

Moapa Valley, Glendale and Moapa Open Space Study



APPROVAL
RECOMMENDING THE ACCEPTANCE OF THE MOAPA VALLEY OPEN SPACE
STUDY BY THE CLARK COUNTY BOARD OF COUNTY COMMISSIONERS
BY THE MOAPA TOWN BOARD

WHEREAS, the Clark County Board of Commissioners requested and received Pre Proposal Planning funds to do an Open Space study for the Bureau of Land Management Disposal Area in Moapa and Moapa Valley and that study has been completed and;

WHEREAS, it is the intent of this plan to assist this rural community in maintaining its rural character to the extent possible while allowing development and;

WHEREAS, the study received community input from a Moapa Valley Open Space Advisory Committee who worked with County Staff and a Contractor to develop a plan that addresses all relevant topics including: land use, topography, drainage, biological resources, existing and planned transportation networks, all terrain vehicles, trails, and high potential developments areas and;

WHEREAS, the study also included input from the Moapa Town Board, the Moapa Valley Town Board, the community at large, and the Bureau of Land Management who are the primary stakeholders and;

WHEREAS, the document recommends maintaining access to adjacent federal lands, identifies appropriate OHV and passive recreational uses, protects valuable species, view sheds, and natural and cultural resources and;

WHEREAS, the document identifies strategies for protecting, conveying and managing open space and;

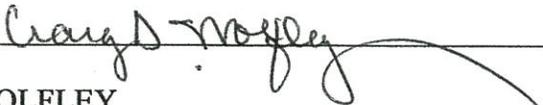
WHEREAS, the document provides adequate and reasonable amounts of disposal land for future community expansion while preserving open space and;

WHEREAS, this document can be considered as community and BCC input into the BLM decision process and;

NOW, THEREFORE, BE IT RESOLVED by the Moapa Town Board:
That the Moapa Valley Open Space Study represents a clear expression of the community which preserves community values and open space while allowing development, and as such the Moapa Town Board recommends acceptance of the study by the Clark County Board of Commissioners.

PASSED, ADOPTED, AND APPROVED this 12th day of November, 2009.

CLARK COUNTY, NEVADA

By _____


CRAIG WOLFLEY
CHAIRMAN

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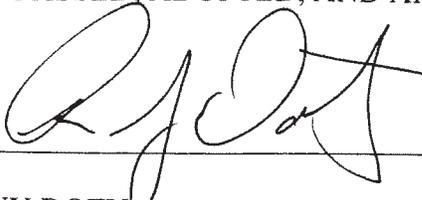
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PASSED, ADOPTED, AND APPROVED this 10th day of November, 2009.

By  _____
CLARK COUNTY, NEVADA
GUY DOTY
VICE-CHAIRMAN



ACKNOWLEDGEMENTS

Moapa Valley Town Advisory Board

Gene Houston, Chair
Guy Doty, Vice-Chair
Judy Metz
Billy Mildice
Deborah Greco

Moapa Town Advisory Board

Craig D. Wolfley, Chair
Jan Johnson, Vice-Chair
Ann Schreiber
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Clark County

Rory Reid, Chair, Commissioner
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Chris Giunchigliani, Commissioner
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Lawrence Weekly, Commissioner

Virginia Valentine, County Manager

Barbara Ginoulas, Comprehensive Planning Director
Dave Carlson, Project Manager
Matt LaCroix, County Liaison

Moapa Valley Open Space Study Committee

Thanks to the members of the Moapa and Moapa Valley communities for their assistance and willingness to participate in this planning process.

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Clark County graciously acknowledges the BLM and SNPLMA for funding and participating in this planning project.



LIST OF ACRONYMS

- ACEC.....Area of Critical Environmental Concern
- ATV..... All Terrain Vehicle
- BLM Bureau of Land Management
- ESA..... Endangered Species Act
- LTS Logandale Trail System
- LVFO Las Vegas Field Office
- MSHCP.....Multiple Species Habitat Conservation Plan
- NPS National Park Service
- OHV.....Off Highway Vehicle
- R+PP Recreation and Public Purpose
- RAMPRecreation Area Management Plan
- Reclamation..... Bureau of Reclamation
- RMP Resource Management Plan
- ROW..... Right of Way
- SRMA Special Recreation Management Area
- TAB..... Town Advisory Board
- VRM..... Visual Resource Management





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* Chapter 7 was added following approval of the Moapa and Moapa Valley Town Advisory Board.



01 Project Goals



The Challenge

“A new ethical attitude about land use is needed in order to protect Moapa Valley’s way of life for everyone’s benefit.”

The greater Moapa Valley is at a crossroads in its history. The Moapa Valley population has almost doubled since 1980 and has grown by more than 66 percent since 1990, as shown in Figure 1-1¹. During the 1990s, the population growth for Moapa Valley exceeded Nevada’s already rapid growth rate. Both Moapa and Moapa Valley will continue to see significant population growth in the next 20 years, which will affect their lifestyle, infrastructure, local government, recreational demands, and land use. With the population forecasted to double again by 2020, now is the time to look long-term.

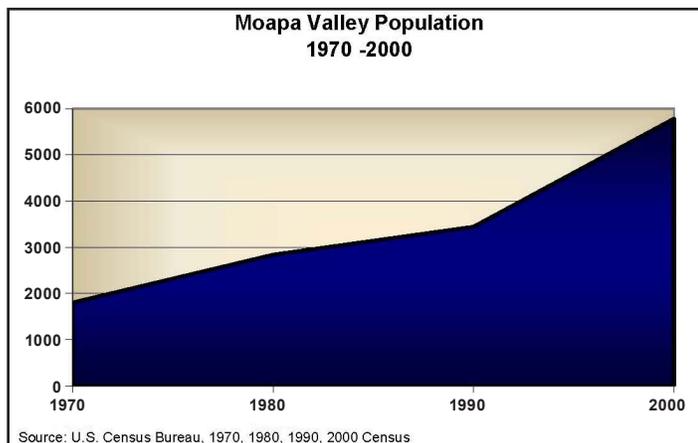


Figure 1-1. Moapa Valley Population 1970 – 2000

For residents and tourists to Moapa and Moapa Valley, the high growth rate comes as no surprise. The valley’s rich cultural history, expansive views, abundant wildlife, rural lifestyle, and ease of recreational access to public lands make the valley a magnet for families and newcomers from Las Vegas, only an hour to the south.

As the Moapa Valley inevitably changes over time, Clark County, the Moapa Town Advisory Board, and Moapa Valley Town Advisory Board are committed to making the right changes. The greatest opportunity to proactively change the future is on public lands identified for “disposal.” In eastern Moapa Valley, 11,000 acres of land managed by the Bureau of Land Management (BLM) are proposed to change ownership under the BLM’s Las Vegas Resource Management Plan. Identifying the desired open space system is of utmost importance to preserving future opportunities and minimizing future costs of acquisition.

This project asks the following questions:

- How will Moapa and Moapa Valley physically accommodate growth, while maintaining its attractive small town rural lifestyle?
- While growth brings economic development advantages, area residents want to avoid a growth pattern such as what has occurred in Las Vegas. How can access to public lands be maintained, and damage to the Valley’s sense of place from vandalism, uncontrolled OHV use, and inappropriate development be avoided?
- Residents are concerned that developers would subtract from the community’s tourism and recreation base by not providing recreation and open space infrastructure. How can growth in the BLM disposal area be managed in advance in order for community values to be accounted for?

The Vision

The 2005 Moapa Valley Community Profile and Vision Plan established a vision which holds true today. It stated that:

“The future of Moapa Valley will be strongly influenced by the natural resources base in which the community is embedded - a limited water supply, striking natural features and viewsheds, nearby Lake Mead, and a vital history and landscape characterized by a rural quality of life. Growth of the community should be directed and managed to ensure greater economic diversity, quality employment, affordable housing, medical health facilities, and tourist-based development compatible with a rural quality of life. Growth and development should not come at the expense of diminishing the very qualities that make the community special, but rather a balance needs to be established between growth and the expansion of public services such as water, schools, public safety, and preservation of the natural resources...”

This vision can be achieved in the BLM disposal area through the following goals articulated by the Open Space Committee:

1. Protect valuable species, viewsheds, and natural and cultural resources
2. Maintain access to nearby Federal lands
3. Identify appropriate OHV and passive recreational uses
4. Accommodate future community expansion
5. Identify strategies for protecting, conveying, and managing open space

To these ends, the Moapa Valley Open Space Study inventories the natural, scenic, recreational, and cultural attributes within the BLM disposal area to identify logical opportunities for conserva-

1 Final Moapa Valley Community Profile and Vision Plan. Clark County 2005.

“Moapa Valley will strive to set aside land eligible for release by BLM for open space and recreational uses.”

- Moapa Valley Community Profile and Vision Plan, 2006

tion, development, and recreation. Later in 2009, the project will propose means to protect these sensitive lands in order to preserve the area’s rural lifestyle and provide access to nearby federal lands. Federal agencies have indicated that they are prepared to work with local governments to preserve areas of open space that are near developing areas.

Plan Background

In 1998, the Bureau of Land Management created the need for this plan by identifying 40,950 acres as “potentially available for disposal through sale, exchange, or Recreation and Public Purpose patent to provide for the orderly expansion and development of southern Nevada” in the Las Vegas Resource Management Plan and Final Environmental Impact Statement² (see Figure 1-2). This Resource Management Plan can be changed through 1) a formal amendment process, 2) the plan update (anticipated to begin in 2010), or 3) through action of the United States Congress. Unlike in the Las Vegas Valley – where land disposal is governed by the Southern Nevada Public Land Management Act – the decision to dispose of land in Moapa Valley is a discretionary not mandatory one. Upon receiving a request for disposal of any of the lands, the BLM would consult with the local community and their views would be considered.

During the BLM Resource Management Planning process in the 1990s, stakeholders indicated that many local residents mistakenly and strongly supported establishing the disposal areas to prevent the BLM from limiting recreation uses or from designating nearby lands as Area of Critical Environmental Concern. Anecdotal evidence suggests that at the time, local residents did not recognize the true intent of disposal areas - as locations for future community development. This misguided interest in keeping the disposal areas open for recreation continues to complicate planning today.

In 2003, with an accurate anticipation of the eventual privatization of the disposal area and in the face of intense growth pressures, Clark County, Town Advisory Boards, University of Nevada Cooperative Extension, and a strategic planning com-

mittee of interested citizens began researching, developing and supporting plans that reflected the communities’ rural lifestyles, unique identities, and historic heritage while improving the quality of life. Since 2003, the Town Advisory Boards and the Moapa Valley Strategic Planning Committee were instrumental in:

- Conducting and publishing an issue identification survey
- Producing the Moapa Valley Community Profile and Vision Plan in 2005
- Completing a community trails plan and trail standards plan in 2003
- Receiving funding for design and construction of trail segments
- Mapping a second access to Interstate 15
- Developing the Moapa Valley Design Standards
- Receiving funding to update the community trails plan in 2008, and
- Receiving funding to complete an open space plan for the BLM disposal area from the SNPLMA Special Account in 2008

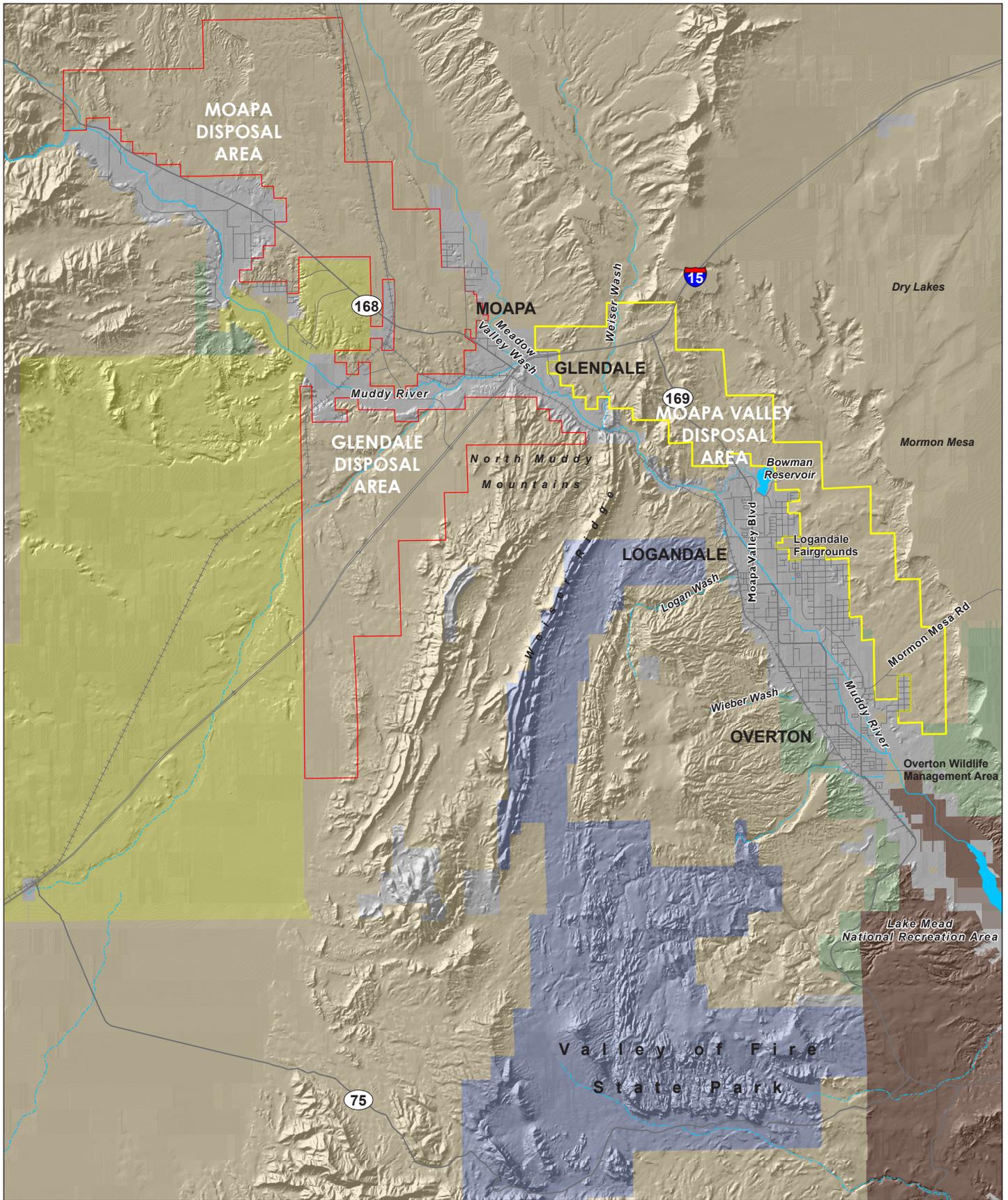
Clark County initiated open space planning for 40,950 acres in three disposal areas in Moapa-Glendale and Moapa Valley in 2007. However, in 2008 the Moapa Town Advisory Board withdrew participation in the study, requesting instead that the BLM remove the disposal area designation as a means to prohibit future development. The Moapa Valley Town Advisory Board continued the study for one disposal area, under the philosophy that growth was inevitable but manageable through proactive, community-based planning. Therefore, the focus of the Moapa Valley Open Space Study is the southeastern-most BLM disposal area located east of Logandale-Overton (Figure 1-3). The project area is approximately 11,460 acres. This disposal area is very unique in terms of its access, its landform characteristics, and its setting within the community as described in Chapter 2. Lands within the Focus Areas are primarily managed by the BLM, with small parcels held by the Bureau of Reclamation (Reclamation) and private parties, as shown in Table 1-1.

Table 1-1. Land Ownership in the BLM disposal area

BLM	Clark County	Private	Reclamation	Total Acres
11,220	113	7	120	11,460

2 Bureau of Land Management. May 1998. Proposed Las Vegas Resource Management Plan and Final Environmental Impact Statement, Volume 1.

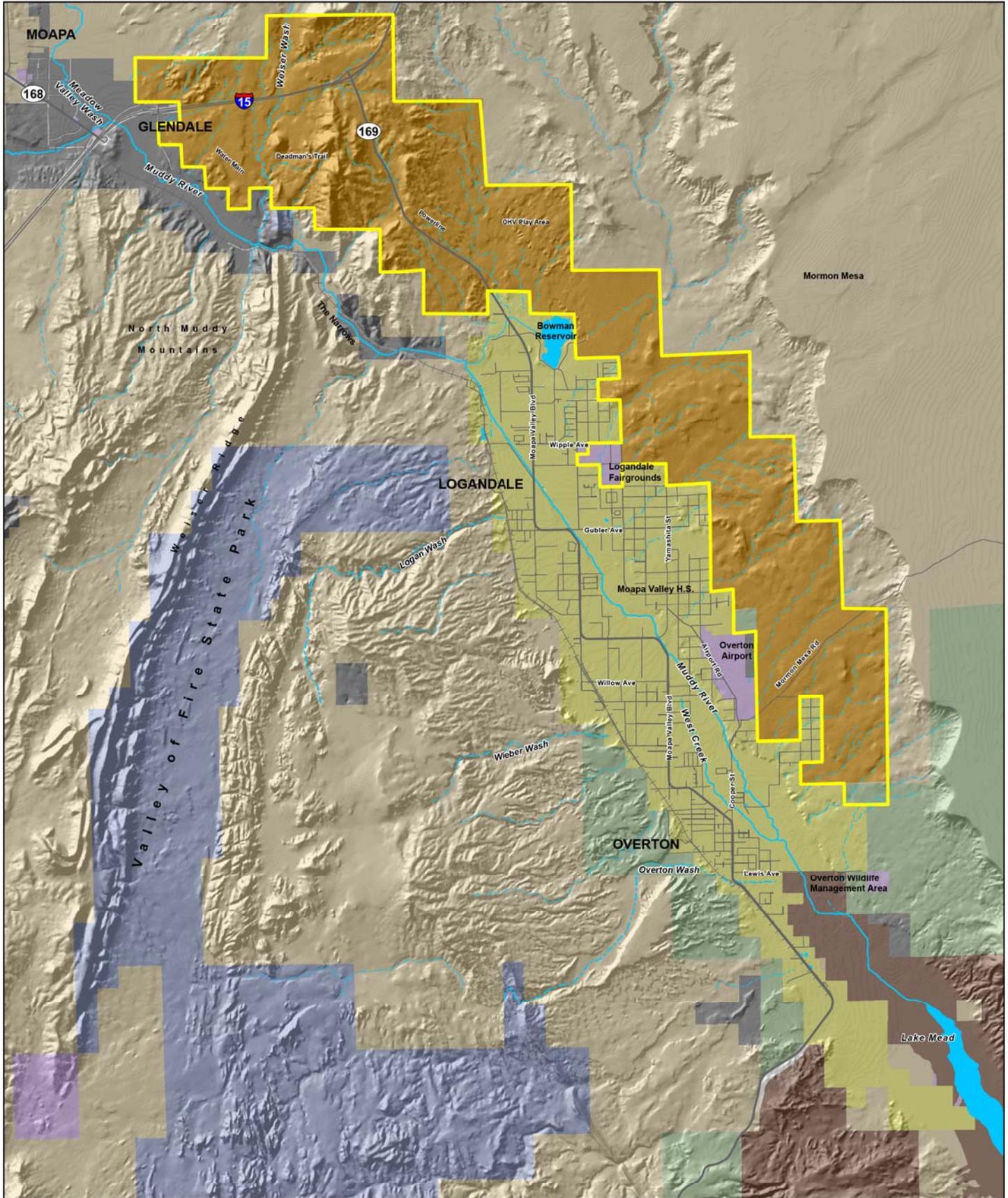




- | | | |
|--------------------------|----------------------------------|-----------------------|
| Project Study Area | Land Ownership/Management | Bureau of Reclamation |
| Other BLM Disposal Areas | State of Nevada | Paiute Reservation |
| | National Park Service | Private Land |
| | Bureau of Land Management | |

*Moapa Valley
Open Space Plan
Figure 1-2. Regional Context*

MOAPA VALLEY, GLENDALE AND MOAPA OPEN SPACE STUDY



- | | | |
|---|------------------------|--------------|
| Project Study Area | Land Management | State |
| Moapa Valley Open Space Study Area (BLM Land) | BLM | Other Public |
| Moapa Valley Trail Study Area (Private Land) | NPS | Private/ ROW |
| | Reclamation | |

*Moapa Valley
Open Space Plan*
Figure 1-3. Open Space & Trails Study Area

0 0.5 1 Miles

Moapa Valley Community Profile and Vision Plan, 2005

Development of a plan to protect open space and trails was a key recommendation of the Moapa Valley Community Profile and Vision Plan. This and other plans reflect the understanding that environmental policies are interrelated with land use and growth decisions. Note the emphasis on protecting hillsides, rural character, scenic resources, trails, and sustainable development in the plan's goals and strategies for land use, environmental quality, and open space, shown on the following page.

