 (July 17, 2002) (Proposed Designation of Critical Habitat for the Preble's).

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Moderate to lower quality habitat consists of densities of herbaceous vegetation and shrubs below approximately 75% cover. Bare ground may be between 25% and 50%, with mesic soil conditions. Adjacent upland slopes may be more open with very little shrub cover and some areas of dense grasses interspersed with patches of bare ground.

Sixty-percent of the riparian corridor within the EA/HCP Property consists of moderate to lower quality habitat. The discontinuation of cattle grazing on the EA/HCP Property could greatly improve these areas of lesser quality Preble's habitat. This improved habitat quality within the riparian corridor would provide increased viability and contiguity of the riparian corridor, potentially beyond pre-development conditions.

Development within the EA/HCP Area under Alternative 1 would permit development of approximately 199.25 acres of the total 479.59 acres in the plan area. However, Alternative 1 is only expected to result in permanent take of approximately 8.64 acres and additional temporary take of approximately 24.87 acres within the riparian corridor (plus 100 feet).

Of the acreage of take, 3.04 acres will be disturbed permanently and 22.72 acres will be disturbed temporarily within the riparian vegetation due to construction and use of the water well system and trail. Construction of the water wells and associated infrastructure would be such that a maximum of two to three wells would be constructed at a given time over a twenty-year period. In addition to phasing water well construction, project plans would further minimize disturbance by insuring that access roads necessary to install water wells follow existing trails whenever possible. These access roads would not be paved as they would in Alternative 2. The minimum amount of vegetation necessary for trucks to access the water well sites during construction would be removed and/or altered.

In addition, encroachment of noise and activity within close proximity to Preble's activity, introduction or increase of predator species (jays, magpies, and domestic cats), and increase of species that may compete with Preble's for resources (deer mice and other small rodents) are potential indirect impacts of adjacent development. To minimize

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potential noise and activity disturbance, development activities within the riparian vegetation will be initiated between October and April, when Preble's is known to be hibernating. To minimize any potential for indirect impacts from increased predator species and increased populations of species that may compete with the Preble's for resources due to development, all trash receptacles within the EA/HCP Property will have tight-fitting lids and routine rodent control within buildings in the EA/HCP Property will be conducted.

A total of 5.59 acres will be disturbed permanently and an additional 2.15 acres will be disturbed temporarily within the upland areas of the Protection Zone due to development on Parcels A and B. Although development within Parcels A and B may impact some habitat occurring within the 100-foot set back, no development within these parcels would extend into the riparian corridor. Consequently, disturbances within Parcels A and B would not impact riparian vegetation.

5.1.1.3.2 Assessment of Take of Other Listed Species

No take is anticipated for any other federally-listed or proposed species within the Protection Zone. The EA/HCP Property has been evaluated for the presence of the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of potential use of the EA/HCP Property by Preble's, there is no evidence of any other threatened or endangered species on the EA/HCP Property. Thus, there appears to be little chance of onsite impacts to listed species other than Preble's.

5.1.1.4 Wetlands

Areas subject to section 404 of the Clean Water Act jurisdiction are limited to the existing East Plum Creek and adjacent riparian corridor. Runoff into this area is to be treated according to local regulations and the Environmental Protection Agency ("EPA") standards for nonpoint-source pollution and sedimentation prevention. Wetlands do exist on the EA/HCP Property that meet the definition as defined by the criteria established in

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the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual. A wetlands and riparian corridor delineation study was conducted on East Plum Creek within the EA/HCP Property (ERM, 2002a). However, these wetlands are small and scattered within the riparian area of the EA/HCP Property and CRDC plans to avoid them during construction of the water wells and associated piping. If planned activities would result in impacts to "waters," then CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

5.1.1.5 Geology/Soils

No significant geologic alterations are anticipated from the proposed project. Some surface soil alterations will result from the proposed development. Best management practices will be utilized to attenuate any sediment transport during construction.

5.1.1.6 Land Use

Current and past land use trends in the vicinity of the EA/HCP Property are toward commercial use. The Town of Castle Rock Master Plan contemplates that the EA/HCP Property will be used for commercial purposes. In accordance with the Master Plan, the Town of Castle Rock has approved zoning for the entire Meadows development, which contemplates commercial use on the EA/HCP Property. Further, the portions of the EA/HCP Property that would be used for commercial purposes are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Location of the proposed water wells, sewer line and trail would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town of Castle Rock has anticipated and planned for commercial development on the EA/HCP Property and it is consistent with nearby development, Alternative 1 is not expected to have a significant impact on land use.

5.1.1.7 Cultural Resources

No impact to cultural resources is expected as a result of the project (ERM, 2002). To the extent that any cultural resources are identified during project development, CRDC would take appropriate steps to insure that any impacts to such resources are avoided or minimized to the greatest extent practicable.

5.1.1.8 Air Quality

The proposed development may contribute to increased local automobile traffic, which may increase traffic noise and exhaust emissions in the immediate area. A temporary increase of dust emissions and noise are expected during construction activities.

The Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current Regional Transportation Plan ("RTP") and Transportation Improvement Plan ("TIP") of the Denver Regional Council of Governments ("DRCOG"). DRCOG assessed conformity of the RTP and TIP with the State Implementation Plan ("SIP") for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because the project is included in the RTP and TIP, and because the RTP and TIP are in conformity with the SIP for carbon monoxide and particulate matter, the project is not expected to violate applicable air quality standards. Therefore, Alternative 1 is not expected to result in significant onsite impacts on air quality.

5.1.1.9 Water Resources and Water Quality

Surface waters would be directed to appropriate sedimentation facilities, consistent with Town of Castle Rock Public Works Regulations (effective Oct. 1998, reprinted Feb. 1999) stormwater requirements. During construction, best management practices would be utilized, including silt fences and rock berms, to capture and contain sediment transport. Access roads required for the construction of the water wells will follow the

existing trails and open areas wherever possible. The water delivery system will be installed along access roads to further minimize any permanent disturbance. Best management practices will ensure erosion and sediment transport will not be significantly increased during construction activities. Following construction, best management practices will be utilized to ensure the success of revegetated areas.

Sanitary sewer lines would be installed in upland zones, outside of the Protection Zone. Impacts due to maintenance, potential spills, and leaching would be away from the East Plum Creek bed and outside of the riparian corridor.

All proposed buildings would utilize best management practices to channel and detain runoff, as required by the Town of Castle Rock, including sediment traps that catch a high proportion of total suspended solids. Subsurface groundwater resources would be slightly altered by the construction of impervious cover in the form of roadways and building foundations. There could be an increase in sediment loading and other pollutants in surface water runoff; however, these increases would be mitigated by existing and planned sedimentation controls as required by the Town of Castle Rock.

5.1.2 Offsite Impacts

The proposed action will not result in any significant offsite impacts.

5.1.2.1 Vegetation

No offsite impacts to vegetation are expected due to the proposed development.

5.1.2.2 Wildlife

The proposed development plan may result in the reduction of overall habitat available to local offsite wildlife species. However, mitigation included in the HCP not only would

offset such habitat reduction, but also may increase the amount of quality habitat available to wildlife species.

Offsite impacts to wildlife include displacement of some species from proposed development areas, possible increase of generalist species, possible introduction and /or increase of predator species, and the reduction in overall habitat available to wildlife. Wildlife utilizing the subject lots would largely be displaced to adjacent areas, which could result in increased competition for nesting, foraging, and breeding habitat, as well as cover in general.

Urban development often results in increases in generalist species, or species that are successful within a wide range of habitats including human impacted areas. Increases in species that are habitat generalist (e.g., crows, jays, and deer mice) often occur at the expense of species with narrower habitat requirements. Possible introduction and/or increase of predators such as house cats, crows, and jays can have an impact on wildlife communities, particularly nesting birds.

5.1.2.3 Threatened or Endangered Species

Offsite impacts pertaining to endangered species may include a reduction in overall foraging and hibernation habitat for Preble's. However, implementation of the mitigation plan described in the HCP will minimize and mitigate potential onsite impacts, and may actually increase the amount of quality habitat available to Preble's.

5.1.2.4 Wetlands

Existing and proposed onsite sedimentation controls will minimize the amount of sediment introduced into downstream areas. No offsite impacts to wetlands are expected. However, if planned activities would result in offsite impacts to wetlands, CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

5.1.2.5 Geology/Soils

No offsite impacts to geologic or soil resources are expected to occur.

5.1.2.6 Land Use

No significant offsite impacts to existing or proposed land uses are expected to occur as a result of the proposed action.

5.1.2.7 Cultural Resources

No offsite impacts to cultural resources are expected.

5.1.2.8 Air Quality

Vehicle emissions and noise may increase slightly due to an increase in the number of vehicles in the area. The local increase may have minor effects on offsite air quality. However, the Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because the project is in the RTP and TIP, and because the RTP and TIP are in conformity with the SIP for carbon monoxide and particulate matter, the project is not expected to violate applicable air quality standards. Therefore, Alternative 1 is not expected to result in significant offsite impacts on air quality.

5.1.2.9 Water Resources and Water Quality

Offsite surface and groundwater resources are not expected to be impacted by this activity. Proposed water quality control devices are discussed in the onsite impacts

sections. Existing offsite water quality conditions are expected to be maintained by these control devices.

In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the proposed action should not result in a significant impact to water quality or quantity on East Plum Creek or groundwater resources.

In addition, utilizing stormwater runoff facilities to detain runoff prior to entering East Plum Creek would attenuate increases in water flow associated with increased impervious cover.

5.1.3 Cumulative Impacts Analysis

5.1.3.1 Vegetation

The proposed action would result in the permanent disturbance of 3.04 acres of riparian vegetation and 5.59 acres of upland vegetation. In addition to 8.63 acres of permanent disturbance, the proposed action also would result in the temporary disturbance of an additional 22.72 acres of riparian vegetation and 2.15 acres of upland vegetation. The 33.51 acres of temporarily and permanently disturbed vegetation would contribute to the cumulative disturbance of these vegetation types in Douglas County from development and other land use projects. However, at least 24.87 acres would be revegetated within the Protection Zone. Approximately 42.85 acres of Preble's habitat would be dedicated to an appropriate entity (approved by the Service) and set aside as open space, as further described in the HCP. In addition, ten acres of existing open space will undergo

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vegetation enhancement and all areas of the Protection Zone will experience improved vegetation conditions through removal of grazing cattle.

The Fourth Amended PD plan, as approved by the town of Castle Rock, identified a location for a potential future bridge approximately one mile Northwest of the existing Meadows Parkway Bridge as generally shown on Figure 3-B (the "Proposed Access Road"). If built, the Proposed Access Road would be built by the Town as a Town project, and CRDC would be required to fund a share of the construction costs. At this time it is not known if the Proposed Access Road will be built, and no final alignment or design for the proposed Access road has been developed. However, a preliminary analysis conducted by CRDC indicates that if the Proposed Access Road is built, it could have a potential permanent impact within the Protection Area of as much as 2.23 acres, and a potential temporary impact within the Protection Area of as much as 3.87 acres. These potential permanent and temporary impacts on the Protection Area are not addressed by this EA/HCP, and if the Town determines to move forward with construction of the Proposed Access road, it will be required to either pursue an amendment of this HCP, or process a separate HCP for the project. Construction of the Proposed Access Road would not be necessitated by anything in this HCP or an ITP based on it, nor would the Proposed Access road affect any of the areas of new dedicated open space or vegetation enhancement under this HCP.

While the uncertainties associated with a Proposed Access Road make it not reasonably foreseeable at this time, it would not be expected to contribute to any significant cumulative impacts. Because construction of the Proposed Access Road within the protection Area would require approval of either a new or amended HCP by the Service, avoidance, minimization and mitigation, significant cumulative impacts to vegetation and Preble's habitat is not expected.

5.1.3.2 Wildlife

The proposed action would contribute to a cumulative reduction of habitat for some wildlife species when added to impacts from development and other land uses in Douglas County. Wildlife species better adapted to urban and suburban habitat (generalists) may increase and exacerbate displacement of species intolerant to development, which may locally decrease. However, because a viable riparian corridor would be enhanced and maintained through mitigation, the overall cumulative effect is more likely positive for wildlife. Therefore, no significant cumulative impacts to wildlife species in Douglas County or the region are expected.

5.1.3.3 Threatened or Endangered Species

The proposed action may contribute to take of Preble's and/or its habitat in the region when added to section 10(a)(1)(B) incidental take permits that may be issued by the Service for other projects. However, any Preble's take or habitat loss that may occur in the short term by loss of riparian and upland habitat may be offset by increasing the quality of riparian habitat through mitigation. This could result in an increase in the number of Preble's on the EA/HCP Property.

5.1.3.4 Wetlands

No cumulative impacts to wetlands are anticipated. However, if any planned activities would result in cumulative impacts to wetlands, CRDC would seek authorization from the U.S. Army Corps of Engineers prior to conducting such activities.

5.1.3.5 Geology and Soils

No significant cumulative impacts to geology and soils would occur as a result of the proposed action.

5.1.3.6 Land Use

The proposed action contributes to the conversion of undeveloped land to developed land in the Town of Castle Rock. However, such development has been contemplated by the Town of Castle Rock in its Master Plan and land use approvals, as well as by DRCOG in its regional planning documents. Such additional development in the area of the Meadows would be consistent with and in proximity to development that has taken place or will take place regardless of the proposed federal action. The portions of the EA/HCP Property that would be used for commercial purposes are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Location of the proposed water wells, sewer line and trail would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town has anticipated and planned for development on The Meadows property, the development would exceed open space requirements in the Amended PD Plan, and the Town has planned for it to be consistent with nearby development, Alternative 1 is not expected to have significant cumulative impacts on land use.

5.1.3.7 Cultural Resources

The proposed development, due to its limited scope, would not result in cumulative impacts to cultural resources.

5.1.3.8 Air Quality

The proposed action will contribute to limited degradation of air quality in the Castle Rock area due to a slight increase in vehicle exhaust emissions. Continued development of the area could result in a cumulative impact on air quality. The Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that

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emissions from motor vehicles were within limits set by the SIP for attainment. Because the project is included in the RTP and TIP, and because the RTP and TIP are in conformity with the SIP for carbon monoxide and particulate matter, the project is not expected to violate applicable air quality standards. Therefore, Alternative 1 is not expected to result in significant cumulative impacts on air quality.

5.1.3.9 Water Resources and Water Quality

The proposed action will cause some change in existing water quality. This change should not result in a significant cumulative impact to area water quality due to the limited size of the EA/HCP Property and proposed structures to minimize pollution from runoff. In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the proposed action should not result in a significant cumulative impact to water quality or quantity on East Plum Creek or groundwater resources.

5.2 Alternative 2 – Alternative Site Design Based on Third Amended PD Plan

5.2.1 Onsite Impacts

Disturbances resulting from the development and construction of the EA/HCP Property under this alternative will destroy vegetation onsite and reduce habitat for wildlife. This alternative is expected to cause potential destruction and degradation of Preble's habitat of 56.15 acres permanently and an additional 31.50 acres temporarily.

5.2.1.1 Vegetation

Under Alternative 2, significant grading operations and land development activities would occur within the Protection Zone. Within that zone, this alternative would remove or alter permanently a total of 56.15 acres of vegetation and would temporarily alter an additional 31.50 acres of vegetation.

In Alternative 2, temporary as well as permanent disturbances will occur within the Protection Zone. Initially, a 200 ft. x 200 ft. area would be disturbed to construct each water well. Paved and/or gravel roads would be installed wherever access is not possible by means of the existing trail. After initial construction, each water well would occupy 40 ft. x 40 ft. The habitat temporarily disturbed as a result of the installation of 20 water wells would be revegetated. Mitigation would occur offsite, so that the existing onsite riparian corridor would be fragmented under this alternative. Cattle grazing would not be eliminated under this alternative, so there would be less opportunity for enhancement of existing vegetation.

In addition to the construction of water wells, office, and industrial development plans, wastewater lines would account for additional disturbance within the riparian corridor. These disturbances would include the removal and/or significant alteration of shrubs and trees from the riparian corridor.

The upland areas to be altered within the Protection Zone are composed mainly of non-native heavily grazed grasses and would undergo permanent impact from the development. These upland zones are considered potential Preble's hibernating and/or foraging habitat. Permanent impacts would result from development within parcels IV-1, IV-2, IV-4, IV-5, IV-6, and IV-8.

5.2.1.2 Wildlife

Wildlife within those areas planned for development would largely be displaced to adjacent areas during the construction process. Such displacement could result in increased competition for breeding, nesting, and foraging habitat, as well as cover, in adjacent undisturbed habitat. Within the upland areas, grassland specialists such as the horned lark may be completely displaced by proposed development. Undetermined effects associated with the promotion of urban wildlife species and human activities associated with the planned development may result in the decline of more specialized species in general.

5.2.1.3 Threatened or Endangered Species

5.2.1.3.1 Assessment of Take of Preble's

Preble's has been trapped above and below The Meadows along East Plum Creek. Based on the results of previous Preble's surveys, the Service has determined that Preble's does occur within the riparian corridor along East Plum Creek, in the vicinity of the project.

Areas within the Protection Zone may be described as suitable breeding, nesting, foraging and/or hibernating habitat for Preble's. The further the distance away from that zone, the potential for Preble's to regularly occur declines. Reasons for this decline are related to increased predation and decreased food source for Preble's (SWCA, 1999).

Preble's habitat is primarily composed of broad, well-vegetated areas. Higher quality habitat typically is found in broad, extensive drainage systems (riparian area extends at least 75 feet from the waters edge) that contain wetland herbaceous and shrub vegetation with very little bare ground. Higher quality habitat is found near open water and associated with wet meadows. Soils range from mesic to hydric. This habitat usually supports thickets of 4 to 7-foot tall coyote willow interspersed with other woody species such as peachleaf willow (*Salix amygdaloides*), western snowberry, alder, narrowleaf

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cottonwood (*Populus angustifolia*), and plains cottonwood (*Populus deltoids*). Adjacent slopes may contain dense interspersions of shrubby thickets, herbaceous patches, and grassy areas. Adjacent upland shrubs can include western snowberry, chokecherry, and Gambel oak, but species composition is variable throughout the range of the mouse. It is likely that Preble's habitat is not driven by the diversity of plant species, but by the density of riparian vegetation.

Moderate to lower quality habitat consists of densities of both the herbaceous vegetation and shrubs below approximately 75% cover. Bare ground may be between 25% and 50% with mesic soil conditions. Open water typically consists of a narrow creek with a narrow riparian area. Adjacent upland slopes may be more open with very little shrub cover and some areas of dense grasses interspersed with patches of bare ground.

The Third Amended PD Plan would permit development of approximately 256.3 acres of the total 479.59 acres in the plan area. Using the riparian corridor (plus 100 feet) method as a measure, Alternative 2 would result in permanent take of approximately 56.15 acres and an additional temporary take of approximately 31.50 acres due to construction of water wells and associated infrastructure, sanitary sewer lines, the trail, development drainage, and a lift station. The temporarily disturbed areas would be revegetated and the permanently disturbed areas would require offsite mitigation due to unavailability of onsite undeveloped land. Encroachment of noise and activity within close proximity to Preble's activity, introduction or increase of predator species (jays, magpies, and domestic cats), and increase of species that may compete with Preble's for resources (deer mice and other small rodents) are potential indirect impacts of adjacent development.

Sixty-percent of the riparian corridor within the EA/HCP Property consists of moderate to lower quality habitat. Since this alternative would not include the discontinuance of cattle grazing, it is unlikely that any of this habitat would be improved over time.

5.2.1.3.2 Assessment of Take of Other Listed Species

No take is anticipated for any other federally-listed or proposed species within the Protection Zone. The EA/HCP Property has been evaluated for the presence of the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of potential use of the EA/HCP Property by Preble's, there is no evidence of any other threatened or endangered species on the EA/HCP Property. Thus, there appears to be little chance of onsite impacts to listed species other than Preble's.

5.2.1.4 Wetlands

Areas subject to section 404 of the Clean Water Act jurisdiction are limited to the existing East Plum Creek and adjacent riparian corridor. Runoff into this area is to be treated according to local regulations and EPA standards for nonpoint-source pollution and sedimentation prevention. Wetlands do exist on the EA/HCP Property that meet the definition as defined by the criteria established in the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual. A wetlands and riparian corridor delineation study was conducted on East Plum Creek within the EA/HCP Property to determine the best crossing location with the least environmental impacts (ERM, 2002a). If planned activities would result in impacts to "waters," CRDC would seek authorization from U.S. Army Corps of Engineers prior to conducting such activities.

5.2.1.5 Geology/Soils

No significant geologic alterations are anticipated from Alternative 2. Best management practices will be utilized to attenuate any sediment transport during construction. Some surface soil alterations will result from the proposed development.

5.2.1.6 Land Use

Current and past land use trends in the vicinity of the EA/HCP Property are toward commercial use. The Town of Castle Rock Master Plan contemplates that the EA/HCP Property will be used for commercial purposes. In accordance with the Master Plan, the Town of Castle Rock previously approved the Third Amended Preliminary PD Plan for the entire Meadows development, which contemplates commercial use on the EA/HCP Property. Further, the portions of the EA/HCP Property that would be used for commercial purposes under the Third Amended PD Plan are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Proposed water wells, sewer line, trail and other improvements would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town of Castle Rock has anticipated and planned for commercial development on the EA/HCP Property and it is consistent with nearby development, Alternative 2 is not expected to have a significant impact on land use.

5.2.1.7 Cultural Resources

No impact to cultural resources is expected as a result of Alternative 2 (ERM, 2002). To the extent that any cultural resources are identified during project development, CRDC would take appropriate steps to insure that any impacts to such resources are avoided or minimized to the greatest extent practicable.

5.2.1.8 Air Quality

Alternative 2 may contribute to increased local automobile traffic. This may increase traffic noise and exhaust emissions in the immediate area. A temporary increase of dust emissions and noise are expected during construction activities. However, the Meadows development was taken into account in the population forecasts for Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity

of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because development of the EA/HCP Property in accordance with Alternative 2 was included in the population forecasts in the RTP and TIP, and those plans are in conformity with the SIP for carbon monoxide and particulate matter, Alternative 2 is not expected to violate applicable air quality standards. Therefore, Alternative 2 is not expected to result in significant onsite impacts on air quality.

5.2.1.9 Water Resources and Water Quality

Surface waters will be directed to appropriate sedimentation facilities, consistent with Town of Castle Rock Public Works Regulations (effective Oct. 1998, reprinted Feb. 1999) stormwater requirements. During construction, best management practices would be utilized, including silt fences and rock berms to capture and contain sediment transport. Access roads required for the construction of the water wells will be paved and/or gravel except wherever existing trails are available. When possible, water pipes will be installed along roads to further decrease any permanent disturbance. Best management practices will ensure erosion and sediment transport will not be significantly increased during construction activities.

Sanitary sewer lines would gravity flow into the riparian corridor where a lift station would direct waste water to a water treatment plant downstream. Potential impacts to water quality within the Preble's habitat include maintenance issues, potential spills, and leaching.

All proposed buildings would utilize best management practices to channel and detain runoff, as required by the Town of Castle Rock, including sediment traps that catch a high proportion of total suspended solids. Subsurface groundwater resources will be slightly altered by the construction of impervious cover in the form of roadways and building foundations. There could be an increase in sediment loading and other pollutants in surface water runoff; however, these increases would be mitigated by

existing and planned sedimentation controls as required by the Town of Castle Rock. In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the alternative should not result in a significant impact to water quality or quantity on East Plum Creek or groundwater resources.

5.2.2 Offsite Impacts

Significant offsite impacts are not anticipated under this Alternative.

5.2.2.1 Vegetation

No offsite impacts to vegetation are expected due to proposed development.

5.2.2.2 Wildlife

Alternative 2 may result in the reduction of overall habitat available to local offsite wildlife species. Offsite impacts to wildlife include displacement of some species from proposed development areas, possible increase of generalist species, possible introduction and/or increase of predator species, and the reduction in overall habitat available to wildlife. Wildlife utilizing the subject lots would largely be displaced to adjacent areas, which could result in increased competition for nesting, foraging, and breeding habitat, as well as cover in general.

Urban development often results in increases in generalist species, or species that are successful within a wide range of habitats including human impacted areas. Increases in species that are habitat generalist (crows, jays, deer mice) often occur at the expense of

species with narrower habitat requirements. Possible introduction and/or increase of predators such as house cats, crows, and jays can have an impact on wildlife communities, particularly nesting birds. Therefore, the wildlife community of the offsite property could be impacted.

5.2.2.3 Threatened or Endangered Species

Offsite impacts pertaining to endangered species may include a reduction in overall nesting, foraging and hibernation habitat for Preble's.

5.2.2.4 Wetlands

Existing and proposed onsite sedimentation controls would minimize the amount of sediment introduced into downstream areas. No offsite impacts to wetlands are expected to occur.

5.2.2.5 Geology/Soils

No offsite impacts to geologic or soil resources are expected to occur.

5.2.2.6 Land Use

No offsite impacts to existing or proposed land uses are expected to occur as a result of the proposed action, except insofar as some existing habitat would be preserved or enhanced as offsite mitigation.

5.2.2.7 Cultural Resources

No offsite impacts to cultural resources are expected.

5.2.2.8 Air Quality

Vehicle emissions and noise may increase slightly due to an increase in the number of vehicles in the area. The local increase may have minor effects on regional air quality. However, the Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of the DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because development of the EA/HCP Property in accordance with Alternative 2 was included in the population forecasts in the RTP and TIP, and those plans are in conformity with the SIP for carbon monoxide and particulate matter, Alternative 2 is not expected to violate applicable air quality standards. Therefore, Alternative 2 is not expected to result in significant offsite impacts on air quality.

5.2.2.9 Water Resources and Water Quality

Offsite surface and groundwater resources are not expected to be impacted by this activity. Proposed water quality control devices are discussed in the onsite impacts sections. Existing offsite water quality conditions are expected to be maintained by these control devices.

In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the alternative should not result in a significant cumulative impact to water quality or quantity on East Plum Creek or groundwater resources.

In addition, utilizing stormwater runoff facilities to detain runoff prior to entering East Plum Creek would reduce water flows associated with increased impervious cover.

5.2.3 Cumulative Impacts Analysis

5.2.3.1 Vegetation

The proposed action would result in the permanent disturbance of 56.15 acres of vegetation and the temporary disturbance of an additional 31.50 acres of vegetation. The 56.15 acres of permanently disturbed area would contribute to the cumulative disturbance of these vegetation types in Douglas County from development and other land use projects.

5.2.3.2 Wildlife

The proposed action will contribute to a cumulative reduction of habitat for some wildlife species when added to impacts from development and other land uses in Douglas County. Wildlife species better adapted to urban and suburban habitat (generalists) may increase and exacerbate displacement of species intolerant to development, which may locally decrease. Significant cumulative impacts to riparian-dependent wildlife species could occur due to the fragmentation of the existing riparian corridor.

5.2.3.3 Threatened or Endangered Species

The proposed action may contribute to take of Preble's and/or their habitat in the region when added to section 10(a)(1)(B) incidental take permits that may be issued by the Service for other projects. Therefore, significant cumulative impacts to Preble's could occur due to the fragmentation of their existing habitat under this alternative.

5.2.3.4 Wetlands

No cumulative impacts to wetlands are anticipated. However, with any unexpected cumulative impacts to wetlands, CRDC would seek authorization from the U.S Army Corps of Engineers prior to conducting such activities.

5.2.3.5 Geology and Soils

No significant cumulative impacts to geology and soils would occur as a result of the proposed action.

5.2.3.6 Land Use

Current and past land use trends in the vicinity of the EA/HCP Property are toward commercial use. The Town of Castle Rock Master Plan contemplates that the EA/HCP Property will be used for commercial purposes. In accordance with the Master Plan, the Town of Castle Rock previously approved the Third Amended PD Plan for the entire Meadows development, which contemplates commercial use on the EA/HCP Property. Further, additional development in the Meadows would be consistent with and in proximity to development that has taken place or will take place regardless of the proposed federal action. The portions of the EA/HCP Property that would be used for commercial purposes are located near other property in the Town of Castle Rock already used for commercial, industrial or institutional purposes. Location of the proposed water wells, sewer line and trail would also not represent a significant change in land uses on the property or in the context of nearby land uses. Because the Town of Castle Rock has anticipated and planned for development on The Meadows property, the development would meet or exceed open space requirements in the Third Amended PD Plan, and the Town has planned for it to be consistent with nearby development, Alternative 2 would not be expected to have significant cumulative impacts on land use.

5.2.3.7 Cultural Resources

The proposed action will not result in cumulative impacts to cultural resources.

5.2.3.8 Air Quality

The proposed action will contribute to limited degradation of air quality in the Castle Rock area due to a slight increase in vehicle exhaust emissions. Continued development of the area could result in a cumulative impact on air quality. The Meadows development was taken into account in the population forecasts for the Town of Castle Rock included in the most current RTP and TIP of DRCOG. DRCOG assessed conformity of the RTP and TIP with the SIP for carbon monoxide and particulate matter and found that emissions from motor vehicles were within limits set by the SIP for attainment. Because development of the EA/HCP Property in accordance with Alternative 2 was included in the population forecasts in the RTP and TIP, and those plans are in conformity with the SIP for carbon monoxide and particulate matter, Alternative 2 is not expected to violate applicable air quality standards. Therefore, Alternative 2 is not expected to result in significant cumulative impacts on air quality.

5.2.3.9 Water Resources and Water Quality

The proposed action will cause some change in existing water quality. This change should not result in a significant cumulative impact to area water quality due to the limited size of the EA/HCP Property and existing and proposed structures to minimize pollution from runoff.

In accordance with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and

non-potable return flows. The decree contains provisions for monitoring and enforcing these requirements. Therefore, the alternative should not result in a significant impact to water quality or quantity on East Plum Creek or groundwater resources.

5.3 Alternative 3 – Alternative Site Location

The intent of CRDC is to provide water and sewer services to other property at The Meadows and to develop the EA/HCP Property in accordance with its overall development plans for The Meadows. There is no other location on The Meadows' property where sufficient water could be extracted or where sewer facilities could be placed to provide the required water and sewer service. The decree allowing the alluvial wells allows withdrawal only at the sites covered by the EA/HCP. Connection of existing Town of Castle Rock trails also drives the location of the proposed trails. Furthermore, it would not be economically practical for CRDC to purchase other property, even if it were available, to locate these facilities and development. Therefore, an alternative that involves another site location was determined to be impracticable.

Also, the EA/HCP Property is located within an active commercial area, and most of the vegetation on the site has been impacted by cattle grazing. Using an alternate site could result in a more pristine location being impacted. Moreover, the site's proximity to areas that can be enhanced to the benefit of Preble's creates an opportunity to increase quantity and quality of habitat for Preble's and other wildlife.

5.4 Alternative 4 – Wait On a Regional 10(A)(1)(B) Permit

Douglas County currently is working to prepare a regional EA/HCP related to Preble's. However, there is no certainty as to when or whether such a regional EA/HCP would be completed and approved by the Service. Because of CRDC's timetables for development of The Meadows and the need to serve other property at the Meadows with water and sewer services, it was considered to be impracticable to wait for completion of the regional EA/HCP to develop the EA/HCP Property.

5.5 Alternative 5 – No Action

This alternative would not result in near-term disturbance of the portions of the EA/HCP Property proposed for development, nor the potential take of Preble's. However, it would not meet CRDC's objectives to provide water and sewer services to other property at The Meadows and to provide commercial or industrial development on the EA/HCP Property.

In addition, as the owner of the EA/HCP Property, CRDC is responsible for economic maintenance of the EA/HCP Property, including taxes and upkeep. The sale of the EA/HCP Property for purposes other than development is not economically feasible. Given the expenses already incurred by CRDC for the development of the EA/HCP Property, CRDC will suffer tremendous losses if prevented from developing the EA/HCP Property. Accordingly, this alternative was not considered to be practicable.

5.6 List of Preparers

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5.7 List of Agencies, Organizations and Persons Contacted

Aquatic & Wetlands Company

Bishop Brogden Associates, Inc., Water Consultants

City of Castle Rock

Colorado Division of Wildlife

Colorado Natural Heritage Program

Colorado Historical Society, Office of Archaeology and Historic Preservation

Denver Regional Council of Governments

Douglas County Open Space Attorney: Deb Freeman, Trout & Raley

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Douglas County Open Space Director: Brooke Fox

Douglas County Regional EA/HCP Consultant: Steve Dougherty, ERO

Rocky Mountain Consultants

SWCA, Inc.

United States Fish and Wildlife Service: Kathleen Linder

United States Department of the Interior, Office of the Solicitor: Thomas Graf

December 15, 2003

**HABITAT CONSERVATION PLAN
FOR A PORTION
OF THE MEADOWS PROPERTY
DOUGLAS COUNTY, COLORADO**

Prepared for:

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6.0 HABITAT CONSERVATION PLAN

This section contains CRDC's proposed HCP related to the development of the portion of The Meadows community (Figure 1) that lies within and adjacent to Preble's habitat and is identified in Figure 2 (the "EA/HCP Property"). The goals of this HCP are to avoid and minimize impacts to Preble's habitat for the purposes of maintaining a viable Preble's habitat corridor. When Preble's habitat impacts were unavoidable, the mitigation strategy was designed to offset those disturbances and continue to maintain the viability of the Preble's habitat corridor. The proposed mitigation measures would actually improve the viability of the Preble's habitat corridor compared to existing conditions.

6.1 Methodology

Three methods were analyzed to determine the best way to delineate Preble's habitat, assess take, and establish avoidance, minimization, and mitigation strategies. The three methods were: (1) the initial draft Section 4(d) rule regarding impacts to Preble's habitat; (2) the current unofficial policy utilized by the Service to determine Preble's habitat protection zones; and (3) a method similar to the one proposed by Douglas County in its draft sub-area regional habitat conservation plan to determine Preble's habitat protection zones.

The three methods delineate three different zones of habitat protection for Preble's. First, the initial proposed 4(d) rule for Preble's, issued by the Service on December 4, 1998, attempted to establish Preble's habitat being located 300 feet beyond the outside edge of the contiguous wetlands corridor in areas presumed to be occupied or probable habitat for Preble's. That protection zone, as it applies to The Meadows, is identified in Figure 4. Second, the current, unofficial Service protocol for Preble's establishes potential Preble's habitat as 300 feet beyond the outside edge of the 100-year floodplain. That protection zone, as it applies to The Meadows, is identified in Figure 5. Third, Douglas County has proposed in its sub-area regional habitat conservation plan, that Preble's habitat would be

up to 100 feet beyond the outside edge of the contiguous riparian corridor. That Protection Zone, as it applies to The Meadows, is identified in Figure 6.

In analyzing these three methods, CRDC sought to choose the method that would delineate habitat and assess take in a manner that protects the highest quality habitat in the most contiguous and complete fashion possible. Accordingly, use of the draft Section 4(d) rule was rejected because it would allow significant destruction of riparian vegetation on the EA/HCP Property and would reduce the width of habitat and impair the viability of Preble's along this stretch of East Plum Creek corridor.

The two other methods—the 100-year floodplain (plus 300 feet) method and the riparian corridor (plus 100 feet) method—were compared to determine which one had the highest potential to protect viable Preble's habitat. The Protection Zone will protect more potentially high quality riparian Preble's habitat (174.73 acres in the 100-year floodplain (plus 300 feet) methodology versus 188.12 acres in the riparian corridor (plus 100 feet) method), because riparian corridor vegetation sometimes extends outside of the 100-year floodplain protection zone and could be destroyed. Conversely, the areas not protected by the riparian corridor (plus 100 feet) method would be in open, grassy areas and usually separated from the riparian corridors by steep slopes. These areas are of lower potential value to the Preble's. Therefore, the riparian corridor (plus 100 feet) method was chosen as the method to delineate habitat and assess take because it was determined to protect higher quality vegetation in a more contiguous and complete fashion.

6.2 Description of Project Activities

Selection of the riparian corridor (plus 100 feet) method caused CRDC to alter the development plans approved for the EA/HCP Property by the Town of Castle Rock to avoid and minimize impacts to habitat to the maximum extent possible. Accordingly, development of the EA/HCP Property would involve four types of uses as shown on Figure 3-B and Figure 7. First, the COI Parcels shown on Exhibit 3-B would be developed with office, commercial and industrial uses. Second, a total of twenty water

wells (including well construction, pipe installation and operation and maintenance) would be drilled over a period of twenty years to serve the entire Meadows community, with only two to three wells being developed at any one time. Sixteen of the twenty wells would be located within the riparian corridor, each permanently occupying 40 ft. x 40 ft. The location and pumping rates for the wells are dictated by a water decree that was approved by the Colorado District Court, Water Division No. 1 (Case No. 85CW480, filed 1985). Third, a proposed trail system approximately two miles long would be built within the riparian corridor of the EA/HCP Property to serve as an upstream and downstream extension of the existing Town of Castle Rock Trail System. The permanent trail would be approximately eight feet wide and would be improved with concrete. Finally, an underground sanitary sewer line would be constructed within the Easterly portions of the COI Parcels located on the Southwesterly bank of East Plum Creek, consisting of an 8" underground main, an above ground lift station, and a 24" underground main in Parcel IV-1. Portions of these sewer facilities would be located in the uplands portion of the Protection Zone. See Figure 7. With the exception of the water well development and trail development, virtually all proposed development will occur outside the riparian zone.

6.3 Preble's Habitat Requirements

Riparian areas are considered to be the main component of Preble's habitat with the presence of upland habitat being dependent on available adjacent riparian areas. For the purpose of this EA/HCP, riparian areas are defined as wetlands and non-wetlands with vegetation typically depending on stream or pond-influenced surface or groundwater for growth and reproduction (Phreatophytic vegetation). Upland areas include less significant potential Preble's habitat than the riparian and ecotone areas but may be beneficial to Preble's foraging and hibernation (SWCA, 1999).

Preble's habitat is primarily composed of broad, well-vegetated areas. Higher quality habitat is typically found in broad, extensive drainage systems (riparian area extends at least 75 feet from the waters edge) that contain wetland herbaceous and shrub vegetation

with very little bare ground. Higher quality habitat is found near open water and associated with wet meadows. Soils range from mesic to hydric. This habitat usually supports thickets of 4 to 7-foot tall coyote willow interspersed with other woody species such as peachleaf willow (*Salix amygdaloides*), western snowberry, alder, narrowleaf cottonwood (*Populus angustifolia*), and plains cottonwood (*Populus deltoides*). Adjacent slopes may contain dense interspersions of shrubby thickets, herbaceous patches, and grassy areas. Adjacent upland shrubs can include western snowberry, chokecherry, and Gambel oak, but species composition is variable throughout the range of the mouse. It is likely that Preble's habitat is not driven by the diversity of plant species, but by the density of riparian vegetation.

Moderate to lower quality habitat consists of densities of herbaceous vegetation and shrubs below approximately 75% cover. Bare ground may be between 25% and 50% with mesic soil conditions. Open water typically consists of a narrow creek with a narrow riparian area. Adjacent upland slopes may be more open with very little shrub cover and some areas of dense grasses interspersed with patches of bare ground.

Sixty-percent of the riparian corridor within the EA/HCP Property consists of lower to moderate quality habitat. The discontinuation of cattle grazing on the EA/HCP Property could greatly improve these areas of lesser quality Preble's habitat. This improved habitat quality within the riparian zone would provide increased viability and contiguity of the riparian corridor, potentially beyond pre-development conditions.

Adjacent upland sites are described by the presence of western wheatgrass, blue grama, smooth brome, yucca, and prickly pear cactus. Non-native plant species, such as cheat grass and Russian knapweed, have invaded much of Douglas County and are significant components to the upland vegetation bordering East Plum Creek. Virtually no shrubs or trees exist in the upland areas. The potential for suitable Preble's habitat within the uplands (beyond the 100-foot setback) is low to non-existent.

6.4 Determination of Incidental Take

Preble's presence has been established through state, federal and private trapping efforts upstream and downstream from the EA/HCP Property. In the areas along the East Plum Creek (the approximate east boundary of The Meadows), biologists have trapped Preble's approximately one mile south of The Meadows, and approximately 3.25 miles north of The Meadows at the confluence of East and West Plum Creeks. Habitat types, including vegetation and cover, found at the general locations of the above-mentioned trapping sites, also are present at The Meadows.

Construction activities will occur primarily in the daytime, when Preble's generally is not engaged in foraging and other activities that might bring it to the sites at The Meadows. Therefore, no direct take of individual Preble's by pursuit, hunting, shooting, wounding, killing, trapping, capturing, or collecting is anticipated as a result of the office, commercial, industrial or other development. Nevertheless, areas disturbed by development of the EA/HCP Property may constitute Preble's habitat. Thus, some modification or degradation of Preble's habitat may occur as a result of activity associated with completion of office, commercial, industrial or other development of the EA/HCP Property. Although not the intended purpose of the project, such potential harm of Preble's is prohibited as an unlawful take under section 9 of the Act and 50 CFR §17.3. The incidental take permit will allow for the destruction or degradation of any Preble's habitat included within the property disturbed as a result of completion of the project.

Almost all development would be located outside of the Protection Zone, thereby avoiding take of potential Preble's habitat to the greatest extent possible. However, a few activities would occur within the Protection Zone, resulting in a total of 8.63 acres of permanent habitat disturbance and an additional 24.87 acres of temporary habitat disturbance (Figure 7). First, Parcels A and B as described on Exhibit 3-B would be developed in the uplands area but within the 100-foot setback of the Protection Zone. Development of Parcels A & B would permanently disturb a total of 5.59 acres of habitat

and would temporarily disturb an additional 2.15 acres of habitat. However, development of Parcels A & B would not remove any riparian vegetation, except for a small trickle channel that would control the rate of stormwater runoff. The remaining development of Parcels A and B will be outside of the Protection Zone. Second, development of water wells, water delivery system and trail would occur within the riparian vegetation and result in 3.04 acres of permanent disturbance to Preble's habitat and an additional 22.72 acres of temporary disturbance. Initially, construction of each water well will disturb 200 ft. x 200 ft. within the riparian zone. Upon completion of each water well, 40 ft. x 40 ft. of permanent disturbance will remain.

6.5 Mitigation Plan

This section identifies the steps that CRDC would undertake to minimize any impacts on Preble's habitat, restore all areas of temporary disturbance and offset permanent impacts to habitat. As stated above, take would result from development of Parcels A and B (and associated wastewater and drainage improvements) on the upland areas but within the Protection Zone and development of a water delivery system and extension of the existing trail system within the riparian area. A total of 8.63 acres of permanent and an additional 24.87 acres of temporary disturbance of Preble's habitat would result from development of the EA/HCP Property. Development of the Parcels A and B and associated infrastructure would result in 5.59 acres of permanent and an additional 2.15 acres of temporary take. Development of the water system and trail system would result in 3.04 acres of permanent and an additional 22.72 acres of temporary take.

The following mitigation strategy has been developed to ensure that the take identified above will be incidental and that a viable Preble's habitat corridor will be maintained along East Plum Creek. To mitigate for the areas of temporary and permanent disturbance, 24.87 acres would be restored, and 52.85 acres will be set aside as mitigation (42.85 acres of additional open space plus an additional 10 acres of enhancement). Also, the discontinuation of cattle grazing on the EA/HCP Property will improve the quality of existing vegetation. This mitigation strategy, to the maximum extent practicable, will

minimize and mitigate the impacts of any incidental taking associated with development of the EA/HCP Property and will not appreciably reduce the likelihood of the survival and recovery of the species in the wild. Mitigation planning to offset take would be reviewed and authorized by the Service before implementing.

6.5.1 Minimization and Restoration

The CRDC will take the following steps to minimize the impacts from temporary and permanent disturbance to the Protection Zone and restore all temporary disturbances:

(1) Development of Parcels A and B (identified on Figure 7)

- (a) CRDC will revegetate areas that would be disturbed temporarily as a result of development of the trickle channel to provide drainage for Parcel B, as shown in Figure 7. Such revegetation will be accomplished consistent with the Restoration Plan provisions of Section 6.5.1(6).
- (b) CRDC will segregate the buildings within Parcels A and B from the riparian areas with barriers (which may include landscaping, fencing or berms) along the perimeter of the areas of permanent disturbance identified in Figure 7 and will revegetate any areas of temporary disturbance with native vegetation (i.e. grasses and shrubs) to minimize any indirect impacts from building within the Protection Zone. Such revegetation will be accomplished consistent with the Restoration Plan provisions of Section 6.5.1(6).
- (c) CRDC will cause all construction to be initiated between October 15 and April 30 of any year to minimize and avoid impacts to the Preble's.

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(2) Development of Water Wells, Water Delivery System and Sewer System within the Protection Zone.

- (a) CRDC will only develop a maximum of three water wells at any time.
- (b) CRDC will insure that access to the well sites would be from existing concrete trails wherever possible. Where existing concrete trails are not available, access would be limited to essential vehicles.
- (c) CRDC will not pave any new well site access roads.
- (d) CRDC will maintain two-track vehicle access to the wells to allow essential operation and maintenance of the wells. CRDC will minimize the use of permanent fill for access roads to the extent possible, but may use fill when necessary to maintain year-round access and minimize erosion.
- (e) Wherever possible, CRDC will insure that access routes and water pipe installation would avoid highest densities of Preble's habitat.
- (f) CRDC will revegetate all areas of temporary disturbance. Such revegetation will be accomplished pursuant to the Restoration Plan provisions of Section 6.5.1(6).
- (g) CRDC will insure that all water system development occurs between October 15 and April 30 of any year. Development outside of this season may occur only when necessary to protect human health and safety.

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- (h) Development of no well site will result in the permanent removal or displacement of more than 1/10 acre of woody riparian vegetation or wetlands.
- (i) Redrills of wells originally drilled under this HCP are a permitted activity under the HCP so long as all minimization and mitigation measures required in this HCP are undertaken and are completed before the ITP expires.

(3) Operation and Maintenance of Well System

- (a) Following installation of the well system, CRDC will assign responsibility for operation and maintenance of the well system to the Town of Castle Rock.
- (b) CRDC will comply with the provisions of the Findings of Fact, Conclusions of Law, Judgment and Decree entered by the Colorado District Court in Case No.85CW480 on April 13, 1993, requiring that any withdrawals of groundwater from the East Plum Creek watershed associated with the proposed action must be replaced by water of similar quality from reusable sources, including irrigation runoff, direct discharge of non-tributary groundwater, and non-potable return flows.

(4) Construction and Maintenance of Trail Facilities within the Protection Zone

- (a) CRDC will insure that all trail development activities occur between October 15 and April 30 to minimize impacts to the Preble's.
- (b) The temporary and permanent loss of woody riparian vegetation will be minimized by utilizing existing trail routes for maintenance and by

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designing trail extensions in efforts to avoid woody riparian vegetation.

- (c) Trail alignment will be designed to have minimal impact on the riparian zone. The alignment will be submitted to the Service for review and approval.
 - (d) Trail heads, parking areas, restrooms and other associated trail facilities will not occur within the Protection Zone.
 - (e) Trail width will not exceed 10 feet within the Protection Zone.
 - (f) CRDC will provide conspicuous signs at all trailheads indicating that recreational trail use must be limited to daylight hours.
 - (g) CRDC will provide conspicuous signs at all trailheads indicating that pets must be confined to trails and required to be on a leash of 8 feet or less at all times.
 - (h) Trails will be maintained to avoid erosion, sedimentation or other threats to habitat.
- (5) EA/HCP Property Development Outside Protection Zone.

CRDC will install barriers, which may include landscaping, fencing or berms, between Preble's habitat and development outside of the Protection Zone to segregate anthropogenic activities from Preble's habitat.

(6) Revegetation Requirements

At least 30 days prior to undertaking any development within the Protection Zone that will involve temporary disturbances to vegetation, CRDC will submit a plan for revegetation of such disturbances (the "Restoration Plan") to the Service. The Restoration Plan(s) will contain a complete description of the steps CRDC will take to revegetate areas of temporary disturbance. The Restoration Plan(s) will meet the criteria and objectives for mitigation in Appendix A to the HCP, including species mix.

(7) Additional Best Management Practices for Activities in the EA/HCP Property

- (a) All disturbance associated with construction will be the minimum necessary.
- (b) All temporarily disturbed areas will be returned to preconstruction grades as much as reasonably possible.
- (c) Disturbance to woody riparian vegetation within the riparian zone will be minimized.
- (d) Any excess material brought on to any maintenance or construction site will be removed from the site following completion of construction or repair.
- (e) Use of temporary access roads will not exceed 200 days per calendar year. Temporary access roads may be reused for subsequent repairs, maintenance, and rehabilitation. The 200 day limit shall not apply to emergency access necessitated by threats to human health, safety, or the environment (e.g., sewer line leaks,

fires, injury, water main breaks, gas line leaks, or hazardous material spills).

- (f) All construction and maintenance personnel operating within the Permit Area will be provided with written and oral instructions on minimization and avoidance strategies to protect the Preble's, including relevant requirements of the Conservation Plan by a biologist or CRDC representative familiar with this EA/HCP and Preble's habitat within the EA/HCP Property. A biologist familiar with this EA/HCP and knowledgeable on Preble's ecology will monitor construction activities.

6.5.2 Habitat Enhancement

Because avoidance, minimization and restoration will not eliminate all impacts to habitat within the EA/HCP Property, CRDC will take the following steps to offset any permanent impacts and enhance the overall Preble's habitat within the EA/HCP Property. These steps will significantly improve Preble's habitat from existing conditions by improving the quality of and connections among Preble's habitat.

(1) Elimination of Cattle Grazing

Prior to development in the Protection Zone, CRDC will eliminate all cattle grazing in the Protection Zone (188.12 acres), as well as in the 42.85 acres of additional mitigation area identified in Figure 9.

(2) Dedication of Land for Open Space

CRDC will dedicate as permanent open space the property designated as open space in the Meadows Third Amendment PD Plan. See Figure 3-A. CRDC will further dedicate as permanent open space approximately 42.85 acres of open

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space and developable uplands adjacent to the Protection Zone, identified on Figure 9, to minimize impacts from the development and enhance the viability of Preble's habitat in East Plum Creek by enlarging the width of undeveloped land along the drainage. Prior to development of the EA/HCP Property after issuance of the ITP, CRDC will execute a deed restriction or conservation easement, with the Service as a third-party beneficiary to ensure that this property will remain open space.

(3) Enhancement of Vegetation

Prior to commencing construction activities within Parcels A and B, or for new trail development or water well development within the Protection Zone, CRDC will initiate enhancement of approximately 10 acres of vegetation near Parcels A and B adjacent to the Meadows Parkway bridge to offset any direct or indirect permanent impacts resulting from the development of Parcels A and B, trail development or water well development within the Protection Zone. The 10-acre area for enhancement is shown in Figure 10. CRDC will submit a plan for vegetation enhancement of these 10 acres (the "Vegetation Enhancement Plan") to the Service for review and approval at least 60 days prior to commencing construction activities within Parcels A and B, or for new trail development or water well development within the Protection Zone. The Vegetation Enhancement Plan will contain a complete description of the steps proposed to be taken to enhance vegetation for the benefit of the Preble's. The Vegetation Enhancement Plan will meet the criteria and objectives for mitigation included in Appendix A to the HCP, including species mix. Revegetation and vegetation recovery resulting from elimination of cattle grazing shall be creditable towards meeting vegetation enhancement criteria and objectives. The Service will make all reasonable efforts to approve or deny the Vegetation Enhancement Plan within 30 days of receipt, and include detailed reasons for any denial. CRDC may submit drafts of the Vegetation Enhancement Plan to the Service prior to formal submittal.

6.6 Biological Goals and Objectives – Achieving Mitigation Plan Success

The biological goals and objectives of the mitigation plan and this EA/HCP for both restoration and enhancement activities are: (1) to avoid and minimize disturbance to Preble's habitat wherever possible; (2) to mitigate as much or more habitat for Preble's as the amount of potential habitat disturbed; and (3) to ensure population viability by maintaining habitat contiguity. The mitigation plan outlined in Section 6.5 above should be sufficient to achieve these biological goals and objectives. The mitigation plan is designed to ensure an adequate number of acres of habitat in a certain configuration, so that a viable corridor is maintained. Criteria for mitigation success are identified in Appendix A to this HCP and will be specifically defined in the Vegetation Enhancement Plan and Restoration Plan(s).

Revegetation required by this mitigation plan would follow commencement of construction in Parcels A and B, or of the water wells or trails, whichever comes first. CRDC would revegetate 100% of the area available for such revegetation in the restoration and enhancements areas to reestablish habitat. The revegetation will be such that if 70% or more of the vegetation planted survives and becomes established, sufficient habitat will have been restored and enhanced to meet the goals and objectives of this EA/HCP. Thus, the mitigation plan will have achieved success when 70% of the revegetated area is established with a mixture of the species listed in Appendix A.

6.6.1 Monitoring and Adaptive Management

6.6.1.1 Success Monitoring

Success will be monitored annually in the summer by CRDC for the first five-year period following implementation of mitigation described in any Vegetation Enhancement Plan or Restoration Plan. CRDC will be responsible for reseeding in order to achieve success, if success is not achieved by the end of the first five-year period. Monitoring will

continue for five years or until success is achieved, whichever is longer. Success will be measured by the use of photo point analysis and vegetation plots using statistically significant sample areas of each of the mitigation areas. The same sample areas will be used for all monitoring analysis. In conjunction with annual success monitoring, CRDC will submit simple, annual compliance reports to the Service regarding the implementation and success of this EA/HCP. Such reports also will detail any new disturbance of areas covered by the ITP during the preceding year. The Service shall have the right to visit and inspect the EA/HCP Property to insure compliance of this EA/HCP pursuant to 50 CFR § 13.21 (e)(1).

6.6.1.2 Adaptive Management

Because of its dependence on biological, climatic and other variable processes, the precise degree of vegetation enhancement attained through the mitigation plan involves some uncertainty. Accordingly, if success, as defined in each Vegetation Enhancement Plan or Restoration Plan, has not been achieved by the end of the monitoring period, CRDC will use alternative measures as part of a process of adaptive management to achieve success. Such alternative methods may include:

- i. Planted herbaceous vegetation may be replaced with material of the same species obtained from a nursery;
- ii. In the event that a second attempt of herbaceous planting does not succeed, plug transplants of adjacent native vegetation cover may be removed from any natural area and seeded with a native seed mix of the same species. A maximum of 10% of the vegetation cover may be removed from any natural area and seeded with a native seed mix of the same species;
- iii. If necessary, seeded areas may be reseeded to the standards indicated in the relevant Vegetation Enhancement and/or Restoration Plan(s); and
- iv. If necessary due to climatic conditions, supplemental watering would be undertaken.

6.6.1.3 Compliance Monitoring

All management, maintenance, and monitoring activities of the proposed mitigation procedures during the first five-year period (or until success as defined above is achieved) would be conducted by CRDC or its successor owners. Once the five-year period expires and success as defined above has been achieved, CRDC would retain the option of managing and maintaining the enhancement activities on all mitigated areas. However, CRDC would likely convey long term management of the areas to the Town of Castle Rock or another entity approved by the Service or utilize a conservation easement for the permanent maintenance, management, and monitoring of the areas. Proposed beneficiaries of the easement include: Douglas County Board of County Commissioners, Town of Castle Rock, and Douglas County Land Board. The Service will expressly allow CRDC to assign responsibility for any necessary monitoring, management, and maintenance activities to one or more of the above listed proposed beneficiaries.

6.6.2 Funding

Conservation planning requires sufficient funding be made available to implement the EA/HCP. CRDC will provide such funds as may be necessary to carry out its obligations under the EA/HCP. CRDC should notify the Service if CRDC's funding resources have materially changed, including a discussion of the nature of the change.

CRDC will further ensure that funding is available to meet its obligations under the Permit and the EA/HCP through accounts sufficient for this purpose. The account may be a trust account, irrevocable letter of credit, insurance or surety bond. Such accounts will contain provisions naming FWS as a beneficiary and allowing FWS to draw upon the account, if CRDC fails to undertake any of its mitigation obligations under this HCP, to the extent necessary to ensure that mitigation identified in this HCP is provided. Prior to disturbing any area in the Protection Zone for office, water well, water delivery system or trail development, CRDC will place or secure funds in an account sufficient to cover all

anticipated costs of monitoring and ensuring success of the Vegetation Enhancement Plan, as defined in Section 6.5.2(3). Such account will contain provisions to ensure that sufficient funds are available to ensure mitigation success as defined in the Vegetation Enhancement Plan. Such an account may also serve as security for other public entities, such as the Town of Castle Rock, so long as there are provisions sufficient to ensure adequate funding for the monitoring and mitigation success of the Vegetation Enhancement Plan. Such funding mechanisms will be maintained by CRDC for five years from the initiation of the mitigation under the Vegetation Enhancement Plan or until success is achieved as defined in the Vegetation Enhancement Plan.

Prior to causing any temporary disturbance in any area within the Protection Zone, CRDC will place or secure funds in an account sufficient to cover anticipated costs of implementing the relevant Restoration Plan pursuant to Section 6.5.1(6). Such account(s) will contain provisions to ensure that sufficient funds are available to ensure mitigation success as defined in the Restoration Plan(s). Such account(s) may also serve as security for other public entities, such as the Town of Castle Rock, so long as there are provisions sufficient to ensure adequate funding for mitigation success of the Restoration Plan. Each such funding mechanism will be maintained by CRDC for five years from the initiation of the mitigation activities under the Restoration Plan or until success is achieved as defined in the Restoration Plan(s).

6.6.3 Foreseeable Events

No significant impact to success of the mitigation plan is likely from foreseeable events such as a 500-year flood. Wildlife browsing on new plantings, particularly by mule deer and beaver will be prevented, if necessary, by putting wire cylinders and fencing around the susceptible vegetation. Additionally, revegetation will be biased towards plants unaffected by wildlife browsing. With respect to a 500-year flood, the types of planting contemplated by this mitigation plan, once established, should survive such a flood. If such a flood occurs prior to the conclusion of the first five-year period and destroys

significant portions of the plantings, success would be as defined in Section 6.6.1.1 above.

Owners of property surrounding the area covered by the EA/HCP, including both riparian and upland, are subject to all the requirements of the Act, which should adequately protect the biological integrity of the area that is revegetated.

6.6.4 Unforeseen Events

Reserves for future activities established as part of the account described in Section 6.6.2 above should be sufficient to provide for any necessary replanting in the event of any unforeseen circumstances. In the event of any unforeseen circumstances that interfere with success, CRDC will submit to the Service a supplemental Vegetation Enhancement Plan or Restoration Plan. Upon approval by the Service, the unforeseen circumstances will be remedied to the extent practicable by the means identified in the relevant Restoration Plan or Vegetation Enhancement Plan. In the event of unforeseen events, the Service shall not require the commitment of additional land or financial compensation beyond the level of mitigation otherwise provided in this EA/HCP, recognizing that the mitigation provided herein is adequate to provide for the conservation of Preble's. If additional mitigation measures are subsequently deemed by the Service to be necessary to provide for the conservation of Preble's, the obligation for such measures shall not rest with CRDC, unless CRDC consents to such measures.

The EA/HCP Property is not proposed for critical habitat designation. No additional requirements will be imposed on CRDC or the EA/HCP Property as a result of any such designation.

6.7 Amendment Procedure

It is necessary to establish a procedure whereby the Section 10(a)(1)(B) permit can be amended. However, it is important that the cumulative effect of the amendments will not

jeopardize any endangered species or other species of concern. Amendments must be evaluated based on their effect on the habitat as a whole. The Service must be consulted and agree on all proposed amendments.

6.7.1 Amendments to Development Plans

It is acknowledged that upon written request of CRDC, the local agency having land use regulatory jurisdiction over the EA/HCP Property is authorized in accordance with applicable law to approve amendments to development plans for the Property which do not result in the disturbance, degradation, destruction or take of any Preble's or other federally-listed threatened or endangered species habitat that is not contemplated to be taken as a consequence of the issuance of the ITP and the development of the Property and which do not alter the conditions set forth in this EA/HCP.

6.7.2 Minor Amendments to EA/HCP

Minor amendments involve routine administrative revisions or changes to the operation and management program and do not diminish the level or means of mitigation. Such minor amendments include corrections in land ownership, minor revisions to surveys, property descriptions, monitoring or reporting protocols, and minor changes in the boundaries of mitigation areas that result in no net loss of mitigation and do not otherwise alter the effectiveness of the EA/HCP. Such minor amendments do not alter the terms of the ITP. Upon the written request of CRDC, the Service is authorized to approve minor amendments to this EA/HCP, if the amendments do not conflict with the primary purpose of the EA/HCP as stated in Section 6.6 above.

6.7.3 All Other Amendments

All other amendments will be considered an amendment to the section 10(a)(1)(B) permit, subject to any other procedural requirements of federal law or regulation which may be applicable to the amendments of such a permit.

December 15, 2003

References:

Note: All referenced documents are available for review at the United States Fish and Wildlife Service, Ecological Services Field Office, 755 Parfet Street, Suite 361, Lakewood, CO.

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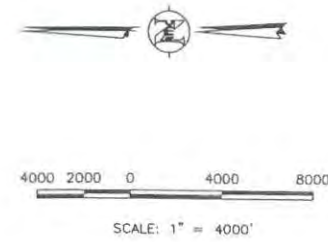
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Town of Castle Rock Public Works Regulations (effective Oct. 1998, reprinted Feb. 1999).

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THE MEADOWS COMMUNITY

MAP LOCATOR



THE MEADOWS
COMMUNITY



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8301 E. Prentice Ave., Suite 101, Greenwood Village, CO 80111
TEL 303.741.6000 FAX 303.741.6106

Date: 7/9/03

Job No. 3572.005.01

FIGURE 1

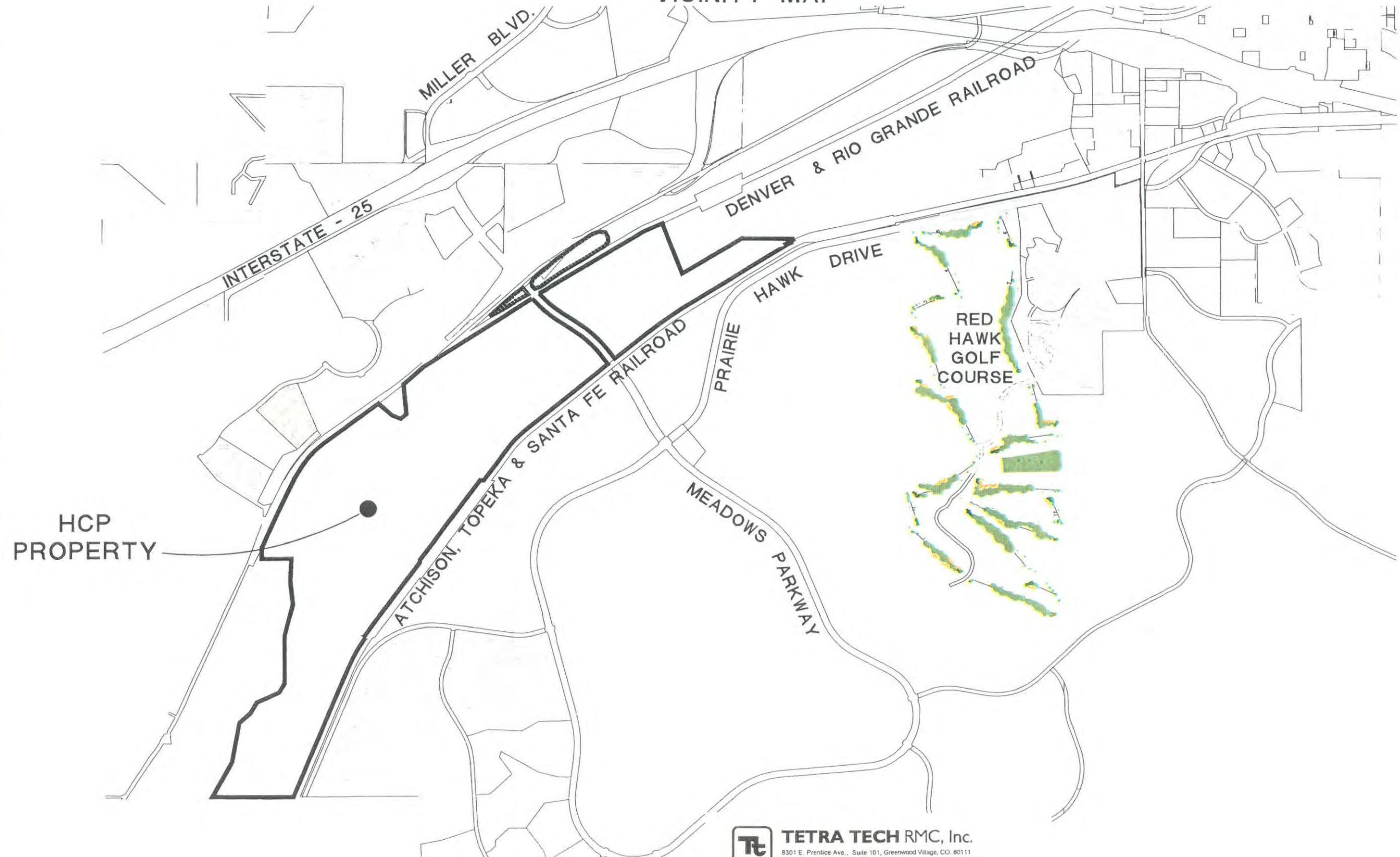


HCP PROPERTY

VICINITY MAP

1600 800 0 1600 3200

SCALE: 1" = 1600'



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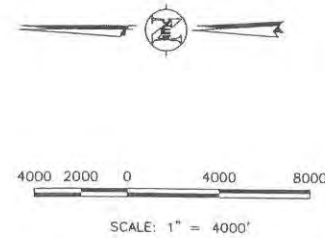
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FIGURE 2