The Northeast County Land Use Plan, 2006

As required by state law, the Northeast County Land Use Plan establishes the regulatory land use goals, policies and maps as a guide for decisions by the private sector, Moapa and Moapa Valley Town Advisory Boards, Planning Commission, and Board of County Commissioners concerning growth and development. It states, "The Northeast Clark County Plan seeks to establish a network of protected open spaces that correspond to significant regional natural features. Protecting open space provides regional, environmental, economic, social, educational, and recreational benefits."

With few exceptions, most of the BLM disposal area is designated as Open Land zoning as shown in Figure 1-4. The Open Land category provides "for permanent open space in the community; to prevent irreversible environmental damage to sensitive areas; and to deter development in areas with highly limited availability of public services and facilities; or severe natural constraints (i.e. areas with 12% or greater slope). Lands are primarily in public ownership. Grazing, open space, and recreational uses may occur."

"There are ridgelines in some of these [disposal] areas which have been identified by the communities to be excluded from any potential development...Disposal of these lands at this time is considered premature."

- Northeast Clark County Land Use Plan, 2006

This land use plan supports local stakeholders' intent that with few exceptions, most of the Moapa Valley disposal area should remain as permanent open space. Much of the disposal area is badlands topography and not suitable for development. It recommends further studies for land use, water, and limited resources prior to any disposal actions.

Several policies from the Northeast Clark County Land Use Plan relate to the Moapa Valley Open Space Study's purpose, namely:

Policy 22.3: Encourage all development to employ ample active and passive open spaces in their overall site design and integrate those open spaces, where possible, with connectivity to adjoining properties, trail systems, view sheds, preservation of historical value, schools and public park facilities in an effort to meet the needs of the community.

Policy 28.1: Encourage the integration of funding and goals to build multi-purpose projects that fully use land set aside for public purpose; specific funds from flood control, transportation, recreation, and other agencies should be focused on multiple objective projects.

Policy 28.2: Encourage preservation and protection of washes and waterways.

Policy 28.3: Encourage transitional development to buffer environmentally sensitive lands from more intensive uses.

Policy 28.4: Encourage development to provide access to existing and planned trail facilities.

Policy 32.7: Encourage the development of a designated horse trail system.

This County plan re-iterates the purpose of BLM land disposal boundaries (to promote an orderly method of land disposal between public and private stakeholders) but adds that limiting factors to this boundary include: federally designated lands, slope, environmentally sensitive lands, cultural resources, and buffers for these areas.

The Moapa Valley Trails Study and Other Ongoing Trail Projects

The Moapa Valley Open Space Study and its public involvement is being conducted in tandem with the Moapa Valley Trails Study (led by Clark County Department of Comprehensive Planning and Alta Planning + Design) and the Phase 1 Trails Project (led by Clark County Department of Transportation). The study area for these other trail projects is shown in yellow in Figure 1-3. These ongoing projects are important building blocks in achieving a connected trails system, and are further described in Chapter 2.

Several policies from the Moapa Valley Community Profile and Vision Plan relate to the Moapa Valley Open Space Study's purpose, namely:

Land Use Goals

- Growth in Moapa Valley should be logical, predictable, sustainable, and foster and protect the quality of life of all its citizens.
- Moapa Valley will maintain its rural, small town nature by welcoming new sustainable development only in designated areas where public water and sewer services have been expanded to accommodate growth.
- Moapa Valley will only encourage new small-scale developments that are interspersed with plenty of open land and recreational areas, transitioning to open farmland and blending into the surrounding rural environment. Moapa Valley will attempt to preserve its historical agricultural economy.

Land Use Strategies

- Moapa Valley will develop a plan for managed growth that recognizes the diverse needs of its residents at all stages of their lives while seeking to maintain its largely rural and residential characteristics.
- The residents desire to promote a unified identity for Moapa Valley.
- Moapa Valley will seek to prevent the release of nearby BLM lands until such time that a plan has been developed to provide for necessary public infrastructure including water, wastewater, transportation, and schools.
- Moapa Valley will strive to set aside land eligible for release by BLM for open space and recreational uses.
- Moapa Valley will require developers of new housing to offset reductions in farm open space with other open space.

Environmental Quality Goal

- Moapa Valley seeks to preserve its agricultural heritage and rural landscape by protecting the environment including air and water quality, viewsheds, and habitat.

Environmental Quality Strategies

- Moapa Valley will protect environmentally sensitive habitat.
- Moapa Valley will protect its visual resources and viewsheds.
- Moapa Valley will manage development in ways that minimize impacts on its rural character.
- Moapa Valley will seek to maintain a sustainable per capita use of its natural resources.
- Moapa Valley will only pursue development strategies that do not adversely affect the natural environment.

Open Space Goals

- Moapa Valley recognizes the importance of the natural environment to preserving the small town feel of the area, and will seek to balance new growth with the preservation of open space.
- Moapa Valley seeks creative development that includes lots of various sizes and acreage.
- Moapa Valley seeks to protect its ridgelines and hilltops.

Open Space Strategies

- Moapa Valley will promote and support community volunteer and private sector efforts, including pursuing grants to increase open space and enhance recreational opportunities.
- Moapa Valley will compile a scenic resources inventory.
- Moapa Valley will develop a plan identifying priority trails, connections, opportunities, and constraints.
- All citizens will be well-served by an extensive system of park facilities and recreation programs.
- Moapa Valley will encourage the preservation of hillsides and ridgelines as well as some of the nearby BLM land for open space.
- Moapa Valley will encourage the recruitment of sport and recreation-related business as part of its economic development plan. Safety to the community and air quality should be a priority in identifying those businesses.



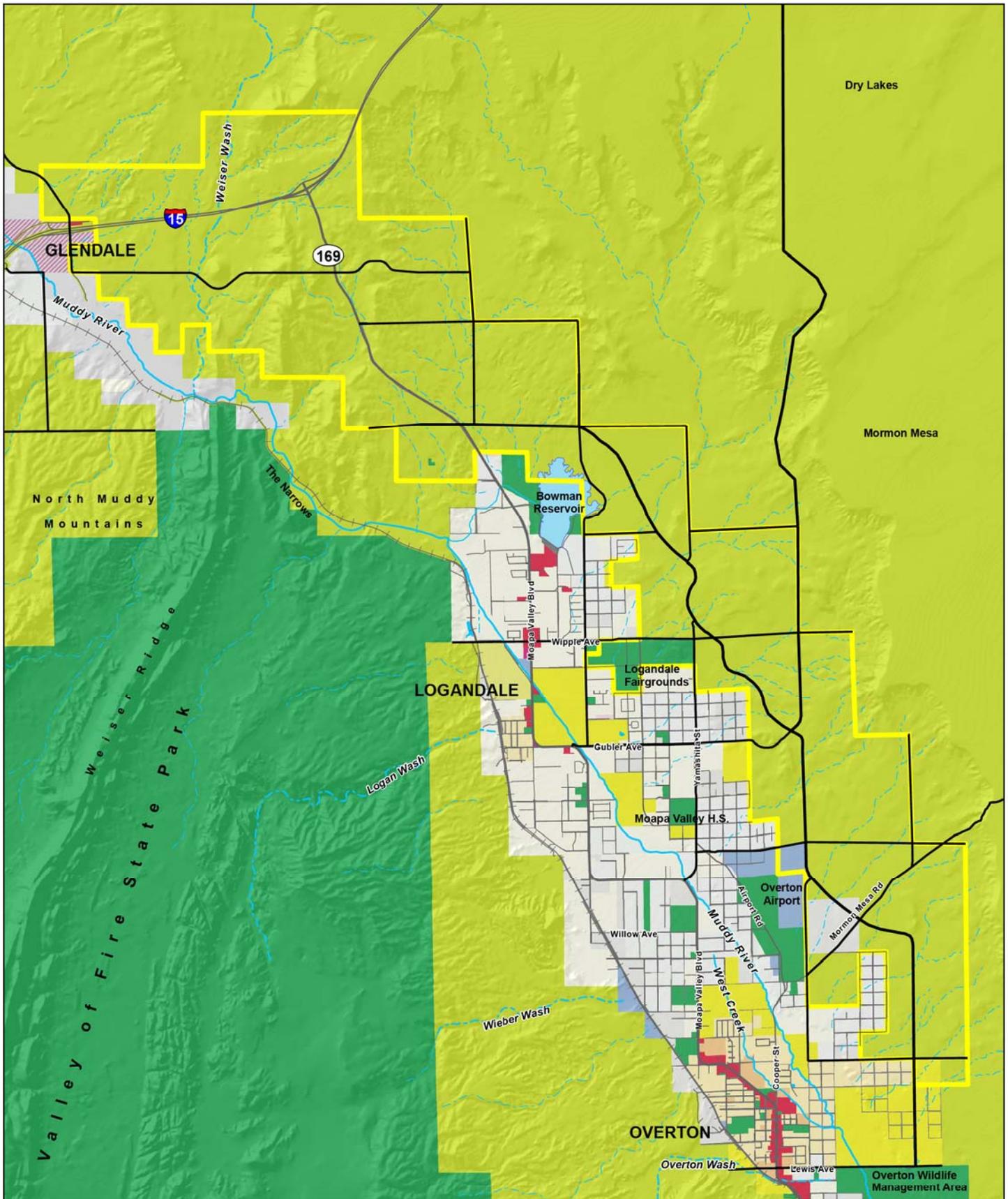


Figure 1-4. County Planned Land Use

Relationship to BLM Resource Management Planning

The planning process was designed to assist the BLM in reconciling regional issues in support of their mission. Specifically, this plan seeks to create a defensible platform for joint BLM and Clark County recommendations, and to avoid the challenges presented by the Upper Las Vegas Wash Conservation Transfer Area. The Moapa Valley Open Space Study does not suggest changes to BLM land management practices, as these are governed by the 1998 Las Vegas Resource Management Plan.

Once approved by Clark County Commissioners, the BLM would treat the Moapa Valley Open Space Study as an advisory document. It will help the BLM understand direction from the local community and as a tool in evaluating potential disposal actions.

Relationship to Bureau of Reclamation (Reclamation) Land Management

A small portion of the disposal area contains lands managed by Reclamation. Managing these properties for high recreation use levels or community development is not feasible for Reclamation at this time. Therefore, Reclamation is in the early stages of developing a long-term lease for Clark County to take over management and liability for most of the Reclamation lands in the Moapa Valley, primarily due to flood control needs. The Reclamation lease would be similar to a Recreation and Public Purpose (R&PP) lease, but would use a different form. The primary purpose of the lease is for flood control but recreation and open space are other valid purposes. An environmental assessment is required before Reclamation can sign the agreement.

Public Involvement

The Moapa Valley community has been planning for change in the disposal area since its designation in 1998. Since 2007, stakeholders informed the development of this plan through stakeholder interviews, an open space committee, Town Advisory Board briefings and a worksession, and public events on March 12, May 27 and October 28, 2009. The Plan was designed as a cooperative planning process with the Bureau of Land Management and other land management agencies.

To that end, the project team conducted phone, in-person, and small group interviews with over 40 individuals in March 2009 to inform the planning process. The interviews were designed to 1) assess support for the project, 2) identify issues, 3) and request information. Individuals from the following organizations were contacted:

User Groups

- Moapa Valley Runners Club
- Equestrian users
- Boy Scout Council
- Overton Motorsports

Conservation Organizations

- The Nature Conservancy
- The Conservation Fund
- Lost City Museum

Development and Business Interests

- Moapa Development Group
- The Pound Group

Political Stakeholders

- Moapa Valley Town Advisory Board
- Moapa Town Advisory Board
- Board of County Commissioners

Resource and Land Management Agencies

- Bureau of Land Management
- Lake Mead National Recreation Area
- Bureau of Reclamation
- National Park Service, Rivers and Trails Conservation Assistance Program
- Nevada Energy
- Overton Power
- Moapa Valley Water District
- Clark County Regional Flood Control
- Nevada Department of Wildlife



- Moapa Wildlife Refuge
- Valley of Fire State Park
- Clark County Departments of Comprehensive Planning, Parks, Public Works, Transportation, and Property Management

Major Findings and Comment Themes

Support for the Project. Most interviewees expressed support for the Moapa Valley Open Space Study and its process as a proactive step towards planning for the Valley's future. All BLM staff in attendance supported the project's intent and identified specific concerns that should be addressed during the process (see Challenges, below).

While the Moapa Town Advisory Board withdrew two of the three BLM disposal areas from the study, they are supportive of the opportunity to evaluate suitable development and open space areas within the Moapa Valley disposal area.

How would you define a successful plan?

Based on stakeholder feedback, a successful plan would be one that:

- Partners with the BLM and assists them in achieving their goals, as nearly all of the disposal area is on land managed by the BLM;
- Includes representatives from the BLM and Town Advisory Boards to keep one another informed about the project status;
- Develops defensible, fact-based open space and trail mapping
- Identifies realistic and achievable ownership and management options that are sustainable over the long-term.
- Recommends methods to direct and manage uncontrolled OHV use.

What challenges must the plan address?

Eventual Management of Urban Open Space. While urban open space can be desirable for trails, scenic area preservation, economic development, and wildlife movement, it does create potential management issues for resource and land management agencies, such as illegal dumping and shooting. The disposal area was designated in order to remove the BLM from management increasing responsibilities; another party would need to take explicit and funded management of the land, which could be challenging in light of current economic conditions. Land conservation is only half the answer for an open space network, as many preserved lands are degraded through unlawful activities or overuse. With the exception of the Clark County Wetlands Park and some work by the Desert Conservation Program, the County does not have experience in maintaining open spaces and does not have maintenance programs for soft-surface trails and natural washes.

For these reasons, agency stakeholders suggested that identifying management (i.e., maintenance) responsibilities and realistic funding sources for urban open space is critical, perhaps more essential than mapping the desired system. As stated by one interviewee, the BLM is not prepared to manage County open space, nor is the County prepared to manage BLM land.

OHV Trail Use. Off-highway vehicle riding is the fastest growing and dominant recreational activity, often to the exclusion at times of hiking, equestrian, and wildlife observation. According to local residents, OHV use has increased dramatically in the Moapa Valley since the Logandale Trail System was designated. Land managers are seeing a dramatic increase in off-road vehicle use from Las Vegas users. For this reason, local residents and management agencies are wary of advertising another formal system. New OHV trails regularly created, as no signage or enforcement is provided in the disposal area. The County does not have standards for OHV trails and no County department has direct responsibility for native-surfaced trails (such as in washes) that are popular by OHV users. Land management agencies are skeptical of new alignments being proposed on public land maps unless they are incorporated into their management and capital improvement plans. Noise, dust, equestrian conflicts, and OHV use on paved roads were also cited as concerns by residents. As a result, there is hesitancy among locals to discuss creating an additional system without first confronting litter, shooting, artifact destruction, and enforcement of existing trails.

Management of the BLM Interface. The plan should acknowledge issues relating to vandalism, shooting, and illegal dumping. Similar to urban open space above, neither the BLM, Reclamation, or the Fish and Wildlife Service currently have the capacity and funding to manage urban interface lands to the degree desired by many users. The plan should advocate for additional resource or partnerships. Southern Nevada communities and recreation interests are changing, and agency and municipal planners are struggling to provide facilities that meet their demands.



02 Moapa Valley Disposal Area Resources





Disposal: \di-'spō-zel\ *noun*. the getting rid of whatever is unwanted or useless <trash disposal is on Wednesday in our neighborhood> **Synonyms:** discarding, disposition, dumping, jettison, junking, removal, riddance, scrapping, throwing away. **Related Words:** clearance, clearing; decimation, demolition, demolition, destruction.
- Merriam-Webster Online Thesaurus

“Disposable” Resources

The designation, BLM Disposal area, is accurate in the sense that the Bureau of Land Management has authority to transfer control of land managed by the Federal government to another party. Unfortunately, however, the term *disposal* conjures up references to garbage, hazardous waste, and unnecessary or useless objects that can easily be discarded. Not surprisingly, in surveying disposal areas in southern Nevada, one finds deserted land encumbered with landfills, detention basins, power lines, highways, and other infrastructure that is often intentionally placed out of sight and out of mind. At the edge of urbanization, as is the case in Moapa Valley, disposal areas are commonly littered with refuse, bullet shells, and social trails. Once designated, the BLM reduces functions, illicit activity increases, and natural resources become degraded. Those familiar with the Moapa Valley disposal area, however, view it as a community gateway and key ingredient of their rural lifestyle. This chapter summarizes the BLM and community’s values toward disposal area resources to inform potential trail, open space and development areas. The Open Space Advisory Committee reviewed all pertinent, available inventory data as a supplement to their collective experience and professional judgment.

To begin the inventory process, the project team compiled a GIS database of the most accurate, available resource information for the disposal area. Every effort was made to locate the most recent data through interviews and contacts with stakeholders. Sources included Clark County and multiple non-profit, state and federal agencies. Specific questions about each dataset should be referred to the appropriate county department or source agency. Locations of sensitive or confidential data, such as archeological and biological data, are deliberately shown with only a general location indicated. Data was categorized into six resource areas:

1. Trail Resources
2. Biological Resources
3. Physical and Natural Drainage Resources
4. Infrastructure Resources
5. Visual Resources
6. Cultural Resources

All data source are provided in the appendix of the final plan.

Trail Resources

Trail planning activities have been ongoing in the greater Moapa-Logandale-Overton area for at least 10 years. The following studies were considered in the decision-making process of this plan:

- BLM Las Vegas Resource Management Plan and FEIS (1998)
- Moapa Valley Trail Master Plan (2003)
- Logandale Trails Plan (2007)
- Moapa Valley Trails Plan (Ongoing)

BLM Las Vegas Resource Management Plan and FEIS

In addition to designating the BLM disposal area, this management plan permits OHV use on existing roads and trails, and in washes if the wash is greater than 6 feet across. The BLM recommends that non-OHV recreators use existing routes they are currently allowed to travel cross-country.

Moapa Valley Trail Committee Master Plan

Residents of the Moapa Valley area formed a Trail Committee in 2001 to plan and advocate for the development of an extensive trail network. The vision of this group was to have multi-use trails that connect the communities to each other and the surrounding landscape. The Committee created a map accompanied by trail standards and its proposed trails formed the basis for trail alignments in subsequent plans.

Logandale Trails Plan

The Logandale Trail System (LTS) is located on BLM-managed land just west of Moapa Valley, Nevada. An Integrated Resource and Recreation Area Management Plan and EA were prepared by BLM, Reclamation and Nevada State Parks to address increasing public use of the area. The purpose of the LTS is to offer multiple recreational experiences and opportunities in a safe and desirable environment, while at the same time protecting the resources of the area. Connectivity of the Logandale Trail System with local and regional trails systems is a concomitant goal.

The LTS is a system of trails used by a variety of recreationists. Activities include picnicking, hiking, off-highway vehicle (OHV) touring, free play and events, camping, nature study, scenery viewing, equestrian, and interpretive activities. Currently, OHV activities are the most popular use of the area. Future recreational use of the area is expected to increase. The LTS divided the area into a series of management zones to allow for dispersed and diverse recreational uses. This system of separation across the landscape provides a variety of uses from solitary hiking to OHV activities. Delineation of the management zones was based on the type and extent of the resources, the type and demand of recreational use, and available facilities.