THE MEADOWS COMMUNITY

MAP LOCATOR



THE MEADOWS
COMMUNITY



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FIGURE 1

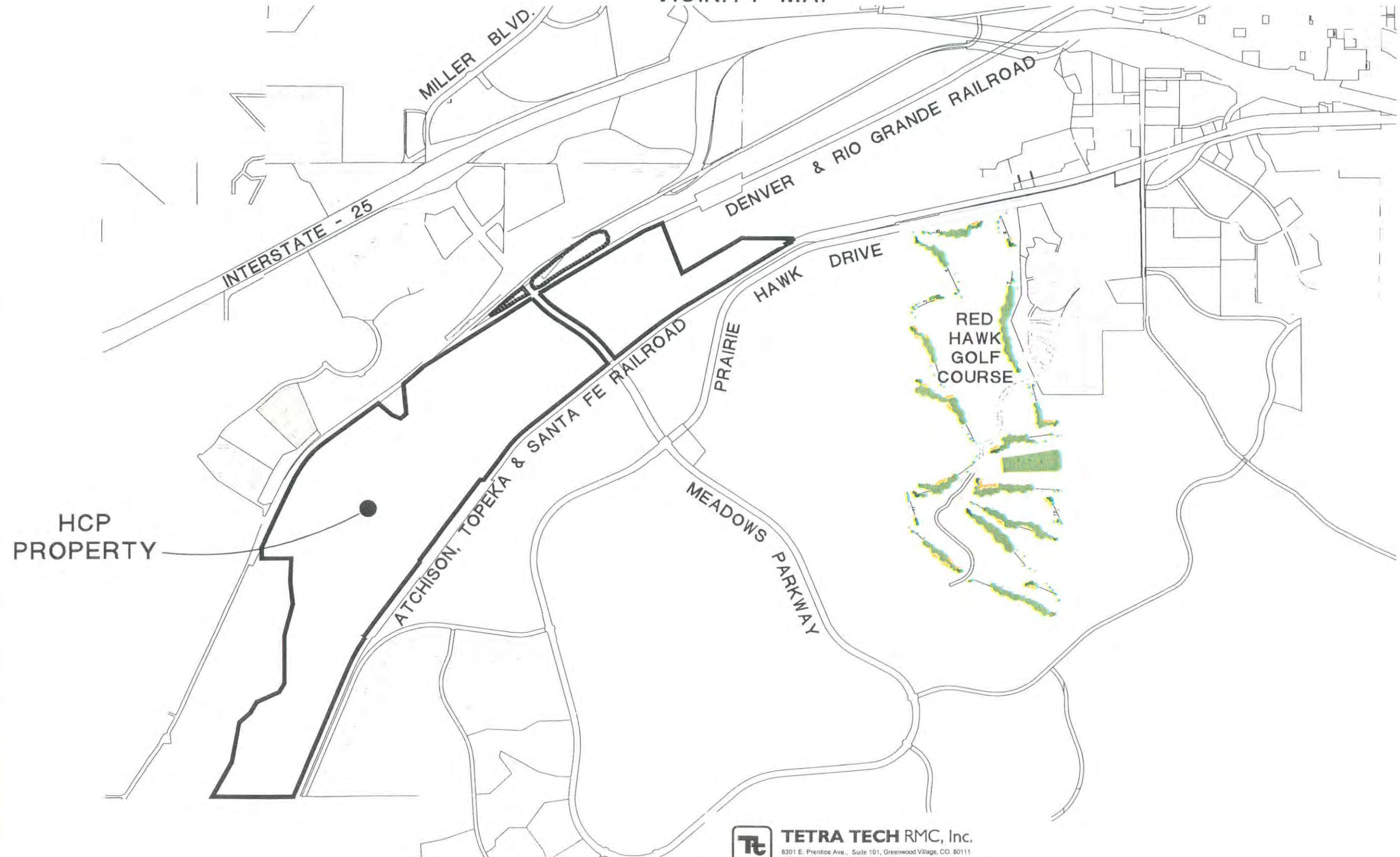


HCP PROPERTY

VICINITY MAP

1500 800 0 1600 3200

SCALE: 1" = 1600'



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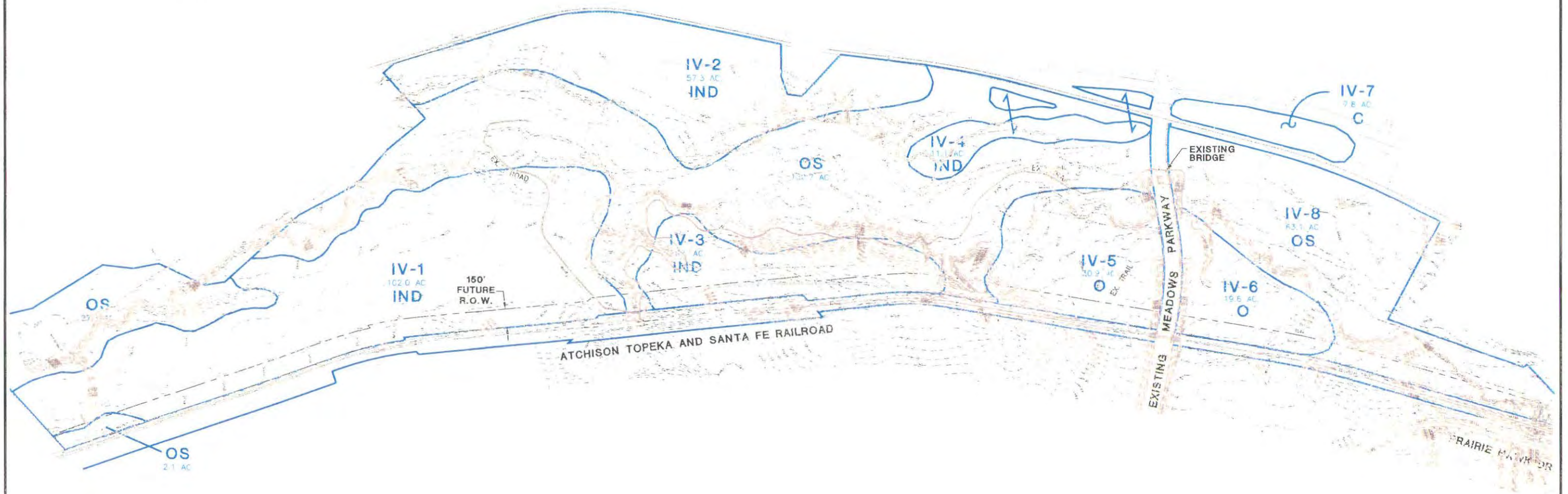
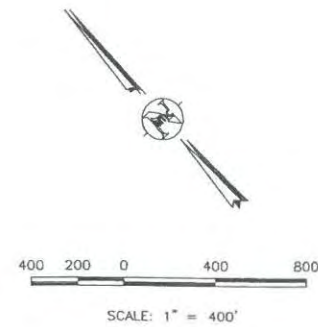
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FIGURE 2

HCP PROPERTY

MEADOWS 3rd AMENDMENT P.D. ZONING



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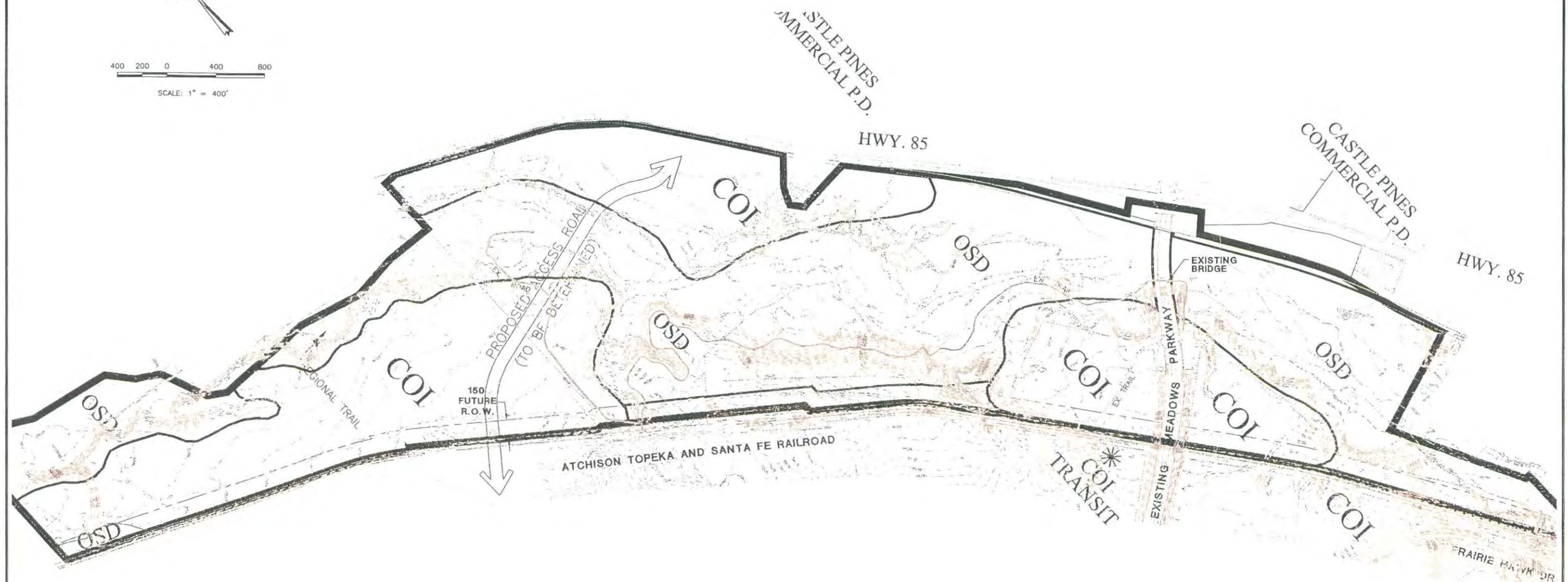
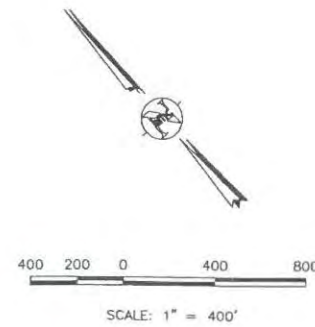
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FIGURE 3-A

HCP PROPERTY

MEADOWS 4th AMENDMENT P.D. ZONING



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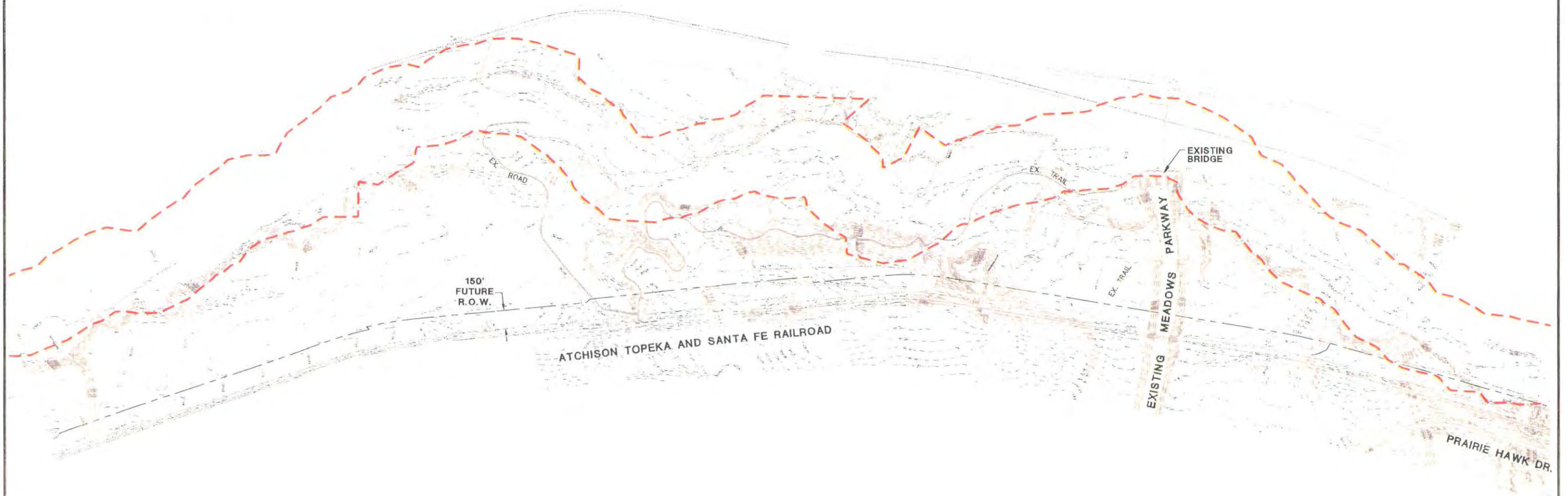
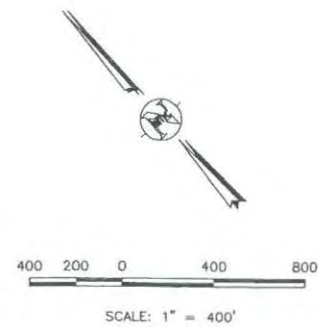
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FIGURE 3-B

HCP PROPERTY

DISTURBANCE ANALYSIS LINE

PROPOSED 4-D RULE LINE



----- PROPOSED 4-D RULE LINE



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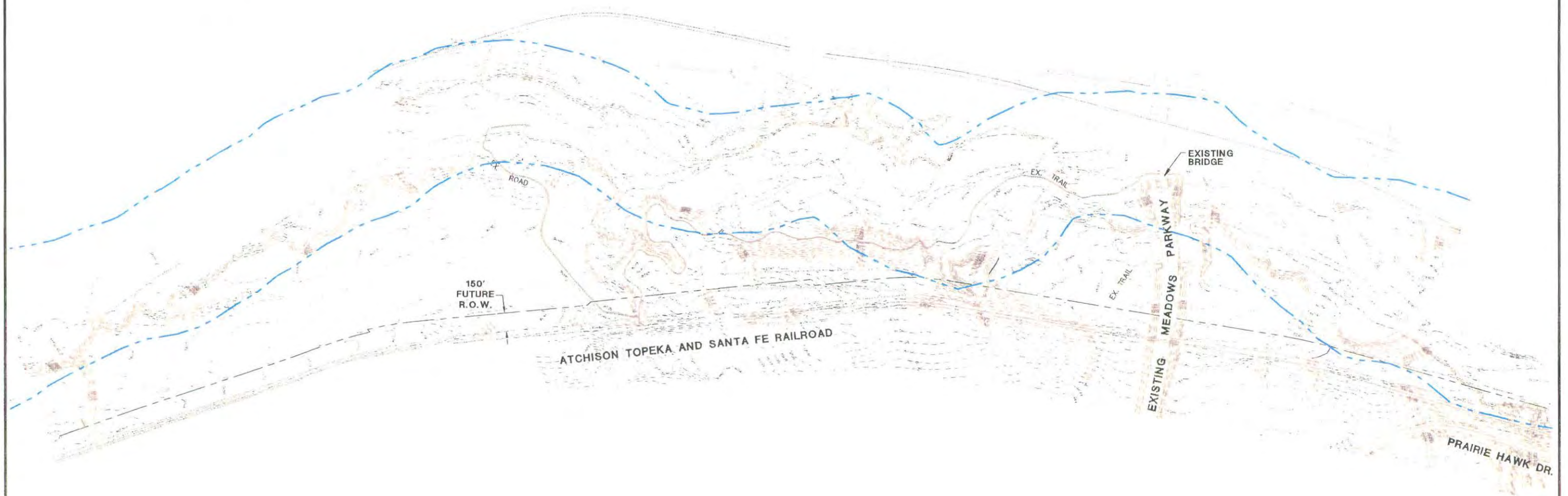
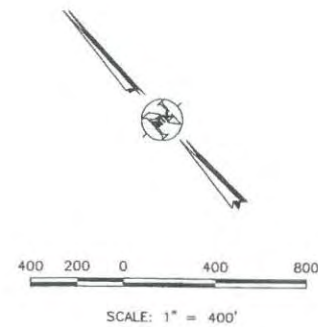
Job No. 3572.005.01

FIGURE 4

HCP PROPERTY

DISTURBANCE ANALYSIS LINE

300' OFFSET FROM 100 YR. FLOODPLAIN



--- 300' OFFSET FROM 100 YR. FLOODPLAIN

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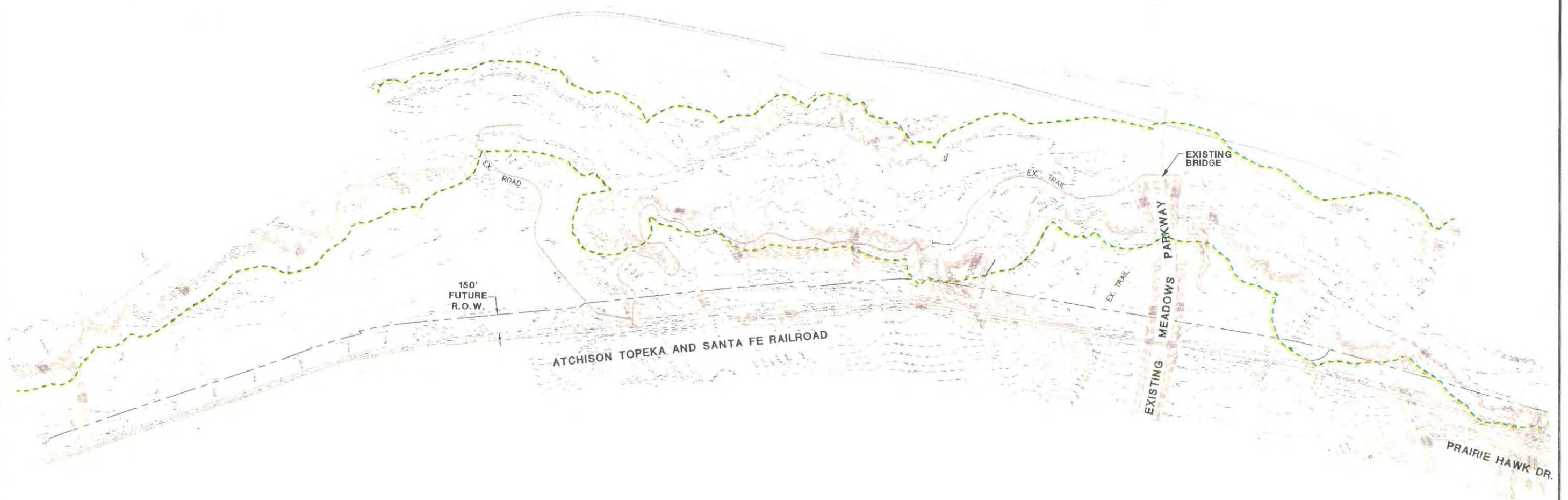
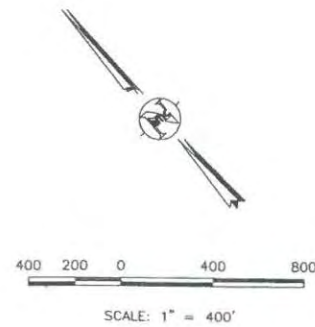
Date: 7/9/03 Job No. 3572.005.01

FIGURE 5

HCP PROPERTY

DISTURBANCE ANALYSIS LINE

100' OFFSET FROM RIPARIAN CORRIDOR



--- 100' OFFSET FROM RIPARIAN CORRIDOR



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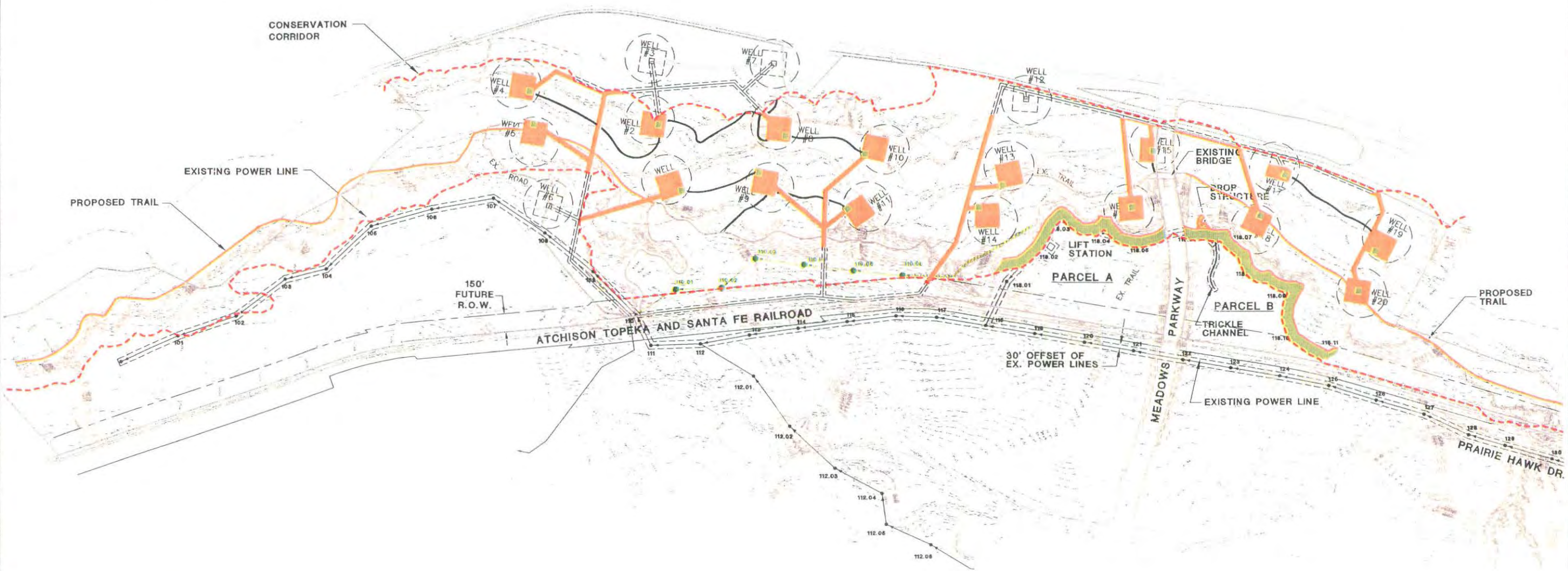
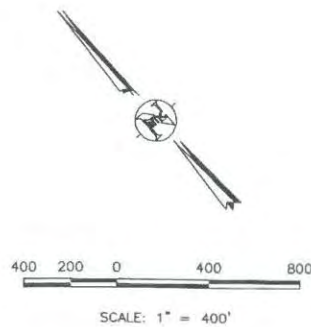
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FIGURE 6

HCP PROPERTY - ALTERNATIVE I PREFERRED ALTERNATIVE

TEMPORARY AND PERMANENT DISTURBANCE
BASED ON RIPARIAN CORRIDOR (PLUS 100 FEET) METHOD



TETRA TECH RMC, Inc.

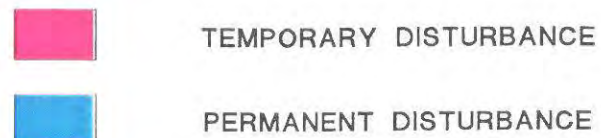
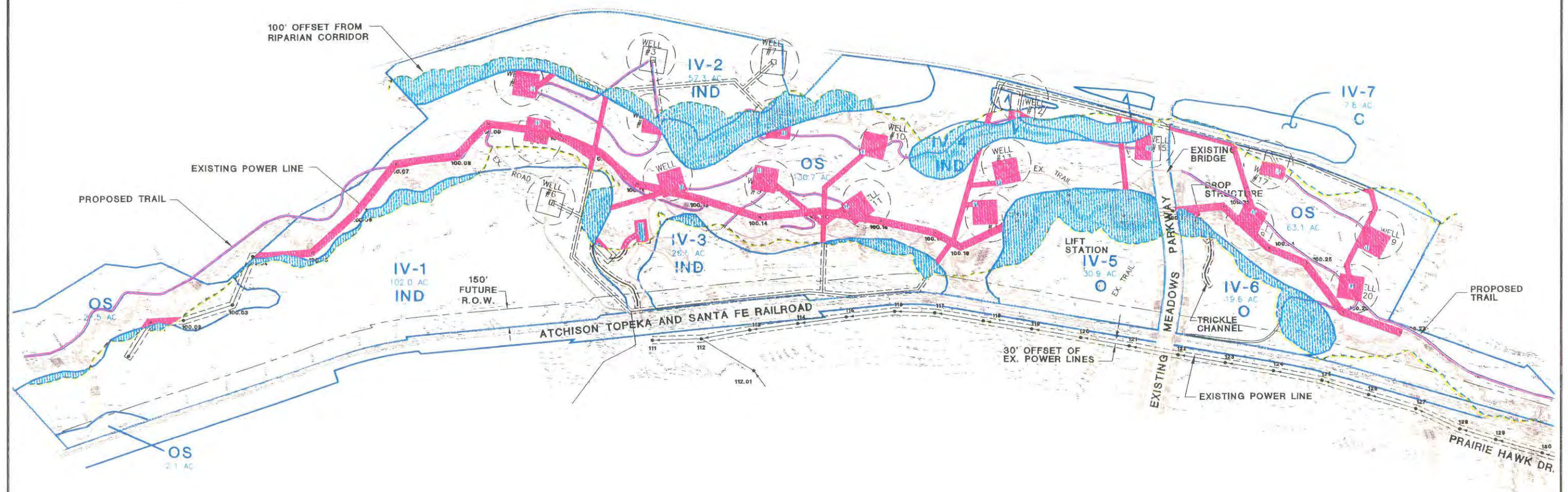
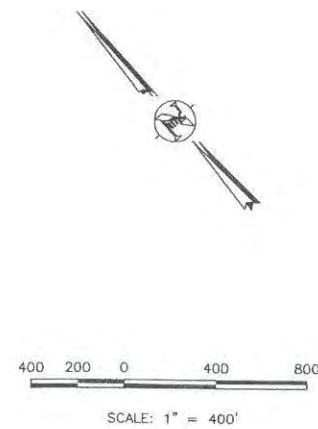
8301 E. Prentice Ave., Suite 101, Greenwood Village, CO 80111
TEL 303.741.6000 FAX 303.741.6106

Date: 7/9/03 Job No. 3572.005.01

FIGURE 7

HCP PROPERTY - ALTERNATIVE II

TEMPORARY AND PERMANENT DISTURBANCE BASED ON RIPARIAN CORRIDOR (PLUS 100 FEET) METHOD

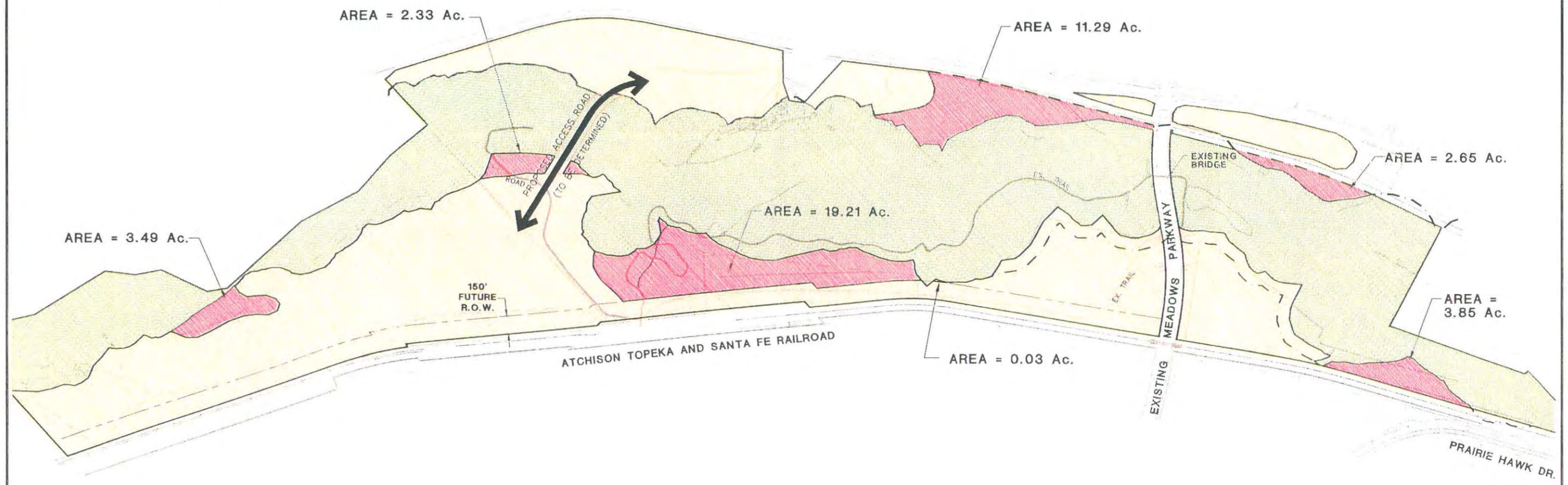
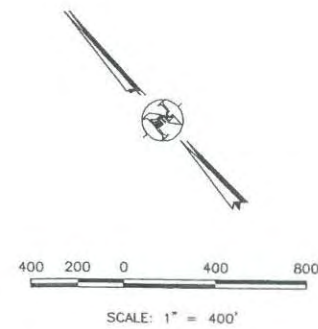


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Date: 7/9/03 Job No. 3572.005.01

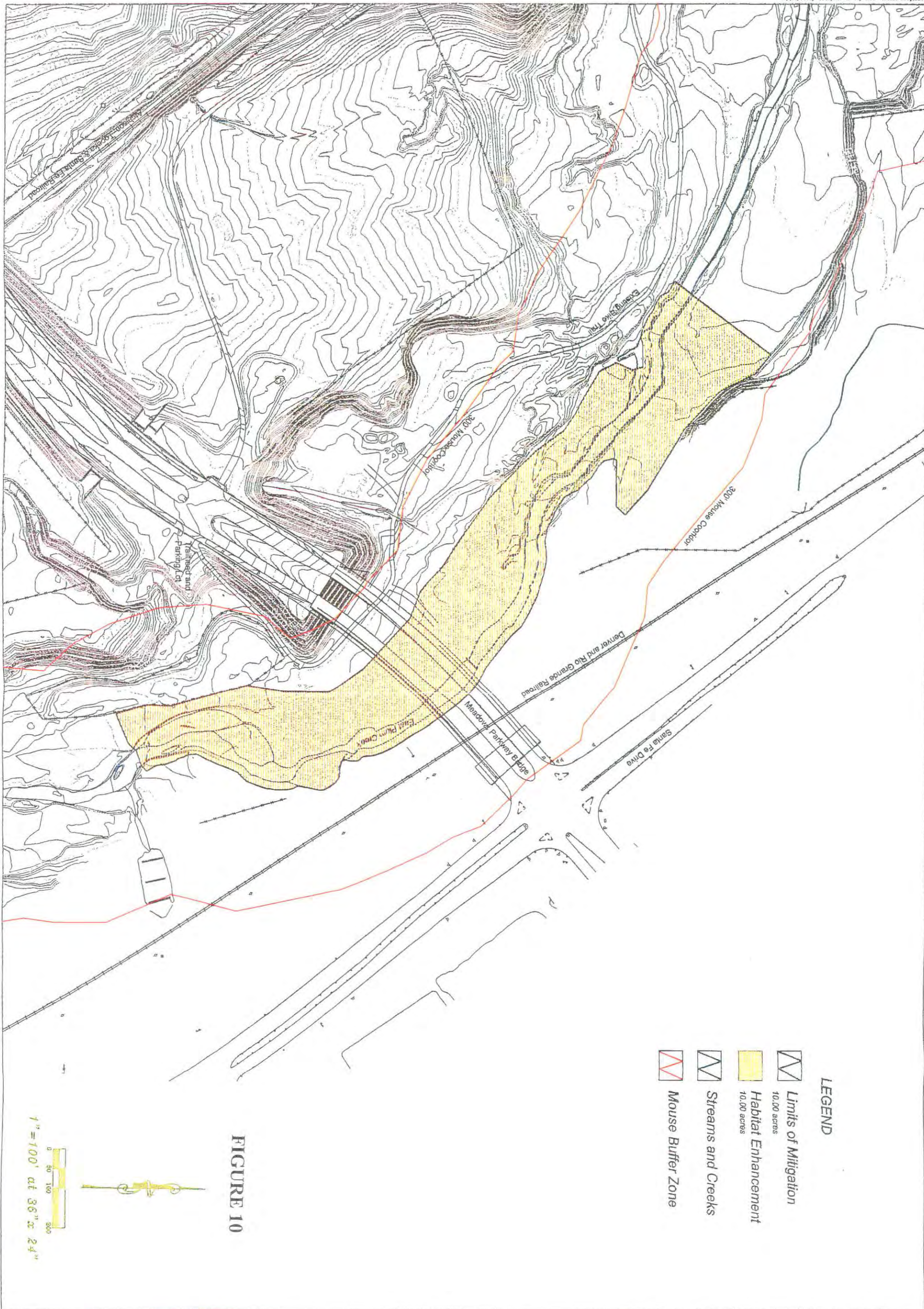
FIGURE 8

HCP PROPERTY CONSERVATION AREAS



- DEVELOPABLE AREAS
AREA = 199.25 Ac.
- OPEN SPACE
AREA = 237.49 Ac.
- ADDITIONAL MITIGATION AREAS
AREA = 42.85 Ac.

FIGURE 9



APPENDIX A

Mitigation Plan Requirements, Criteria and Objectives

This appendix identifies the requirements, criteria and objectives of the mitigation plan for The Meadows pursuant to the Habitat Conservation Plan ("HCP"). The HCP proposes mitigation measures as compensation for unavoidable direct and indirect disturbances to Preble's habitat that will result from development of the site. The HCP would require that CRDC develop and initiate a Vegetation Enhancement Plan to mitigate permanent impacts associated with proposed development in the Protection Zone by enhancing vegetation on 10 acres of the HCP Property ("Enhancement Area") identified in Figure 10. The HCP also would require CRDC to develop and implement Restoration Plans to mitigate temporary impacts associated with development in the Protection Zone, including water well development, trail development, and office parcel development. CRDC will initiate the Restoration Plans associated with development of the water wells and associated utilities at the time each water well or group of water wells is installed.

The mitigation plan proposes to improve Preble's habitat in the Enhancement Area by removing livestock grazing, enhancing low-quality habitat, and conserving the existing high quality habitat within the East Plum Creek floodplain meadow and adjacent upland habitat. The areas that will be temporarily disturbed will be restored to the preexisting quality of habitat or better. Within the Protection Zone, 43.3 acres of developable uplands will be set aside as open space to mitigate for these temporary impacts. This open space is in addition to the 237.49 acres of existing open space already included in the Amended PD Plan. Because the wells will be installed as needed (maximum of three in any one given year over a period of several years), areas temporarily impacted by this activity will be restored as each individual well or group of wells is drilled. The ultimate goals of the proposed measures are to avoid, minimize, and mitigate any effects caused by the proposed Project.