Proposed trail alignments from the Logandale Trails System were used to inform trail alignments in this plan.

Moapa Valley Trails Plan (to be completed in early 2010)

To follow up on the trail planning started by the Moapa Valley Trails Sub-Committee and the Logandale Trails System, Clark County and the BLM decided to fund a more in-depth study of trail opportunities on private lands in the developed area of Moapa Valley. The County retained Alta Planning and Design to assist with the preparation of the plan. This ongoing study intends to capture the opportunities afforded by the setting through the development of a trail network linking key destinations. Within Logandale and Overton, park sites, schools, museums, neighborhoods, the fairgrounds, commercial and business centers are all key destinations that could be well served by a trail network. In addition, regional linkages will be considered that include the Lake Mead National Recreation Area, surrounding BLM lands as well as potential OHV access and connections. A well developed trail system will give the residents both recreational opportunities as well as an alternative transportation resource.

Clark County, community committee members and consultants are working together to plan trails for both the private area and BLM disposal area to come up with an integrated trail network for the greater Moapa Valley area. This integration is important to provide important linkages and balance the types and length of planned trails.

Existing Trails and Uses

Moapa Valley has a significant number of routes (roads and trails) that are used for “trail experiences” (Figure 2-1.). Within the BLM disposal area, most of the roads were created for access to utility ROWs. The public has also historically used natural washes as routes to explore and recreate. Many other

routes (“social trails”) have been created by various motorized and non-motorized recreators to provide cross-country route connections. These social trails are most often concentrated close to residential neighborhoods where more people have easy access. OHV recreators have also created a play area northeast of Bowman Reservoir. This play area is easy to access from Moapa Valley Boulevard and is comprised of highly dissected natural landforms conducive to OHV bumps and berms. OHV use has extended close to the reservoir’s edge, causing the loss of riparian vegetation.

Existing Routes in the disposal area	Miles
Right of Way Roads	15.8
Other Roads	4.3
Trails In Washes	22.4
Upland Social Trails	63.7
Total	106.1

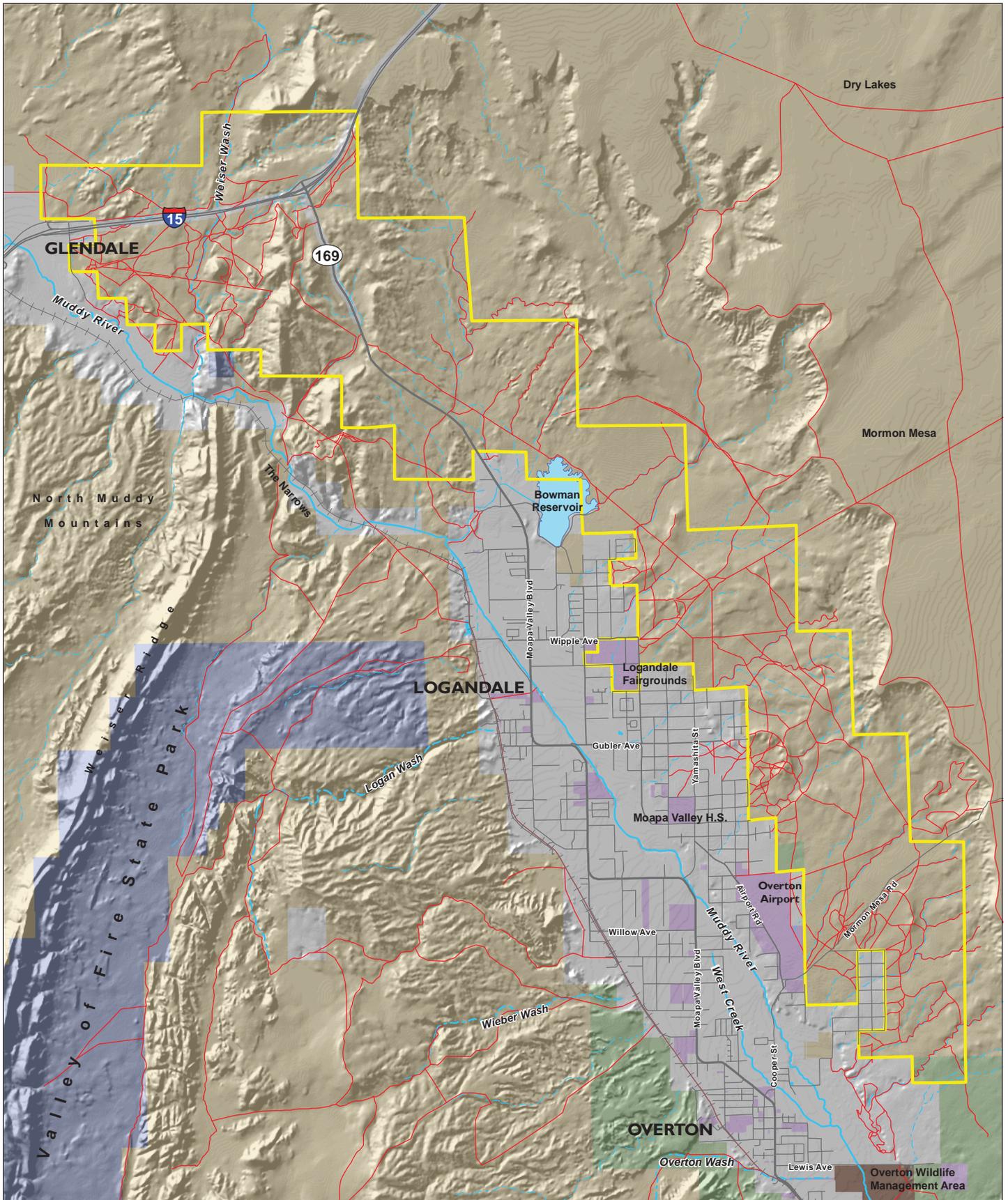
Note: Totals do not include Moapa Valley Boulevard, Interstate 15 or Mormon Mesa Road through the disposal area.

Community Outreach Findings

Key trail themes from the open space committee, trails committee, stakeholder interviews, and public meetings regarding the BLM disposal area include:

- Connectivity of trails and trailheads, and equestrian uses are important components to stakeholders.
- Create a motorized loop trail to connect towns in the region
- Visitors bring large trailers of OHVs. This could provide an opportunity for an RV park with hookups located at an OHV trailhead.
- Provide at least one trail that is north-south through the disposal area.
- More than one north-south trail may not be supportable by either the BLM or future developers.
- It is important to look beyond the disposal area to adjacent BLM lands in order to see the big picture, loops, etc.
- Keep OHV use away from development areas as much as possible.
- The plan has to be compatible with new owners that may purchase and develop the property. Uplands may be more suitable for development, potentially leaving primarily the washes for trail corridors.
- There is disagreement regarding the suitability of washes for motorized recreation. Washes are highly desirable by motorized users as they provide a unique sense of mystery and character, with rain events changing the seasonal experience in washes by removing vegetation, sediment, and OHV tracks). However, BLM biologists and conservationists dis-





- ~ Existing Trails and Routes
- Project Study Area
- Land Management**
- BLM
- NPS
- Reclamation
- State
- Other Public

**Moapa Valley
Open Space Plan**
Figure 2-1. Existing Trails and Routes

courage using washes for OHV use due to habitat and soil impacts. At the same time, BLM's policy is to allow OHV use in washes greater than 6 feet wide. The study should explore other options for OHV trails beyond washes, such as uplands. In the disposal area, uplands can be traversed – whereas in the Logandale Trails System the upland terrain was too steep for OHV routes so washes had to be used.

- There is need for an OHV Play Area and loop around Bowman Reservoir.
- The Cement Plant area is more suitable for OHV trailhead development to avoid residential conflicts near the reservoir.
- Provide multiple trails from town to the Mormon Mesa.
- Provide trails east-west across Moapa Valley Boulevard and towns.
- Non-motorized access across the Bowman Reservoir dam would be supported by the Irrigation District. The dam is not engineered for continual motorized use.
- Motorized watercraft on Bowman Reservoir contribute to dam erosion.
- Possibility of developing a BMX and/or Motocross park could be explored as a way of consolidating those user groups and a possible source of revenue.
- Where in the Valley do you most like to go on trails?
 1. Bowman Reservoir
 2. Willow to Owl Trail/Wash
 3. Perkins Wash
 4. Double Negative
 5. Wildlife Management Area
 6. Muddy River
 7. Gold Butte
 8. Huntsman Trail
 9. Valley of Fire
 10. Lost City Museum
 11. Mormon Mesa
 12. Cottonwood Trail
 13. Railroad Trail
 14. Honeybee Pond

Community Trails Survey

In 2009, as part of the Moapa Valley Trails Plan (for the privately-owned areas), Clark County and Alta Planning and Design completed a community opinion survey to understand trail use and preferences. While this survey focused on the privately-owned areas, questions were general and related to trails in the greater Moapa Valley. The goals of the survey were as follows:

- Assess existing, needed and potential use of trails and trail facilities within the Moapa Valley
- Identify the needs and issues specific to: pedestrians, cyclists, equestrians and ATV users.

A brief summary relevant to the BLM disposal area is provided below. For the complete results, refer to the Moapa Valley Trails Plan.

Survey Response

- 121 responses (1.5% of the Moapa Valley population, which is approximately 7,000 – 8,000 residents)
- Response mode: 89% on-line
- Gender: even male/female
- Residency: 85% live in Moapa Valley

Respondents believe the primary benefits of trails are:

- Recreational opportunities - 81.4%
- Reduced exposure to auto traffic - 55.8%
- Improved physical fitness and health - 53.5%
- Nature watching - 30.2%
- Active transportation - 24.4%
- No benefits – 4.7% (lowest scoring category)
- (Participants were allowed to select up to 3 of 10 proposed benefits)

Reported Trail Activities

- 75% - Walk (including pet walking)
- 66% - ATV/OHV/Motorcycle
- 42% - Bicycle
- 33% - Ride horses
- 28% - Run/Jog

Walking

- A majority walk on a weekly, if not daily, basis
- Zero respondents reported that they never walk
- The average distance respondents walk is less than 5 miles
- Walkers and runners currently utilize roads with a slight preference found for paved over unpaved surfaces
- Moapa Valley Boulevard is currently used by 31% of respondents for walking.

Cycling - Where do you usually ride?

- “Around the reservoir, desert on unpaved roads”
- “Dirt roads in Logandale surrounding Fairgrounds area.”
- “Mountain bike riding in the desert”

Equestrian Use

- 40% of respondents are interested in horseriding
- All respondents to the equestrian section of the survey own 2 or more horses
- 70% of equestrians begin their trip from their home (30% trailer to a destination)



- The majority of rides last 1-2 hours
- 3 - 6 miles is the most common distance traveled during a trip.
- 45% typically ride on public lands
- 42% were unsure of land ownership where they ride
- 74% reported that they would use equestrian trails if provided

Where do you ride horses?

- “In hills anywhere nearby. Post offices, behind the old Simplot, Logandale trails, Mesa, behind Clark County fairgrounds, Overton Wash, wildlife game farm”
- “Across Cottonwood, cross the river past airport to Mormon Mesa”
- “Fairgrounds and power line road to the reservoir”

ATV/OHV and Motorcycle Use

- 69% of respondents are interested in motorized trail uses
- Most depart directly from home (87%)
- 72% cross Moapa Valley Boulevard each time they ride.
- The average trip was reported to be 3 to 4 hours
- The average length of ride was over 10 miles
- 71% reported that they would be likely to use designated off-road trails
- 67% believe they are riding on public lands
- 30% are unsure of the land ownership where they ride

Where do you ride?

- “Over the mesa along the Virgin River, Red Rock area, Logandale Trails, Willy Flats, Overton Wash, West side of mesa from the water tank to the jump back area to Well Siding”
- “Take Cottonwood to cross RR tracks then follow smaller trails out to the Logandale trails”
- “...The reservoir area is nice and towards the Virgin River area are all fun places to take the rhino out in.”

Community Outreach Survey Conclusions

- The residents of the valley value their open spaces and recreational opportunities
- There is certainly demand for trails
- There is a need for more safe routes for bicyclists and pedestrians
- ATVers and equestrians are protective of their current riding routes and want them to remain
- Amenities like directional signs, interpretive sites, bike racks, etc. are not as important as simply having trails

Biological Resources

The project team identified locations within the disposal area which contain, or have a high likelihood of containing, species or habitats of importance or special significance. Species which are listed as rare or endangered by one or more agencies, and landscapes that provide crucial linkages, habitat, or refugia, may warrant additional protections within the planning framework.

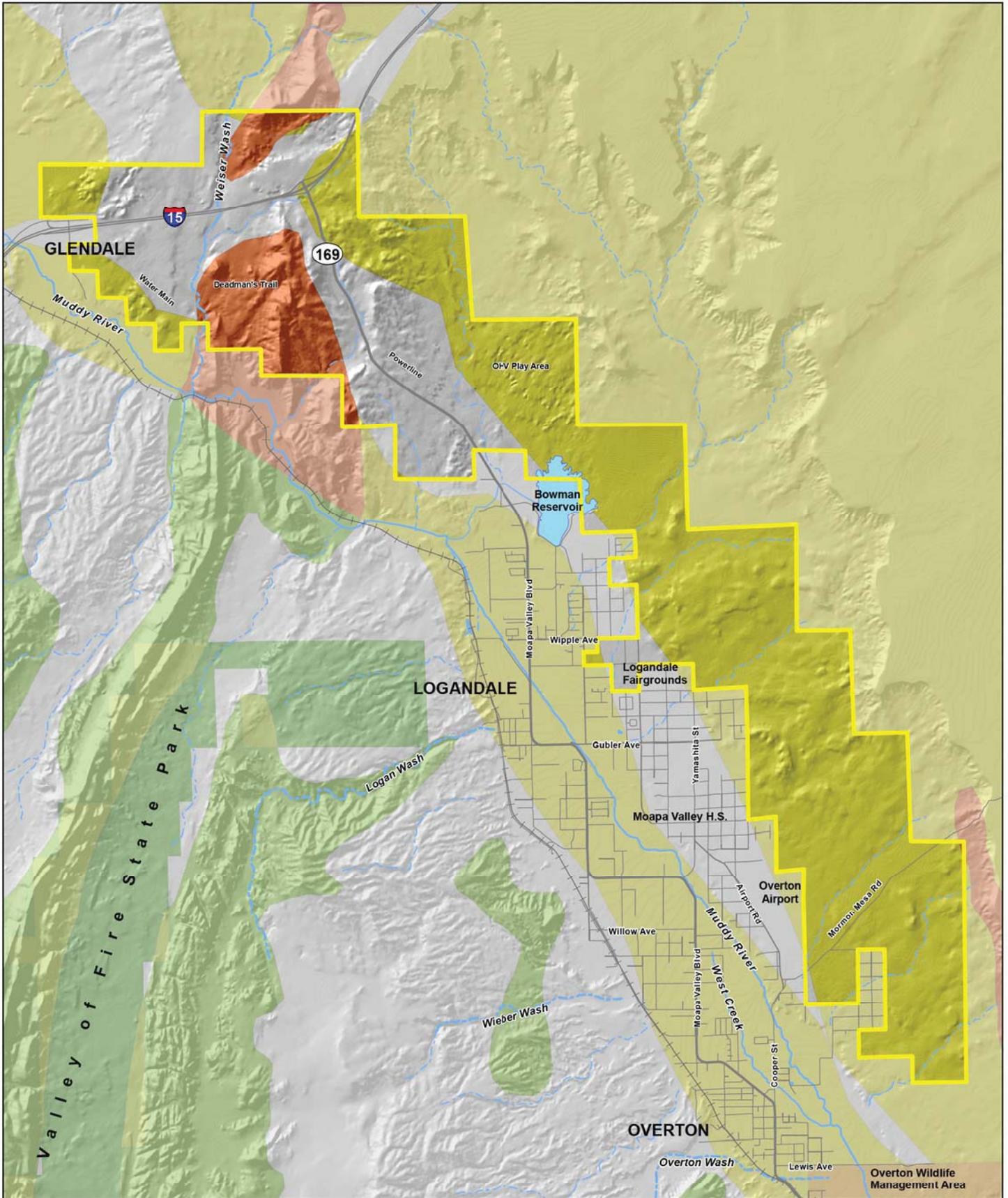
Clark County is responsible for compliance with the federal Endangered Species Act, compliance with a Section 10(a)(1)(B) incidental take permit, and for implementing the Clark County Multiple Species Habitat Conservation Plan (MSHCP).

The MSHCP employs a conservation system consisting of public land areas (primarily Federal) defined by their kinds and levels of management as it affects covered species. These conservation management areas are defined in section 2.4.2.7 (page 2.74) of the MSHCP as Intensively Managed Areas (IMA), Less Intensively Managed Areas (LIMA), Multiple Use Managed Areas (MUMA) and Unmanaged Areas (UMA). The IMA and LIMA represent the “reserve system” in Clark County, with MUMA providing conservation value as corridors, connections and buffers for the IMA and LIMA where management preserves the quality of habitat sufficient to allow for unimpeded use and migration of the resident species in the IMA and LIMA. The goal for each covered species is no net unmitigated loss or fragmentation of habitat, primarily within IMA and LIMA, or MUMA where a substantial proportion of the species habitat occurs within a MUMA. The disposal area is designated by Clark County as a MUMA conservation management category.

Environmentally Sensitive Lands:

Environmentally sensitive lands (ESL, Figure 2-2) were modeled by Clark County in 2004 to identify areas of the county which had high combined levels of the following desired resources: ecosystem level biodiversity, aesthetic areas, administrative areas, and cultural and historic areas. ESL areas are classified and ranked into seven levels of priority, one being the lowest and seven being the highest priority.

The disposal area contains two levels of priority: The majority of the central and southern portions are an ESL rank of 4; the northern portion are an ESL rank of 3.



- Project Study Area** **Priority Lands**
- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7

*Moapa Valley
Open Space Plan*
Figure 2-2. Environmentally Sensitive Lands

Biological Data

Data sources for the assessment include threatened and endangered species from the MSHCP; rare and tracked species observations from the Nevada Natural Heritage Program (NNHP); wildlife habitat models for thirty seven Mojave Desert vertebrate species based on those addressed by the MSHCP; conservation importance rankings from The Nature Conservancy (TNC) from the 2001 Ecoregion-Based Conservation in the Mojave Desert report; and landcover data from the US Geological Survey.

Threatened or Endangered Species Issues and Species of Concern

There are a number of threatened or endangered species in Clark County. The MSHCP has been developed to address these species and other species of concern in Clark County. Several threatened and endangered species of plants, animals, invertebrates, and numerous species of fish and birds are found in northeast Clark County. An example of protection measures for threatened and endangered species in Clark County includes buffer areas of 2,000 meters around private land outside of the Las Vegas Valley to reduce impacts to desert tortoise populations associated with high levels of vehicular traffic. These buffers were created to guide discussion of potential risks from the proximity of human development, and prioritization of conservation actions.

Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat are three vascular plant species of concern covered by the MSHCP in northeast Clark County, two of which are found in the disposal area.¹ If any of these species becomes listed as a state or federal threatened or endangered species, they may present challenges to land use activities in the planning area. Other species of concern in or around the disposal area are: the Mojave Gypsum bee, the red-tailed blazing star bee, the Mojave poppy bee, Allen's big-eared bat, rough fringemoss, Gold Butte moss, Virgin River thistle, Las Vegas buckwheat, Beaver Dam breadroot and rosy twotone beardtongue.

Species Richness:

A predicted habitat species richness model, Figure 2-3, was prepared from the 37 vertebrate species covered by the Clark County MSHCP. The source for the habitat models was the Southwest Regional GAP Analysis Project, led by the U.S. Environmental Protection Agency. The selected species are all

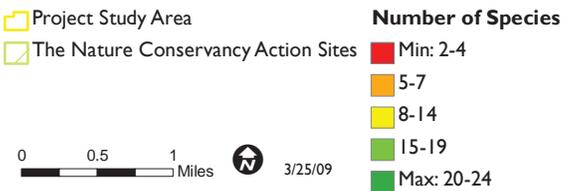
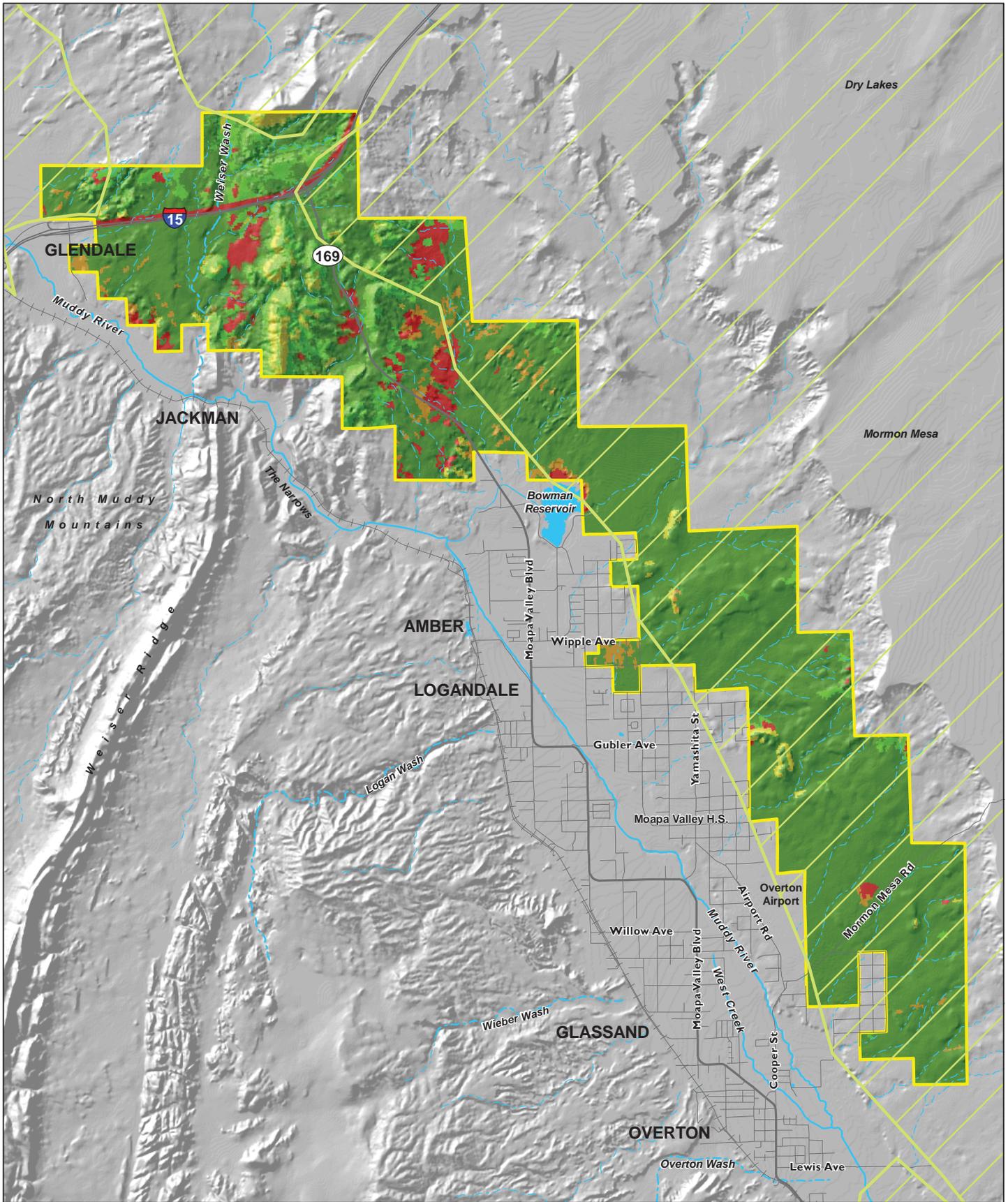
endemic Mojave Desert ecoregion species. The richness model shows the areas with potentially low, moderate, and high concentrations of the 37 terrestrial species (i.e., fish, insects, plants are not included in the SW ReGAP model). Species richness is calculated by overlaying every species model and counting the number of species whose predicted habitat occurs in each cell. The purpose of creating a species richness model is to spatially determine those areas that contain the highest concentration of species habitats.

- Every 30 square meter of land within the disposal area contained between a minimum of 2 predicted species and a maximum of 24 predicted species out of a total of 37 modeled species.
- Both the highest and lowest predicted species richness values occur in the northern portion of the disposal area where landform and vegetation variation is the greatest.
- The majority of the disposal area contains predicted species richness values in the 19-24 species range; comparatively this is a high value. The highest richness values occur in the Sonora-Mojave Creosotebush-White Bursage Desert Scrub vegetation community type.

Observed Species:

The Nevada Natural Heritage Program's (NNHP) mission is to help coordinate the resource needs of Nevada's diverse biological heritage with human activities. The NNHP maintains an inventory and current databases on the locations, biology, conservation, and management status of all threatened, endangered, sensitive, and at-risk species and biological communities, and of noxious weed infestations in the state. To this end, the NNHP tracks the populations and distribution of 172 species of animals, insects, and plants, which includes rare, endemic, and Federal and State listed species. Observation data from the US Fish and Wildlife Service, TNC, and Clark County were also reviewed, and are shown on Figure 2-4.

¹ Clark County Department of Comprehensive Planning. 2000. Final Clark County Multiple Species Habitat Conservation Plan and Environmental Impact Statement for Issuance of a Permit to Allow Incidental Take of 79 Species in Clark County, Nevada.



Moapa Valley
Open Space Plan
Figure 2-3. Species Richness and TNC
“Action Sites”

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The observed TNC or NNHP tracked species found within the disposal area are as follows:

Species name	Common name	Listing Agency	Status	Endemic
<i>Aegialia knighti</i>	Aegialian scarab beetle	NNHP	Tracked; G1?S1	yes
<i>Astragalus geyeri</i> var. <i>triquetrus</i>	threecorner milkvetch	TNC; NNHP	Rare plant; Tracked; G4T2T3S2S3	
<i>Eriogonum viscidulum</i>	sticky buckwheat	TNC; NNHP	Rare plant; Tracked; G2S2	
<i>Heloderma suspectum cinctum</i>	banded Gila monster	NNHP	Tracked; G4T4S2	
<i>Megandrena mentzeliae</i>	red-tailed blazing star bee	NNHP	Tracked; G2S2	yes
<i>Pediomelum castoreum</i>	beaver dam breadroot	NNHP	Tracked; G3S3	

If all observations within a half mile of the disposal area are considered, nine additional TNC or NNHP tracked species would be added to the above observation list.

TNC Biodiversity Targets:

The Nature Conservancy of Nevada created a model of “portfolio sites” to indicate goals for the conservation of target species and communities in the Mojave Desert in “whose protection would ensure the long-term survival of viable, vulnerable species and representative natural communities in the ecoregion”². The target areas identified by TNC “were established by considering the relative rarity and distribution of targets across the ecoregion and where relevant, community patch size. Goals were also based upon the Conservancy’s desire to secure geographic variability of targets.”

As shown in Figure 2-3, the disposal area is overlapped by two of these target areas: the majority of the central and southern portions are overlapped by the Mormon Mesa functional aggregation; the northernwestern portion is overlapped by the Muddy River Complex functional aggregation.

The predominant vegetation type is Sonora-Mojave Creosote-bush-White Bursage Desert Scrub. This is a common community type in northeast Clark County and covers a majority of the upland habitat in the disposal area and local vicinity. The observations of NNHP tracked species within the disposal area are dominated by plant species of concern. Observations of rare reptile and insect species have also been recorded within the disposal area. Again, site-specific biological surveys will need to be performed before development occurs.

In summary, relatively high species richness values exist over the majority of the disposal area. These values are predicted based on habitat models and site-specific surveys will be needed to determine species presence if development proposals were submitted.

Physical and Natural Drainage Resources

As evidenced by the face of the Mormon Mesa, water has and will have a major bearing on the character of the disposal area. Multiple washes bisect the study area with a northeast to south-westerly direction, providing habitat diversity, connectivity, and movement opportunities for both human and animal species.

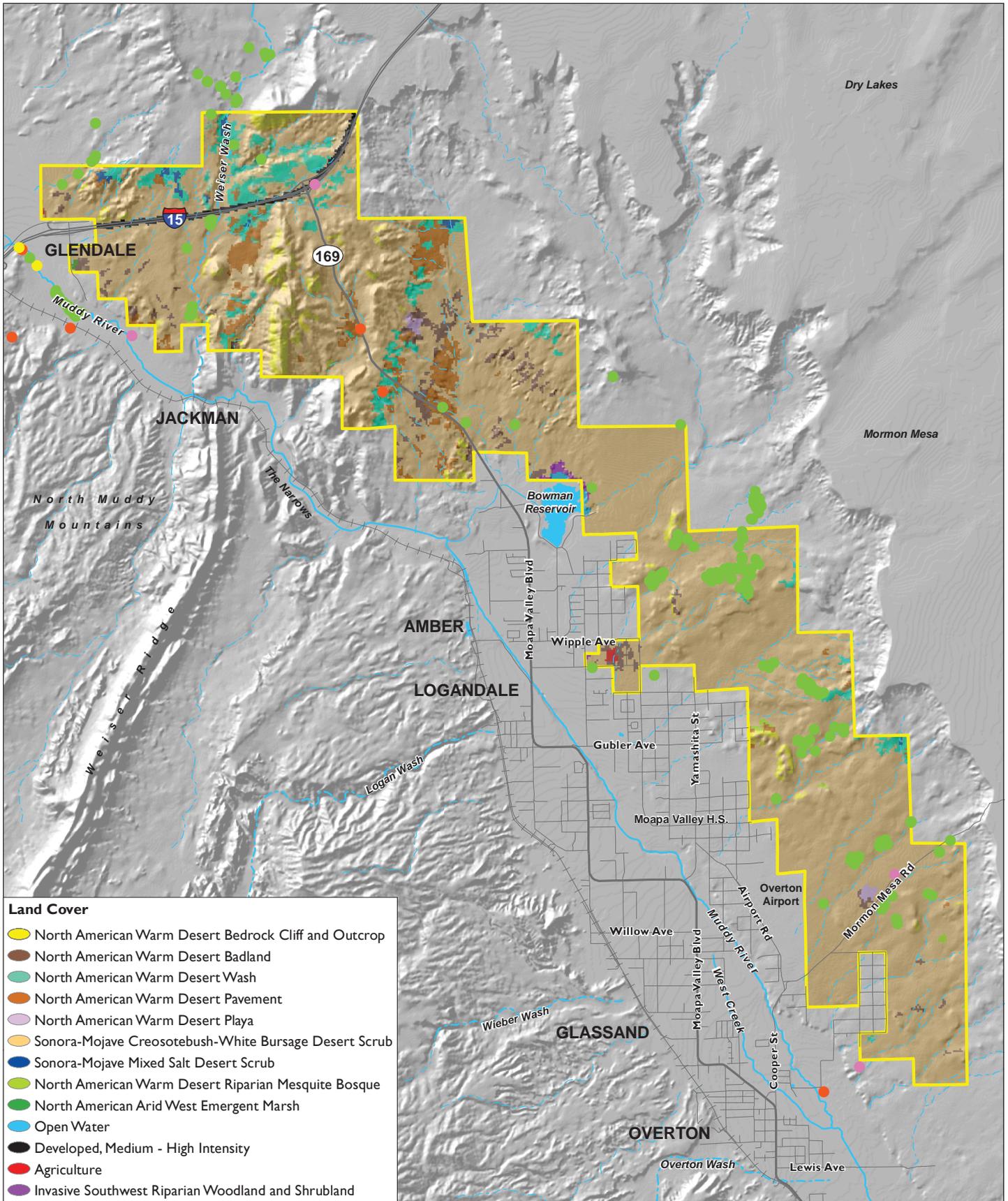
Soils and Slopes

Soils and slopes are an important planning consideration that can greatly impact the cost of construction and a region’s scenic quality. The U.S. Department of Agriculture soil survey identifies potential limitations of soil series types for development uses. Soils within northeast Clark County are primarily erosion remnants (sand, silt, etc.) from the surrounding mountains that have been deposited by flowing water to form alluvial fans and river valleys. Soils north of Bowman Reservoir are identified as Severely Erodable, and the Mormon Mesa escarpment as Highly Erodable (see Figure 2-5). The Clark County Department of Development Services requires on-site soil analysis of proposed development sites in order to provide site specific information that Soil Survey maps do not show.

There are large areas of the disposal area where development is constrained by steep slopes of 12% or greater (Figure 2-6). Development in areas with severe slopes can be very expensive and is not recommended³. The steepest slopes occur in and

² The Nature Conservancy, 2001. Ecoregion-Based Conservation in the Mojave Desert

³ Clark County, 2006. Northeast Clark County Land Use Plan



Moapa Valley
Open Space Plan
Figure 2-4. Landcover and Species
Observations

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3/25/09 EDAW | AECOM

around the mountains, along the cliff face of the Mormon Mesa, around the scattered hill sites, and along the edges of washes. Steep areas over 15% slope hinder development opportunities while at the same time providing scenic amenities.

Natural Drainages

Storm drainage improvements are an essential element of a safe community. Moapa Valley stakeholders have repeatedly stated that natural or natural-appearing washes and arroyos provide the most optimal recreational experience. However, preserving natural-appearing channels is generally dependent on the value of developable land versus the cost to remove the land from a floodplain. A master planned community in the BLM disposal area presents an opportunity to design and construct drainage improvements as multi-purpose projects that not only achieve flood protection, but also create opportunities for trail development, resource conservation and enhancement of the natural environment. Many southwestern communities such as Scottsdale, Arizona, have found that the cost of designing and installing flood control structures is greater than the cost of protecting natural washes (through building setbacks, acquisition, easements, etc.). Consequently, many communities are moving away from the practice of reinforcing drainages and instead are reinforcing land use planning in areas that avoid floodplain encroachment.

The Clark County Regional Flood Control District (CCRFCD) mission centers on protecting “life and property for existing residents, future residents, and visitors from the impacts of flooding.” They have recently developed policies and design standards for natural channels. The standards most in line with local stakeholder preferences are 704.1.1 Natural Unencroached Channels and 704.1.2 Natural Encroached Channels. As the disposal area drains into the lower Moapa Valley, development upstream will cause alterations in channel characteristics downstream, with immediate, delayed, and far-reaching consequences that can be propagated for long distances. Because of the complexity of the processes occurring in natural flows, and the absence of a defined land use plan for the disposal area, an analytical assessment cannot be completed at this time. Future development proposals must carefully assess effects to both natural channel characteristics and downstream interests.

The disposal area is broken into ten watershed sub-basins which were determined by natural topography within the Lower Muddy River Wash Basin which is in the Lower Moapa Valley region. A small portion of the disposal area is north of the area known as the “Narrows” where the Muddy River cuts through the North Muddy Mountain Range. The estimated storm water flows that would potentially impact the disposal area are calculated based

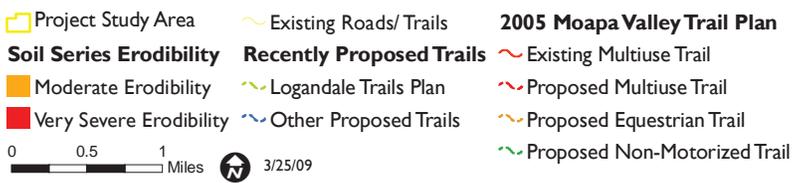
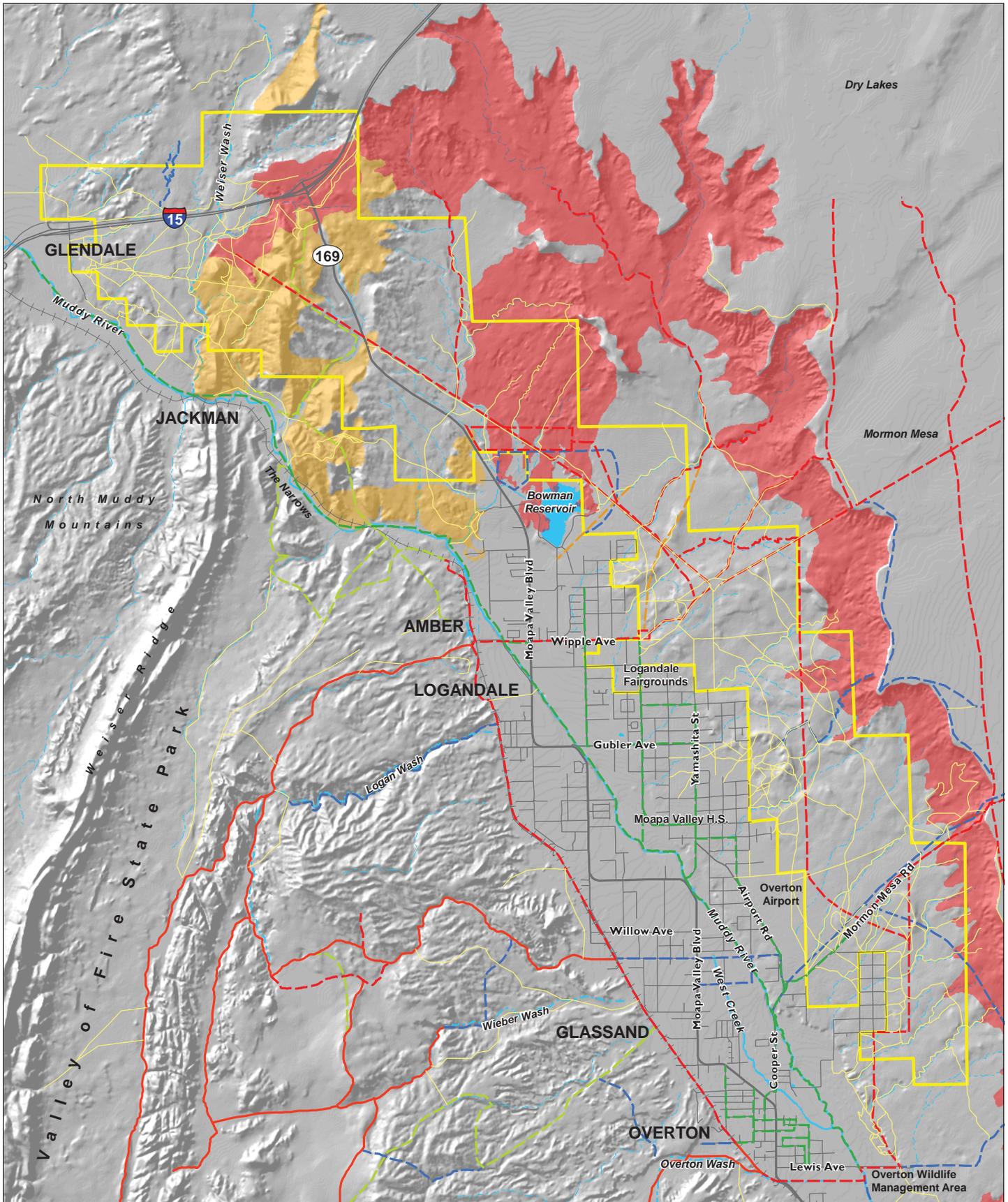
on the subbasin areas (see Figure 2-6). Many of these basins extend outside of the disposal area. The largest basin is Weiser Wash and is approximately 35,000 acres which could potentially generate as much as 7,062 cubic feet per second (cfs); the smallest basin of the group is 274 acres with an estimated 486 cfs. The washes within each subbasin vary in size, amount of water carried, and seasonality, and are an important ecological component of the regional environment.