1. Enhancement

The goal of the Vegetation Enhancement Plan will be to create a continuous and contiguous area of Preble's habitat connecting existing areas of non-contiguous Preble's habitat of high quality. See Section 6.3 of the EA/HCP. Habitat is defined for purposes of this mitigation plan as: (1) a continuous area along the riparian corridor; (2) with ground cover provided by grasses, forbs, and shrubs; and (3) providing sources of food for the Preble's.

Enhancement activities will involve improving areas that are currently low- or moderate-quality Preble's habitat that would either benefit directly from improved habitat or in the expansion of dispersal routes and travel corridors. Enhancement opportunities exist within riparian/upland transition zones to benefit Preble's habitat, water quality, and other wildlife by providing important ecotone habitat.

The Vegetation Enhancement Plan will increase Preble's habitat by utilizing native plant species management practices to control weeds and enhance plant community health. Exclusion of cattle will be used to improve Preble's habitat in the Enhancement Area. Minor grading and slope stabilization will be conducted within the stream corridor.

Disturbed, barren, or poorly diverse areas will be revegetated utilizing native seed mix and vegetation planting. The Vegetation Enhancement Plan will include a complete description of the revegetation plan based on the species found in Table 1. The goal of the Vegetation Enhancement Plan is to establish at least 75 percent ground cover (i.e. high quality Preble's habitat) utilizing native grasses, forbs, and shrubs. As indicated in the proposed designation of critical habitat, Preble's abundance is likely driven by the density of riparian vegetation rather than species diversity. Therefore, seeding and planting efforts will be designed to create a dense combination of native grasses, forbs, and shrubs in order to provide high quality Preble's habitat. If vegetation of the same species identified in Table 1 exists within the Enhancement Area at the time of the submission of the Vegetation Enhancement Plan, for example due to exclusion of cattle, CRDC may reduce the planting and seeding to reflect the extent of vegetation already in place.

Within 30 days of completion of the mitigation, as-built plans will be submitted to the Service. The as-built plans shall include final updated plans and specifications, photographs of completed work, number of each species planted, fertilizer used and dosage rates, dates planted and fertilized, and orientation of planting rows or description of plant groupings and spacing. Locations of photographs must be documented and plotted for replication during monitoring sessions.

2. Livestock Exclusion

Cattle are attracted to, and tend to loaf in, riparian areas, regardless of the availability or abundance of upland forage. Overgrazing of riparian vegetation makes stream banks more vulnerable to the destabilizing effects of livestock trampling and the erosive force of water, exposes soils to drying out by wind and sunlight, reduces water storage capacity of the riparian area, reduces shade and thereby increases stream water temperature, encourages invasion of undesirable plants, speeds up runoff, and reduces filtration of sediment necessary for building stream banks, wet meadows, and floodplains (EPA, 1993).

Over time, the presence of cattle within the riparian corridor of East Plum Creek has constricted the growth of vegetation and limited the quality and quantity of Preble's habitat. Within the Enhancement Area, CRDC will remove livestock as the initial stage of mitigation and will not reintroduce grazing activities. Exclusion of cattle will likely result in a significant improvement to the vegetative communities at the site. It is anticipated that these efforts will eventually lead to a successive state of healthy Preble's habitat within the East Plum Creek corridor.

Significant mitigation value can be achieved through the removal of cattle from the East Plum Creek riparian corridor. The benefits of cattle removal shall be considered in the Vegetation Enhancement Plan to be submitted by CRDC prior to any office parcel, new trail or water well development. To document the increase in mitigation value, the Vegetation Enhancement Plan, with input from the Service, shall identify the quantity and quality of Preble's habitat anticipated after a five-year period without livestock grazing on the site and account for such improvements in determining the extent of necessary supplemental plantings and seeding. The mitigation value would be documented before initiation of construction. Early removal of cattle from the mitigation areas, if applicable, shall also be considered in determining the extent of plantings and seeding necessary to meet the biological objectives of the Vegetation Enhancement Plan. An inventory of the habitat characteristics will be conducted to identify the percentages of ground cover and canopy, soil quality and composition, and the hydrology of the defined areas.

3. Restoration

Restoration will occur within areas that are temporarily disturbed due to the installation of alluvial wells, water lines, access roads, and extension of the existing trail system. After initial installation of the water wells, access roads will be used for maintenance. Access roads will undergo re-growth of native grasses, except to the extent that permanent fill may be required in some locations to provide year-round access and prevent erosion. The overall footprint required for the installation of each well is not to exceed 200 ft. x 200 ft. However, Restoration Plans will identify the precise area required for the trucks and machinery necessary to install each well within the footprint to avoid and minimize destruction of Preble's habitat to the maximum extent practicable. The permanent impact of each well is 40 ft. x 40 ft. The permanent impacts for the sixteen wells proposed within the Protection Zone total 0.59 acres, which will be mitigated by the 10 acres of enhancement.

An inventory of Preble's habitat characteristics will be conducted prior to any disturbance to identify the percentage of ground and canopy cover, soil quality and composition, and the hydrology of defined area. The inventory will include photographic documentation and be utilized as baseline data for restoration.

The temporarily disturbed areas due to the installation of the water lines, office development and the trail system will be restored. The Restoration Plan(s) shall include a depiction of the expected areas of disturbance, the inventory of habitat characteristics and specific plans for restoration (including planting and seeding plans). Restoration of the temporarily disturbed areas will involve the replanting of disturbed vegetation on the site and reconnection of any upstream or downstream connector routes that may have been interrupted. The replanting of disturbed vegetation will be equivalent to the preexisting species composition and densities. Restoration will be such that if 70 percent of the revegetation survive and become established, the temporarily disturbed areas will be restored to their preexisting vegetative composition and densities. Survival rates higher than 70 percent will yield a greater density of vegetation than previously existed. In

addition, areas that were bare ground previous to temporary disturbances will also be seeded with native grasses and forbs. The Restoration Plans shall include plantings and seeding of the species identified in Table 1 for riparian areas and Table 2 for upland areas.

Within 30 days of completion of the mitigation, as-built plans will be submitted to the Service. The as-built plans shall include final updated plans and specifications, photographs of completed work, number of each species planted, fertilizer used and dosage rates, dates planted and fertilized, and orientation of planting rows or description of plant groupings and spacing. Locations of photographs must be documented and plotted for replication during monitoring sessions.

4. Operation and Maintenance

The Vegetation Enhancement Plan and Restoration Plan(s) shall contain detailed provisions for operation and maintenance of the mitigation area until success is achieved. Maintenance will include: watering, weed control, use of pesticides if necessary, pruning, and installation of exclosures to prevent wildlife depredation (when necessary).

Watering

All plant material located in the mitigation areas shall be watered during the first growing season (growing season is approximately May through October). Watering is recommended no less than twice weekly throughout the growing season. After the first watering during installation, each watering of tree and shrub plant basins shall provide 5 gallons per square yard. Thereafter, all plant material should be watered once a week until final acceptance or the end of the monitoring period, whichever comes first. CRDC or its contractor will reshape plant saucers, repair washouts and gullies, and replace lost wood mulch.

Weed Control

During the establishment and monitoring period, all weeds and noxious plants shall be removed and controlled before they have grown more than four inches. Weeds and noxious plants are defined as those plants that have been determined to be aggressive and potentially detrimental to the establishment and long-term growth of the native planted species. Weeds and noxious plants may be manually or mechanically removed, or controlled with herbicides. Use of herbicide materials, means of application, and application rates shall be in accordance with any local, county, state or federal regulations and will be strictly adhered to according to the manufacturer's recommendations. Prescribed burns will not be used unless authorized by the Service and under the supervision of a burn specialist.

Pesticide Use

Application of pesticides (including herbicides) to control noxious plants, etc., may be necessary. Various inorganic insecticides with controlled application rates may be effective in controlling these plants without causing significant harm to other flora and fauna. Any use of these types of pesticides (including herbicides) will be conducted in coordination with the Service and other applicable agencies.

Pruning

All containerized and transplanted trees and shrubs will be cultivated and pruned as needed to remove dead or degraded plant material. Pruning will take place before or immediately after planting and as necessary (as identified during subsequent monitoring sessions) to maintain the health of the plant.

Wildlife Exclosures

Upon signs of wildlife depredation (presence of waterfowl, beaver activity or grazed vegetation) wildlife exclosure fencing or other measures shall be implemented immediately to protect the vegetation.

5. Achieving and Determining Success

Success criteria are intended to allow for the inherent variability of native habitat restoration and creation projects, provided that the end result is the creation of habitat that supports the life requisites of Preble's.

The techniques that will be utilized to achieve success will include a watering schedule, a pruning methodology to maintain health and habitat of the plants, control of weed and noxious plants, and the implementation of exclosures or other methods to protect from wildlife depredation.

Vegetation Enhancement Plan

The goal of the Vegetation Enhancement Plan will be to create a continuous and contiguous area of Preble's habitat connecting existing areas of non-contiguous Preble's habitat of high quality. See Section 6.3 of the EA/HCP. Habitat is defined for purposes of this mitigation plan as: (1) a continuous area along the riparian corridor; (2) with ground cover of more than 75 percent provided by grasses, forbs, and shrubs; and (3) providing sources of food for the Preble's. The dominant herbaceous species shall consist of species specified in the Table 1, and the planted areas shall be relatively free of weeds and exotic, invasive species (i.e., less than 5 %).

Restoration Plans

If 70 percent of the revegetation specified in the Restoration Plan(s) survives and becomes established, sufficient habitat would have been restored and enhanced to meet the stated biological goals and objectives. Thus, the mitigation plan will have achieved success when 70 percent of the revegetated area is established, the dominant herbaceous species consist of species specified in the planting plan, and the planted areas are relatively free of weeds and exotic, invasive species (i.e., less than 5 percent). If a survival rate of 70 percent is not achieved, additional plantings will be conducted.

Table 1: Riparian Zone Species List

Scientific Name	Common Name	Indicator Status
Herbaceous Species		
Grasses		
<i>Achnatherum hymenoides</i>	Indian ricegrass	FACU
<i>Andropogon gerardii</i>	big bluestem	FACU
<i>Andropogon halii</i> var. Hack	sand bluestem	UPL
<i>Boutelous curtipendula</i>	side-oats grama	N/A
<i>Botelous gracilis</i>	blue grama	N/A
<i>Calamovilfa longifolia</i>	prairie sandreed	FACU
<i>Elymus canadensis</i>	Canada wildrye	FACU
<i>Elymus lanceolatus</i> <i>dasystachyum</i>	thickspike wheatgrass	N/A
<i>Elymus elymoides</i>	bottlebrush squirreltail	N/A
<i>Festuca arizonica</i>	pinegrass	N/A
<i>Festuca longifolia</i>	hard fescue	FACU
<i>Koeleria macrantha</i>	prairie junegrass	N/A
<i>Panicum virgatum</i>	switchgrass	FAC
<i>Pascopyrum smithii</i>	western wheatgrass	N/A
<i>Poa secunda</i> (sandbergii)	Sandberg bluegrass	N/A
<i>Schizachyrium scoparium</i>	little bluegrass	UPL
<i>Sorghastrum nutans</i>	yellow Indian grass	N/A
<i>Sporobolus cryptandrus</i>	sand dropseed	N/A
<i>Stipa comata</i>	needle and thread	N/A
<i>Stipa viridula</i>	green needlegrass	N/A
Forbs		
<i>Achillea lanulosa</i>	western yarrow	FACU
<i>Liatris punctata</i>	dotted gayfeather	FACU
<i>Linum lewisii</i>	blue flax	UPL
<i>Oenothera pallida</i>	white evening primrose	N/A
<i>Ratibida columnifera</i>	prairie coneflower	N/A
<i>Rudbeckia hirta</i>	black-eyed susan	FACU
Riparian/Wetland Species		
<i>Carex atrata</i>	black sedge	FACW
<i>Carex lanuginosa</i>	wooly sedge	OBL
<i>Carex nebrascensis</i>	Nebraska sedge	OBL
<i>Carex vulinoidea</i>	fox sedge	FACW
<i>Carex hystericina</i>	porcupine sedge	OBL
<i>Distichlis spicata</i>	inland saltgrass	OBL
<i>Glyceria striata</i>	mannagrass	OBL
<i>Elymus elymoides</i>	bottlebrush squirreltail	FACU
<i>Juncus balticus</i>	Baltic rush	FACW
<i>Juncus confusus</i>	Colorado rush	FAC+
<i>Panicum virgatum</i>	switchgrass	FAC

<i>Sporobolus airoides</i>	alkali sacaton	FAC
<i>Triglochin maritimum</i>	Arrowgrass	OBL
<u>Woody Species</u>		
Trees		
<i>Acer negundo</i>	boxelder	FAC/FACW
<i>Alnus incana</i>	thinleaf alder	FACW
<i>Betula occidentalis</i>	water birch	FACW
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	UPL
<i>Pinus ponderosa</i>	ponderosa pine	UPL
<i>Populus angustifolia</i>	narrowleaf cottonwood	FACU
<i>Populus deltoides</i>	plains cottonwood	FAC
<i>Populus tremuloides</i>	aspen	FAC
Shrubs		
<i>Prunus americana</i>	American Plum	FACU
<i>Prunus virginiana</i>	chokecherry	FACU
<i>Quercus gambelii</i>	Gambel Oak	UPL
<i>Rhus trilobata</i>	oakleaf sumac	UPL
<i>Ribes aureum</i>	golden currant	FACW
<i>Ribes cereum</i>	wax currant	UPL
<i>Rosa woodsii</i>	Wood's Rose	FACU
<i>Salix amygdaloides</i>	peachleaf willow	OBL
<i>Salix exigua</i>	coyote willow	OBL
<i>Salix monitcola</i>	mountain willow	OBL
<i>Symphoricarpos occidentalis</i>	common snowberry	UPL

Table 2: Upland Zone Species

<u>Scientific Name</u>	<u>Common Name</u>	<u>Indicator Status</u>
<u>Herbaceous Species</u>		
Grasses		
<i>Achnatherum hymenoides</i>	Indian ricegrass	FACU
<i>Andropogon gerardii</i>	big bluestem	FACU
<i>Andropogon hali</i> var. Hack	sand bluestem	UPL
<i>Boutelous curtipendula</i>	side-oats grama	N/A
<i>Botelous gracilis</i>	blue grama	N/A
<i>Calamovilfa longifolia</i>	prairie sandreed	FACU
<i>Elymus canadensis</i>	Canada wildrye	FACU
<i>Elymus lanceolatus</i> <i>dasystachyum</i>	thickspike wheatgrass	N/A
<i>Elymus elymoides</i>	bottlebrush squirreltail	N/A
<i>Festuca arizonica</i>	pinegrass	N/A
<i>Festuca longifolia</i>	hard fescue	FACU
<i>Koeleria macrantha</i>	prairie junegrass	N/A
<i>Panicum virgatum</i>	switchgrass	FAC
<i>Pascopyrum smithii</i>	western wheatgrass	N/A
<i>Poa secunda</i> (sandbergii)	Sandberg bluegrass	N/A
<i>Schizachyrium scoparium</i>	little bluegrass	UPL
<i>Sorghastrum nutans</i>	yellow Indian grass	N/A
<i>Sporobolus cryptandrus</i>	sand dropseed	N/A
<i>Stipa comata</i>	needle and thread	N/A
<i>Stipa viridula</i>	green needlegrass	N/A
Forbs		
<i>Achillea lanulosa</i>	yestern yarrow	FACU
<i>Liatris punctata</i>	dotted gayfeather	FACU
<i>Linum lewisii</i>	blue flax	UPL
<i>Oenothera pallida</i>	white evening primrose	N/A
<i>Ratibida columnifera</i>	prarie coneflower	N/A
<i>Rudbeckia hirta</i>	black-eyed susan	FACU
<u>Woody Species</u>		
Trees		
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	UPL
<i>Pinus ponderosa</i>	ponderosa pine	UPL
<i>Populus angustifolia</i>	narrowleaf cottonwood	FACU
<i>Populus deltoides</i>	plains cottonwood	FAC
<i>Populus tremuloides</i>	aspen	FAC
Shrubs		
<i>Prunus americana</i>	American Plum	FACU
<i>Prunus virginiana</i>	chokecherry	FACU

December 15, 2003

<i>Quercus gambelii</i>	Gambel Oak	UPL
<i>Rhus trilobata</i>	oakleaf sumac	UPL
<i>Ribes cereum</i>	wax currant	UPL
<i>Rosa woodsii</i>	Wood's Rose	FACU
<i>Symphoricarpos occidentalis</i>	common snowberry	UPL

DECLARATION OF USE RESTRICTIONS

THIS DECLARATION OF USE RESTRICTIONS (this "Declaration") is made as the date set forth below next to the signature of Declarant, as hereinafter defined, by and between **CASTLE ROCK LAND CO., LLC**, a Colorado limited liability company, whose address is 3033 East First Avenue, Suite 410, Denver, Colorado 80206, (hereinafter referred to as "Declarant") for the benefit of the **UNITED STATES FISH AND WILDLIFE SERVICE** (hereinafter referred to as "Service").

RECITALS

This Declaration is made with respect to the following facts:

WHEREAS, Declarant is the owner of certain real property located within the Town of Castle Rock, County of Douglas, State of Colorado (the "Property"); and

WHEREAS, the Preble's meadow jumping mouse ("PMJM") is listed as a threatened species under the United States Endangered Species Act ("ESA"). The ESA prohibits the unlawful take of PMJM; and

WHEREAS, Declarant anticipates that it will undertake certain activities on the Property which may impact PMJM habitat. As a result, Declarant has applied for and received from the Service an Incidental Take Permit under Section 10 of the ESA (the "Incidental Take Permit"); and

WHEREAS, the Habitat Conservation Plan approved by the Service in granting the Incidental Take Permit (the "HCP") requires that the temporary and permanent impacts of Declarant's activities within the Property be mitigated by (a) maintaining that portion of the Property which is more particularly described in Exhibit A, attached hereto and incorporated herein (the "Open Space Property") as open space; and (b) by adhering to the mitigation measures which are more particularly described in the HCP; and

WHEREAS, the HCP requires Declarant, prior to the development of any portion of the Property, to execute a deed restriction or conservation easement, with the Service as a beneficiary, to ensure that the Open Space Property shall remain as open space consistent with the terms and conditions of the HCP; and

WHEREAS, Declarant desires to establish the Restrictions, as hereinafter defined, on the Open Space Property, consistent with and in accordance with the terms and provisions of the

Incidental Take Permit and the HCP, as hereinafter set forth.

DECLARATION

NOW, THEREFORE, Declarant hereby declares that from and after the date of this Declaration, the Open Space property shall be owned, held, transferred, conveyed, sold, leased, rented, hypothecated, encumbered, used, occupied, maintained, altered and improved at all times subject to the Restrictions set forth in this Declaration, which are declared to be a part of, pursuant to, and in furtherance of a common and general plan for the improvement and development of the Open Space Property. The provisions of this Declaration are imposed as equitable servitudes upon the Open Space Property, and are intended to and shall run with the land and shall bind, be charged upon, and inure to the benefit of the Service, its successors and assigns.

RESTRICTIONS

I. Use Limitations.

Subject to the conditions and limitations set forth below, the Open Space Property shall be perpetually maintained in a scenic, natural or open condition, and shall be used only for purposes consistent with such limitation, including but not limited to the Permitted Uses and Practices set forth below. The Service shall have the right from time to time, upon reasonable prior written notice to Declarant and in a manner that will not unreasonably interfere with Declarant's use of the Open Space Property in a manner that is consistent with this Declaration, to enter upon the Open Space Property to inspect the Open Space Property and to enforce its rights under this Declaration.

II. Permitted Uses and Practices. Declarant shall have the right to use the Open Space Property for any use that is consistent with the foregoing obligation to maintain the Open Space Property in a scenic, natural or open condition. Without limiting the generality of the foregoing, Declarant shall further have the following specific retained rights with respect to the use of the Open Space Property:

2.1 Any and all uses of the Open Space Property permitted under the HCP, as amended from time to time, or as otherwise approved by the Service.

2.2 Maintenance, repair, replacement, removal and use of all fences, roads, trails and structures existing on the Open Space Property as of the date of this Declaration, substantially in their present condition and not to exceed their existing permanent footprint.

2.3 Installation, maintenance, repair, removal, relocation, and replacement of existing

drainage facilities and underground utility mains, lines and facilities for the purpose of providing utility services and drainage to or through the Open Space Property.

2.4 Weed control through the application of agrochemicals, including but not limited to fertilizers and biocides, but only in those amounts and with the frequency of application necessary to accomplish suppression of noxious weeds and maintenance or enhancement of PMJM habitat. Declarant shall have the right to control all noxious weeds on the Open Space Property according to the provisions of Title 35 of the Colorado Revised Statutes and/or any rules and regulations promulgated by the Commissioner of Agriculture of the State of Colorado, by the Board of County Commissioners of Douglas County, Colorado, or the Town Council of the Town of Castle Rock Colorado, or any other governmental agency having jurisdiction over the Open Space Property.

2.5 Control of predatory and problem animals by the use of techniques that will control specific animals or species which have caused or are likely to cause damage to the Open Space Property, provided that any such control techniques shall have no material adverse effect on the biological integrity of the Open Space Property as habitat for the PMJM.

2.6 Passive recreation, other than that permitted within the conditions identified within the Section 10(a) Incidental Take Permit, shall be permitted as long as those activities will have no material adverse effect on the biological integrity of Open Space Property as PMJM habitat.

2.7 Any use approved by the Town Council of the Town of Castle Rock and Service.

III. Prohibited Uses.

3.1 Except as otherwise provided in the HCP or the Incidental Take Permit, no alterations will occur in the Open Space Property that would have a material adverse impact on the biological integrity of the Open Space Property as PMJM habitat, including, but not limited to: (a) dumping or placing of soil, or other material, such as trash, on the Open Space Property; (b) mowing, removal or destruction of vegetation, except as otherwise set forth in Section 2.4, above; (c) excavation of soil; and (d) activities detrimental to flood control, water conservation or erosion control.

3.2 Free roaming pets, including but not limited to domestic cats and dogs, are prohibited on the Open Space Property.

IV. Enforcement.

4.1 The Service shall have the right to enforce the Restrictions set forth in this Declaration. The right of enforcement shall include only the right to bring an action for equitable

relief, including, without limitation, any action to enjoin any violation or specifically enforce the Restriction or other provision of this Declaration.

V. TERM

5.1 This Declaration shall be perpetual in duration.

VI. MISCELLANEOUS

6.1 This Declaration shall be binding upon Declarant and its successors in interest to the Open Space Property. The terms "Declarant" and "Service", whenever used herein, and any pronouns used in place thereof, shall mean and include the above-named Declarant and Declarant's successors, assigns and lessees, and the above-named Service and its successors and assigns, respectively.

6.2 If any provision of this Declaration or the application thereof to any person or circumstance is found to be invalid, the remainder of the provisions of this Declaration and the application of such provisions to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

6.3 This Declaration may be modified only by an instrument in writing, duly executed by the Service and the then current owner or owners of the entirety of the Open Space Property.

IN WITNESS WHEREOF, the Declarant has caused this Declaration to be duly executed this __ day of _____, 200__.

CASTLE ROCK LAND CO., LLC
a Colorado limited liability company

By: _____
Title: _____

STATE OF COLORADO

)

Attachment A
December 15, 2003

_____) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of _____, 200__, by
_____ as _____ of Castle Rock Land Co., LLC, a
Colorado limited liability company.

Witness my hand and official seal.

(S E A L)

Notary Public

My Commission Expires:

Attachment A
December 15, 2003

EXHIBIT A
Description of Open Space Property

Attachment B
December 15, 2003

(This form of LC is provided to the US Fish and Wildlife Service for informational purposes only. The funding mechanism to be provided by applicant at the time of construction may vary from this form of LC. Applicant's obligations to provide funding in the event that it should fail to undertake any of its mitigation obligations under the EA/HCP are more specifically addressed in Section 6.6.2 of the EA/HCP)

Proposed Letter of Credit Form
Environmental Assessment/Habitat Conservation Plan for a Portion of the
Meadows Property, Douglas County, Colorado

Standby Credit: _____

Date: _____

Beneficiaries:

United States Fish and Wildlife Service

Town of Castle Rock
100 North Wilcox St
Castle Rock, Colorado 80104

Applicant:
Castle Rock Development Company
3033 East First Avenue, Suite 410
Denver, Colorado 80206

Gentlemen:

We hereby issue our irrevocable credit no. _____ in your favor for the account of Castle Rock Development Company for an amount or amounts not to exceed _____ (\$_____.00) available by your drafts at sight on _____, effective _____ and expiring at our counters on _____.

Funds under this credit are available against drafts mentioning our credit number.

The below mentioned documents must be presented at sight on or before the expiry date on this instrument in accordance with the terms and conditions of this letter of credit.

Attachment B
December 15, 2003

Your signed and dated statement, reading as follows: "Castle Rock Development Company is in default of its mitigation obligations under the Environmental Assessment/Habitat Conservation Plan for a Portion of the Meadows Property, Douglas County, Colorado (the "EA/HCP")."

We engage with you that drafts drawn under and in conformity with the terms of this credit will be duly honored on presentation if presented on or before the expiry date. The original letter of credit must accompany the documents required under this credit.

It is a condition to this credit that it shall be automatically renewed for additional periods of one (1) year from the present or any future expiration date unless at least sixty days prior to such expiration period we notify you, in writing, that we elect to not renew this letter of credit for such additional periods. Upon receipt of that notice you have the right to draw against the amount available under this credit by presentation of your clean sight draft, without any accompanying statement.

This credit is subject to the Uniform Customs and Practices for Documentary Credits (1993 revision), International Chamber of Commerce Publication 500.

Please address all correspondence regarding this letter of credit to the attention of our letter of credit unit, trade service group, mentioning our reference number as it appears above.

Very truly yours,
Name of Bank

Authorized Signer



Tri-County Health Department

Serving Adams, Arapahoe and Douglas Counties

Chris J. Wiant, M.P.H., Ph.D.
Executive Director

October 2, 1998

SWCA Inc., Environmental Consultants
Attn: Trent A. Miller
1155 Sherman Street, Suite 215
Denver, CO 80203

RE: Prairie Dog Die-Off
Meadows Subdivision

Dear Mr. Miller:

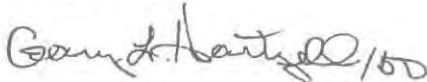
On August 10, 1998, this department received a complaint concerning a possible prairie dog die-off in the Meadows Subdivision in Douglas County. An investigation was conducted that same day, thus confirming the complaint. Staff members did not see any activity at any prairie dog burrows throughout the community.

Fleas were collected at selected burrow entrances and submitted to CDC for plague testing. On August 21, we were notified that the flea pool was positive for plague.

During the interim between investigation and confirmation, representatives of this department notified residents, posted the sites as possible plague presence, and dusted the burrows.

I hope this letter will assist you. If I can be of further assistance, please call this office.

Sincerely,



Gary L. Hartzell
Environmental Health Field Supervisor

GLH/bd

enc: CDC confirmation

Fifty years of working to

50

improve the public's health

101 Third Street □ Castle Rock, Colorado 80104-2428
303-663-7650 □ FAX 303-688-8870



ATTACHMENT 2

September 24, 2012

VIA ELECTRONIC MAIL

Susan C. Linner
Colorado Field Supervisor
United States Department of the Interior
Fish and Wildlife Service
Colorado Field Office
P.O. Box 25486
Denver, Colorado 80225-0486

Re: Request for Approval of Minor Amendment to Meadows Habitat Conservation Plan and
for Approval of Restoration Plan Pursuant to Meadows Habitat Conservation Plan

Dear Ms. Linner:

The Town of Castle Rock Utilities Department (Town) has been working on plans to develop a well field on property owned by Castle Rock Development Company (CRDC) in the Town of Castle Rock. The property is covered by the Meadows Habitat Conservation Plan (Meadows HCP) and Incidental Take Permit (ITP).

The purpose of the attached report is to provide the necessary documentation to secure two approvals for the Project from the USFWS. First, pursuant to Section 6.7.2 of the Meadows HCP, CRDC and the Town seek approval of a minor amendment to the Meadows HCP for slight changes to the well infrastructure plan that was originally identified in Figure 7 of the Meadows HCP. The minor changes include adjusting the well locations within the 200 foot radius of the decreed well sites, and changes in the alignments for utilities and access routes to the wells. As shown in the attached report, these changes (1) do not diminish the level or means of mitigation in the Meadows HCP, (2) result in no net loss of mitigation, (3) do not otherwise alter the effectiveness of the Meadows HCP, (4) do not alter the terms of the ITP, and (5) do not conflict with the primary purpose of the Meadows HCP or its accompanying environmental assessment (EA) as stated in Section 6.6 of the Meadows HCP. Therefore, the granting of the minor amendment is consistent with the requirements of Section 6.7.2 of the Meadows HCP.

Second, pursuant to Section 6.5.1(6) of the Meadows HCP and Condition O of the ITP, CRDC and the Town seek approval of the enclosed Restoration Plan covering activities associated with the construction of the alluvial wells. The Restoration Plan is based in part on the previous restoration plan and habitat assessments covering test boring activities for the Central Well Field, dated October 21, 2011, and approved by the USFWS on December 16, 2011. CRDC and the Town seek concurrence from USFWS that implementation of the Restoration Plan is consistent with and meets the requirements of the Meadows HCP and ITP, and is unlikely to result in a take of Preble's meadow jumping mouse (*Zapus hudsonius preblei*).

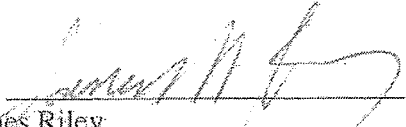
Absolutely no activity related to the well construction phase of the Project will commence until CRDC receives approval of the minor amendment to the Meadows HCP and the Restoration Plan.

If you have any questions or need additional information regarding this request, please do not hesitate to contact the Town or CRDC at the numbers listed below.

Thank you for your assistance.

Sincerely,

Castle Rock Development Company

By: 

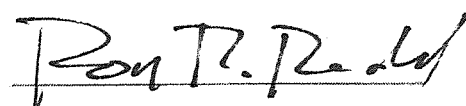
James Riley

Castle Rock Development Company

(303)394-5500

jriley@crdcco.com

Town of Castle Rock

By: 

**MINOR AMENDMENT AND RESTORATION PLAN
COVERING THE PREBLE'S MEADOW JUMPING MOUSE PROTECTION ZONE
FOR THE MEADOWS – PLUM CREEK CENTRAL WELL FIELD PROJECT
PRODUCTION WELL CONSTRUCTION**

DOUGLAS COUNTY, COLORADO

Prepared by:

Barbara Spagnuolo, *Natural Resource Specialist*
Town of Castle Rock Parks and Recreation Department

Bryan Baker, *Water Resources Program Analyst*
Town of Castle Rock Utilities Department

September 24, 2012

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List of Attachments

Attachment A – Well Site Photos

Attachment B – The Meadows Habitat Conservation Plan Native Grass and Plant Species Mix

Attachment C – Douglas County Habitat Conservation Plan Revegetation Guidelines

Attachment D – Douglas County Habitat Conservation Plan Woody Riparian Vegetation Guidelines

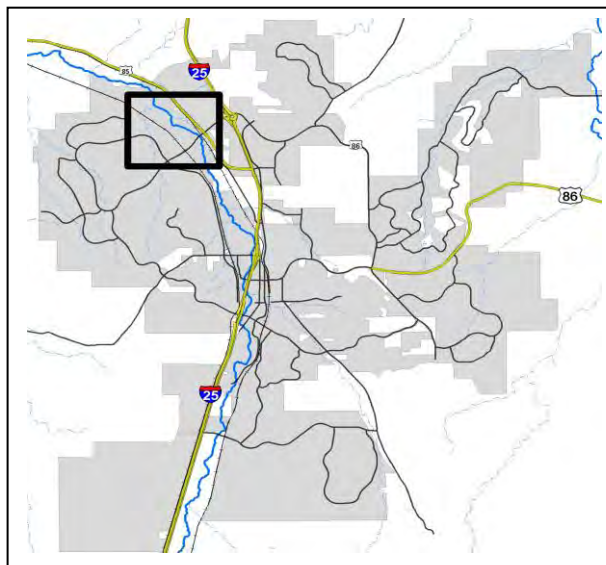
1.0 INTRODUCTION

The Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (PMJM) is currently a species listed as threatened in the State of Colorado under the Endangered Species Act (ESA). Typically, PMJM occurs below 7,600 feet in elevation, generally in lowlands with medium to high moisture (USFWS 1999) and dense vegetation along permanent or intermittent streams and canals (Ryon 1996, Meaney et al. 1996). Locally, PMJM is known to occur along East Plum Creek within the Town of Castle Rock (Town) based on positive trapping surveys.

The U.S. Fish and Wildlife Service (USFWS) issued a 30-year Incidental Take Permit (ITP) to Castle Rock Development Company (CRDC) on February 17, 2004. The permit authorized take of PMJM under activities associated with the construction and use of a portion of the Meadows Development owned by CRDC in the Town of Castle Rock, Colorado, and as more fully described in the Habitat Conservation Plan for a Portion of The Meadows Property (Meadows HCP). The Meadows HCP defines a corridor of viable PMJM habitat along East Plum Creek that includes both riparian and adjacent uplands habit areas, and has been designated in the report as the Protection Zone. The Protection Zone boundary is delineated on most of the figures provided in this report.