The *2005 Flood Control Master Plan Update for the Muddy River and Tributary Washes* provides a summary of Master Plan drainage facility recommendations. The Drainage Master Plan was updated approximately every 5 years since 1986. In their 10-year program and master plan (2005), the Flood Control District is planning for a detention basin in Whipple Wash (Clark County Fairgrounds Detention Basin). The detention basin is proposed to be located near the eastern edge of the disposal area on the main drainage channel between the headwater area of the wash and the Muddy River. Whipple Wash has an estimated peak flow volume of 1,550 cfs.

The estimated peak discharge rate for the basins mentioned above may vary depending on the method used for calculating them. However, the actual peak discharge is less important than fully understanding that this desert region has the potential of producing flash floods containing very large amounts of water that can reshape the channel and surround landscape very quickly. All of the basins evaluated have the potential to produce major flows within the conveyance channels and the recommendations for future development take this into account.

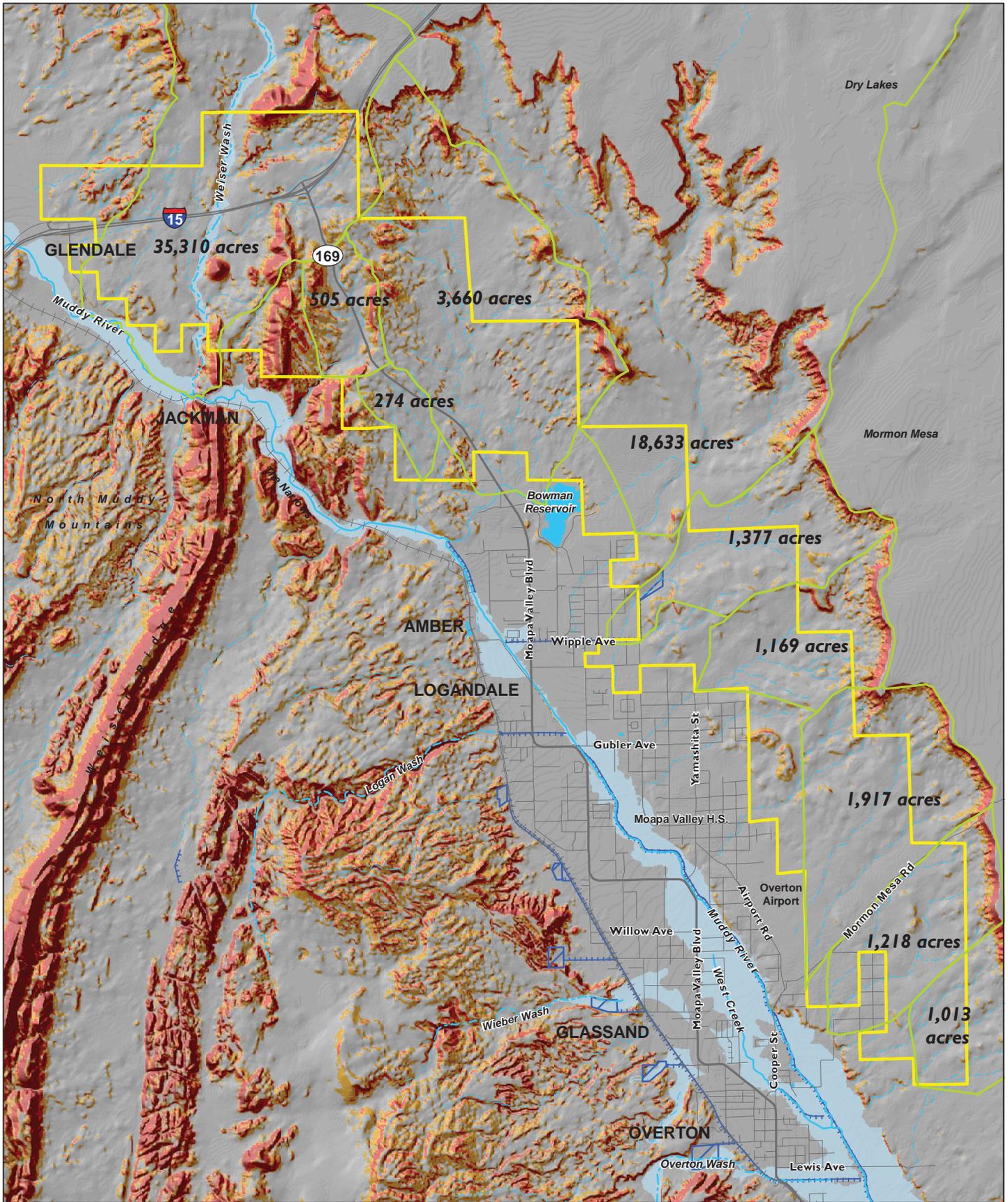
The Physical Resources Map (Figure 2-6) displays the Valley’s topography, emphasizing steep slopes, washes, and floodplains. Important data sources include:

- A digital elevation model has been used to illustrate areas with high slopes. Clark County Title 30.56.100 places conditions on or prevents development of lands with slopes from 12-25% and above 25%.
- Floodplain data shows the location and extent of 100-year floodplain, from FEMA.
- Multiple drainages that braid together to form a wash, from the EPA. Most washes only carry water during storm events, and most watersheds extend over 2 square miles.
- There are no natural spring locations documented within the study area
- Existing and planned Clark County Regional Flood Control facilities including channels and detention basins. The only proposed basin in our study area is the Clark County Fairgrounds Detention Basin east of the Fairgrounds.



0 0.5 1 Miles 3/25/09

**Moapa Valley
Open Space Plan**
Figure 2-5. Soil Series Erodibility



0 0.5 1 Miles 3/24/09
EDAW | AECOM

Moapa Valley
Open Space Plan
Figure 2-6. Physical Resource

Infrastructure Resources

While most of the disposal area appears undeveloped, over half of the area is already encumbered by existing and pending rights-of-way for public or private uses. Figure 2-7, Rights-of-Way and Infrastructure displays all publicly available, existing and pending rights-of-way on lands managed by the BLM. The ROWs are recorded by the BLM on an aliquot-part level (or quarter-quarter section), even though the actual ROW may be much smaller (such as 150 feet for a transmission line). Overton Power is proposing a new 230-kV transmission line through the disposal area, from I-15 to Lewis Avenue below the Mormon Mesa.

Several solar plant applications have been submitted to the BLM – including some below the Mormon Mesa - though none have been approved for construction. The Mormon Mesa is currently included in the BLM’s Programmatic Solar EIS.

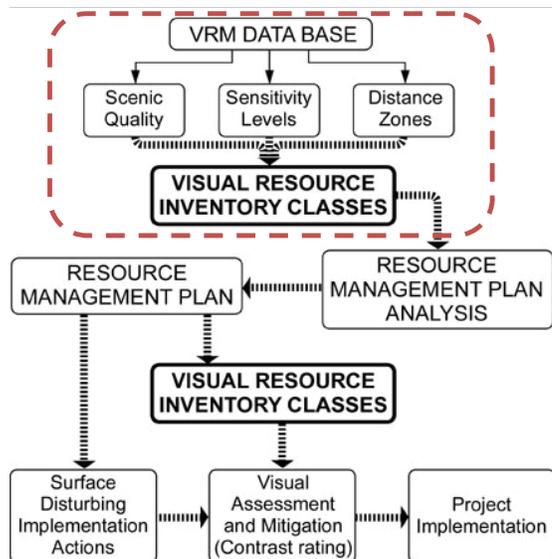
Visual Resources

The Moapa Valley community has stated that the scenic values of the BLM Disposal area should be a primary consideration in the open space planning process. In evaluating existing data, Clark County determined that the BLM’s existing Visual Resource Management data is unacceptable for use at the scale of the Moapa Valley disposal areas, having been completed at a regional rather than a project level. Therefore, EDAW completed a new inventory to show the range of scenic priorities that can then be compared to other resources. To be consistent with BLM procedures, the new inventory is based on the methodology described in BLM Manual H-8410-1 - Visual Resource Inventory (available at <http://www.blm.gov/nstc/VRM/8410.html>).

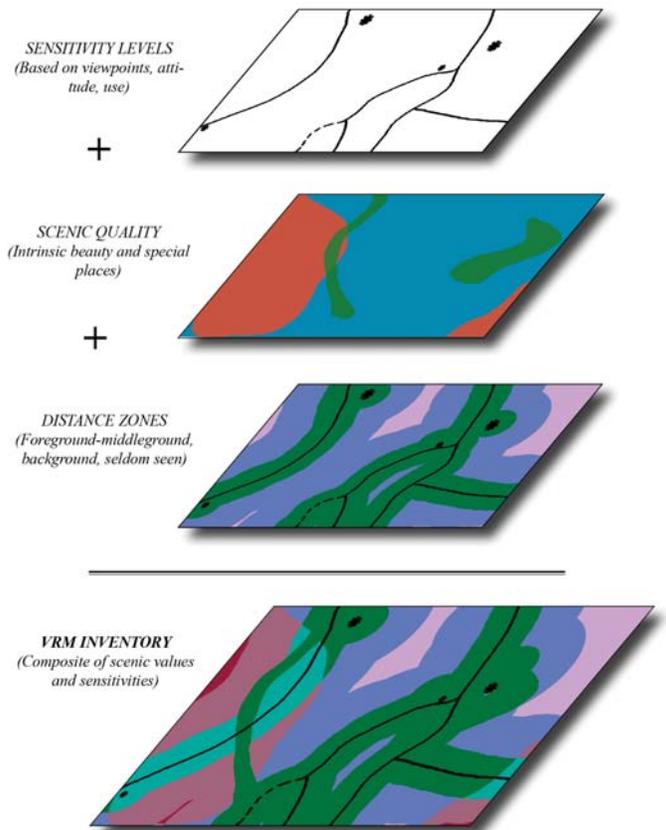
Similar to other routine baseline inventories, the visual resource inventory process provides BLM managers with a means for determining the distribution of visual values. The inventory consists of three inputs: 1) a scenic quality evaluation, 2) sensitivity level analysis, and 3) a delineation of distance zones. When combined, these three inputs produce Visual Resource Inventory Classes, representing the relative distribution and value of the visual resources. The Inventory Classes provide the basis for considering visual values in the open space and development planning process.

Scenic Quality

Scenic quality is a measure of the visual appeal of a tract of land. In the visual resource inventory process, public lands are give an A, B, or C rating based on the apparent scenic quality which is determined using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural

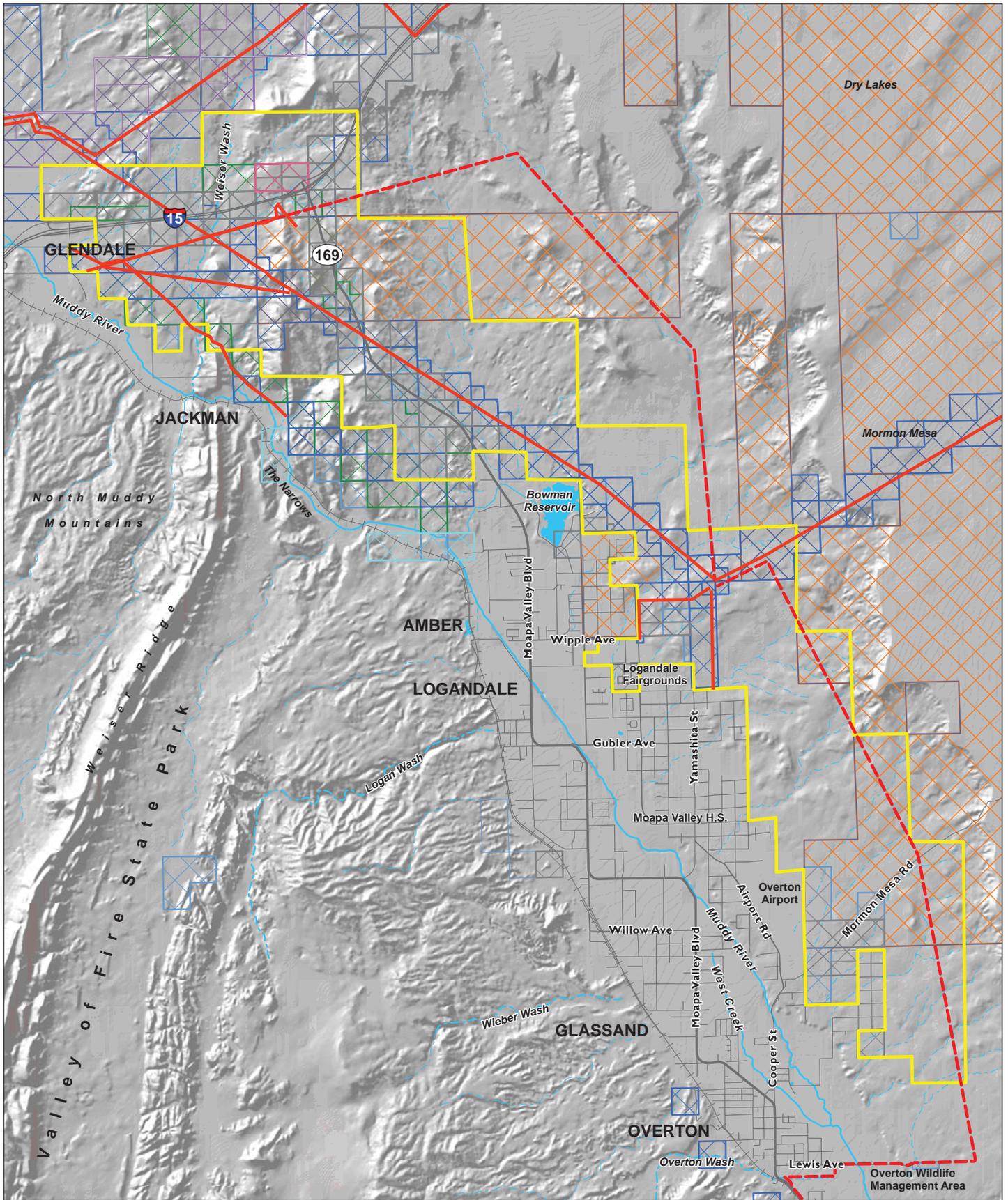


Overview of the BLM Visual Resource Management process. BLM Handbook 8410-1 describes the visual resource inventory process, comprised mainly of three inputs: scenic quality, sensitivity levels, and distance zones.



Scenic quality, sensitivity levels, and distance zones are composited through a weighting process to result in Visual Resource Inventory Classes.





- | | | | | |
|---------------------------------|---------------|------------|--------------|-------------|
| Project Study Area | Telephone ROW | Power ROW | Pipeline ROW | Other ROW |
| Proposed Transmission Corridors | Pending | Pending | Pending | Pending |
| Existing Transmission Corridors | Authorized | Authorized | Authorized | Authorized |
| Solar Energy Projects | Railroad ROW | Road ROW | Water ROW | General ROW |
| Pending | Pending | Pending | Pending | Pending |
| Authorized | Authorized | Authorized | Authorized | Authorized |

*Moapa Valley
Open Space Plan*
**Figure 2-7. Transmission Corridors and
Existing and Pending Right-of-Ways**

modifications (see Illustrations 1, 2, and 3). Class A represents the most outstanding combined scenic characteristics, and Class C represents features which are fairly common to the region. Figure 2-8: Scenic Quality Classes shows the distribution of Class A, B, and C lands.

During the rating process, each of these factors are ranked on a comparative basis with similar features within the physiographic province. An important premise of the evaluation is that all public lands have scenic value, but areas with the most variety and most harmonious composition have the greatest scenic value. Another important concept is that the evaluation of scenic quality is done in relationship to the natural landscape. Most human features in the disposal area (landfills, substations, transmission lines, OHV play areas) detract from the scenic quality.

Sensitivity Levels

Sensitivity Levels are a measure of the public's concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern based on the type of user, amount of use, public interest, adjacent land uses, and special areas.

Stakeholders consistently expressed concern for conserving the scenic quality of the following landscapes and views, as shown in Figure 2-9:

- Mormon Mesa and rim (which falls outside the disposal area)
- Highway 169 from Interstate 15 to Bowman Reservoir as a gateway to Moapa Valley
- Bowman Reservoir
- Washes
- Cliffs and steep mountains between Interstate 15 and Muddy River

Distance Zones and Visibility

The last consideration in inventorying scenic values is to identify 1) the relative visibility of the disposal area from travel routes or observation points, and 2) the distance from which landscapes are seen. Figure 2-10: Visibility shows the viewsheds seen from Highway 169 and Interstate 15. The visibility analysis was conducted using ArcINFO 9.2 GIS software and does not account for screening from buildings or vegetation. Lands in a grey color are not visible or seldom seen. All of the disposal area is within the foreground-middleground (i.e., less than 3 to 5 miles away).



Class A lands represent the most outstanding combination of landform, vegetation, water, color, adjacent scenery, scarcity, and cultural characteristics.

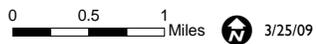
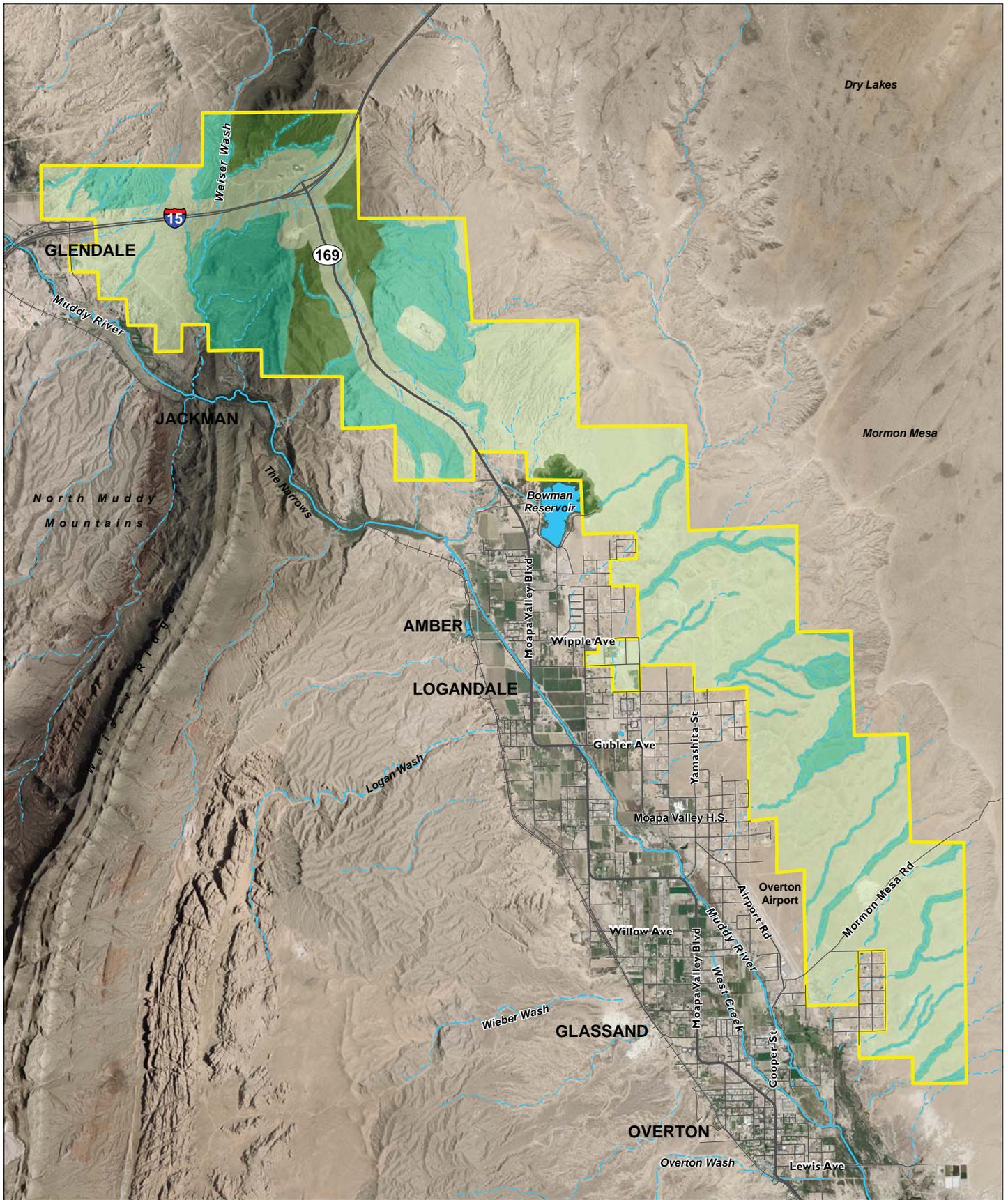


Class B lands have several distinctive scenic characteristics which are interesting though not dominant or exceptional.