As one of the allowed construction activities identified in the Meadows HCP, a total of up to twenty alluvial water wells are permitted to be drilled within viable PMJM habitat (Protection Zone) identified in the Meadows HCP. This water well project has been identified by the Town as the Plum Creek Central Well Field (the Project). Production from the Plum Creek Central Well Field will supply renewable water to the Plum Creek Water Purification Facility located north of downtown Castle Rock, and currently under construction. The Project area is located within The Meadows subdivision west of Interstate 25 in the Town of Castle Rock. The well sites are dispersed along East Plum Creek but are generally found in the eastern portion of Section 28, southwestern quarter of Section 27 and northern portion of Section 34, Township 7 South and Range 67 West. See **Figure 1** for Town-wide reference map.

Figure 1 - Project Location in Castle Rock.



During April of 2011, the Town secured permission from CRDC to conduct preliminary site surveys and water quality assessments in the riparian corridor of the Meadows near the decreed well sites. On April 22, 2011, by email from Adam Misztal, USFWS stated its concurrence that these activities were not likely to adversely affect Preble's (*Zapus hudsonius preblei*) and were therefore consistent with and anticipated in the Meadows HCP.

The preliminary work also included water sampling and analysis of several existing monitor wells that were installed during a previous hydrologic investigation undertaken by Bishop-Brogden Associates, Inc. (BBA) in the 1980's. Using information from the water quality analyses, site surveys, and habitat assessment work, a number of the decreed well sites were evaluated for development potential. Based on the preliminary assessment, the twenty decreed well sites were narrowed down to nine possible sites which offered, at least initially, the best prospects for development. These nine prospective well sites were selected based on minimizing the amount of impact to riparian habitat, potential for productive alluvial wells, and best routes for the infrastructure needed for the water delivery system.

By letter dated November 18, 2011, CRDC and the Town provided to USFWS a Work Plan and Habitat Assessment and Restoration Plan prepared by the Town, both of which covered the test boring activity proposed for the design phase of the project. By letter dated December 16, 2011, USFWS provided concurrence that these actions were unlikely to result in a take of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) and were consistent with the Meadows HCP and ITP.

Following that concurrence, the Castle Rock Utilities Department (Utilities) conducted a subsurface investigation at nine out of the twenty decreed water well sites during January of 2012. The intent of the investigation was to collect subsurface information on the thickness and hydraulic properties of the Plum Creek alluvium in the vicinity of the well sites, in order to come up with locations having the best potential for water production. Of the nine well sites that were selected for subsurface investigation, two locations were eliminated as potential well sites based on results of the investigation. With the final number of production wells narrowed down to seven, the Town's consultant for the project, CDM-Smith, was able to proceed with well and facility construction plan design.

With the design plans nearly complete, Utilities is ready to begin the next phase of the Project. This phase will entail installation of the seven alluvial wells, and the construction of the infrastructure necessary for collection and transmission of water from the production wells to the new treatment plant. To commence the construction phase, the Town and CRDC require additional authorization from the USFWS under the HCP and ITP. The project construction work is proposed to begin after approval from the USFWS and CRDC, and no earlier than October 15, 2012. Construction activities at the three well sites will be completed by or prior to April 30, 2013.

Accordingly, the purpose of this report is to provide the necessary documentation to secure two approvals for the Project from the USFWS. First, pursuant to Section 6.7.2 of the Meadows HCP, CRDC and the Town seek approval of a minor amendment to the Meadows HCP for slight changes to the well infrastructure plan that was originally identified in Figure 7 of the Meadows HCP. The minor changes include adjusting the well locations within the 200 foot radius of the decreed well sites, and changes in the alignments for utilities and access routes to the wells. As shown in this report, these changes (1) do not diminish the level or means of mitigation in the Meadows HCP, (2) result in no net loss of mitigation, (3) do not otherwise alter the effectiveness of the Meadows HCP, (4) do not alter the terms of the ITP, and (5) do not conflict with the primary purpose of the Meadows HCP or its accompanying environmental assessment (EA) as stated in Section 6.6 of the Meadows HCP. Therefore, the granting of the minor amendment is consistent with the requirements of Section 6.7.2 of the Meadows HCP.

Second, pursuant to Section 6.5.1(6) of the Meadows HCP and Condition O of the ITP, CRDC and the Town seek approval of a Restoration Plan covering activities associated with the construction of the alluvial wells. The Restoration Plan is based in part on the previous restoration plan and habitat assessments covering test boring activities for the Central Well Field, dated October 21, 2011, and approved by the USFWS on December 16, 2011. CRDC and the Town seek concurrence from USFWS that implementation of the Restoration Plan is consistent with and meets the requirements of the Meadows HCP and ITP and is unlikely to result in a take of Preble's meadow jumping mouse (*Zapus hudsonius preblei*).

Absolutely no activity related to the well construction phase of the Project will commence until CRDC receives approval of the minor amendment and restoration plan.

2.0 PREBLE'S MEADOW JUMPING MOUSE HABITAT OVERVIEW

Habitat for the Preble's meadow jumping mouse along the Front Range of Colorado into Wyoming typically consists of a matrix of riparian vegetation and associated upland grasslands and shrubs (Fitzgerald et al. 1994; Shenk and Sivert 1998). These systems are relatively narrow and represent a small percentage of the landscape (USFWS 2002a). Riparian vegetation typically is varied with a mixed overstory comprised of willows (*Salix* spp.) and cottonwoods (*Populus* spp.) and an understory of scattered shrubs including snowberry (*Symphoricarpos* spp.). Two major habitat components appear necessary; open water and dense cover. Both of these are present within the Protection Zone delineated in the Meadows HCP.

In addition to these habitat features, suitable habitat must also provide requirements for survival throughout the life cycle (Shenk 1998). This means that habitat for the active period and hibernation period are essential. Active period habitat must provide areas where reproductive

activities and daily survival can occur. Hibernation habitat is not just that habitat in which hibernacula are created but also provides adequate food sources for fat storage during hibernation. Habitat for active and hibernating periods do not have to occur in the same location but must be connected.

Threats to Preble's and their habitat include alteration, degradation, loss, and fragmentation resulting from urban development, flood control structures, water development, agriculture, and other human land uses. Habitat destruction may impact individual Preble's directly or by destroying nest sites, food resources, and hibernation sites, by disrupting behavior, or by forming a barrier to movement (USFWS 2002a). Invasive non-native and noxious weeds can alter habitat and decrease its value. Habitat is maintained over time along rivers and streams by a natural flooding regime that periodically scours riparian vegetation, reworks stream channels, floodplains, and benches, and redistributes sediments such that a pattern of appropriate vegetation is present along river and stream edges and throughout floodplains (USFWS 2002a).

Primary habitat constituent elements for Preble's include (USFWS 2002b):

- Dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams that provide open water through the Preble's active season.
- Adjacent floodplains and vegetated uplands with limited human disturbance.
- Areas that provide connectivity between and within populations.
- Dynamic geomorphological and hydrological processes typical of systems within the range of Preble's, i.e., those processes that create and maintain river and stream channels, floodplains, and floodplain benches, and promote patterns of vegetation favorable to Preble's.

3.0 HABITAT DESCRIPTION FOR MEADOWS HCP STUDY AREA

According to the Environmental Assessment prepared for the Meadows HCP, the HCP property is located in the foothills transition zone between the grasslands of the eastern Colorado plains and ponderosa pine forests to the west. The HCP property, where the well sites are located, consists of two distinct vegetative communities: (1) the East Plum Creek drainage; and (2) upland areas on the eastern and western sides of the East Plum Creek drainage. The East Plum Creek drainage is a riparian corridor with a perennial stream meandering through dense to moderately dense interspersions of open grassy areas and woody vegetation, such as ponderosa pine (*Pinus ponderosa*), various willows (*Salix* spp.), alder (*Alnus tenuifolia*), dogwood (*Cornus* spp.), plains cottonwood (*Populus sargentii*), coyote willow (*Salix exigua*), and Gambel's oak (*Quercus gambelii*). Other shrub species, such as western snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), wild plum (*Prunus Americana*), black hawthorne (*Crataegus douglasii*), grass species such as bluestem (*Schizachyrium* spp.), and sedges (*Carex* spp.) also occur within the riparian corridor. Adjacent upland areas are described by the presence of western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), smooth

brome (*Bromus inermis*), yucca (*Campestris* spp.), and prickly pear cactus (*Opuntia phaeacantha*). Few shrub or trees exist in the upland areas. Non-native plant species identified within the project site include cheat grass (*Bromus tectorum*), knapweed (*Centaurea* spp.), and thistle (*Carduus* spp.).

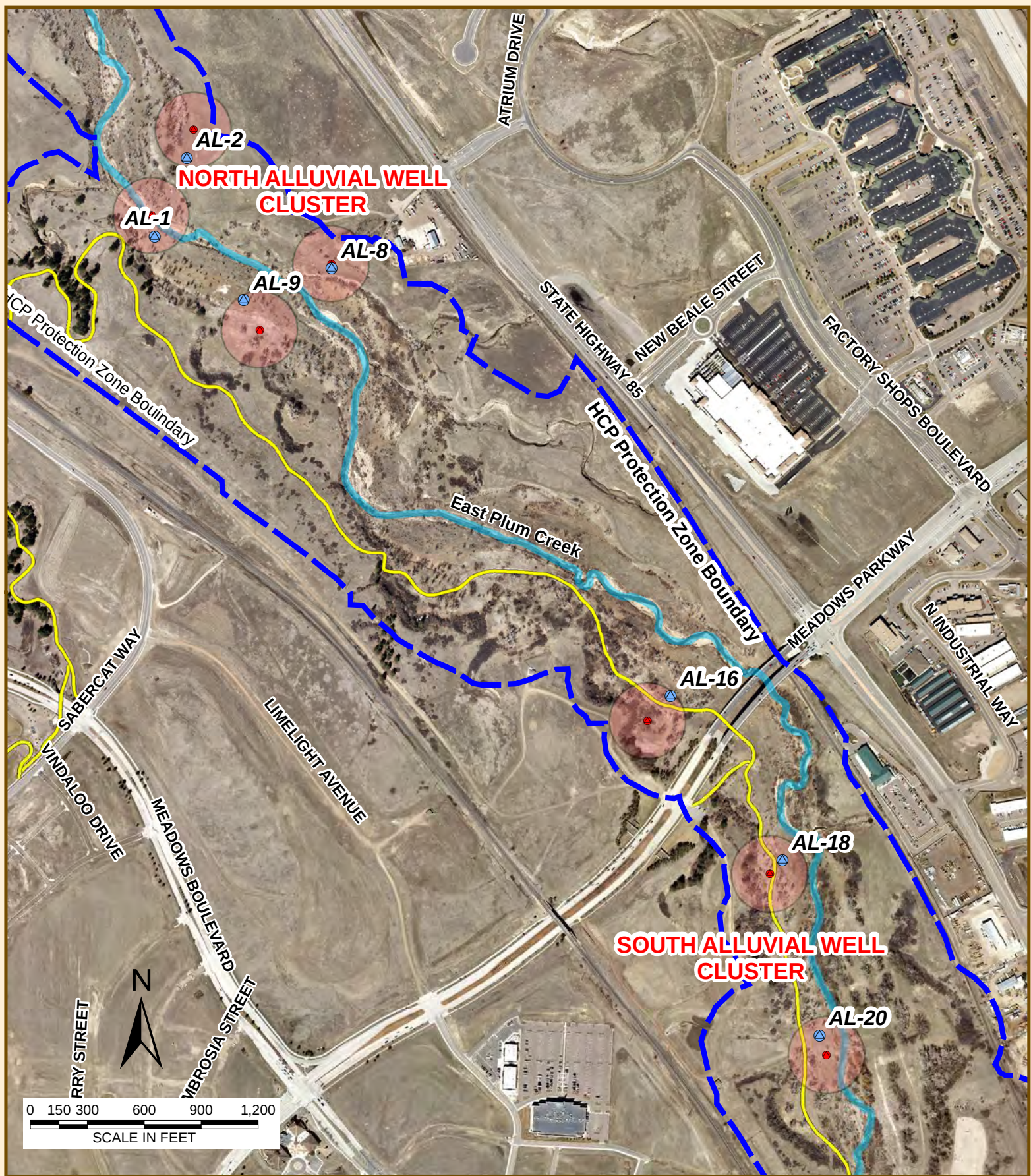
All well sites in this assessment have soils classified as loamy, alluvial land-Sampson sands, according to the Soil Conservation Service Soil Survey of the Castle Rock Area (Larsen 1974). These soils are described as deep, nearly level to gently sloping, loamy, and sandy soils on floodplains and terraces.

4.0 PLUM CREEK CENTRAL WELL FIELD PROJECT OVERVIEW

As part of the Meadows HCP, twenty water well locations were identified along the East Plum Creek corridor in the Meadows Subdivision for potential development. These twenty well sites were decreed under Water Court Case Number 85CW480. Nine of the decreed locations were selected for subsurface analysis work that was conducted in January of 2012. The nine locations were narrowed down from twenty, based on minimizing the degree of potential impacts to riparian habitat determined during earlier habitat assessment work, and the ease of access for water system infrastructure. The subsurface analysis entailed drilling one or two test bores at each of the nine locations for a total of 15, and provided subsurface stratigraphy and preliminary hydrologic information. Following analysis of the test bore data two potential well sites were eliminated based on poor subsurface conditions. The seven remaining well sites offered the least amount of impact to riparian habitat and the thickest sections of Plum Creek alluvium providing the best opportunity for productive wells. These well locations are on CRDC property and within the Protection Zone delineated in the Meadows HCP. **Figure 2** is a map depicting the proposed locations of the seven well sites that make up the Plum Creek Central Well Field. The map shows that the seven wells are situated in two clusters, a north cluster that includes wells AL-1, AL-2, AL-8, and AL-9; and a south cluster that consists of wells AL-16, AL-18, and AL-20.

4.1 Vertical Production Wells

Production well installation will entail drilling a 30-inch borehole with a reverse-circulation rotary drilling rig. The rig will most likely be a small truck mounted tandem axle rig, approximately 30 feet in length. During drilling a polymer type drilling mud will be used to maintain the borehole and to keep the well from collapsing into the loose, unconsolidated alluvium. The drilling mud will be circulated from a small excavated mud pit. The mud pit will be lined to prevent infiltration of fluid into the alluvium. When a well is completed, drill cuttings and drilling mud will be hauled away and disposed of at designated spoils storage area near the Ray Waterman Regional Water Treatment Center. The temporary disturbance area for each production well is anticipated to be approximately 75 feet by 100 feet, which will accommodate the drilling rig, supply truck, mud pit, and work area. The Meadows HCP allows



for a 200-foot by 200-foot temporary disturbance area for each well drilling pad, so Utilities is estimating a considerably smaller footprint.

The seven selected production well locations are relatively flat and clear with minor amounts of woody vegetation present at a few of the sites. As a result, blading or grubbing at the well sites is not anticipated. A grading, erosion, and sediment control (GESC) plan will be designed and implemented at each well site in conjunction with the required permitting. Access to the production well sites will be limited to essential vehicles and will use existing roads and the 10-foot wide concrete multi-purpose East Plum Creek Trail as much as possible, otherwise the same access routes used during the test bore drilling will be used. Drilling and testing of each well will take approximately two weeks to complete. Well testing will consist of a step-drawdown test and a 48-hour constant rate test. The drilling contractor will acquire all the necessary permitting to conduct the pump tests and water discharges, including a National Pollutant Discharge Elimination System permit (NPDES permit) from the Colorado Department of Public Health and Environment. As stipulated in the Meadows HCP, well construction activity will only occur between October 15th and April 30th, which is during the PMJM hibernation period, and a maximum of three wells and associated facilities will be under construction at any given time.

4.2 Optional Horizontal Lateral Wells

As specified in Water Court Case 85CW480, the maximum production rate allowed for each alluvial well is 250 gallons per minute (gpm). Data from the well tests for each well will be analyzed to provide information concerning the well's hydraulic conductivity and yield potential. If the well production is anticipated to be considerably less than the 250 gpm maximum, then Utilities will propose a production enhancement technique be added to the well design to increase the well's production capacity. This common technique has been recommended by CDM-Smith following analysis of the alluvium test bore investigation work, but was not discussed in the Project Work Plan dated October 2011. The technique would add a U-shaped horizontal lateral well to intersect the gravel pack of the vertical well thereby contributing additional water drainage area, improving well yield. The horizontal lateral well would be drilled in the alluvium using horizontal directional drilling methods, which should result in minimal impact to the surface vegetation. The directional drilling activity will require a 50-foot by 50-foot temporary disturbance area at the entry point of the well bore and a 50-foot by 30-foot temporary disturbance area at the well bore exit point, which is in addition to the 100-foot by 75-foot pad required for the vertical well. Once the drilling is completed, a perforated HDPE pipe will be installed in the bore, which will act like a French drain system draining a greater reach of the alluvium, and conveying the collected water to the vertical well thereby increasing well productivity.

The horizontal lateral well enhancement is optional, and may not be proposed at each of the production well sites. Installation of the horizontal laterals is a relatively quick process, and can

typically be completed in three days. The bore entry point requires the larger footprint for the boring rig and support materials. The bore exit point requires less area, basically to allow room for the casing that will be pulled back through the bore. The boring entry and exit points for the lateral wells have been selected in less sensitive habitat areas generally void of woody vegetation. Any sensitive habitat will be delineated with construction fencing to protect it from being impacted. The combined temporary impact for the lateral well operation is estimated to be approximately 4000 square feet. Permanent disturbance will consist of a small pad at each end of the lateral well for a steel casing and a locking cap to seal and protect the lateral ends. The permanent disturbance will be approximately 25 square feet (5-foot by 5-foot pad).

4.3 Vehicle Access to Well Heads and Facilities

During well construction the well sites will need to be accessible for moderate to heavy vehicles such as the drilling rig, water trucks, and supply trucks. In most cases, at least part of the access routes to the sites will be by way of existing gravel roads or trails, or by the East Plum Creek Trail system. However access for some of the sites will require some part of the course to be over areas in the Protection Zone, at least during construction. The facility design has been planned to minimize the need for frequent staff visits to the wellheads once completed, for normal operations. Visits can be reduced to as few as once or twice a month, whereas the vaults, which are located in the less sensitive upland areas along the perimeter of the Protection Zone, will be the facilities likely visited on a daily basis. Where practicable, access routes will share the same routes as the pipeline and conduit alignments. Access will be permanent disturbance. The wellhead access will consist of double-track trails. The proposed access to the vaults will be gravel roads that will be extensions of existing gravel roads.

4.4 Well Facility Vaults

Following completion and testing of the first set of three production wells, the facilities needed for operating the wells and collecting the pumped water will be constructed. The water system facilities will include wellheads, buried meter vaults, and electrical and telemetry panels. The original plan for facilities, as presented in the Project Work Plan issued October 2011, proposed facilities to be installed at each well site. However in an effort to decrease the footprint for the facilities and limit the amount of permanent and temporary disturbance area, Utilities now propose combining facilities for each cluster of wells into a single meter vault, and single set of electrical panels. For the seven vertical wells planned, the number of vault and electrical panel locations has been reduced to two. Additionally the sites for well meter vaults and electric panels are planned to be located outside of the riparian habitat, in the upland areas above the 100-year flood plain. This reduces the footprint of permanent disturbance area at each well site to about a 10-foot by 10-foot pad for the wellhead, or 100 square feet. The permanent disturbance area at the two vault sites in the uplands will be approximately a 25-foot by 25-foot pad, or 625 square feet, which includes a small unimproved pad for vehicle parking. This amount of permanent disturbance is a substantial reduction from the allowed 1600 square feet of

area (40-foot by 40-foot pad) that was designated for each of the decreed well sites in the Meadows HCP, and the majority of the impact area will be in the less critical habitat area of the uplands.

4.5 Well Collection Pipelines and Electrical Conduits

Additional infrastructure required for the alluvial well water system are water collection pipelines, and underground power and telemetry conduits from each well head to the meter vaults. Several segments of pipelines must traverse East Plum Creek, where horizontal directional drilling methods will be used for installation. The remainder of the pipeline alignments will be constructed by open trenching with a minimum of five feet of bury depth. The conduits will typically be installed in the same corridor as the pipelines with a minimum of three feet of bury depth. The diameter of most the water pipelines will be either four inch diameter, or twelve inch diameter, and be constructed of either PVC (polyvinyl chloride) or HDPE (high density polyethylene) pipe. The width of the construction area needed for pipeline and conduit installation, including area for the excavated spoils will be approximately 30 feet. For the most part, all the planned alignments will avoid disturbance to more sensitive riparian areas and any woody vegetation. Also, most of the activity associated with construction will be temporary in nature and will be fully restored after the work is completed using the Mitigation Measures for Restoration of Impacts described in Section 6.1.

The three segments of water collection pipeline and one section of electrical conduit that will be installed using horizontal directional drilling methods will result in minimal impact to surface vegetation. The four horizontal directionally drilled segments will total approximately 1560 linear feet. Like with the lateral wells, directional drilling activity will require a 50-foot by 50-foot temporary disturbance area at the entry point of the bore and a 50-foot by 30-foot temporary disturbance area at the bore exit point. The drilling and pipe pullback process is expected to take approximately three days to complete for each segment.

4.6 Water Transmission Pipeline

Each alluvial well will pump water to two shared meter vaults. One vault will be used for the south cluster of wells and one for the north cluster of wells. Downstream of the flow meters, the well water will be comingled at each vault into a common discharge line that will connect to a planned 16-inch transmission line. The transmission line will take production from the seven planned wells and deliver the water to the Plum Creek Water Purification Facility. Most of the alignment for the transmission pipeline is outside of the Meadows HCP Protection Zone area. However, the 1400 foot segment of transmission line that connects to the discharge line from the meter vault for the north cluster of wells, does cross into the Protection Zone, and also must traverse East Plum Creek. Approximately 1000 feet of this section of transmission line will be horizontally directionally drilled. The remaining 400 feet of pipeline, located in the upland area of the Protection Zone, will be open trench constructed. The open trenched segment of pipeline

will also share the same alignment as the access route for wells AL-1 and AL-9, so only the disturbance area caused from open trench pipe installation outside of the road width will need to be re-vegetated. Maps have been provided in Section 5 of this report depicting the final well field development plan with the well pad locations, staging areas, and utility and access alignments shown. Photos of the proposed well site locations provided as **Attachment A** document baseline conditions at the areas.

As required by the Meadows HCP, all facility construction will occur between October 15 and April 30. Also, no more than three wells will be developed at any one time. The staging areas are proposed to be centralized outside of Meadows HCP Protection Zone. Temporary construction fence will be used near construction sites to delineate and deter access to PMJM habitat. Blading and grubbing of woody vegetation in areas of temporary disturbance will be avoided. Construction personnel will be provided training on strategies to protect PMJM habitat.

5.0 PLUM CREEK CENTRAL WELL FIELD MINOR AMENDMENT

5.1 Introduction

As previously discussed, development of alluvial wells along East Plum Creek will require installation of wells and the infrastructure needed to deliver raw water to the new treatment facility. The Meadows HCP report provided two well system development plans designed by CRDC's consultant (Athabasca Consulting, Inc.) proposing alternative alignments for well infrastructure. The alternate plans were presented as two figures in the Meadows HCP report, each depicting the proposed drilling pad locations for the decreed well sites, along with proposed alignments for the water system infrastructure and site access. The first alternate plan (Alternative I), which was titled as the preferred plan, is Figure 7 in the Meadows HCP. The second alternate plan (Alternative II) is Figure 8 in the Meadows HCP. Town staff will use the preferred plan, Alternative I, for comparison purposes. Because the Town plan only considers developing seven out of a possible twenty decreed well sites, the proposed access routes and alignments for the water delivery system differs somewhat from what was presented as the preferred plan in the HCP report. Because of these differences, the Town and CRDC as the property owner are therefore seeking a minor amendment to the Meadows HCP to allow for adjustments to infrastructure alignments within the overall well development plan. According to Section 6.7.2. of the Meadows HCP, the USFWS is authorized to approve minor amendments to the HCP, provided there is no net loss of mitigation and the amendments do not conflict with the primary purpose of the HCP.

The preferred plan map as presented in the Meadows HCP report is provided as **Figure 3** in this report. In the figure, the brown areas show the temporary disturbances located in the Protection Zone that were approved by USFWS for the pipelines and electrical utilities; the green squares show the permanent disturbance anticipated for the well pads; and the black lines represent the

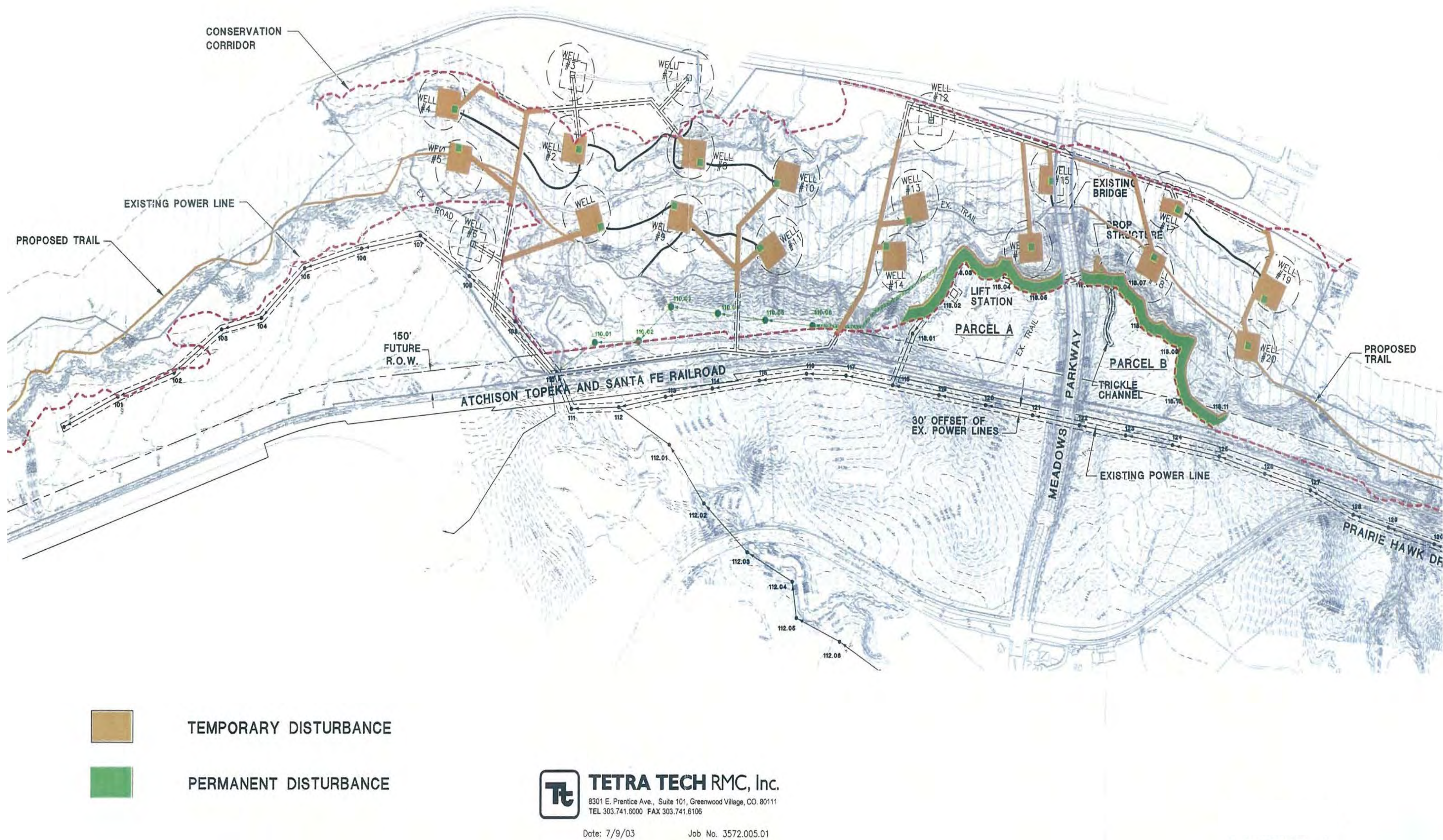
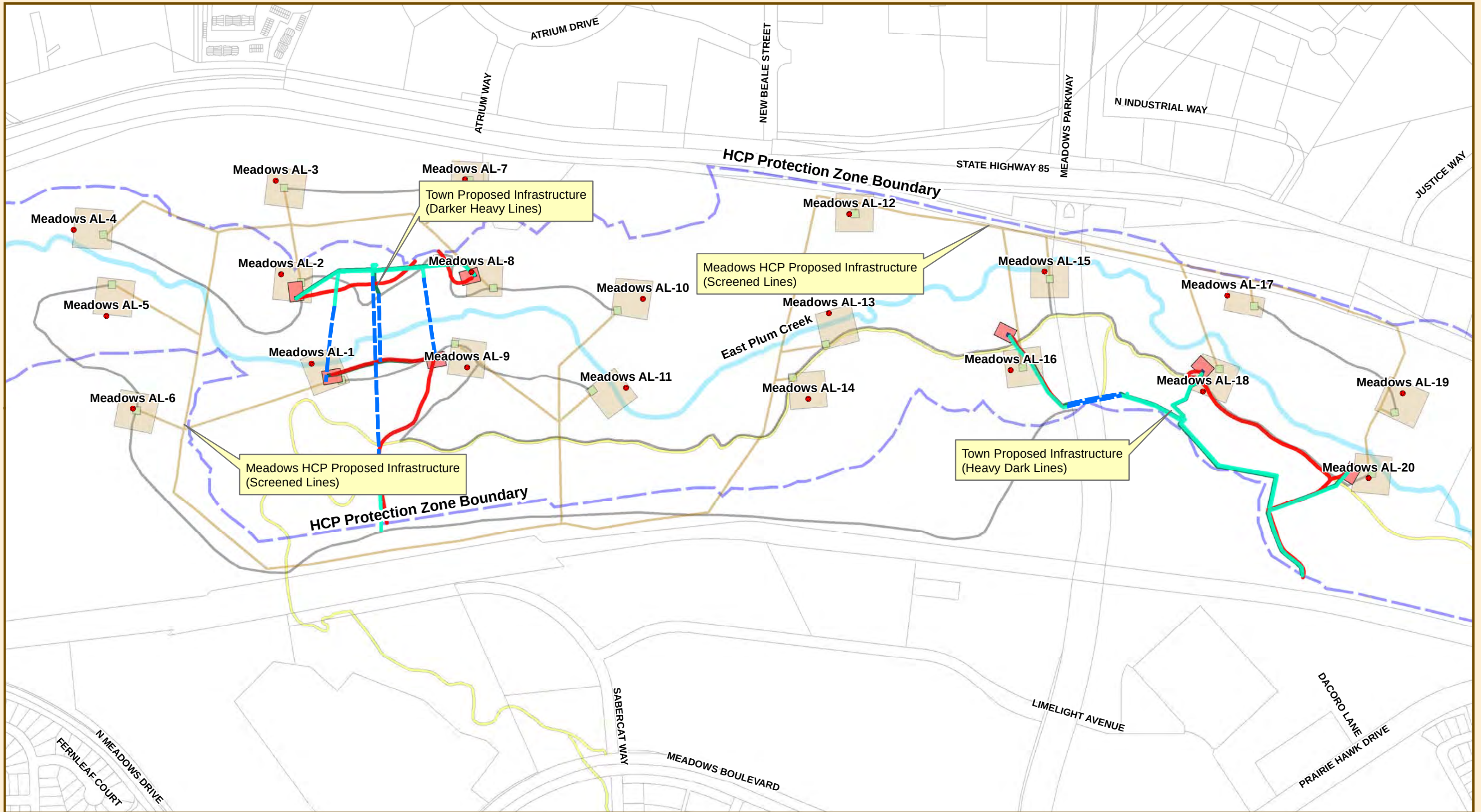


Figure 3. Preferred Well Development Plan Showing Disturbance Areas from the Meadows HCP.

access routes planned to the well sites. To assist in comparing plans, alignment information from Alternative I (**Figure 3**) was digitized into the Town's GIS from the original map. The final well locations and infrastructure alignments proposed by the Town for developing the Central Well Field were also entered into the Town's GIS. To plainly illustrate the differences between the plan from the Meadows HCP versus the plan proposed by the Town, **Figure 4** has been provided in this report. The figure shows the well locations and utility alignments proposed in the Town plan with the preferred alternative (Alternative 1) from the Meadows HCP screened in the background.

Utilities also used the Town GIS to quantitatively compare the total length of alignments for access and infrastructure within the Protection Zone between plans. In the case of the Meadows HCP preferred alternative plan, a total length of 9,645 linear feet of access route and 13,176 linear feet of infrastructure alignment was approved by USFWS across the Protection Zone. In comparison, the plan for Town Central Well Field Project proposes disturbance of approximately 3858 linear feet for access routes and 3369 linear feet for utilities infrastructure. On a percentage basis, the Town plan uses 60% less access route length, and 75% less infrastructure alignment length than the preferred plan approved by USFWS in the Meadows HCP. The majority of the difference is due to the Town plan proposing to develop just seven wells, versus the 20 wells allowed in Meadows HCP. The Town plan also calls for several sections of water pipeline to be horizontal directional drilling versus open trenched, leading to a smaller disturbance area. Lastly, the Town plan proposes sharing alignments between the access routes and underground infrastructure when feasible.

Much care has been taken by Town staff and CDM-Smith in selecting the final well locations and the design of the water collection infrastructure to avoid disturbance to the more sensitive riparian areas. Numerous site visits were made during the design phase of the project. Temporary and permanent disturbance areas proposed for well construction are primarily located in flat open areas with few nearby trees and woody shrubbery. The meter vaults and electrical panels have been designed to serve multiple wells, which will reduce the well site footprint, and are proposed to be located in less sensitive upland areas, on the perimeter of the Protection Zone. The water pipelines and electrical conduits that will connect the well heads to the meter vaults will either be horizontally directionally drilled or will utilize alignments that also avoid sensitive riparian habitat.