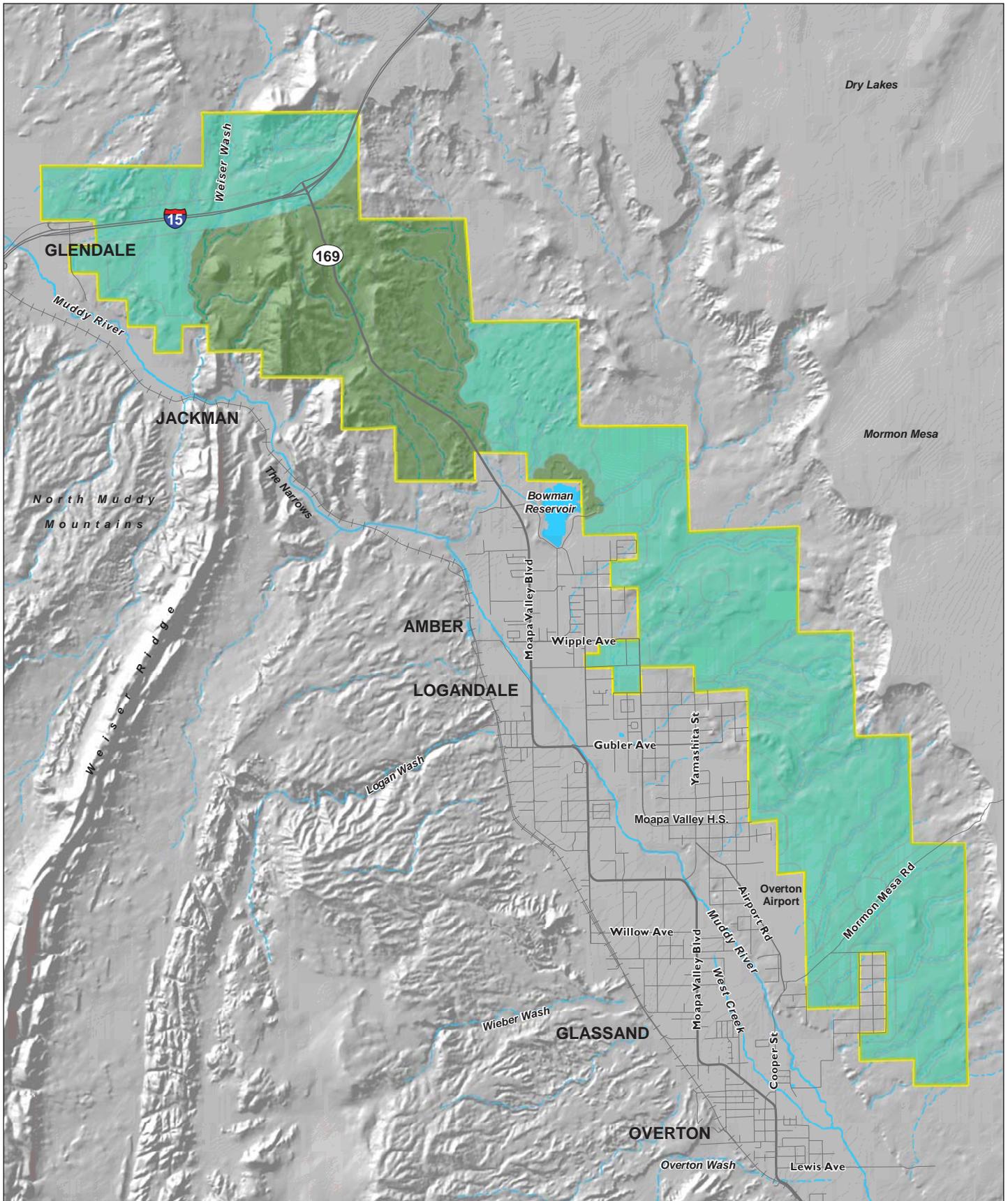


Class C lands have few or no distinctive landscape features that while interesting are fairly common to the region.





**Moapa Valley
Open Space Plan
Figure 2-8. Scenic Quality Classes**



Project Study Area

Sensitivity Level

L

M

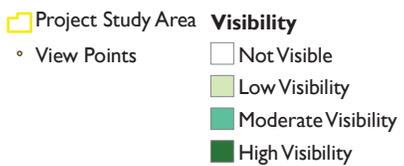
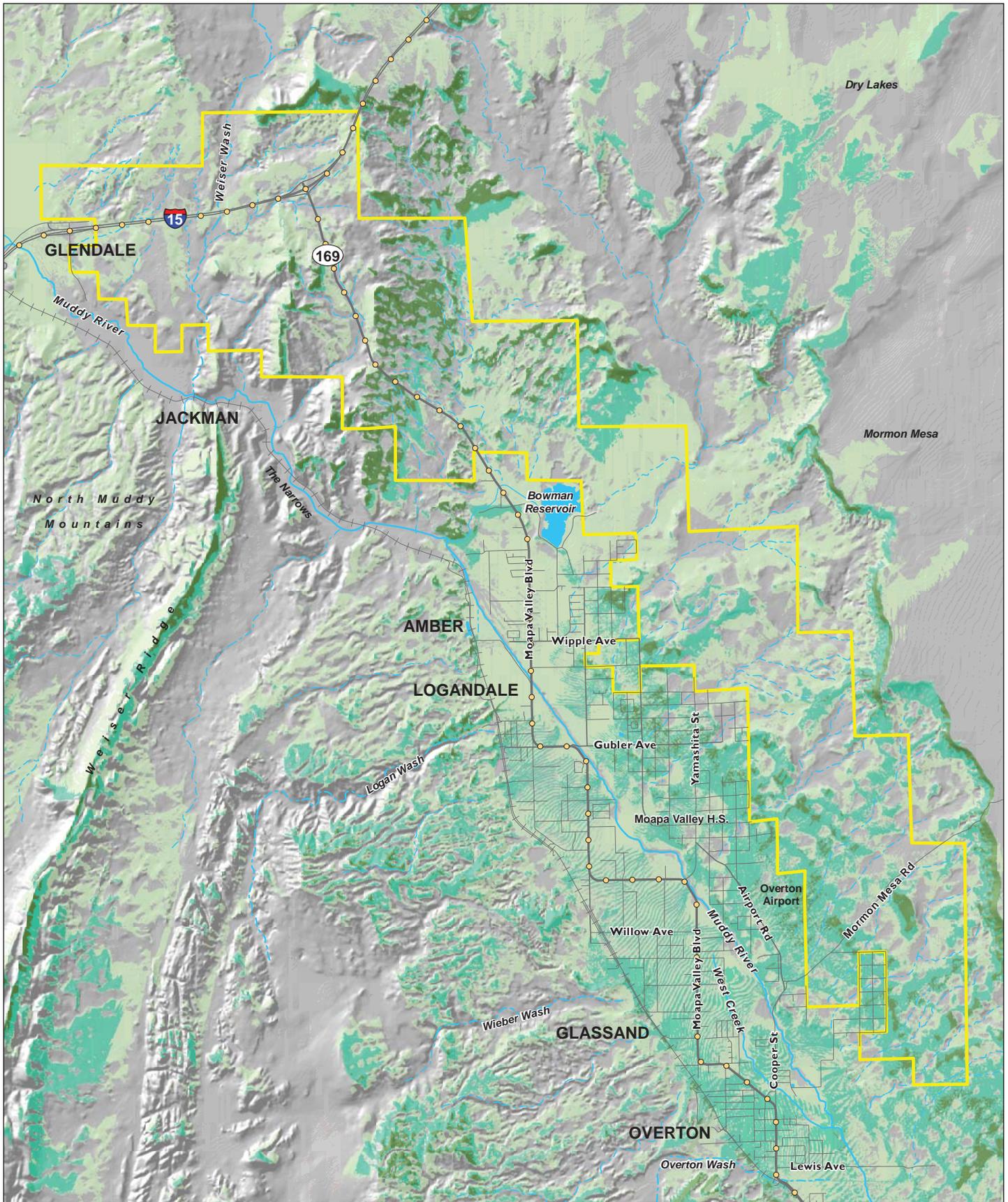
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EDAW | AECOM

Moapa Valley
Open Space Plan
Figure 2-9. Sensitivity Levels



*Moapa Valley
Open Space Plan
Figure 2-10. Visibility*

Visual Inventory Classes

Based on these three factors (Scenic Quality, Sensitivity Levels, and Visibility), BLM-administered lands are placed into one of four visual resource inventory classes (I – IV), representing the relative value of the visual resources. Classes I and II being the most valued, Class III representing a moderate value, and Class IV being of least value.

The final Visual Resource Inventory Classes are shown in Figure 2-11. Note that no Special Areas, or areas where the current management situation requires maintaining a natural environment essentially unaltered by man such as wilderness areas, have been designated by the BLM so no lands are classified as Class I. Inventory classes are informational in nature and provide the basis for considering visual values in the open space and development planning process. They do not establish management direction for the BLM or Clark County.

Cultural Resources

As one of few perennial rivers of arid Nevada, humans have lived near the Muddy River as far as 1000 B.C., and Pueblo occupations of the area began around the time of Christ and spread throughout the valley. Sometime after 1150 A.D., the Paiute Indians took advantage of the fertile soil of the rivers and resided there until the recorded Mormon settlement in 1864. This rich cultural history makes the Moapa Valley a tourist destination.

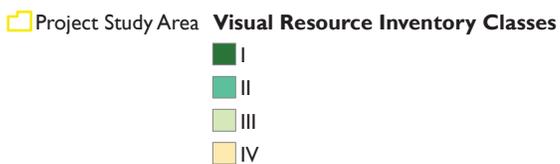
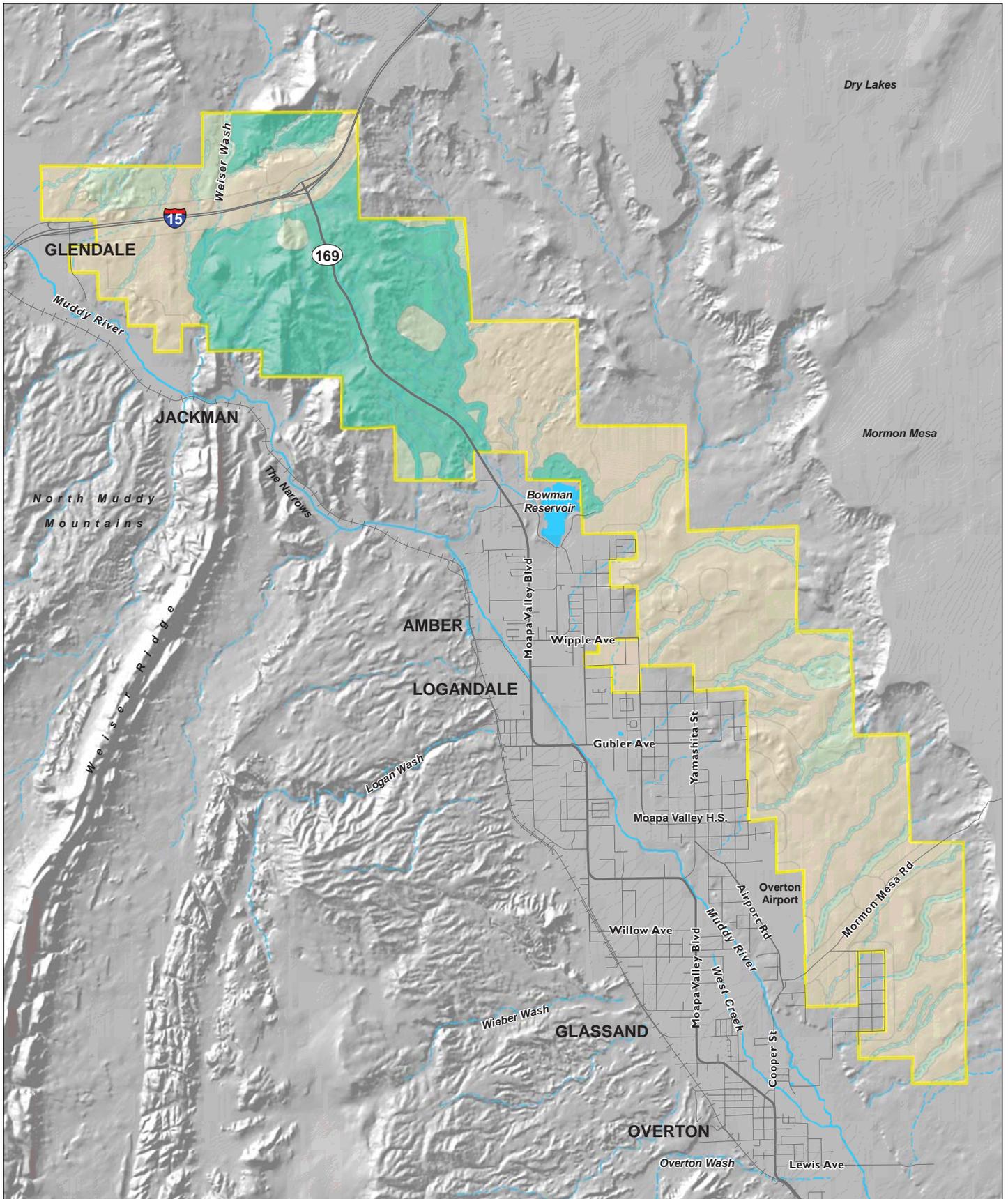
Throughout several pre-historic phases, most groups shared a similar settlement pattern of locating within or adjacent to the Muddy River floodplain⁴. This means that the most significant cultural sites on record occur in present day Moapa, Logandale, and Overton – a point substantiated by J.W. Clark in her thesis, *Prehistoric Settlement in the Moapa Valley*⁵, and by the UNLV Harry Reid Center for Environmental Studies through their work on the Moapa Valley Trail Study. Figure 2-12 shows UNLV's mapping of moderately and extremely sensitive cultural resources. The disposal area is not known to contain, or would not likely contain, substantial cultural sites⁶. Scattered artifact sites and rock shelters may infrequently occur.

⁴ Personal interview. Eva Jensen, Lost City Museum archeologist. March 12, 2009.

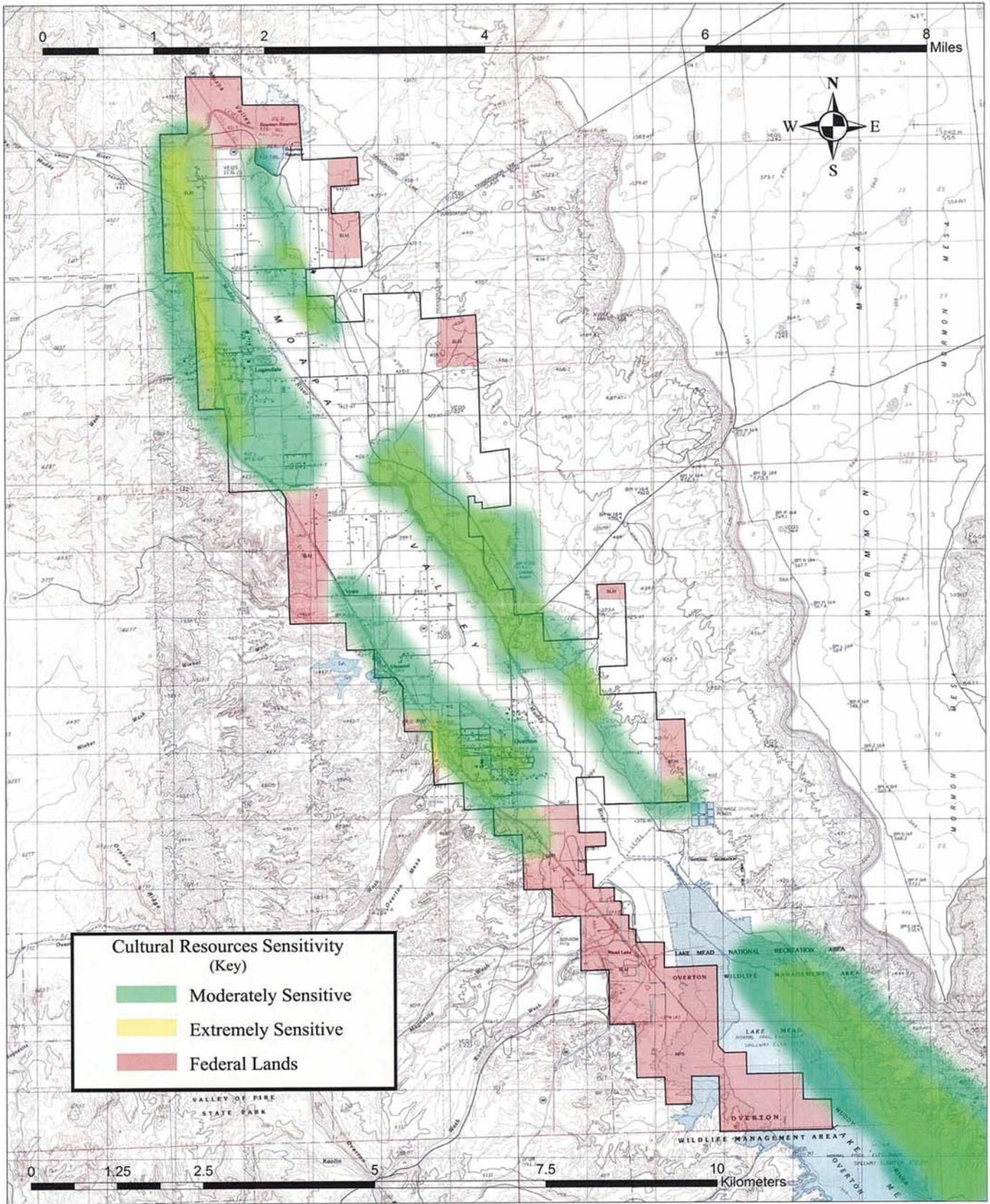
⁵ Clark, Jeanne Wilson. 1984. *Prehistoric Settlement in the Moapa Valley*. Nevada State Museum, Carson City, NV.

⁶ Personal interview. Eva Jensen, Lost City Museum archeologist. March 12, 2009.





*Moapa Valley
Open Space Plan
Figure 2-11. Visual Inventory
Classes*



**Moapa Valley
Open Space Plan**
 Figure 2-12. Cultural Resources Sensitivity
 (Harry Reid Center for Environmental Studies as
 part of the Moapa Valley Trail Study)



03 Moapa Valley Open Space Recommendations





Open Space Recommendations

Chapter 3 describes promising opportunities for long-term economic vitality, a more complete and context-sensitive transportation network, a more distinct and appealing sense of place, and appropriate recreational opportunities. With full awareness of the disposal area's unique assets and opportunities as described in Chapter 2, the open space recommendations respond to the questions: "How should development occur differently than what would have typically occurred under the status quo? Where would an open space and trail network maximize community benefits? How does the system fit in with the needs of Federal land management agencies?"