Legend

HCPA1_Temporary_Drilling_Pads	Plum_Creek_Trail	Production_Well_Permanent_Disturbance
HCPA1_Permanent_Well_Pads	HCP_Protection_Zone	Production_Well_Temporary_Disturbance
HCPA1_Site_Access	Decreed_Well_Location	Production_Well_Access_Phase1
HCPA1_Pipeline_Power_Alignments	HDD_Pipe_Segments	Production_Well_Collection_Line
		Production_Well_Uilities

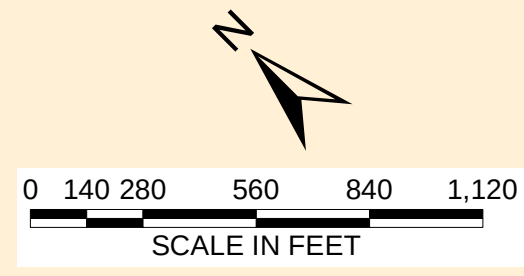


FIGURE 4
Minor Amendment to Meadows HCP
Comparison of Infrastructure Alignments
Between HCP Property (Alternative 1)
and Town Central Well Field Project

5.2 Habitat Assessment and Site Impacts

The seven well sites proposed as part of the Town's Central Well Field Project are dispersed throughout the riparian corridor and upland areas within the 1.3 mile long project area along East Plum Creek. The seven wells are situated in two clusters, a north cluster which includes wells AL-1, AL-2, AL-8, and AL-9; and a south cluster which consists of wells AL-16, AL-18, and AL-20. The well head locations we are proposing for these wells are still within 200 feet of the decreed location for the wells as defined in water court case 85CW480.

This section discusses the habitat and existing conditions assessed at each well location. The assessments include the production well locations, as well as the access routes, and utility alignments for associated infrastructure. The Town's Natural Resource Specialist has catalogued the general terrain, percent of vegetative cover, soil types, and inventory of native plants and noxious weeds for each well location over the course of several site visits. This section also covers how construction activity associated with development of the Central Well Field will impact the habitat in these areas. Lastly, all the estimated permanent and temporary disturbance areas associated with the well project are totaled in a table and compared to the amount of disturbance allowed in the Meadows HCP.

A detailed map is provided as **Figure 5**, showing the seven well pad locations and the overall infrastructure design that is planned for development. More detailed maps of the two well clusters are also provided in this section, showing each of the seven well pad locations planned for development, defined access routes, and anticipated areas of disturbance associated with installation of production wells and water delivery system infrastructure. Photos documenting existing site conditions prior to future construction and restoration activity are also included in **Attachment A**.

5.2.1 Well AL-1

This project area is located on a broad, flat floodplain area on the south side of East Plum Creek. The area has been heavily grazed by livestock, so the low vegetative ground cover, which is mostly clipped pasture grasses, is less than 40%. Access to the well site will be mostly along an unimproved and seldom used two-track path that will double as access for the AL-9 well site. The route is about 976 feet in length to AL-9 and an additional 488 feet to AL-1 location. No disturbance to any woody vegetation is anticipated. The temporary disturbance area for the vertical well drilling pad, approximately 100 feet by 75 feet, will be delineated by construction fence, and will be easily oriented to avoid all woody vegetation. Approximately 400 feet of the water collection pipeline for AL-1 will be horizontally directional drilled under East Plum Creek; an additional 500 feet of the pipeline length will use open trench construction. The water collection pipeline will connect to the planned meter vault that will also be used for the other



Legend

Production_Well_Permanent_Disturbance	Production_Well_Uilities	HDD_Sections
Production_Well_Temporary_Disturbance	Plum_Creek_Trail	Staging_Area
Production_Well_Access_Phase1	HCP_Protection_Zone	
Production_Well_Collection_Line	East_Plum_Creek_Channel	

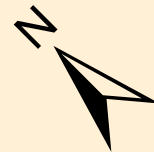


FIGURE 5
Central Well Field Project
Overall Well Development Plan
Showing proposed Infrastructure

north cluster of wells (AL-2, AL-8, and AL-9). Some of the electrical conduits for AL-1 will be shared with AL-9. The conduits dedicated for AL-1 will be approximately 314 feet in length and be open trenched installed. **Figure 6** shows the planned alignments for infrastructure proposed for the north cluster of wells including AL-1.

5.2.1.1 Existing Natural Resources at Site

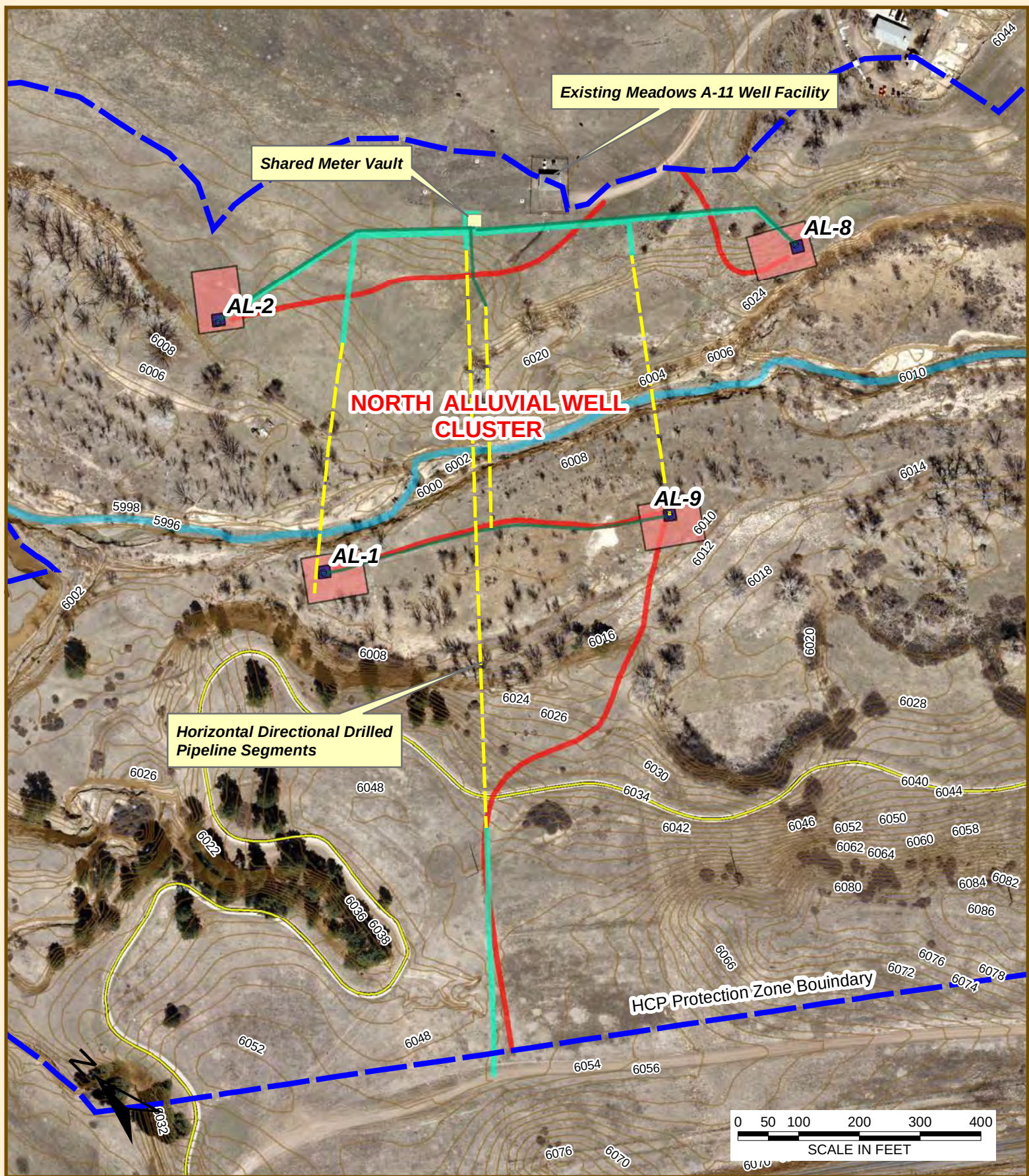
The well site is generally located in a broad open area interspersed with a variety of native woody vegetation mainly along the perimeter, including Sandbar willow (*Salix exigua*), Peachleaf willow (*Salix amygdaloides*), Hawthorn (*Crataegus douglasii*), Wild rose (*Rosa woodsii*) and Common snowberry (*Symphoricarpos albus*), as well as Narrow-leaved yucca (*Yucca glauca*), Common mullein (*Verbascum Thapsus*), but these are not located within the disturbance area. The well site is bordered on the southwest by a steep vegetated slope with Rocky Mountain ninebark (*Crataegus douglasii*), Choke cherry (*Prunus virginiana*), and Gambel's oak (*Quercus gambelii*) shrubs, as well as Ponderosa pine (*Pinus ponderosa*) trees, which are located well outside the disturbance area. Herbaceous vegetation in the well site disturbance area can be characterized as open grassland dominated by pasture grasses, such as Downy brome (*Bromus tectorum*), noxious weeds, specifically Diffuse knapweed (*Centaurea diffusa*) and Yellow sweet clover (*Melilotus officinalus*).

5.2.1.2 Effects of the Action

All disturbance activities, both temporary and permanent, will be to herbaceous vegetation and noxious weeds. Temporary disturbance areas will be re-vegetated.

5.2.2 Well AL-2

This project area is located along the upland area adjacent to the floodplain on the north side of East Plum Creek. It has been heavily grazed by livestock and has minimal vegetative ground cover (<20%). Access to the well site will be partly along an existing dirt road and the rest over an undefined access route through a prairie dog town with minimal vegetative cover. The estimated length of the access route over the Protection Zone is 662 feet. The 100 foot by 75 foot temporary drilling pad can be oriented so as to stay within the upland area consisting of pasture grasses and noxious weeds. The drill pad will be delineated



Legend

- | | |
|---|--|
| Production_Well_Permanent_Disturbance | Production_Well_Uilities |
| Production_Well_Temporary_Disturbance | Plum_Creek_Trail |
| Production_Well_Access_Phase1 | HCP_Protection_Zone |
| Production_Well_Collection_Line | East_Plum_Creek_Channel |
| HDD_Pipe_Segments | |

FIGURE 6
North Well Cluster Central Well Field
Showing Proposed Access Routes
And Utility Infrastructure

with construction fence, so no impacts to any native woody vegetation should occur. The collection pipeline and electrical conduits for AL-2 will be installed in an open trench from the well head to the same meter vault for the north well cluster. The temporary disturbance area for the pipeline and conduits will be approximately 465 linear feet across grazed pastureland with minimal vegetative ground cover. Part of the alignment will use the same corridor used for the AL-1 pipeline. No woody vegetation will be disturbed. **Figure 6** shows the proposed alignments for the AL-2 infrastructure.

5.2.2.1 Existing Natural Resources

Herbaceous vegetation in the upland area at the AL-2 well site can be characterized as grassland dominated by pasture grasses and noxious weeds such as Downy brome (*Bromus tectorum*), Diffuse knapweed (*Centaurea diffusa*), Musk thistle (*Carduus nutans*) and Perennial pepperweed (*Lepidium latifolium*).

5.2.2.2 Effects of the Action

All disturbance activities, both temporary and permanent, will be to herbaceous vegetation and noxious weeds of the upland areas.

5.2.3 Well AL-8

This project area is located on a dry, narrow upland bench above the floodplain and riparian corridor of East Plum Creek. No wetland or riparian areas or vegetation occur on the site. The area is heavily grazed by livestock and has minimal vegetative ground cover mostly dominated by invasive weed species such as Diffuse knapweed (*Centaurea diffusa*) and Musk thistle (*Carduus nutans*). Access to the well site will be mostly along an existing dirt road as well as an older and poorly defined two-track route. Approximately 284 linear feet of the access route is located within the Meadows HCP Protection Zone. The 100 foot by 75 foot temporary drilling pad will be within the upland area and be delineated with construction fence. In order to avoid for the well head being located in a low spot, the location was moved onto a slight slope. A minor amount of grading will be needed to provide a flat bench for the drilling rig and support truck. Only noxious weed species and a minor amount of pasture grasses will be impacted. The alignment for the pipeline and electrical conduits will be shared and extend about 550 feet between the AL-8 well head and the shared meter vault for the north well cluster. No living woody vegetation will be disturbed, although a small patch of dead shrubbery along the pipeline alignment

will be removed. **Figure 6** shows the proposed alignments for the AL-8 infrastructure.

5.2.3.1 Existing Natural Resources

Herbaceous vegetation in the well site disturbance area can be characterized as upland grassland dominated by pasture grasses and noxious weeds such as Downy brome (*Bromus tectorum*), Diffuse knapweed (*Centaurea diffusa*) and Musk thistle (*Carduus nutans*). Other plant species in the area, although not as common, include Pennycress (*Thlaspi arvense*), Common burdock (*Arctium minus*) and Common sagewort (*Artemisia campestris*).

5.2.3.2 Effects of the Action

All disturbance activities, both temporary and permanent, will be to herbaceous vegetation and noxious weeds. In fact, none of the habitat components typically associated with the presence of PMJM exists on this dry, weedy and grazed site located outside of the floodplain. In particular, although a few woody shrubs are present nearby (but will not be disturbed), the actual well site lacks any vegetative component that could provide cover and hibernaculum for PMJM, and therefore, should be excluded as potential PMJM habitat.

5.2.4 Well AL-9

AL-9 is the final well in the north well cluster. The project area is located on a broad, flat riparian area on the south side of East Plum Creek. This area has been grazed recently, but the high water table has facilitated growth of the grasses and other vegetation in the area so that ground cover is fairly high (approximately 80%). Access to the well site will be along an existing two-track as well as an unimproved and poorly-defined two-track path, but will not disturb any woody vegetation. Approximately 976 feet of the route will be in the protection zone and share the same alignment used for accessing the AL-1 location. The temporary disturbance area for the well drilling pad will be approximately 100 feet by 75 feet, will be delineated by construction fence, and easily oriented to avoid all woody vegetation. Approximately 450 feet of the water collection pipeline for AL-1 will be horizontally directional drilled under East Plum Creek; an additional 300 feet of the pipeline length will use open trench construction. The water pipeline will connect to the same meter vault that will also be used for the other north cluster wells. Also, a portion of the alignment for the electrical conduits for AL-9 will be shared with AL-1. This section crosses to the north side of East

Plum Creek and will be horizontally directionally drilled under the creek for a length of approximately 400 feet. The conduits from the end of the directionally drilled portion to the AL-9 well head will be approximately 410 feet in length and be open trenched installed. **Figure 6** shows the alignments for the necessary infrastructure to serve the AL-9 well.

5.2.4.1 Existing Natural Resources

The well site is surrounded by a variety of native woody vegetation, including Sandbar willow (*Salix exigua*), Peachleaf willow (*Salix amygdaloides*), Hawthorn (*Crataegus douglasii*) and Choke cherry (*Prunus virginiana*), as well as nonnative Russian-olive trees (*Elaeagnus angustifolia*), but these are not located within the disturbance area. The pipeline and conduit alignments, and the well drilling pad can be oriented to avoid woody vegetation. Herbaceous vegetation in the well site disturbance area can be characterized as riparian grassland dominated by pasture grasses, noxious weeds and grass-like plants including Downy brome (*Bromus tectorum*), Diffuse knapweed (*Centaurea diffusa*) and Common bulrush (*Scirpus tabernaemontani*). Other species in the area but in less abundance include Common dandelion (*Taraxacum officinale*), Common mullein (*Verbascum Thapsus*) and Prickly pear cactus (*Opuntia macrorhiza*).

5.2.4.2 Effects of the Action

The work area is flat and open with sparse amounts of native woody vegetation. All disturbance activities, both temporary and permanent, will be to herbaceous vegetation and noxious weeds.

5.2.5 Well AL-16

AL-16 is one of three wells that make up the south cluster of production wells. The project area is located on a flat, sandy and dry bench beyond the floodplain limits on the west side of East Plum Creek and adjacent to the paved East Plum Creek Bike Trail. This area has been grazed in the past and has minimal ground cover (<30%) with bare patches of sandy soil areas. Access to the well site will be along an unimproved but frequently used two-track trail. The access route is over approximately 531 feet of the protection zone area, but will not disturb any woody vegetation. Like the north cluster locations, the temporary disturbance area for the well drilling pad will be approximately 100 feet by 75 feet, and be oriented to avoid most woody vegetation. A construction fence will be installed to delineate the limits of construction. As with the north well cluster, the three south cluster

wells will pump water to a jointly used meter vault. The meter vault is located in an upland area well above the floodplain, and outside of the sensitive riparian habitat area. The collection pipeline and electrical conduits from the AL-16 wellhead will run approximately 1160 feet to the shared vault location. The portion of the pipeline and conduit alignment in the lowland area will be routed within the existing two-track trail (approximately 460 feet). The remainder of the pipeline and conduit alignment will be in the upland area above the floodplain, and be routed along an existing improved double-track used for maintenance of an existing sewer line. All construction will be by open trench, except where the utilities cross under Meadows Parkway, which will be by horizontally directional drilled (approximately 315 feet). **Figure 7** shows the planned alignments for infrastructure proposed for the south cluster of wells including AL-16.

5.2.5.1 Existing Natural Resources

The well site area is fairly open and lacks any woody vegetation, but is surrounded by a mixed stand of Peachleaf willow (*Salix amygdaloides*), Sandbar willow (*Salix exigua*), Choke cherry (*Prunus virginiana*), and Golden currant (*Ribes aureum*). Construction fencing will be placed to delineate the limits of construction and protect woody vegetation along the drilling pad perimeter. Herbaceous vegetation within the well site disturbance area can be characterized as riparian grassland dominated by pasture grasses and noxious weeds, mainly Downy brome (*Bromus tectorum*) and Diffuse knapweed (*Centaurea diffusa*), as well as other herbaceous plants in less abundance including Common sagewort (*Artemisia campestris*), Common mullein (*Verbascum Thapsus*), Western spiderwort (*Tradescantia occidentalis*) and Prickly pear cactus (*Opuntia macrorhiza*).

5.2.5.2 Effects of the Action

All disturbance activities, both temporary and permanent, will be to herbaceous vegetation and noxious weeds.

5.2.6 Well AL-18

This project area is located on a flat, gravelly and narrow bench between East Plum Creek and the paved East Plum Creek Trail. This location is within the Habitat Enhancement Area designated in the Meadows HCP. Access to the well site will be along an existing two-track utility trail and the existing paved bike trail. Access from the bike trail to the drilling pad will be a short distance through a livestock fence and along a route that may require removal of a few select shrubs, including Sandbar willow and Wild rose (*Rosa woodsii*) plants, as well as



Legend

 Production_Well_Permanent_Disturbance	 Production_Well_Uilities
 Production_Well_Temporary_Disturbance	 Plum_Creek_Trail
 Production_Well_Access_Phase1	 HCP_Protection_Zone
 Production_Well_Collection_Line	 East_Plum_Creek_Channel
 HDD_Sections	

FIGURE 7
South Well Cluster Central Well Field
Showing Proposed Access Routes
And Utility Infrastructure

one standing dead planted Boxelder sapling (*Acer negundo*). The bench where the proposed drilling pad is located outside a thick stand of Sandbar willow (*Salix exigua*) along the stream channel. The ground covering the pad area is composed mainly of herbaceous vegetation and noxious weeds. The construction fence for the drilling pad will be oriented to avoid the willow thicket, and most other woody vegetation. Some woody shrubbery may end up in the construction limits and have to be pruned back or removed. The total length of the access route to AL-18 within the Protection Zone is estimated at 1816 feet, although most of that length will be along either the paved bike trail (1054 feet) or a maintenance trail used for an existing sewer line (450 feet). The collection pipeline and electrical conduits from the AL-18 wellhead will run approximately 337 feet to the shared vault location. The alignment will snake through woody vegetation in the lowland area and up the slope to the upland area where the meter vault is located. All construction will be by open trench. This alignment was considered for horizontal directional drilling, but the difference in elevation between starting and ending points of the bore made it unworkable. **Figure 7** shows the alignments for the necessary infrastructure to serve the AL-18 well.

5.2.6.1 Existing Natural Resources

This site has been grazed recently resulting in limited ground cover with bare spots (40%), but is surrounded by thick stands of Sandbar willow (*Salix exigua*). Herbaceous vegetation in the well site disturbance area can be characterized as riparian grassland dominated by Downy brome (*Bromus tectorum*), as well as other herbaceous plants in less abundance including Common sagewort (*Artemisia campestris*), Common bulrush (*Scirpus tabernaemontani*), and. Diffuse knapweed (*Centaurea diffusa*), Prickly pear cactus (*Opuntia macrorhiza*), Common mullein (*Verbascum Thapsus*) and Diverse-leaved Cinquefoil (*Potentilla diversifolia*) are also present in the well site area.

5.2.6.2 Effects of the Action

All disturbance activities, both temporary and permanent related to the well site, will be to herbaceous vegetation and noxious weeds. There will be limited permanent disturbance to woody vegetation, specifically willow and rose shrubs, for the access route.

5.2.7 Well AL-20

This project area is located on a flat, open bench between East Plum Creek and the bike trail. This area has been grazed in the recent past, but a high water table has allowed sufficient growth of low herbaceous ground cover (>70%). All but a short section of the access route to the well site will be shared with the proposed route for well AL-18. Within the Protection Zone, about a 450 foot section of an existing two-track utility road in the upland area will be used for access. From there, the remaining 440 feet of the proposed course drops down a gradual slope, along what appears to be a former ranch trail, and crosses the bike trail to the drilling pad area. The bench where the proposed 100 foot by 75 foot drilling pad is located is in an open flat area, completely void of any woody vegetation. The construction limits for drilling will be defined by construction fencing. The alignment for the collection pipeline and electrical conduits from the AL-20 wellhead will follow the access route to the utility maintenance road, and then generally follow the utility road to the shared meter vault location. The entire length of construction (1334 linear feet) will be by open trench. **Figure 7** shows the alignments for the necessary infrastructure to serve the AL-20 well.

5.2.7.1 Existing Natural Resources

The large open area that will be used for the drilling pad is lacking any woody vegetation. At the perimeter of the area lies a thick stand of Sandbar willow (*Salix exigua*), as well as a few Wild plum (*Prunus Americana*), Choke cherry (*Prunus virginiana*), Serviceberry (*Amelanchier alnifolia*) shrubs and mature Narrow-leaved cottonwood trees (*Populus angustifolia*). Herbaceous vegetation in the well site disturbance area can be characterized as riparian grassland dominated by Downy brome (*Bromus tectorum*), as well as other herbaceous plants in less abundance including Common sagewort (*Artemisia campestris*), Prickly pear cactus (*Opuntia macrorhiza*), Common mullein (*Verbascum Thapsus*) Yellow salisfy (*Tragopogon dubius*) and Black medic (*Medicago lupulina*). Diffuse knapweed (*Centaurea diffusa*) is also present in the well site area.

5.2.7.2 Effects of the Action

All disturbance activities, both temporary and permanent, will be to herbaceous vegetation and noxious weeds.

5.3 Temporary and Permanent Disturbance Tabulations

The temporary and permanent disturbance areas that are anticipated for each well site for infrastructure construction and access discussed in the prior section have been tabulated. As previously mentioned, permanent disturbance area will consist of approximately a 10-foot by 10-foot pad for each well head; and a 12-foot wide double track area for the access routes, except where the East Plum Creek Trail can be utilized; the temporary disturbance areas will consist of approximately a 30-foot by 30-foot area for the two meter vaults; a 20-foot wide swath where water collection pipelines are open trenched; and a 10-foot width over the lengths of the electrical conduit runs that are open trenched.

The Town well development plan also proposes use of four staging areas for construction materials storage. All the staging areas will be located outside of the Protection Zone in the upland areas, and adjacent to existing maintenance roads. The approximate dimensions of the proposed temporary areas will be 100 feet by 50 feet.

Table 1 on page 29 shows a tabulation of the estimated temporary and permanent disturbance area for each of the seven alluvial well sites planned to be developed as the Town's Central Well Field Project. The total amount of permanent disturbance for the Central Well Field is estimated at **1.30** acres (shown in green), which includes the optional lateral well at each well site. This total is **57%** less permanent disturbance area than what was approved by USFWS in the Meadows HCP (**3.04** acres). The total estimated amount of temporary disturbance is **6.07** acres (shown in brown), which again includes the optional lateral well at each site. That figure is **73%** less temporary disturbance area than what was approved by USFWS in the Meadows HCP (**22.72** acres).

Table 1 – Tabulation of Estimated Disturbance Area from Town Construction Activity

Estimated Disturbance Areas within Protection Zone From Well & Infrastructure Installation								
Well ID	Estimated Permanent Disturbance Area Per Production Well (10' x 10' Pad) (Sq. ft.)	Estimated Length of Site Access Road (Linear ft.)	Estimated Permanent Disturbance from Access Road (12' Width) (Sq. ft.)	Estimated Temporary Disturbance Area (100' x 75' Drill Pad) (Sq. ft.)	Estimated Length of Raw Water Pipeline (ft.)	20' Width Area (Sq. ft.)	Estimated Length Electrical Service Conduits (ft.)	10' Width Area (Sq.ft.)
AL-1	100	488	5,856	7,500	500	10,000	314	3,140
AL-2	100	662	7,944	7,500	465	9,300	465	4,650
AL-8	100	284	3,408	7,500	550	11,000	550	5,500
AL-9	100	976	11,712	7,500	300	6,000	410	4,100
AL-16	100	531	6,372	7,500	845	16,900	845	8,450
AL-18	100	762	9,144	7,500	337	6,740	337	3,370
AL-20	100	892	10,704	7,500	1,334	26,680	1,334	13,340
Discharge Line South Well Cluster	NA	NA	NA	NA	1,326	26,520	NA	NA
Trans Pipeline	NA	NA	NA	2,500	400	8,000	NA	NA
4 HDD Bores				16,000				
2 Flow Meter Vaults (30' x 30')				1,800				
Total Sq. ft. or LF	700	4,595	55,140	72,800	6,057	121,140	4,255	42,550
Total Acres	0.02		1.27	1.67		2.78		0.98

Disturbance Areas within Protection Zone From Optional Lateral Well Installation

Well ID	Estimated Permanent Disturbance Area for Lateral Well (Two 5' x 10' Pads) (Sq. ft.)	Temporary Disturbance for Lateral Well Entry Point (50' x 50' Pad) (Sq. ft.)	Temporary Disturbance for Lateral Well Exit Point (50' x 30' Pad) (Sq. ft.)
AL-1	100	2,500	1,500
AL-2	100	2,500	1,500
AL-8	100	2,500	1,500
AL-9	100	2,500	1,500
AL-16	100	2,500	1,500
AL-18	100	2,500	1,500
AL-20	100	2,500	1,500
Total Sq. ft. or LF	700	17,500	10,500
Total Sq. ft. or LF	0.02	0.40	0.24

Town Well Development Plan - Total Permanent Disturbance Area (Acres) -	1.30
Town Well Development Plan - Total Temporary Disturbance Area (Acres) -	6.07
Approved Permanent & Temporary Disturbance area Listed in Meadows HCP:	
Permanent Disturbance (Acres) -	3.04
Temporary Disturbance (Acres) -	22.72

5.4 Mitigation Measures

The Town and contractors are proposing to conduct construction activities related to development of the Plum Creek Central Well Field in the Meadows subdivision. All planned construction will be undertaken in accordance with the requirements stipulated in Meadows HCP. The Town will comply with all the procedures as described in the Meadows HCP, including conservation measures, restoration activities, monitoring and reporting as required, and also the definition and boundary limits of Preble's habitat along East Plum Creek. There may be some additional guidelines for impact minimization and restoration taken from the Douglas County Habitat Conservation Plan (DCHCP) approved by the USFWS in 2006, but they will supplement The Meadows HCP guidelines. To ensure compliance with all guidelines and regulations stated in the Meadows HCP, all construction personnel will be provided instructions on avoiding and minimizing strategies to protect PMJM habitat.

5.5 Avoidance and Minimization of Impacts

Construction of the wells will follow Best Management Practices to minimize any temporary or permanent impacts to PMJM habitat, including, but not limited to the following:

- All construction will occur between October 15 and April 30. Activities outside of this time period may occur if deemed necessary to protect human health and safety.
- A maximum of three water wells will be developed at any time.
- Access to the water wells will utilize existing concrete trails or two-track vehicle access roads wherever possible.
- Any new access roads will not be paved.
- Two-track vehicle access routes will be maintained to allow essential operation and maintenance of the wells. Minimal fill may be used when necessary to maintain year-round access and minimize erosion.
- Wherever possible, access routes and well installation will avoid highest densities of PMJM habitat.
- All areas of temporary disturbance will be restored to pre-disturbance grades and re-vegetated with a native grass seed mix approved in The Meadows HCP (see Attachment C). Such re-vegetation will be accomplished according to the Restoration of Impacts section described below.
- Excess material shall be disposed of at a location outside of PMJM habitat approved by the Town.
- Disturbance will be limited to the minimum amount necessary and the minimum duration possible to accomplish the work.
- Temporary construction fences will be used to deter unauthorized access to PMJM habitat.

- Materials storage and cleaning equipment maintenance will not be allowed within PMJM habitat and will follow the general construction practices of the Douglas County GESC Manual.
- The Town's GESC Inspector will inspect BMPs for effectiveness and compliance.
- Staging areas will not occur within PMJM habitat.
- In all cases possible, blading and grubbing of woody vegetation in areas of temporary disturbance will be avoided.
- All construction and maintenance personnel will be provided with written and oral instructions on minimization and avoidance strategies to protect PMJM habitat

Additional avoidance and minimization measures include:

- Selecting production well sites outside of higher quality PMJM habitat zones.
- Choosing well sites that are relatively flat and open, so blading or grubbing in sensitive habitat areas for well construction pads should not be necessary.
- Delineating construction pads and utility alignments with construction fencing to keep activity outside of protected areas.
- Combining flow metering and well controls for multiple wells at shared vaults sites (two total for seven wells), and locating the vaults in the upland areas of the Protection Zones.
- Designing a well development plan that reduces the estimated total amount of permanent disturbance area by 57%, and reduces estimated temporary disturbance area by 72% from what is allowed under the Meadows HCP.
- Choosing access routes to wells and facilities that utilize existing maintenance roads, two-track paths, and paved trails to prevent new impacts from vehicle travel.
- Utilizing horizontal directional drilling for pipeline installation for a number of utility alignments and for the optional horizontal lateral wells.
- Sharing alignments between facility access routes and utilities when feasible to reduce the amount of temporary disturbance.
- Storage and staging areas will be located outside of the riparian zone in the upland areas of the property.
- The Town's Natural Resource Specialist will make periodic site visits during construction activities to verify the project contractors are maintaining compliance with the Meadows HCP. All contractor

personnel will be provided instructions on avoiding and minimizing strategies to protect PMJM habitat. Immediately following the completion of construction activities related to development of three well sites and prior to restoration activities, a final inspection will be performed by the Town's HCP Permit Coordinator and CRDC's natural resource consultant to document impact totals and planting requirements.

5.6 Justification for Minor Amendment

Section 6.7.2 of the Meadows HCP allows for minor amendments to the HCP so long as the minor amendment (1) does not diminish the level or means of mitigation in the Meadows HCP, (2) results in no net loss of mitigation, (3) does not otherwise alter the effectiveness of the Meadows HCP, (4) does not alter the terms of the ITP, and (5) does not conflict with the primary purpose of the Meadows HCP or its accompanying environmental assessment (EA) as stated in Section 6.6 of the Meadows HCP.

For the following reasons, the grant of the minor amendment to address changes to the well infrastructure plan is consistent with the requirements of Section 6.7.2 of the Meadows HCP.

- The Town is proposing to construct only 7 of the 20 water wells proposed in the Meadows EA/HCP, and has eliminated the remaining 13 proposed wells for various reasons. The proposed well head locations are still within 200 feet of the decreed location for the wells as defined in water court case 85CW480.
- The Town Well Development Plan would have an estimated 1.30 acres of permanent disturbance in the Protection Zone, compared to 8.63 acres of authorized permanent impacts in the Protection Zone shown in the EA/HCP (for 20 proposed wells). Therefore, the permanent disturbance is significantly less than was anticipated in the Meadows HCP.
- The Town Well Development Plan would have an estimated 6.07 acres of temporary disturbance in the Protection Zone, compared to 24.87 acres of authorized temporary impacts in the Protection Zone shown in the EA/HCP (for 20 proposed wells). Therefore the amount of temporary disturbance is significantly less than in the Meadows HCP.
- The proposed Protection Zone temporary and permanent disturbances resulting from the proposed Town Well Development Plan would fall within the limits of the authorized Protection Zone temporary and permanent impacts.

- The Town will follow all of the mitigation measures in the Meadows HCP; therefore, there will be no net loss of mitigation.
- The minor amendment would not alter the terms of the ITP or conflict with the primary purpose of the Meadows HCP or its accompanying EA as stated in Section 6.6 of the Meadows HCP.

6.0 RESTORATION PLAN

Section 6.5.1(6) of the Meadows HCP and Condition O of the ITP require that at least 30 days prior to undertaking any development within the Protection Zone that will involve temporary disturbances to vegetation, a Restoration Plan will be submitted to USFWS which will contain a complete description of the steps CRDC will take to re-vegetate areas of temporary disturbance. The proposed Restoration Plan related to the Town's well construction activities is provided below:

6.1 Restoration of Impacts

All temporary disturbances associated with this project will be re-vegetated. All temporary impacts will be reseeded and restored according to the Meadows HCP Restoration Plan requirements, as supplemented by the DCHCP Re-vegetation Guidelines (see Attachment D) and Woody Riparian Vegetation Guidelines (see Attachment E), which are referenced from the appendices in the DCHCP.