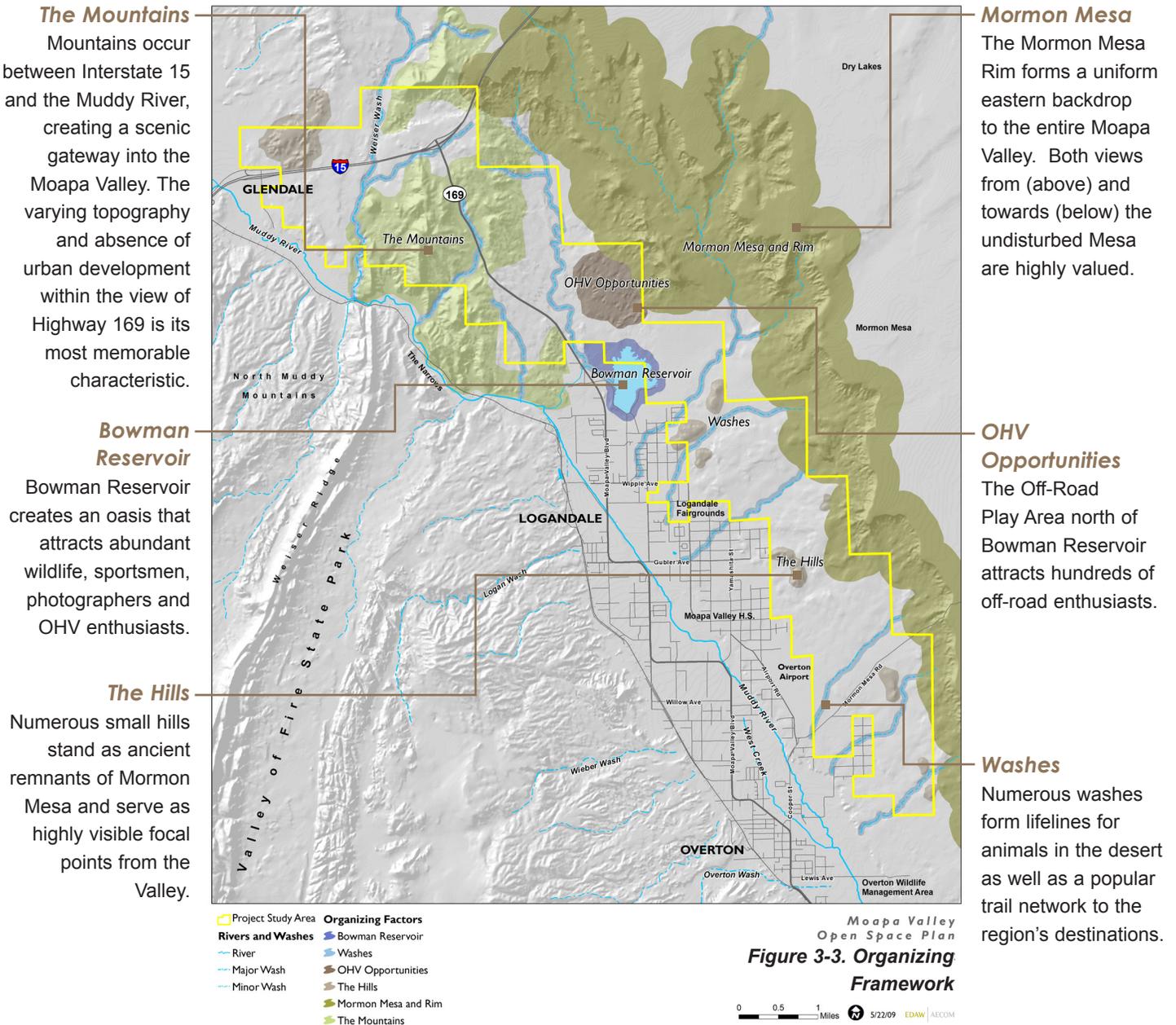
Organizing Framework

As shown in Figure 3-1, the Moapa Valley community has consistently expressed concern for conserving the experience of the following landscapes and views:

- Mormon Mesa and Rim
- Interstate 15 / Highway 169 to Bowman Reservoir as a gateway to Moapa Valley
- Bowman Reservoir
- Washes

- Prominent hills
- Steep mountains between Interstate 15 and the Muddy River
- Off highway vehicle opportunities

The organizing framework, data analysis, and public feedback combined to create Figure 3-3, the Open Space and Trails Concept. This draft plan continues to be refined based on field verification, committee review, and stakeholder feedback. Goals statements were drawn from public feedback and adopted plans such as the Moapa Valley Community Profile and Vision Plan (2005) and Northeast County Land Use Plan (2006).





The Mountains

Mountains occur between Interstate 15 and the Muddy River, creating a scenic gateway into the Moapa Valley. The varying topography and absence of urban development within view of Highway 169 is its most memorable characteristic.

Goals

- Support continued BLM ownership and management of large-scale landscapes eligible for release by BLM that is unsuitable for development.
- Maintain access to public lands as new neighborhoods and commercial areas grow through connecting trail systems.
- Protect environmentally sensitive habitat.
- Protect scenic resources and viewsheds to create a gateway into the Moapa Valley by discouraging surface-disturbing uses within the viewshed of Highway 169.



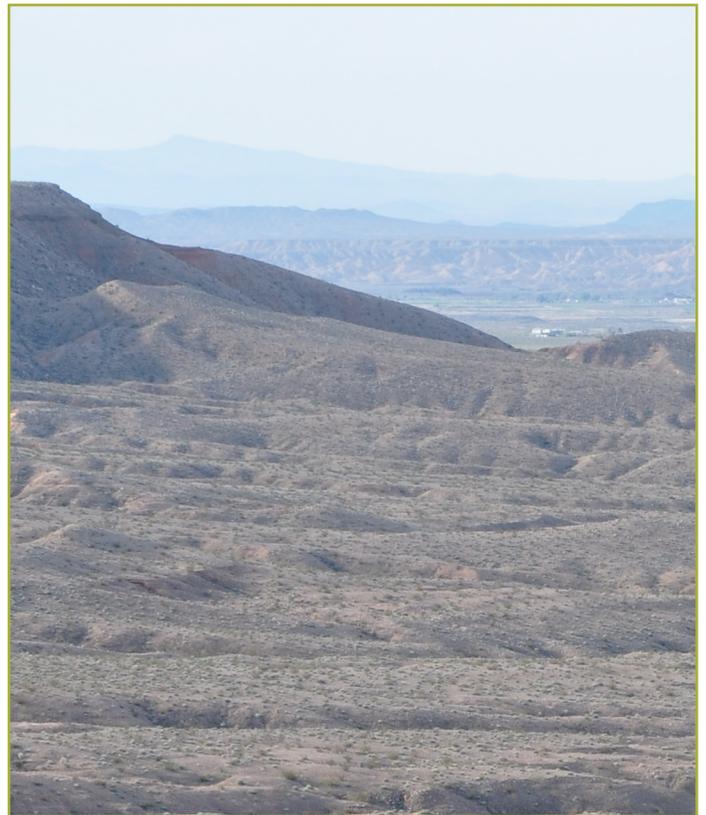


Mormon Mesa

The Mormon Mesa Rim forms a uniform eastern backdrop to the entire Moapa Valley. Views toward (above) and from (below) the undisturbed Mesa are both highly valued.

Goals

- Encourage the preservation of hillsides and ridgelines as well as some of the nearby BLM land for open space.
- Encourage transitional development to buffer environmentally sensitive lands from more intensive urban uses.
- Protect views to public lands by limiting development near the Mesa.
- Employ desert edge buffer concepts between development and public lands. The width of the buffer is determined by distance to the Mesa and degree of slope.
- Support solar energy proposals that include setbacks from the Mormon Mesa rim so that they are not seen from the Moapa Valley.



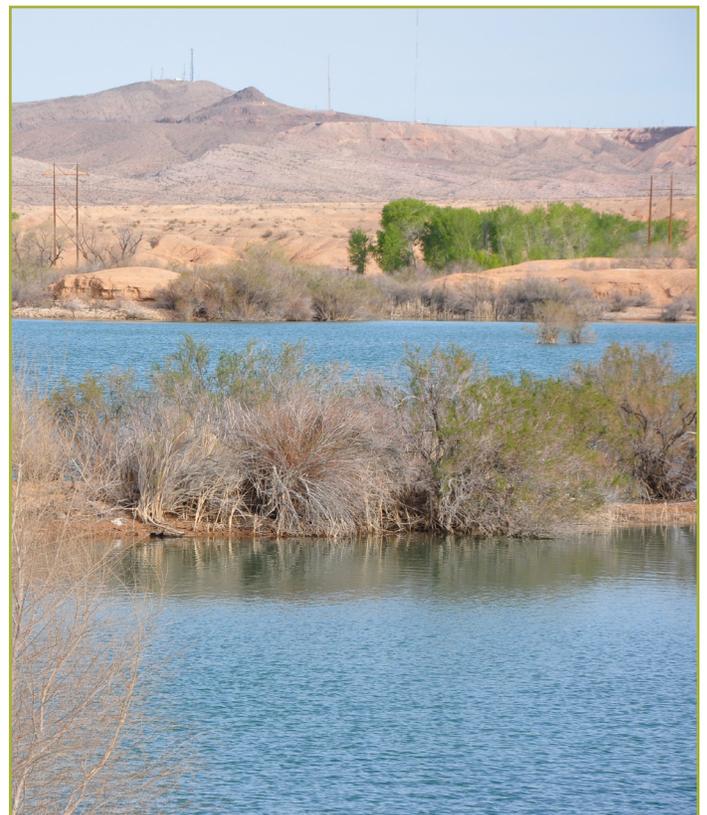


Bowman Reservoir

Bowman Reservoir creates an oasis that attracts abundant wildlife, sportsmen and photographers.

Goals

- Combine efforts to jointly plan for and manage Bowman Reservoir and adjacent public lands.
- Provide access to hiking, wildlife viewing and horseback riding while maintaining Muddy River Irrigation Company operational, liability and safety requirements.
- Protect water quality, sensitive habitats and shoreline vegetation from OHV use.





The Hills

Moapa and Moapa Valley's hills are valuable scenic resources which should be preserved. Dominant ridges should be protected in order to preserve the city's unique visual setting, promote its economic well-being, and encourage tourism. Regulating the intensity of development according to the natural characteristics of hillside terrain, such as degree of slope, significant vegetation and landforms, and soil stability and existing drainage patterns, will allow for development in hillside areas while minimizing the physical impacts of such development.

Goals

- Manage development in ways that minimize impacts on the valley's rural character.
- Moapa Valley seeks to protect its ridgelines and hilltops.
- Encourage the preservation of hillsides and ridgelines.
- Protect views to public lands and from Moapa Valley communities by limiting development on hilltops.
- Protect scenic resources and viewsheds.





Washes

Numerous washes form lifelines for animals in the desert, as well as a popular trail network to the region's destinations.

Goals

- Encourage preservation and protection of washes for habitat connectivity and trails.
- Encourage development to provide existing and planned trail facilities.





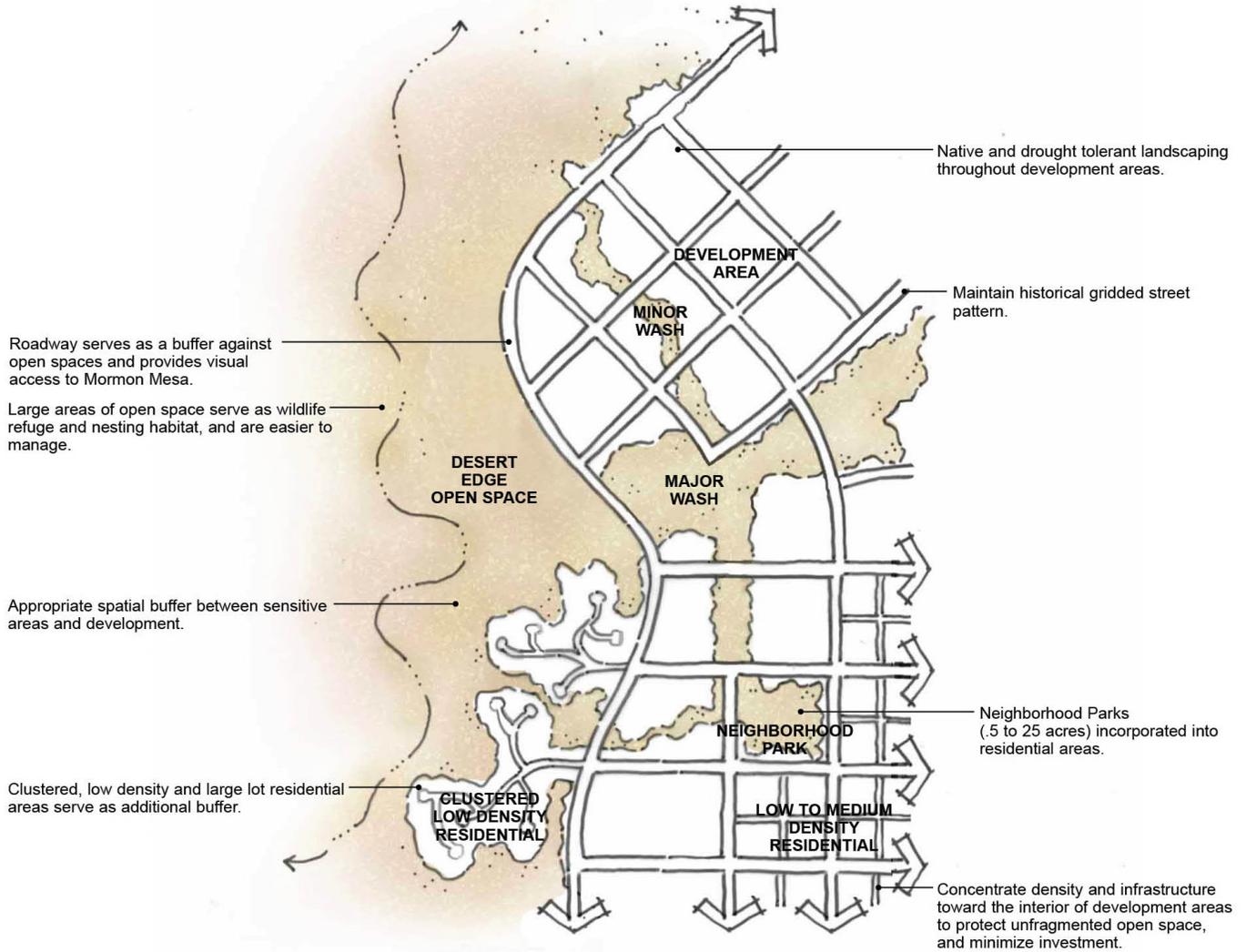
OHV Play Area

The existing dunes north of Bowman Reservoir attract hundreds of off-road enthusiasts.

Goals

- Promote and support community volunteer and private sector efforts including pursuing grants to manage recreational opportunities.
- Provide active recreation areas that meet desires and needs of community.
- Combine efforts with the BLM and Clark County to jointly plan for and manage OHV use in suitable areas.





Development Areas

Moapa Valley and Moapa recognize the importance of the natural environment to preserving the small town feel of the area, and will seek to balance new growth with the preservation of open space. Suitable areas for future community expansion are flat, low resource lands adjacent to existing development.

Goals

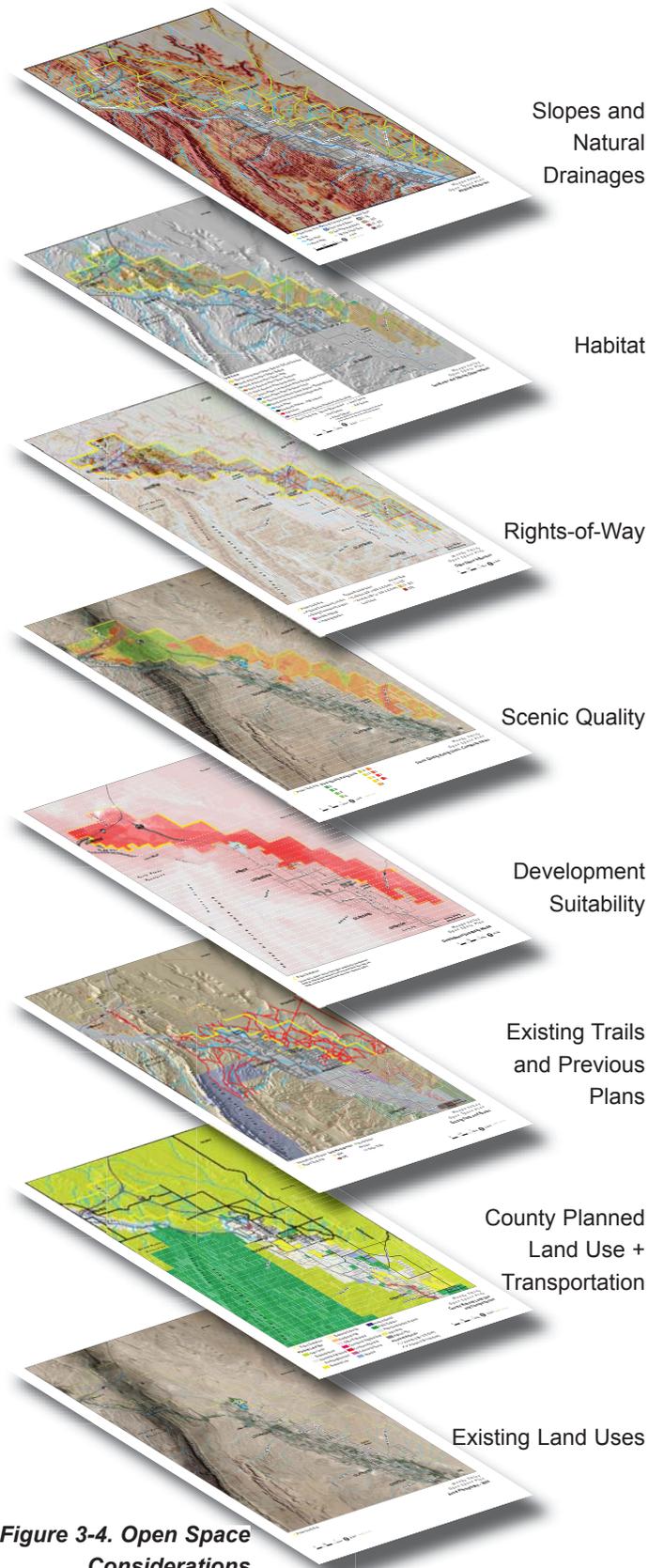
- Growth in Moapa Valley should be logical, predictable, sustainable, and foster and protect the quality of life of all its citizens.
- Encourage new small-scale developments that are interspersed with plenty of open land and recreational areas, transitioning to and blending into the surrounding rural and desert environment.

- Encourage all development to employ ample active and passive open spaces in their overall site design and integrate those open spaces, where possible, with connectivity to adjoining properties, trail systems, view sheds, schools and public park facilities in an effort to meet the needs of the community.
- Maintain the rural, small town nature by welcoming new sustainable development only in designated areas where public water and sewer services have been expanded to accommodate growth.
- Moapa Valley seeks creative development that includes lots of various sizes and acreage.
- Seek to prevent the release of nearby BLM lands until such time that a plan and financing methods have been developed to provide for necessary public infrastructure including water, wastewater, transportation, and schools.