- Re-vegetation will occur as soon as practicable after the activity (or each phase of a multiphase activity) has been completed in accordance with the recommended season for re-vegetation and with practices conducive for success.
- Re-vegetated and restored areas will be monitored annually by the Town HCP Permit Coordinator for the first five-year period or until success is achieved.
- Disturbed areas will have sediment and erosion control devices installed and maintained per the Douglas County GESC Manual. These devices are to remain in place until determined by the Town GESC Inspector.
- Trees and shrubs removed due to temporary impacts shall be replaced as practicable on a 1:1 species with appropriate species.
- All new plant material shall be watered, at least twice weekly, during the first growing season, and once weekly thereafter until established.
- New trees or shrubs will be encircled by a protective wire cage to guard against beaver and deer browsing.

- Noxious weeds in the restored areas shall be monitored and may be manually or mechanically removed or controlled with herbicides in accordance with local, county, state or federal regulations.
- Restoration of herbaceous vegetation will follow the recommended seed mix provided in the Meadows HCP. Replanting of any woody vegetation will reference the woody plant species mix provided in the Meadows HCP. Both seed mix and species list are attached.

6.2 Monitoring and Reporting

Town staff from the Utilities Department, including the Town GESC Inspector, as well as the Town's HCP Permit Coordinator, will routinely inspect the project areas during construction to ensure compliance with the Town Stormwater regulations, the Meadows HCP and DCHCP. The project areas will again be inspected immediately following the end of construction activities before restoration activities are initiated to document impact totals and planting requirements. Project areas will also be inspected annually in the summer for a minimum of five years or until success is achieved. Success will be measured by the use of photo point analysis to track restoration activities to ensure success criteria have been met for herbaceous and woody plantings, which include the following standards:

- 70% of re-vegetated areas survive and become established.
- No bare spots larger than 100 square feet.
- No eroded areas as determined by Town staff qualified to inspect erosion.
- Less than 5% noxious weed infestation in restored areas as determined by Town staff qualified to inspect weeds.
- The disturbed area must be re-vegetated to a density of woody vegetation similar to the disturbed area prior to the disturbance.
- Dead planting will be replaced in monitoring years 1 and 2.
- The total surface coverage of the planted woody material must be 80% or greater for all nursery stock and transplants and 70% or greater for all willow and cottonwood cuttings and pole plantings.

Town staff will prepare an annual monitoring report that tracks the Town's construction activities, including temporary and permanent impacts to PMJM habitat, and related restoration activities. This report will be provided to CRDC no later than March of the year following the year the report addresses. CRDC can submit this report to the USFWS as part of their Incidental Take Permit.

7.0 REFERENCES CITED

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- Larsen, L.S. 1974. Soil Survey of Castle Rock Area, Colorado. U.S. Department of Agriculture, Soil Conservation Service.
- Meaney, C.A. and N.W. Clippinger. 1995. A survey of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Colorado. Prepared for Judy Sheppard, Colorado Division of Wildlife.
- Ryon, T.R. 1996. Evaluation of historical capture sites of the Preble's meadow jumping mouse in Colorado. Final Report. MSES Thesis University of Colorado at Denver. May 1.
- Shenk, T. 1998. Conservation assessment and preliminary conservation strategy for Preble's meadow jumping mouse (*Zapus hudsonius preblei*).
- Shenk, T.M. and M. M. Sivert. 1999. Movement patterns of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) as they vary across time and space. Unpublished report of the Colorado Division of Wildlife. 27 pp. + figures.
- U.S. Fish and Wildlife Service. 1999. Survey Guidelines for Preble's Meadow Jumping Mouse. USFWS, Colorado Field Office. Revised May.
- _____. 2002a. Endangered and threatened wildlife and plants; designation of critical habitat for the Preble's meadow jumping mouse (*Zapus hudsonius preblei*); Proposed Rule.

Attachment A

WELL SITE PHOTOS

WELLS AL-1, AL-2, AL-8, AL-9, AL-16, AL-18, AL-20

WELL AL-1 PHOTOS



WELL AL-1. Access Route.



WELL AL-1. Well Disturbance Area.



WELL AL-1. General Site Photo.

WELL AL-2 PHOTOS



WELL AL-2. Access Route.



WELL AL-2. Well Location and Access Route.



WELL AL-2. General Site Photo.

WELL AL-8 PHOTOS



WELL AL-8. Access Route.



WELL AL-8. Access Route (vehicles will travel down left side of photo).



WELL AL-8. Well Disturbance Area.



WELL AL-8. General Site Photo.

WELL AL-9 PHOTOS



WELL AL-9. Access Route (up to the gap next to the Ponderosa Pine).



WELL AL-9. Well Disturbance Area.



WELL AL-9. General Site Photo.



WELL AL-9. General Site Photo.

WELL AL-16 PHOTOS



WELL AL-16. Access Route (two-track to right of mature willow)



WELL AL-16. General Site Photo.



WELL AL-16. Well Disturbance Area.

WELL AL-18 PHOTOS



WELL AL-18. Access Route (through the shrubs & trees).



WELL AL-18. Well Disturbance Area.



WELL AL-18. General Site Photo.

WELL AL-20 PHOTOS



WELL AL-20. Access Route (through shrubs to top of hill).



WELL AL-20. Well Disturbance Area.



WELL AL-20. General Site Photo.

Attachment B

THE MEADOWS HABITAT CONSERVATION PLAN

NATIVE GRASS AND PLANT SPECIES MIX

Table 1: Riparian Zone Species List

<u>Scientific Name</u>	<u>Common Name</u>	<u>Indicator Status</u>
<u>Herbaceous Species</u>		
Grasses		
<i>Achnatherum hymenoides</i>	Indian ricegrass	FACU
<i>Andropogon gerardii</i>	big bluestem	FACU
<i>Andropogon halii</i> var. Hack	sand bluestem	UPL
<i>Boutelous curtipendula</i>	side-oats grama	N/A
<i>Botelous gracilis</i>	blue grama	N/A
<i>Calamovilfa longifolia</i>	prairie sandreed	FACU
<i>Elymus canadensis</i>	Canada wildrye	FACU
<i>Elymus lanceolatus</i> <i>dasystachyum</i>	thickspike wheatgrass	N/A
<i>Elymus elymoides</i>	bottlebrush squirreltail	N/A
<i>Festuca arizonica</i>	pinegrass	N/A
<i>Festuca longifolia</i>	hard fescue	FACU
<i>Koeleria macrantha</i>	prairie junegrass	N/A
<i>Panicum virgatum</i>	switchgrass	FAC
<i>Pascopyrum smithii</i>	western wheatgrass	N/A
<i>Poa secunda</i> (sandbergii)	Sandberg bluegrass	N/A
<i>Schizachyrium scoparium</i>	little bluegrass	UPL
<i>Sorghastrum nutans</i>	yellow Indian grass	N/A
<i>Sporobolus cryptandrus</i>	sand dropseed	N/A
<i>Stipa comata</i>	needle and thread	N/A
<i>Stipa viridula</i>	green needlegrass	N/A
Forbs		
<i>Achillea lanulosa</i>	yestern yarrow	FACU
<i>Liatris punctata</i>	dotted gayfeather	FACU
<i>Linum lewisii</i>	blue flax	UPL
<i>Oenothera pallida</i>	white evening primrose	N/A
<i>Ratibida columnifera</i>	prarie coneflower	N/A
<i>Rudbeckia hirta</i>	black-eyed susan	FACU
Riparian/Wetland Species		
<i>Carex atrata</i>	black sedge	FACW
<i>Carex lanuginose</i>	wooly sedge	OBL
<i>Carex nebrascensis</i>	Nebraska sedge	OBL
<i>Carex vulinoidea</i>	fox sedge	FACW
<i>Carex hystericina</i>	porcupine sedge	OBL
<i>Distichlis spicata</i>	inland saltgrass	OBL
<i>Glyceria striata</i>	mannagrass	OBL
<i>Elymus elymoides</i>	bottlebush squirreltail	FACU
<i>Juncus balticus</i>	Baltic rush	FACW
<i>Juncus confusus</i>	Colorado rush	FAC+
<i>Panicum virgatum</i>	switchgrass	FAC

<i>Sporobolus airoides</i>	alkali sacaton	FAC
<i>Triglochin maritimum</i>	Arrowgrass	OBL
Woody Species		
Trees		
<i>Acer negundo</i>	boxelder	FAC/FACW
<i>Alnus incana</i>	thinleaf alder	FACW
<i>Betula occidentalis</i>	water birch	FACW
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	UPL
<i>Pinus ponderosa</i>	ponderosa pine	UPL
<i>Populus angustifolia</i>	narrowleaf cottonwood	FACU
<i>Populus deltoides</i>	plains cottonwood	FAC
<i>Populus tremuloides</i>	aspen	FAC
Shrubs		
<i>Prunus americana</i>	American Plum	FACU
<i>Prunus virginiana</i>	chokecherry	FACU
<i>Quercus gambelii</i>	Gambel Oak	UPL
<i>Rhus trilobata</i>	oakleaf sumac	UPL
<i>Ribes aureum</i>	golden currant	FACW
<i>Ribes cereum</i>	wax currant	UPL
<i>Rosa woodsii</i>	Wood's Rose	FACU
<i>Salix amygdaloides</i>	peachleaf willow	OBL
<i>Salix exigua</i>	coyote willow	OBL
<i>Salix monitcola</i>	mountain willow	OBL
<i>Symphoricarpos occidentalis</i>	common snowberry	UPL

Table 2: Upland Zone Species

<u>Scientific Name</u>	<u>Common Name</u>	<u>Indicator Status</u>
<u>Herbaceous Species</u>		
Grasses		
<i>Achnatherum hymenoides</i>	Indian ricegrass	FACU
<i>Andropogon gerardii</i>	big bluestem	FACU
<i>Andropogon halii</i> var. Hack	sand bluestem	UPL
<i>Boutelous curtipendula</i>	side-oats grama	N/A
<i>Botelous gracilis</i>	blue grama	N/A
<i>Calamovilfa longifolia</i>	prairie sandreed	FACU
<i>Elymus canadensis</i>	Canada wildrye	FACU
<i>Elymus lanceolatus</i> <i>dasystachyum</i>	thickspike wheatgrass	N/A
<i>Elymus elymoides</i>	bottlebrush squirreltail	N/A
<i>Festuca arizonica</i>	pinegrass	N/A
<i>Festuca longifolia</i>	hard fescue	FACU
<i>Koeleria macrantha</i>	prairie junegrass	N/A
<i>Panicum virgatum</i>	switchgrass	FAC
<i>Pascopyrum smithii</i>	western wheatgrass	N/A
<i>Poa secunda</i> (sandbergii)	Sandberg bluegrass	N/A
<i>Schizachyrium scoparium</i>	little bluegrass	UPL
<i>Sorghastrum nutans</i>	yellow Indian grass	N/A
<i>Sporobolus cryptandrus</i>	sand dropseed	N/A
<i>Stipa comata</i>	needle and thread	N/A
<i>Stipa viridula</i>	green needlegrass	N/A
Forbs		
<i>Achillea lanulosa</i>	yestern yarrow	FACU
<i>Liatris punctata</i>	dotted gayfeather	FACU
<i>Linum lewisii</i>	blue flax	UPL
<i>Oenothera pallida</i>	white evening primrose	N/A
<i>Ratibida columnifera</i>	prarie coneflower	N/A
<i>Rudbeckia hirta</i>	black-eyed susan	FACU
<u>Woody Species</u>		
Trees		
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	UPL
<i>Pinus ponderosa</i>	ponderosa pine	UPL
<i>Populus angustifolia</i>	narrowleaf cottonwood	FACU
<i>Populus deltoides</i>	plains cottonwood	FAC
<i>Populus tremuloides</i>	aspen	FAC
Shrubs		
<i>Prunus americana</i>	American Plum	FACU
<i>Prunus virginiana</i>	chokecherry	FACU

<i>Quercus gambelii</i>	Gambel Oak	UPL
<i>Rhus trilobata</i>	oakleaf sumac	UPL
<i>Ribes cereum</i>	wax currant	UPL
<i>Rosa woodsii</i>	Wood's Rose	FACU
<i>Symphoricarpos occidentalis</i>	common snowberry	UPL

Attachment C

DOUGLAS COUNTY HABITAT CONSERVATION PLAN REVEGETATION GUIDELINES

Appendix 4:

Revegetation Guidelines

Introduction

The general Best Management Practices for all covered activities require that all temporary disturbances associated with covered activities within the RCZ be revegetated. Appendix 4 presents the revegetation guidelines for areas that do not have woody vegetation. Additional guidance and requirements to avoid, minimize, and replace lost woody vegetation within the RCZ is presented in Appendix 5.

This appendix provides recommendations to establish herbaceous vegetation within the RCZ following temporary disturbances. It contains seeding and planting recommendations, including species appropriate for riparian, upland, and wetland areas in Douglas County.

All revegetation plans will be written or verified by a person familiar with plant ecology. Reseeding will be conducted in accordance with such plans. Inspections to verify plant survival will be conducted or verified by a person with similar knowledge.

Seeding

The seed mixes listed in Tables 4-A and 4-B are appropriate for seeding areas of temporary disturbance within the RCZ. The seed mixes are designed to accommodate all soil types. The following guidelines are applicable to seeding:

- Order seed early because native seed may be in short supply.
- All temporarily disturbed areas within the RCZ shall be reseeded using a sterile cover crop or the appropriate seed mix listed in this appendix. The mixes may be modified due to lack of seed availability; development of new seed/plant varieties; new seed or plant materials becoming commercially available; adjustments of the mix to the specific site conditions; habitat requirements or due to field experience proving success or failure of specific species, varieties or techniques. All plant species used must be beneficial and native to the County.
- Seeding must occur within 3 days of topsoil placement unless delayed by weather conditions improper for seeding or crimp mulching. Seeding will not occur when the ground is frozen.
- Once construction and ground disturbing activities have been completed, the site must be seeded as conditions and season allow. If seeding must occur between May 2 and September 30, disturbed areas may be seeded with a sterile cover crop such as Quickguard or Regreen, or a crop that will be killed by frost before going to seed. The cover crop shall not be cut. The permanent native seed mix shall be seeded into the standing cover crop during the first dormant period suitable for seeding (October 1 through May 1) after planting the cover crop unless the cover crop was planted late in the previous growing season, was not winterkilled and will continue to grow as a winter-wheat type crop for part of the following growing season. In that case, the permanent mix shall be planted a year later during the dormant period (October 1 through May 1) to allow the cover crop

time to come to maturity and die, avoiding competition with seeded species. Wetland seeding and plantings can be excepted from the additional year delay if it is likely that the area will become inundated and kill the cover crop.

- Planting a cover crop as specified above and seeding the native grass mix into the cover crop the second year can increase the successful establishment of grasses in most instances.
- A properly prepared seedbed is critical for a successful restoration site. Seeds may not grow or may grow slowly in soils that are too compacted, and soils that are too loose may lead to erosion and poor germination. After grading, rip soil to a minimum of 12 inches. Avoid or minimize compaction associated with vehicles driving over ripped soil.
- Add fertilizer only if the soil is deficient in a particular nutrient (such as nitrogen). If used, select a slow release fertilizer or organic fertilizers such as Biosol™. In general, native plants do not need much nitrogen, and too much nitrogen can “burn” young native seedlings and encourage heavy weed growth.
- Mycorrhizal and/or beneficial bacterial inocula may aid revegetation efforts and should be considered where topsoil is lacking or deficient in microbial flora, in soils recently subjected to heavy disturbance, and in burned areas.
- The environmental contractor shall supply the County or Town with all seed bag tags and a certification from the supplier stating that the seed complies with the Federal Seed Act. All seed must be guaranteed for purity and germination, free of noxious weed seeds, and supplied on a pure live seed (PLS) basis. Using the seed species name listed on the “Certified Seed Blue Tag,” verify that the seed received is the seed specified prior to seeding.
- Seed shall be drilled where appropriate, but may be broadcast in areas that cannot be accessed using a drill seeder. **Double rates for broadcast seeding.** Seeding equipment used for applying grass seed shall be designed, modified, or equipped to regulate the application rate of native grass seed. Seed shall be distributed uniformly in the broadcasting device, and seed shall be distributed evenly throughout the revegetation site.
 - The most effective seeding equipment is a grass drill with 7- to 12-inch spacing and capable of planting fluffy seeds, equipped with a seedbox agitator, small seedbox, double disc furrow openers with depth bands, and packer wheels. Drills used shall be capable of dropping the seed between the double disk openers and not behind them when planting light fluffy seed. Grass seed shall be planted directly into the cover crop residue without additional seedbed preparation if a cover crop is used. The grass drill shall be operated as near to the contour as practical. To accurately maintain seeding depth, drilling speed is limited to 4 to 4.5 mph.
 - Drag chains may be used in place of packer wheels only on deep sand and similar range sites to prevent seeding too deep.
 - Any modified equipment such as air seeders and drills that control seeding depth with packer wheels must be able to insure proper seeding depth, uniform seed distribution, and firm seed-soil contact. Ground speed shall not

exceed 4 to 4.5 mph so that proper seeding depth can be maintained.

- In small areas or sites where drill seeding is not practicable, seed shall be broadcast and lightly raked to cover the applied seed with a soil thickness no greater than 0.5 inches in depth. A spike-toothed harrow pulled behind a tractor or ATV may be used to cover the seed in this application, or the seed may be raked lightly into the soil by hand.
- Hydroseeding may only occur on slopes that are too steep for drill seeding equipment to be safely or effectively operated.
- A straw mulch shall be applied at a rate of 4,000 lbs/acre, and crimped into the soil surface. If seed is planted into a standing cover crop, mulch shall not be applied. Wheat straw free of noxious weed seed and undesirable plant seed shall be used. Mulch shall be applied to seeded areas no more than 24 hours after seeding; however, mulching shall not take place during adverse weather conditions or when wind prevents uniform distribution and must be postponed until adverse weather conditions subside. Mulch shall be applied in a manner that does not compact the seedbed.
- Noxious and undesirable weeds shall be controlled within RCZ revegetation areas. Control shall start as soon as possible, preferably prior to ground disturbance. Herbicides may injure young grass seedlings during their first growing season and shall be applied during the first season only after grasses have matured beyond their susceptible stage for the selected herbicide if practicable. Mowing and other Integrated Pest Management (IPM) techniques shall be employed as appropriate to control weeds, and especially to keep them from going to seed. Mowing may be especially important during the first growing season because some herbicides may not be able to be used in that timeframe.
- Revegetation must meet GESC Manual criteria for approval of vegetation coverage and control of noxious weeds (GESC Manual Sections 6.3 and 6.4).

Transplants — Herbaceous

Herbaceous plantings can be an effective way to revegetate temporarily disturbed wetland areas. All species used for herbaceous transplants shall be beneficial species native to Douglas County. The following guidelines are applicable to the herbaceous wetland transplants (Table 4-C):

- Transplants grown from locally collected plants or seeds have the greatest chance for long-term establishment and survival.
- Herbaceous nursery container stock comes in a variety of sizes. Transplants with well-developed root systems have the greatest potential for successful establishment. Typically, tubelings (also labeled as supercells or 3 cubic inch containers) have the most extensive root development. Small transplants (2.5-inch containers) are acceptable, but may establish more slowly than deeper-rooted transplants.

- Securely anchoring plants in inundated areas is difficult; therefore, plant emergent areas before the site is inundated. The ability to control inundation and saturation of the wetland or riparian areas will increase the potential for successful plant establishment. Sites shall be moist when planted. Increase inundation in marshes or seasonally inundated wetlands as the plants become established.
- Transplants shall be planted on approximate 3-foot centers. The density of plantings may be varied to result in a more naturalized pattern.
- After planting, the transplants shall be watered unless the soil is already saturated. Saturated conditions shall be maintained during the growing season with supplemental irrigation as needed.
- Combining wetland seeding (Table 4-B) with herbaceous wetland plantings can speed wetland vegetation establishment and increase successful revegetation of disturbed wetlands.

Table 4-A. Riparian/Upland Seed Mix.

Species	Scientific Name	Variety	Notes	% in Mix	PLS#/AC
Big Bluestem	<i>Andropogon gerardii</i>	Bonilla, Kaw, Champ, Bison	PNWS	8	0.9
Little Bluestem	<i>Schizachyrium scoparium</i>	Pastura	PNWB	8	0.6
Yellow Indiangrass	<i>Sorghastrum nutans</i>	Cheyenne, Holt, Llano	PNWS	8	0.8
Switchgrass	<i>Panicum virgatum</i>	NE28, Greenville, Blackwell	PNWS	15	0.6
Sideoats Grama	<i>Bouteloua curtipendula</i>	Vaughn	PNWB	10	0.9
Western Wheat	<i>Agropyron smithii</i>	Arriba, Rosanna	PNCS	9	1.5
Blue Grama	<i>Bouteloua gracilis</i>	Hachita	PNWB	8	0.3
Indian Ricegrass	<i>Achnatherum hymenoides</i>	Paloma, Nez Par, Rimrock	PNCB	8	1.0
Prairie Sandreed	<i>Calamovilfa longifolia</i>	Goshen/Pronghorn	PNWS	8	0.5
Green Needlegrass	<i>Nassella viridula</i>	Lodorm	PNCB	8	0.8
Slender Wheatgrass	<i>Agropyron trachycaulum</i>	Pryor, San Luis	PNCB	5	0.6
TOTAL PLS/ACRE					8.5

Notes: P=Perennial; A=Annual; N=Native; C=Cool Season; W=Warm Season; B=Bunchgrass; S=Sod former.

Table 4-B. Wetland Seeding Mix for RCZ Wetland Areas.

Common Name	Genus/Species	Variety	% in Mix	PLS#/AC
Switchgrass	<i>Panicum virgatum</i>	NE28, Greenville	10	0.4
Canada Wildrye	<i>Elymus canadensis</i>		5	0.5
Prairie Cordgrass	<i>Spartina pectinata</i>		8	0.6
Fowl Mannagrass	<i>Glyceria striata</i>		5	0.5
American Sloughgrass	<i>Beckmannia syzigachne</i>	Egan	4	0.04
Western Wheat	<i>Pascopyrum smithii</i>	Arriba/Rosana	4	0.6
Yellow Indiangrass	<i>Sorghastrum nutans</i>	Cheyenne/ Holt/ Llano	3	0.3

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Big Bluestem	<i>Andropogon gerardii</i>	Bonilla/Kaw/Champ/Bison	5	0.5
Common Spike-rush	<i>Eleocharis palustris</i>		10	0.3
Arctic (Baltic) Rush	<i>Juncus balticus</i>		10	0.1
Hardstem Bulrush	<i>Schoenoplectus acutus</i>		6	0.5
Softstem Bulrush	<i>Schoenoplectus tabernaemontani</i>		6	0.2
Three Square Bulrush	<i>Schoenoplectus pungens</i>		15	1.0
Woolly Sedge	<i>Carex pelita (lanuginose)</i>		5	0.1
Nebraska Sedge	<i>Carex nebrascensis</i>		2	0.04
Water Sedge	<i>Carex aquatilis</i>		2	0.03
TOTAL PLS/ACRE				5.71

Table 4-C. Transplant species commercially available and appropriate for use in wetlands.*

Common Name	Scientific Name	Depth to Plant (Inches of Standing Water)
Woolly sedge	<i>Carex lanuginosa</i>	3" under to 3" above
Nebraska sedge	<i>Carex nebrascensis</i>	0-6" below water
Fox sedge	<i>Carex vulpinoidea</i>	0-6" below water
Creeping spikerush	<i>Eleocharis palustris</i>	0-6" below water
Baltic rush	<i>Juncus balticus</i>	0-3" above water
Torrey's rush	<i>Juncus torreyi</i>	0-3" above water
Arrowhead	<i>Sagittaria latifolia</i>	0-6" below water
Threesquare bulrush	<i>Scirpus americanus</i>	3" under to 3" above
Alkali bulrush	<i>Scirpus maritimus</i>	0-6" below water
Softstem bulrush	<i>Scirpus tabernaemontani</i>	0-6" below water
Giant burreed	<i>Sparganium eurycarpum</i>	0-6" below water
Prairie cordgrass	<i>Spartina pectinata</i>	0-3" above water

*This is not an exhaustive list of plants that may be transplanted or otherwise used in wetlands in the RCZ. These wetland species are available commercially from nurseries.

Success Criteria for Seeding and Herbaceous Planting

The GESC Manual establishes the following success criteria:

- **Herbaceous Cover** — At least three plants per square foot with a minimum height of 3 inches. The three plants per square foot shall be beneficial native grasses or forbs.
- **Bare Spots** — No bare spots larger than 100 square feet.
- **Erosion** — No eroded areas as determined by County or Town staff qualified to inspect erosion.

- **Weeds** — Free of noxious weed infestation as determined by County or Town staff qualified to inspect weeds (see GESC Manual Section 6.4).

The County or Town shall inspect the revegetation for at least two growing seasons. If the success criteria are not met after the first growing season, the County or Town will implement additional weed control, reseeding, replanting, irrigation, or other remedial measures. If minimum success criteria have not been met by the end of the review period, or remedial herbaceous plantings have not been proven for at least two growing seasons, then the County or Town will continue remedial measures, monitoring and inspections.

Attachment D

DOUGLAS COUNTY HABITAT CONSERVATION PLAN

WOODY RIPARIAN VEGETATION GUIDELINES

Appendix 5:

Woody Riparian Vegetation Guidelines

Introduction

The general Best Management Practices for all covered activities require that activities within the RCZ minimize temporary disturbance to and permanent loss of woody vegetation within the RCZ.¹ These BMPs further require that trees and shrubs removed from the RCZ associated with temporary impacts shall be replaced per these Woody Riparian Vegetation Guidelines.

Trees, and particularly shrubs, provide an important potential habitat component for Preble's and woody vegetation can be slow to recover from impacts or re-establish in a disturbed area. Impacts to trees and shrubs within the RCZ should be avoided and minimized to the extent practicable. Unavoidable losses of trees and shrubs associated with temporary impacts shall be mitigated through replacement.²

The objectives of these guidelines are to provide:

- Measures to avoid and minimize impacts to woody vegetation within the RCZ
- Methods to speed recovery to woody vegetation disturbed by covered activities within the RCZ
- Criteria for the replacement of necessary losses of woody vegetation within the RCZ associated with temporary impacts

This document contains best management practices to avoid and minimize impacts to woody vegetation. In addition, it contains planting recommendations, including species appropriate for streamside and upland areas within the RCZ in the plains, foothills, and montane environments of Douglas County.

These guidelines may be modified periodically to ensure the recommendations reflect advances in revegetation technology and experience in Douglas County.

Best Management Practices to Avoid and Minimize Impacts to Woody Vegetation

The best management practices presented here are designed to avoid and minimize impacts to woody vegetation in the RCZ. In general, however, impacts to all vegetation types within the RCZ, not just woody vegetation, shall be avoided and minimized to the

¹ These guidelines focus on woody vegetation within the RCZ. There is no attempt to distinguish between trees and shrubs that are obligate riparian species and upland trees and shrubs that occur within the RCZ. All trees and shrubs within the RCZ provide potential habitat for Preble's.

² Losses of the RCZ, including woody vegetation, associated with permanent impacts that replace the RCZ with non-habitat are mitigated through habitat preservation associated with the DCHCP's mitigation program.

maximum extent practicable. Additional site-specific opportunities for avoidance and minimization may be available, and project designers and engineers shall incorporate opportunities to avoid and minimize impacts to woody vegetation within the RCZ to the greatest extent practical. Best management practices for avoiding impacts to woody vegetation include:

- Plan and adjust site grading so that impacts to woody vegetation can be avoided. It is recommended that engineers visit a site frequently during the design, grading, and construction phases of a project so that adjustments can be made that limit impacts to woody vegetation. Minor adjustments to alignments and footprints, road and building elevations, and slope steepness can significantly diminish impacts to woody vegetation within the RCZ.
- Avoid clearing and grubbing woody vegetation in areas of temporary impacts. If necessary, prune woody vegetation to ground level so that it may grow back following construction.
- Avoid the unnecessary removal of trees or shrubs; for example, prune the aerial portions of trees and shrubs that hang over a project area and interfere with equipment.
- When it is necessary to clear woody vegetation, leave at least a quarter of the trunks and branches greater than 2 inch in diameter piled in windrows on the project site. The dead woody vegetation can provide cover for Preble's.
- Temporary fencing should be erected at the limits of all construction sites so that vegetation not to be disturbed is not inadvertently impacted during construction.

Replacement of Woody Vegetation

Losses of woody vegetation (trees and shrubs) in the RCZ associated with temporary impacts shall be mitigated. All trees that are removed by activities with temporary impacts other than Russian olive (*Eleagnus angustifolia*), Siberian elm (*Ulmus pumila*), crack willow (*Salix fragilis*), white willow (*Salix alba* var. *vitellina*), buckthorn (*Frangula alnus*), or salt cedar (*Tamarix* spp.) shall be replaced. Replacement of trees and shrubs shall occur as follows:

1. Trees or shrubs removed from areas of temporary disturbance within the RCZ shall be replaced on a 1:1 basis with appropriate species from Table 3-A.
2. The entire area of disturbed woody vegetation shall be replanted at the following density: shrub willow cuttings shall be planted 1 to 3 feet apart, 1 foot apart in areas of higher erosion. Tree type willow pole cuttings (e.g., peachleaf willows) shall be planted 6 to 12 feet apart. All other shrubs and trees shall be spaced at $\frac{3}{4}$ of their maximum mature spread when planted adjacent to another of the same species, or $\frac{3}{4}$ of the average of the maximum mature spread between adjacent plants of different species (see Table 3-A). If a shrub is to be an understory plant, its spacing can be superimposed on canopy species in the vicinity. Openings or grass/herbaceous strips may be created in the woody revegetation areas to create diversity or a mosaic effect. Spacing may be decreased (planted more closely) to create clumps or thickets, or to ensure adequate plant survival to meet the success

criteria outlined in this appendix.

Woody vegetation can be replaced using transplants from nurseries or willow stakes and cottonwood pole cuttings. The trees and shrubs lost shall be replaced with appropriate species from Table 3-A. These trees and shrubs are native to Douglas County.

Transplants — Woody

Woody species appropriate for transplanting in Douglas County are listed in Table 3-A. The following recommendations will increase the survival and establishment of woody transplants:

- The soil shall be prepared—either disked, tilled or a hole dug twice the diameter of the root ball of the tree/shrub. Soil preparation reduces compaction and competitive vegetation.
- Transplants shall be inoculated with appropriate mycorrhizae if there is not a reasonable expectation of a sufficient quantity of *appropriate* mycorrhizal propagules in the soil. Previously inoculated nursery stock is available; the roots or root zones of transplants may be inoculated at the time of planting.
- Leguminous shrub/tree transplants (e.g., leadplant) shall be inoculated with an appropriate rhizobium unless the stock was previously inoculated or is now likely to be colonized.
- If the soil is likely to be deficient in natural microflora other than mycorrhizae, the appropriate local jurisdiction may require an appropriate inoculum or addition of “live” topsoil from an appropriate area.
- The addition of organic matter to soils deficient in humus may be necessary unless the transplants are adapted to deficient soils.
- Water retention polymer (i.e., polyacrylamide or PAM) and slow-release fertilizer tab(s) sufficient for the specific transplant shall be placed in its root zone.
- Weed barrier or mulch shall be used whenever practicable around each planted shrub or tree to protect from competition and to moderate soil temperatures. This requirement may be eliminated if grasses or forbs are to be planted in close proximity to the shrub or the barrier/mulch would otherwise be counter-productive.
- For optimal survival, trees and shrubs should be transplanted in early spring prior to May 1. Trees and shrubs shall not be transplanted from May 1 through October 15 unless potted or balled and burlapped plants are used **and** are watered by an automatic drip irrigation system or consistently watered with a portable tank or by hand. No woody transplants should be planted between October 15 and ground thaw in the spring.
- If browsing from beaver, deer, elk, etc. is a concern, each shrub shall be encircled by a protective cage and each tree trunk protected with wire mesh. Alternatively, rabbit guards secured with bamboo poles may be used for smaller stock in some cases.

- The root ball shall be moist when planted. After planting, each planting shall be watered to ensure good soil to root contact and minimize air pockets.
- In areas where soils are not saturated or constantly moist, supplemental irrigation shall be provided as needed to ensure the transplants' long-term survival. Irrigation shall be applied as needed for at least the first two growing seasons.

Bare Root Whips or Tubeling Potted Trees and Shrubs

If bare root whips or tubeling potted trees or shrubs are planted, the following protocol will help to ensure success.

- The ground shall be disked or worked thoroughly to prepare it to receive the trees and reduce undesirable vegetation.
- The roots/root zones of transplants shall generally be inoculated with an appropriate mycorrhizal inoculum if there is not a reasonable expectation of a sufficient quantity of appropriate mycorrhizal propagules in the soil.
- Other inocula may be required for leguminous transplants (rhizobium) or for soils deficient in beneficial natural microflora.
- If the soil is likely to be deficient in natural microflora other than mycorrhizae, the appropriate local jurisdiction may require an appropriate inoculum or addition of "live" topsoil from an appropriate area.
- The addition of organic matter to soils deficient in humus may be necessary unless the transplants are adapted to deficient soils.
- Whips shall be planted using a tree-planting implement with a spade to open a furrow and packer wheels to firm the soil around the roots of transplanted trees, or hand dug.
- Whips shall be spaced within rows based on $\frac{3}{4}$ of their mature spread (Table 3-A). Under-story plants may be planted more densely or superimposed on the spacing of the over-story shrubs/trees. To establish clumps or thickets or to ensure adequate survival, trees/shrubs may be planted more densely.
- Rows should generally be spaced a minimum of six feet apart (to accommodate weed barrier), but may be varied to provide adequate spacing to accommodate the mature spreads of the species involved. Rows may be spaced farther apart to allow for a grass/herbaceous strip between rows of shrubs/trees. Row spacing may be tightened to accomplish a thicket or clump planting effect, especially with smaller shrubs or to ensure enough plant survival to meet performance specifications.
- A slow release fertilizer tab (or tabs) and hydrated water-retention polymer (PAM) shall be applied to the root-zone of whips and tubelings.
- Weed barrier shall be placed over the rows of whips with a weed-barrier implement. The location of each tree should be marked with spray paint at the time of installation and later slit and the tree stem pulled through. The weed barrier must be anchored with soil on the edges, and staked with landscape staples periodically and beside openings for trees. Weed barrier squares may be placed by hand. Organic mulch may be applied in lieu of weed barrier.

- If browsing from beaver, deer, elk, etc. is a concern, each shrub shall be encircled by a protective cage and each tree trunk protected with wire mesh. Alternatively, rabbit guards secured with bamboo poles may be used for smaller stock in some cases.
- Plantings shall be irrigated to ensure their survival. Local experience suggests that during the months of May – August, one gallon of water per shrub applied bi-weekly is probably adequate for bare-root stock planted per this protocol on clay or loam soils. Irrigation shall occur for at least the first two seasons after planting.

Willow Stakes and Cottonwood Pole Cuttings

Willows and cottonwoods can be obtained from nurseries as bare root, container, or balled and burlapped stock or can be established from stakes and poles in the spring. Willow stakes and cottonwood pole cuttings are appropriate for use in wetland and riparian areas with ground water levels within 2.5 feet of the surface for willow shrubs and 4 feet for pole cuttings during the growing season. The willow and cottonwood species listed in Table 3-A can be used for cuttings as follows.

- Cuttings should be taken from live wood that is at least 2 years old.
- Willows and cottonwoods should be cut in the spring while plants are dormant (before the leaves appear). This is typically prior to April 15.
- Optimally, live cuttings should be taken from willow and cottonwoods found on or near the site. The trees and shrubs should be cut a minimum of 8 to 10 inches from the ground with loppers or handsaws. Cuts should be at a 45° angle.
- Never harvest more than 60 percent of any one plant; if there is an abundant resource, harvest no more than 30 percent of individual plants.
- Willow shrub cuttings should be approximately 2 to 3 feet long and greater than ½ inch in diameter.
- Cottonwood or willow tree pole cuttings should be 4 to 20 feet in length and 3 inches or greater in diameter.
- All side branches and the terminal bud shall be trimmed off.
- Willow and cottonwood cuttings shall be long enough so that the bottom ⅓ of the stake or pole reaches soil that will remain saturated throughout the growing season, and at least the upper ⅓ of the stake remains above the soil surface. **It is important to plant willow stakes and cottonwood poles deep enough so that the bottom of the cutting reaches saturated soil throughout the growing season.**
- Immediately after cutting, all live stakes shall be placed in water so that the cut ends are covered with water. The cuttings shall be soaked in water for 5 to 7 days prior to planting but removed from soaking and planted before root tips appear. They shall be stored in a cool, humid, dark place until planting time. Cuttings may be stored for up to 6 months in a cool, dark, moist environment that maintains the cuttings dormancy.

- Willow stakes shall be planted using a piece of rebar to create a vertical hole approximately 1 to 2 feet deep. Alternatively, a narrow hole for the cutting may be dug with a shovel or auger. Approximately $\frac{2}{3}$ of the stake shall be inserted into the hole so that the stake is in contact with the water table. After the willow cutting is inserted, the hole shall be backfilled with native soils and lightly tamped to prevent air pockets. The stake shall then be watered to help fill in the air pockets.
- To plant cottonwood or willow tree poles, a shovel or an auger shall be used to dig a hole to the ground water table (usually within 1 to 4 feet deep; if the water table is deeper, then the location may not be appropriate for cottonwoods). After the cottonwood pole cutting is inserted, the hole shall be backfilled with native soils and lightly tamped to prevent air pockets. The cottonwood poles shall then be watered to help fill in the air pockets.
- Willow stakes and poles shall be planted with the leaf buds pointing up (i.e., the stakes and poles need to be oriented in the same direction they were growing when cut).
- There should be at least two lateral buds and/or a terminal scar above ground on the cuttings (cuttings put out the largest number and strongest shoots just below a terminal bud scar).
- Alternatively, willow stakes may be planted in groups of ten or more stakes in the same manner as discussed for individual stakes. Planting several willow stakes together increases the likelihood of at least one of the stakes surviving.

Willow Bundles

Willow bundles are buried horizontally and are commonly used along streambanks to help establish streambank vegetation and as a biotechnical means to stabilize soil. The following guidelines apply to construction and placement of willow bundles:

- Willow bundles shall be installed while dormant, usually in the spring before April 15.
- Willow cuttings shall be collected using guidelines presented for willow stakes above.
- Bundles should be composed of about 8 to 12 dormant shrub branches in cross section, ranging $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter, and 3 to 4 feet in length. Fascines may be lengthened as necessary for a particular application. The completed bundles should be 6 to 8 inches in diameter. Stagger the cuttings in the bundles so that the tops of the cuttings are evenly distributed throughout the length of the uniformly sized live fascine.
- Using cotton or other biodegradable string, the willow cuttings shall be tied together in bundles about 6 to 8 inches in diameter.
- About half the thickness of the bundles shall be buried in a shallow trench horizontally along the streambanks with some overlap of bundles. Stakes shall be driven (wood or if possible, willow cuttings) through the bundle, and two stakes at the ends of the bundle to help stabilize it. Willow bundles must be buried so that a portion of the bundle is in saturated soil during the growing season.

- Avoid using gravel, cobbles, or rocks (i.e., gravelly material 4.75 mm in diameter or larger) as fill around willow bundles.

Willow Transplants

Live willows can be transplanted on site. If willows grow in areas that will be disturbed during construction, willows can be salvaged from the area to be disturbed and transplanted by pruning, excavating, and replanting following site grading. The following specifications apply to transplanting willows:

- Willows shall be transplanted using an excavator, backhoe, or tree spade.
- The amount of pruning necessary will depend on the size of the root ball that can be obtained. Generally excavators and tree spades can acquire larger root balls, so less pruning is necessary. If it is possible to transplant only small root balls, it may be necessary to prune willows to within 8 inches of the ground level.
- Efforts shall be made to excavate as much of the willow root ball as possible, keeping it intact as it is lifted out of the ground and transported.
- If possible, willow should be transplanted immediately after excavation, as this increases survival rates.
- If it is not possible to transplant willows immediately, willows shall be temporarily heeled in, or placed in large groups so that the roots are not exposed to air. Willows shall be watered frequently to make sure that the roots do not dry out.
- When planting, a hole large enough for the entire root ball shall be excavated, so that the top of the root ball is flush with the adjacent soil surface. The root ball shall be placed gently into the hole, making sure that there are no air pockets and watered following planting.
- Willow transplants shall be located so that the lower portion of the root ball encounters the groundwater table. The root ball shall not be placed in an area where the entire root ball is permanently saturated.
- Transplant success can be increased by transplanting the willows in early spring while the willows are dormant (typically prior to April 15).

Maintenance

- Trees and shrubs shall be irrigated for a minimum of 2 years as needed to ensure the planting's survival and vigor. Any type of transplant, cutting, fascine, etc. that is planted in soil that is saturated during the growing season is exempt from watering requirements.
- Hand watering or spraying from a tank mounted on a cart, ATV or other vehicle is appropriate if an automatic drip irrigation system cannot be practicably installed. Impacts to vegetation and habitat shall be kept to a minimum. Staging water tanks and vehicles from trails, roads, other hardened areas, or areas outside the RCZ is required if practicable; if not, the smallest cart/vehicle feasible (that will minimize impacts to the RCZ) shall be utilized. Long hoses or hand carried buckets shall be used to further minimize impacts whenever possible.

Alternatively, tank driven solar-powered automatic drip irrigation systems are encouraged where water is otherwise unavailable. The tank and controls shall be located outside the RCZ if practicable; if not, they shall be placed in an area where refilling the tank and system maintenance will impact the RCZ least. The appropriate local jurisdiction shall approve the irrigation plan, and may monitor it as appropriate.

- Weed control is critical for the success of a revegetation project. Control efforts should focus on noxious weeds listed on the State and County Noxious Weed Lists³ because these species are the most serious threat to habitat and the most difficult to control. The sooner control methods are started, the easier to control or eliminate weeds; otherwise the infestation may become impossible to control.
 - If noxious weeds are found at a site before grading, areas to be disturbed shall be pre-treated with either an approved herbicide or mowing before grading. Mowing is acceptable only if mowing is an effective management against that particular weed *and* if it is the appropriate season/timing to mow. Mowing can be an effective technique to prevent weeds from going to seed.
 - After planting, the site shall be monitored for weeds. If noxious weeds occur, they shall be controlled using an Integrated Weed Management Plan targeted for the specific species involved/infesting the area. An Integrated Weed Management Plan combines several methods (mechanical, biological, and herbicides) in the most effective and least environmentally damaging way to control a weed species.
- The site shall be continually checked for erosion and the erosion concerns remediated as soon as possible to prevent further damage.

Success Criteria

Minimum success criteria are as follows. Areas of temporarily disturbed woody vegetation must be revegetated with appropriate woody vegetation (Table 3A). The area replanted should generally be the same area that was disturbed. Expanding the area to be planted is generally acceptable, unless grassy or herbaceous vegetation is limited in the area. Increasing the area to be replanted is generally encouraged to both increase habitat quality and to ensure that sufficient area is restored to prevent the delays and additional costs associated with replanting and remediation.

Planting Density

To be considered successfully revegetated, the disturbed area must be revegetated to a density of woody vegetation similar to the disturbed area prior to the disturbance. The density shall be calculated based on the surface area covered by tree and/or shrub canopy. For this calculation, the area covered by a tree or shrub is considered to be $\frac{3}{4}$ of its mature canopy spread (MCS), not the current cover of the newly planted immature vegetation. Table 3A lists $\frac{3}{4}$ MCS for each species, which also may be calculated as shown in the example below based on the formula for the area of a circle (πr^2).

³ www.douglas.co.us/publicworks/weeds/weed_home.htm

The following minimum standards must be met at the end of two growing seasons for woody revegetation to be considered successful, and hence, to be released from monitoring requirements:

- All transplants (bare-root, potted and balled-and-burlapped) must survive to at least 80 percent canopy density, based on $\frac{3}{4}$ MCS.
- Pole plantings must survive to at least 70 percent canopy density, based on $\frac{3}{4}$ MCS.
- Woody material used in bioengineering techniques must survive at reasonable rates to ensure the success of the technique (i.e., bank stabilization and recolonization with willows).

The target density and coverage is appropriate for the following reasons. Many species will spread vegetatively or by seed and fill in gaps over time. The $\frac{3}{4}$ MCS is conservative; in many cases the trees and shrubs will continue to grow to full canopy spread. In most cases, a mosaic of woody and herbaceous vegetation is more beneficial to wildlife than a large uninterrupted stand of woody vegetation.

Monitoring

All plantings shall be monitored (to ensure a sufficient revegetation of the site and plant survival) for a minimum of 2 years. An inspector designated by the appropriate local jurisdiction and experienced in native plant material shall conduct inspections. Generally, verification of appropriate coverage/density shall be based on a visual inspection for sufficient density without counting or measuring. If a dispute arises as to sufficiency, individual plantings can be counted and the approximate surface area calculated using the following method.

Count the number of the living individuals of each planted species and multiply each sum by the surface area of $\frac{3}{4}$ MCS of each species. These products shall be added together to get a total woody vegetation coverage figure. If the total woody vegetation coverage area equals or exceeds that required for woody revegetation, the effort shall be considered adequate. The surface area required for woody revegetation shall be calculated by measuring the surface area of the woody vegetation temporarily impacted and multiplying it by the minimum percentage density required for the planting method employed.

Example: A covered activity temporarily impacts 1,000 square feet of woody vegetation within the RCZ. 1,000 square feet of woody vegetation impacted x 80 percent density required for potted transplants = 800 square feet of coverage required.

Determine $\frac{3}{4}$ MCS from Table 3A or calculate $(\text{spread in feet} \times 0.75 \times 0.5)^2 \times 3.14 = \frac{3}{4} \text{ MCS in square feet}$. If spread is a range, take the average.

Total surface coverage for 10 chokecherries and 43 golden currants would be calculated as follows, regardless of their current canopy size: [10 chokecherries x 44 square feet (surface area of $\frac{3}{4}$ MCS) = 440 square feet] + [43 golden currants x 11 square feet (surface area of $\frac{3}{4}$ MCS) = 473 square feet] = 913 square feet restored into woody vegetation.

913 square feet restored is greater than the 800 square feet required. Therefore, the planting is accepted as successful and monitoring may end as long as plants have survived two seasons for initial planting or two seasons for replacements.

All dead plantings shall be replaced in years 1 and 2. At the end of year 2, the total surface coverage (see example above) of the planted woody material must be 80 percent or greater for all nursery stock and transplants, and 70 percent or greater for all willow and cottonwood cuttings and pole plantings, or monitoring and plant replacement shall continue. Replacements shall not be considered “proven” until they have remained viable for two full growing seasons. Ultimately, it must be demonstrated that 100 percent of the temporarily impacted woody vegetation area has been revegetated to woody cover per the success criteria.

Table 3-A. Woody Transplant Species for use in Douglas County.

Scientific Name [†]	Common Name	Wetland, Riparian, Upland [‡]	Notes	Height (ft)	Spread (ft)	Surface Area of $\frac{3}{4}$ of Mature Canopy Spread (MCS) (ft ²)
Shrubs						
<i>Amelanchier alnifolia</i>	Saskatoon serviceberry	R, U	5000-10,900 ft	15	8-10	36
<i>Amorpha canescens</i>	Leadplant	U	3500-7600 ft	2-4	2-4	4
<i>Atriplex canescens</i>	Fourwing saltbush	R, U	3900-8600 ft	3-6	2-4	4
<i>Betula nana</i>	Bog birch	W, R	6000-11,500 ft	3	3	4
<i>Cercocarpus montanus</i>	Mountain mahogany	R, U	4000-8500 ft	2-4	2-4	4
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush	U	various	2-6	2-4	4
<i>Cornus sericea</i>	Red-Osier dogwood	W, R	4500-10,000 ft	4-6'	4-6	11
<i>Crataegus erythropoda (rivularis)</i>	Red hawthorn	R, U		15	10	44
<i>Crataegus macracantha</i>	Big-thorned hawthorne	R, U	4500-7500 ft	15	10	44
<i>Fallugia paradoxa</i>	Apacheplume	U	3500-8000 ft	3-5	3-5	7
<i>Juniperus communis</i>	Common juniper	U	5000-7500 ft	2-3	3-6	9
<i>Krascheninnikovia lanata</i>	Winterfat	U	2500-8000 ft	1-3	1-3	2
<i>Lonicera involucrate</i>	Twinberry honeysuckle	R, U	6000-11,500 ft	2-7	2-7	9
<i>Purshia tridentata</i>	Antelope bitterbrush	U	4500-8000 ft	4	5	11
<i>Prunus americana</i>	Wild plum	R, U	3500-6000 ft	10-20	8-12	44

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Scientific Name [†]	Common Name	Wetland, Riparian, Upland [‡]	Notes	Height (ft)	Spread (ft)	Surface Area of $\frac{3}{4}$ of Mature Canopy Spread (MCS) (ft ²)
<i>Prunus virginiana</i>	Chokecherry	R, U	4500-9000 ft	8-20	8-12	44
<i>Quercus gambelii</i>	Gambel oak	R, U	4500-8500 ft Container plant from seed only	5-15	10-15	69
<i>Rhus glabra</i>	Smooth Sumac	R, U		6-12	6-12	36
<i>Rhus typhina (hirta)</i>	Staghorn Sumac	R, U		10-20	12-20	113
<i>Rhus trilobata</i>	Skunkbrush sumac	R, U	4000-9000 ft	3-6	3-6	9
<i>Ribes aureum</i>	Golden currant	R, U	3000-9000 ft	4-6	4-6	11
<i>Ribes cereum</i>	Wax currant	R, U	4000-11,400 ft	2-4	2-4	4
<i>Rosa woodsii</i>	Wood's rose	R, U	3000-11,500 ft	3-6	3-6	9
<i>Rubus deliciosus</i>	Boulder raspberry	R, U	4500-9000 ft	3-6	3-6	9
<i>Salix bebbiana</i>	Bebb willow	W, R	5000-9000 ft	10	8-10	36
<i>Salix boothii</i>	Booth's willow	W, R	5000-10,300 ft	10	8-10	36
<i>Salix drummondiana</i>	Drummond willow	W, R	6000-11,000 ft	12	8-12	44
<i>Salix eriocephala</i> <i>var. ligulifolia</i>	Strapleaf willow	W, R	5000-9000 ft.	10-15	10-14	64
<i>Salix exigua</i>	Sandbar willow	W, R	3500-9200 ft	6-12	4-8	16
<i>Salix geyeriana</i>	Geyer's willow	W, R	> 6000 ft	15	10-14	64
<i>Salix irrorata</i>	Bluestem Willow	W, R	5500-7500 ft	8	8-10	36
<i>Salix lasiandra</i>	Whiplash willow	W, R	4100-10,000 ft	10	8-10	36
<i>Salix monticola</i>	Mountain willow	W, R	5700-12,500 ft	15	10-14	64
<i>Salix planifolia</i>	Planeleaf willow	W, R	7000-12,000 ft	5	4-6	11
<i>Salix scouleriana</i>	Scouler willow	R, U	8000-10,000 ft	5-12	8-12	44
<i>Sambucus nigra</i> <i>Canadensis</i>	Common elderberry	R, U		8-12	8-12	44
<i>Sambucus nigra</i> <i>cerulea</i>	Blue elderberry	W, R, U	5500-8500 ft	10	8-12	44
<i>Sambucus racemosa</i> <i>(microbotrys)</i>	Red elderberry	R, U		8-10	8-10	36
<i>Shepherdia argentea</i>	Silver buffaloberry	U	3800-7500 ft	10	6-12	36
<i>Symphoricarpos</i> <i>albus, occidentalis</i> <i>or oreophilus</i>	Snowberry	R, U	4000-11,500 ft (albus: 5500- 7500 ft)	2-4	2-4	4
Trees						
<i>Acer glabrum</i>	Rocky mountain maple	W, R, U	6500-10,000 ft	10-20	10-15	69

APPENDIX 5:
WOODY RIPARIAN VEGETATION GUIDELINES

Scientific Name [†]	Common Name	Wetland, Riparian, Upland [‡]	Notes	Height (ft)	Spread (ft)	Surface Area of $\frac{3}{4}$ of Mature Canopy Spread (MCS) (ft ²)
<i>Acer negundo</i>	Boxelder	R, U	4500-7600 ft	25-30	20-25	224
<i>Alnus incana</i> (<i>tenuifolia</i>)	Thin leaf alder	W, R	4500-11,500 ft	15-30	15-20	135
<i>Betula occidentalis</i> (<i>fontinalis</i>)	Water birch	W, R	4500-11,500 ft	15	10	44
<i>Celtis occidentalis</i>	Hackberry	W, R, U	3500-7200 ft	40-50	35-40	621
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	U	5000-9000 ft	15-30	15-20	135
<i>Picea pungens</i>	Colorado blue spruce	R, U	7000-9500 ft	50-100	15-20	135
<i>Pinus contorta</i>	Lodgepole pine	U	>8000 ft	20-80	15-25	177
<i>Pinus flexilis</i>	Limber pine	U	5000-9000 ft	30-40	12-15	80
<i>Pinus ponderosa</i>	Ponderosa pine	U	5000-9000 ft	40-100	25-40	466
<i>Populus angustifolia</i>	Narrow-leaved cottonwood	W, R	3000-11,500 ft	50	40	706
<i>Populus deltoides monilifera</i>	Plains cottonwood	W, R	3000-6000 ft	75	40	706
<i>Populus tremuloides</i>	Quaking Aspen	R, U	6000-10,000 ft	30-40	12-15	80
<i>Pseudotsuga menziesii</i>	Douglas fir	R, U	4000-11,000 ft	50-60	20-25	224
<i>Robinia neomexicana</i>	New Mexico Locust	R, U		10-20	10-20	99
<i>Salix amygdaloides</i>	Peachleaf willow	W, R	3000-9000 ft	30-40	25-30	334

[†]Some of these species may not be commercially available.

[‡]W=Wetland, R=Riparian, U=Upland.



ATTACHMENT 3



April 2, 2007

Susan Linner, Colorado Field Supervisor
U.S. Fish & Wildlife Service
Ecological Services
Colorado Field Office
PO Box 25486, DFC (MS 65412)
Denver, Colorado 80225-0486

RECEIVED APR 04 2007

RE: East Plum Creek Trail Phase 3 Project, Castle Rock, Douglas County, Colorado

Dear Ms. Linner,

The Town of Castle Rock Parks and Recreation Department is proposing to construct a 2.6-mile multi-use paved pedestrian trail alongside East Plum Creek in the Town of Castle Rock, Douglas County, Colorado. A short segment (0.85 miles) of the East Plum Creek Trail Phase 3 Project will be located within private property owned by the Castle Rock Development Company (CRDC) (please see Section B on the attached map), but will be constructed by the Town of Castle Rock (Town). Construction of the trail will follow regulations pursuant in the Incidental Take Permit #TE-125749, issued to the Town on May 11, 2006, based on the Douglas County Habitat Conservation Plan (DCHCP) for the federally-listed Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's). CRDC, as current owners of the land where this construction will be conducted, is requesting written verification from the U.S. Fish and Wildlife Service (Service) that this project, and the impacts associated therewith, shall be in compliance with the Endangered Species Act.

The proposed trail construction project is located in Castle Rock, west of Interstate 25, between Wolfensberger Road to the south and Meadows Parkway to the north, and is listed in the DCHCP as Covered Activity ID #CRT1-B. According to Table 3D in the DCHCP, this project has 1.1 acres of temporary impacts and 3.7 acres of permanent impacts (4.8 acres total impacts); legal location is Township 7 South, Range 67 West, SW¼ SE¼ Section 27, E½ Section 34 and Township 8 South, Range 67 West, NE¼ NE¼ Section 3 and Township 8 South, Range 67 West, W½ Section 2. Construction of the trail will be for an 8' wide paved cement path with 2' of temporary construction impacts on either side, for a 12' wide total disturbance area. The Best Management Practices as outlined in Appendix 3 of the DCHCP will be followed to minimize impacts to the Riparian Conservation Zone and temporarily disturbed areas will be revegetated according to the guidelines in Appendix 4 and 5 of the DCHCP.

Impacts to Preble's habitat in this general area are also covered under another existing Incidental Take Permit, TE-064965, issued to the CRDC on February 17, 2004, based on the Habitat Conservation Plan for a Portion of the Meadows. This HCP covers impacts from twenty water wells, a sanitary sewer line and a two-mile trail system extending south from Meadows Parkway. Both this HCP and the DCHCP provide coverage for construction of the same trail, however, the impact and mitigation activities will be

conducted according to the DCHCP and reported as such. CRDC has been informed that any additional or alternative activities they may wish to conduct with the unused impact acreage from the trail project will still require Service review for approval.

The Town and Castle Rock Development Company will be signing a License Agreement regarding access on CRDC land for construction of this trail project. Per the Special Conditions in that agreement, CRDC has requested the Town obtain written verification from the Service that the impacts and any required mitigation be conducted pursuant to the DCHCP. As a Permittee, the Town shall ensure that all requirements of the Incidental Take Permit #TE-125749 will be followed; the required annual monitoring report will provide documentation of our activities. A copy of the annual monitoring report will be forwarded to CRDC for their records.

If you have any questions or need additional information, please do not hesitate to contact myself at (720) 733-2294. Thank you.

Sincerely,



Barbara J. Spagnuolo

Natural Resource Specialist & HCP Permit Coordinator

Cc: Chuck Elliott, Castle Rock Development Company

Enclosures: East Plum Creek Trail – Phase 3 Map (detailed aerial photograph of project area)



ATTACHMENT 4



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
P.O. Box 25486, DFC (65412)
Denver, Colorado 80225-0486

IN REPLY REFER TO:
ES/CO: T&E/PMJM/DRHCP
TAILS 65412-2007-TA-0380

APR 11 2007

Barbara J. Spagnuolo
Natural Resource Specialist
Town of Castle Rock
2301 North Woodlands Boulevard
Castle Rock, Colorado 80104

Dear Barbara Spagnuolo:

This responds to your letter of April 2, 2007 concerning the East Plum Creek Trail Phase 3 Project, Castle Rock, Douglas County, Colorado. The following comments are presented under the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

We concur that this project is covered by the Douglas County Regional HCP (DRHCP). Therefore the impacts from this project to Preble's (*Zapus hudsonius preblei*), and the mitigation for impacts has been described in the DRHCP and permitted by the Service, as stated in your letter.

On February 2, 2005 the U. S. Fish and Wildlife Service issued a 12-Month finding on a petition to delist Preble's. Because of the complexity involved, the Service has extended its original proposal. Until a final determination is made, Preble's remains protected under ESA.

Please note that this clearance is valid for one year from the date of this letter. Should additional information regarding listed or proposed species become available, this determination may be reconsidered under the ESA. If the proposed project has not commenced within one year, please contact the Colorado Field Office to request a clearance extension.

If we can be of further assistance, please contact Adam Misztal, of my staff, at (303) 236-4753 or at email: adam_misztal@fws.gov.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: Chuck Elliott and Steve Paulson, Castle Rock Development Company



ATTACHMENT 5



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Colorado Field Office
P.O. Box 25486, DFC (65412)
Denver, Colorado 80225-0486

IN REPLY REFER TO:
ES/CO: T&E/PMJM/HCP
TAILS 65412-2010-TA-0500

JUL 14 2010

Laura A. Dill
ACI Consulting
1001 Mopac Circle #100
Austin, Texas 78746

Dear Laura A. Dill:

This responds to your letter of June 23, 2010, concerning the completion of mitigation for the Meadows HCP. These comments have been prepared under the authority conferred to the U.S. Fish & Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*)

The Service agrees that the mitigation goals for Meadows HCP have been met. In addition to the 2009 monitoring report, an on-site review of the vegetation status (July 13, 2010) conducted by Adam Misztal, of the Colorado Field Office, also found that vegetation conditions met the requirements of the HCP.

Thank you for your cooperation.

Sincerely,

Susan C. Linner
Colorado Field Supervisor



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
P.O. Box 25486-DFC MS 65412
Denver, Colorado 80225-0486

IN REPLY REFER TO:
ES/CO: Meadows HCP
TAILS: 06E24000-2015-TA-0779

SEP 15 2015

Mr. Steve Paulson
ACI Consulting
1001 Mopac Circle
Austin, Texas 78746

Dear Mr. Paulson,

This responds to your letter of June 18, 2015, requesting approval for the **Minor Amendment to the Habitat Conservation Plan for a Portion of the Meadows Property; Douglas County, Colorado**. These approvals are granted by the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). Additional project information was provided by you to our office on August 17, 2015 through electronic mail.

Existing Meadows HCP - The existing Meadows Habitat Conservation Plan (HCP) identified five types of potential development within the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's) Protection Zone of the Meadows HCP area. Potential development included the following: 1) parcels designated as "COI" were to be developed for commercial, office, and industrial uses; 2) a total of 20 water wells were planned for drilling over a period of 20 years to serve the entire Meadows community, of which 16 would be located within the riparian corridor; 3) a proposed trail system approximately two miles long would be constructed within the riparian corridor of the Meadows HCP; 4) an underground sanitary sewer line was to be installed within the northeastern portions of the COI Parcels A and B; and 5) a bridge would be constructed across East Plum Creek; however the exact location had yet to be determined. With the exception of the well development, trail development and potential bridge, all proposed development was to occur outside the riparian portion of the Protection Zone.

The Meadows HCP anticipated that a total of 8.63 acres of permanent and 24.87 acres of temporary disturbance of Preble's habitat would result from development of the Meadows HCP area. Development of the Parcels A and B and associated infrastructure would result in 5.59 acres of permanent and 2.15 acres of temporary disturbance. Development of the water system and trail system would result in 3.04 acres of permanent and 22.72 acres of temporary disturbance.

Proposed Minor Amendment - The purpose of the minor amendment is to:

1. Identify all activities that have been conducted within the Meadows HCP area by the Castle Rock Development Company and Castle Rock Land Co. (CRDC) (permit holders for the HCP) through 2014 and mitigated as required by the Incidental Take Permit (ITP);
2. Incorporate into the Meadows HCP specific activities that have been undertaken by the Town of

3. Castle Rock within the Meadows HCP project areas that are mitigated by the Douglas County Regional HCP (DRHCP); and
4. Introduce anticipated activities to be constructed in the future by CRDC and the Town of Castle Rock within the Meadows HCP area.

The following text summarizes the types of activities identified above:

1. These activities were either addressed in the Meadow HCP, or received additional coordination with the Service, and are covered through the Meadows HCP (details provided in the biological assessment):
 - A) 10-acre Preble's Habitat Enhancement Area.
 - B) Cattle removal within Protection Zone.
 - C) Cramer Dairy restoration.
 - D) Deep water wells #11 and #12 were constructed and permanently affected 0.01 acres and temporarily affected 1.71 acres of Preble's habitat.
 - E) Gas lines were constructed and resulted in no affects to Preble's habitat due to boring underneath the Protection Zone.
 - F) Sanitary sewer line constructed and permanently affected 0.02 acres and temporarily affected 1.64 acres of Preble's habitat.
 - G) Stormwater outfall constructed and permanently affected 0.004 acres and temporarily affected 0.20 acres of Preble's habitat.

These activities resulted in a combined total of 0.034 acres of permanent impacts and 3.55 acres of temporary impacts to Preble's habitat through the Meadows HCP.

2. The following activities are being/were constructed by the Town of Castle Rock within the Meadows HCP area:
 - A) The East Plum Creek Trail constructed along East Plum Creek permanently affected 1.00 acres and temporarily affected 0.6 acres of Preble's habitat.
 - B) Four alluvial wells constructed in the Preble's Protection Zone permanently affected 0.69 acres and temporarily affected 2.34 acres of Preble's habitat (Note that changes to the well construction plan were addressed through a previous minor amendment to the Meadows HCP on October 4, 2012 with the Service. These changes included a reduction in the number of wells from 20 wells to 7 wells, resulting in a reduction of the temporary habitat disturbance from 22.27 acres to 6.07 acres).
 - C) The Town of Castle Rock is constructing the North Meadows Extension, a roadway that connects the Meadows Community to U.S. 85 and Interstate 25. North Meadows Extension will result in 9.4 acres of impact in the Developable Area, 1.21 acres of permanent impact in Open Space, and 0.27 acres of permanent impact in the Additional Mitigation Area in the Meadows HCP area and is being mitigated through the DRHCP.

The trail and well activities resulted in a combined total of 1.69 acres of permanent impacts and 2.94 acres of temporary impacts to Preble's habitat through the Meadows HCP. The construction of the North Meadows Extension is being mitigated through the DRHCP.

3. Future anticipated activities include:
 - A) Development of COI Parcels A and B will occur inside the Protection Zone but outside the riparian area and will permanently affect 5.59 acres and temporarily affect 2.15 acres of Preble's habitat. This activity is covered by the Meadows HCP.

- B) Construction of the Filing 19 Bridge will permanently affect 0.69 acres and temporarily affect 3.7 acres of Preble's habitat. This activity is covered by the Meadows HCP.
- C) Construction of a future trail system north of the existing trail north of Meadows Parkway will permanently affect 0.80 acres and temporarily affect 1.3 acres of Preble's habitat. This trail will be mitigated through the DRHCP.

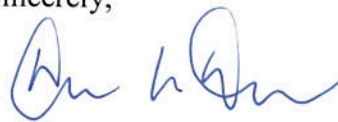
The development of Parcels A and B and construction of the bridge will result in a combined total of 6.28 acres of permanent impacts and 5.85 of temporary impacts to Preble's habitat through the Meadows HCP. The future construction of the trail will be mitigated through the DRHCP.

Summary – The ITP for the Meadows HCP authorized 8.63 acres of permanent habitat disturbance and 24.87 acres of temporary disturbances. To date, only 1.724 acres of permanent impacts and 6.491 acres of temporary impacts to Preble's habitat have occurred. Anticipated future development is proposed to permanently disturb 6.28 acres and temporarily disturb 5.85 acres of Preble's habitat under the Meadows HCP. The remaining disturbance authorized under the February 2004 ITP for the Meadows HCP is 0.626 acres of permanent impacts and 12.341 acres of temporary impacts to Preble's habitat.

Although there are adjustments to the proposed activities addressed under the Meadows HCP, the types and locations of impacts to Preble's habitat will be similar to those anticipated in the 2012 Meadows HCP. The activities proposed under the minor amendment will remain well within the incidental take provided for the Meadows HCP. Based on the information provided, the Service concurs that these actions comply with Section 6.7.2 of the Meadows HCP and that the planned construction will be undertaken in compliance with the Meadows HCP. Additional impacts within the Meadows HCP area will be mitigated through the DRHCP.

If we can be of further assistance, please contact Leslie Ellwood of the Colorado Field Office at 303-236-4747 or by email at leslie_ellwood@fws.gov.

Sincerely,



Drue DeBerry
Acting Colorado Field Supervisor

Ref: HCP\HCP_Meadows HCP_2015_Minor Amendment_FWSconcur