Open Space Plan

The draft Open Space and Trails Concept map is based on six months of community involvement. Prior to development of the map, resources and alternatives were identified to provide choices in circulation, development, and character. As a result, multiple resources and datasets were incorporated to create an environmentally-conscious plan that responds to master planned community market trends (Figure 3-2). As illustrated in Figure 3-3, the draft Open Space and Trails Concept map combines existing and future land uses, existing and planned trails, the County's transportation master plan, and site resources, with the intent to:

- Preserve and protect natural resources and viewsheds
- Maximize community connectivity on both roadways and trails
- Identify the prime locations for community expansion
- Protect important natural functions such as storm drainage and wildlife connectivity





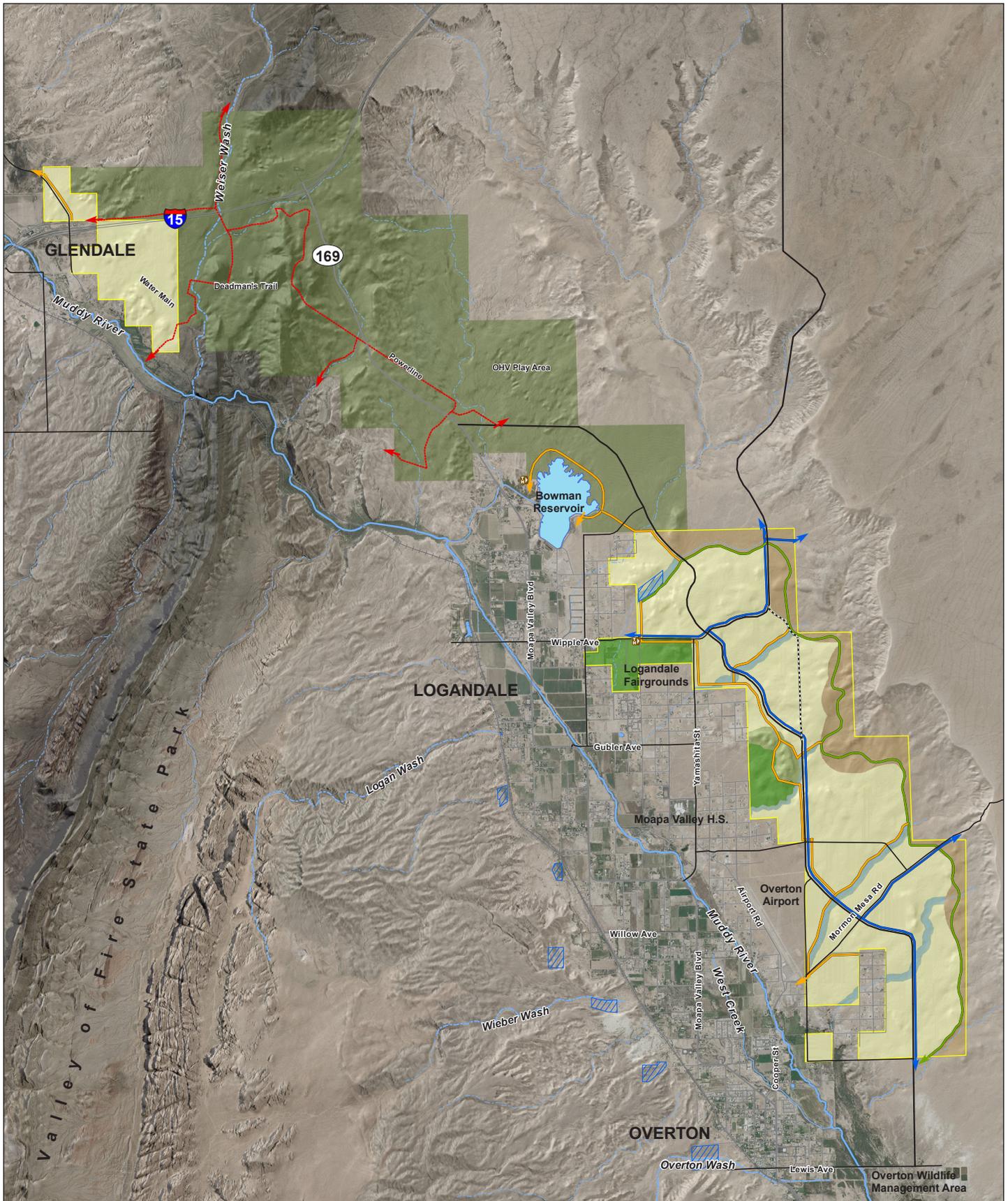
Mapping decisions were based on both constraints and opportunities for conservation and development to:

- Balance the expectation of economic growth with the demand for environmental consciousness and social/cultural wellbeing.
- Retain the “sense of place,” rural lifestyle, and connections to surrounding public lands that define the Moapa and Moapa Valley communities.

Figure 3-3 proposes changes to the County’s Transportation Master Plan so that new arterials follow the lay of the land. To respond to concerns over potential impacts to existing neighborhoods, an alternative arterial alignment is also shown.

The environmental guiding principles behind the plan’s vision are:

- Preserve natural ecological functions through preservation and connectivity.
- Conserve and manage open space for the continued health of the natural environment and enjoyment of the region’s residents.
- Conserve and manage native plant and animal communities to maintain biodiversity and ecosystem functions.
- Conserve water quality, natural hydrology, and habitat, and preserve biodiversity through conservation and management of water bodies and washes.
- Identify high quality natural areas suitable for additional protection, and other natural areas that have the potential for enhancement, restoration, or mitigation elsewhere in the study area.
- Protect and enhance scenic amenities.
- Define public access to open space and public lands.
- Protect and manage access to high biodiversity habitat areas used by species sensitive to human intrusion.
- Incorporate appropriate buffers between significant habitats and resources and development areas.



- Proposed Disposal Area Boundary
- Open Space Concepts**
- Corridors
- Edges
- Natural Areas
- Parks
- Multi Use Managed Area
- Proposed Development Areas

- Trail Corridor Concepts**
- Multi-Use Non-Motorized
- Desert Edge
- ATV
- Multi-Use Motorized

- Proposed Arterial Roads**
- Arterials (100+ ft R-O-W)
- Arterials (120+ ft R-O-W)
- Arterial Alternative

- Rivers and Washes**
- River
- M
- M
- Flood Control Basins

**Moapa Valley
Open Space Plan
Figure 3-5. Open Space and Trails
Concept**

Land Categorization

Table 3-1 outlines the approximate size, purpose, use, and access of each type of open space type. Criteria and intended uses for each open space designation are further elaborated below.

Table 3-1. Open Space Categories

Open Space Types	Size	Purpose	Use
Washes (261 ac.)	Major wash corridors are 400 ft. wide, centered on the wash channel. Minor wash corridors are 100 ft. wide.	Buffer major drainage ways to preserve hydrological processes and species movement	Provides connectivity between neighborhoods, parks, and open spaces via pedestrian trail systems; provides visual buffers between developments; provides additional capacity to manage for flood control. Multi-use non-motorized trails.
Desert Edges (1663 ac.)	Located at the eastern edge of the study area between development and BLM-managed land; varies in width from 200 to 2000 feet.	Buffer areas between existing or planned development and natural resource areas; provides visual protection of scenic resources; creates an intermediate use green space between neighborhoods and public lands	Provides protection of views to scenic resources; provides a use buffer between residential areas and motorized uses or natural resources on public lands; allows access to neighborhoods, parks, recreational areas, and public land through natural areas Multi-use non-motorized trails.
Parks (303 ac., Regional Parks)	Regional Parks are greater than 160 acres. Community Parks range from 26–160 acres Neighborhood Parks range from 5–25 acres and are not shown on the Open Space and Trail Map. Neighborhood Parks would be sited during development review.	Provide mini-park, neighborhood, community, and regional-level active recreation facilities Parks may include trails on adjacent areas that are indicated as open space.	See discussion of Moapa Valley Regional Park (Clark County Fairgrounds and Sports Complex) and Community Park. Multi-use non-motorized trails.
Natural Areas (82 ac.)	Located at the edge of a community park approximately 80 acres. Additional open space areas can vary, though smaller, unconnected parcels should be avoided unless outstanding natural features are present.	Protect important natural, cultural, or visual resources from excessive disturbance and development; provide natural environments adjacent to development areas for the enjoyment of the public and protection of native species and ecological processes; provide visual and physical buffers between neighborhoods to enhance the feeling of rural development	Low-impact and passive recreation, nature-oriented outdoor activities; activities that do not always need a formal facility and do not involve a great deal of physical exertion; connectivity between neighborhoods and other open space types including public land. Multi-use non-motorized trails
Multiple Use Managed Area (6094 ac.)	Approximately 6,000 acres	Recommended to be retained by the BLM; maintain important natural, cultural, or visual resources in public ownership; provide destinations for nature-oriented outdoor experiences on public land.	Recreation is allowed based on the rules and regulations set forth by the BLM; additional potential uses include open grazing allotments, oil/gas leasing, and mineral mining (LVFO-RMP 1997).

Washes:

Open space corridors are centered on major washes in the study area and are designed with a 200 foot buffer to capture the meandering of drainage corridors as they change over time, and to protect the banks of the washes. Maintaining the historic flow and dissipation of stormwater events in a natural channel requires less intensive engineering solutions, less capital costs, and decreases safety problems. Important environmental values include the protection of migration and propagation corridors for native species within their natural environment, maintenance of high biodiversity values, and the safeguard of native habitats. Corridors located within proposed development areas provide a location for non-motorized trails which link active and passive recreation opportunities between neighborhoods, as well as provide access to planned trail systems within currently developed areas.

Minor washes not shown on the Open Space and Trail Concept Map should be incorporated into development plans to provide neighborhood pedestrian connectivity.

Desert Edges:

Planned open space areas along the eastern edge of the study area serve several functions, both scenic and environmental. Their purpose includes visual protection, buffers between land uses and disturbances, and a transition zone for native species and habitats from developed areas to public lands. These areas range from 200 ft. to 2000 ft. wide from the edge of the study area and form a natural transition zone between intensive development uses and undeveloped public land by allowing nature-oriented recreational uses. The edges also form a buffer between residential areas and motorized uses on BLM lands. The edges are wider in areas where the rim of the Mormon Mesa is closer to the study area and are used to protect the scenic views to the bluffs from visual interference. The Desert Edge connects to washes through the development areas so that public lands beyond are directly accessible by residents.

Active Recreation Areas:

Active recreation areas provide traditional park and higher-impact recreational needs in open space settings. The Moapa Valley Master Plan for Parks and Recreation establishes a parkland level of service standard for Moapa Valley, or the amount of park space needed to meet recreation demand, at 8.25 acres per 1,000 residents. This standard consists of 6.0 acres per 1,000 residents of programmable park land (fields, playgrounds, and court areas) and 2.25 acres of non-programmable park land (open space, trails and picnic areas). Four active recreation areas are identified on the Open Space and Trails Concept Map, described below.

Neighborhood Parks (5–25 acres) required in the Moapa Valley Master Plan for Parks and Recreation are not shown on the concept map. The locations of Neighborhood Parks would be determined during development review.

1. The proposed OHV Play Area is approximately 1 square mile (Township 15S Range 67E Section 10) and is located north of Bowman Reservoir. Currently, the area contains a varied and rolling topography due to the dune structure in the area that makes it an ideal fun park for ATVs and dirt bikes. This area has little natural vegetation or wildlife habitat, due to its historic use as a “creative riding” area including hillclimbs, banking and jumping.

Formalizing and appropriately managing this open riding area in a suitable landscape is preferred to allowing OHV riders to create additional play areas in natural settings. A master plan and management plan should be prepared for the open riding area by the BLM and County, with participation from user groups. A multi-use motorized trail would connect the open riding area to neighborhoods and regional trail networks. The open riding area will need to be delineated with signage, boundary roads, and/or fencing to contain open riding. Steep topography in the open riding area would limit access to some portions of the adjacent landscapes, where use is limited to existing roads. The open riding area is proposed away from development areas, is surrounded by open space and has a future arterial road on its southern boundary to limit OHV noise and dust impacts. A parking area and toilets would be minimal requirements to accommodate OHV use as demand increases.





2. Bowman Reservoir is owned by the Muddy River Irrigation Company and the BLM. There is a strong demand for recreation at Bowman Reservoir, however, water-based recreation is not currently permitted due to liability and security requirements. BLM, Clark County, and user groups should work with the Muddy River Irrigation Company to support non-water based recreation (such as picnicking, hiking, photography, etc), as well as to resolve concerns about water-based recreation and OHV use. Day use facilities (restrooms, picnic tables, interpretive signage, garbage collection) are necessary, and should be pursued through a cooperative arrangement with Clark County or equivalent partner.
3. Moapa Valley Regional Park (Clark County Fairgrounds and Sports Complex) is a regional amenity owned and operated by the Clark County Department of Parks and Recreation. If the entire fairgrounds area were developed and improved to the dimensions of the plan, it would be approximately 195 acres in size (see the Moapa Valley Master Plan for Parks and Recreation for more details). Access to the fairgrounds would be by ATV and non-motorized trails, as well as a new proposed arterial.
4. A proposed Community Park is located east of Moapa Valley High School and north of Overton Airport adjacent to the western edge of the study area. The park would be approximately 100 acres in size and would be surrounded on three sides by natural areas or washes. The Community Park could accommodate organized sporting events and intense recreation activities such as lighted ball fields, field game areas, court areas, playgrounds, walking/jogging and picnic areas. A new arterial road, local roads, and non-motorized trails would provide access to the community park. Clark County Parks and Recreation should begin the process of working with the Bureau of Land Management to acquire ownership of the 100 acres before the BLM commits to other uses for the parcels on the disposal list.

Natural Areas:

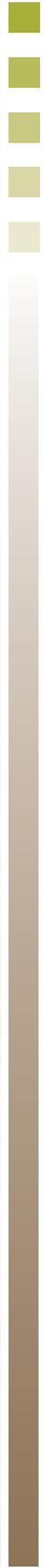
Natural areas provide passive outdoor experiences and protect natural habitat for species and ecosystem processes. Natural areas have similar functions as Desert Edges, but are smaller parcels that are integrated and surrounded by development. Natural areas in the plan range in size from 80 acres to over 1000 acres.

Multiple Use Managed Area:

More than 4,000 acres of the northern portion of the BLM disposal area is recommended to remain under BLM ownership and management. This area contains the highest levels of visual quality, biodiversity, steep slopes, and lower levels of OHV social trails. This area also serves as a gateway into the Valley along Highway 169 and with few exceptions is relatively free from development.

If this area were to remain under BLM management, the current Las Vegas Field Office Resource Management Plan allows multiple uses such as grazing, oil and gas leases, mineral mining, and target shooting. Energy transmission and renewable energy development could occur with appropriate environmental review and ROW applications. Access in this area would continue to follow the same regulations that are currently in place for its Roaded Natural ROS classification: motorized vehicles are limited to existing roads, trails, and dry washes.

Local stakeholders should actively and constructively participate in the RMP Update to help inform the BLM's ongoing management of this area.



04 Moapa Valley Development Recommendations



Development Area Recommendations

This chapter describes development projections, constraints and opportunities, as the driver for this plan is the anticipated privatization and development of the BLM disposal area. Should the area not be developed, the open space and trail values would remain as long as appropriate management and community stewardship continued.

Development Projections

Measuring demand for new development involves many factors. The analysis of demand for new development in the Moapa/ Glendale and Moapa Valley is based on

- An analysis of build out population based on the adopted land use plan.
- Input from Clark County Department of Comprehensive Planning staff.
- An assumption of strong long-term growth based on historical trends and approved developments, such as the Riverview Development proposed by the Moapa Development Group/ Glendale Holdings

- An assumption of weak short-term growth based on the 2008-2009 recession. In 2008-2009, the residential and commercial markets flattened and even declined as an economic recession battered southern Nevada and the nation, reversing a decade of ever-increasing property values, residential demand, and consumer spending. It is anticipated that the current decline is short-term and new proposals for large-scale developments will begin again in approximately five years.

One method of forecasting growth is by analyzing historical trends. According to figures compiled by Clark County Comprehensive Planning, the Moapa Valley population forecast was based on historical growth rates as shown below in Figure 4-1. This forecast anticipated a population of 17,680 by 2035, or an increase of approximately 11,000 people.

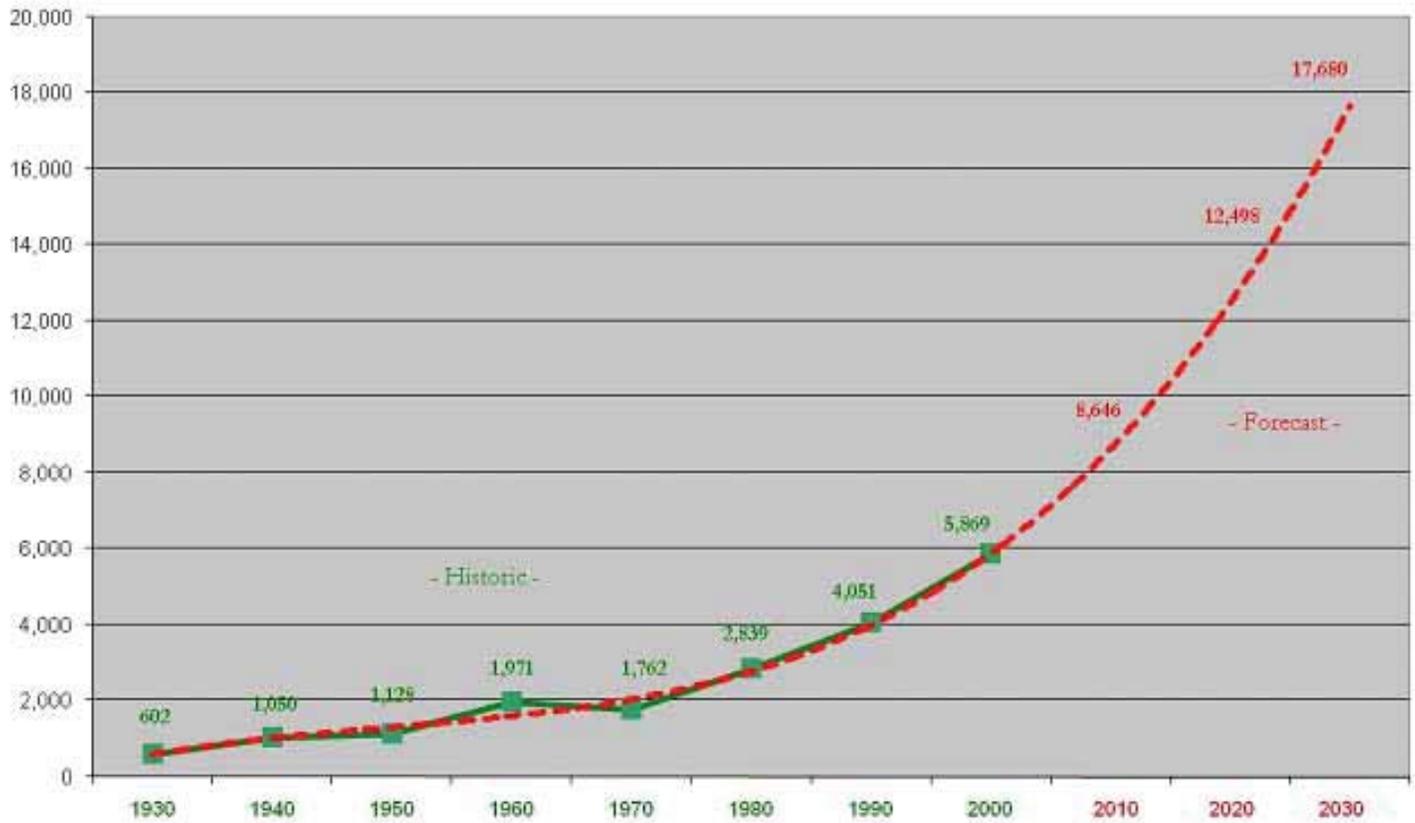


Figure 4-1. Moapa Valley Unconstrained Population Forecast (Clark County Comprehensive Planning, 2009).

Another method of forecasting growth (as well as the capacity to accommodate growth) is to evaluate current land use designations. The 2006 Northeast Clark County Land Use Plan completed a statistical break down of the adopted residential land use designations and estimates of the potential build out population for Moapa Valley (excluding Moapa/Glendale). Note that the Northeast Land Use Plan did not assume any future growth in the BLM disposal area, assigning it a zoning of Open Lands; growth in the disposal area was considered to be beyond the 20-year planning horizon. Calculations of the build out population on existing private land was re-evaluated in the 2007 Moapa Valley Master Plan for Parks and Recreation, where the maximum allowable density was assumed for each land use classification. Table 4-1 shows that 15,500 units could be built, resulting in a population of over 45,000 or an increase of approximately 38,000 people – without any development in the BLM disposal area.

That all forecasted growth could be accommodated on existing private land under current zoning calls into question the necessity of the BLM disposal area. Still, community leaders believe that 1) developers are more inclined to negotiate with one large landowner (the BLM) than multiple, small landowners; and 2) the market demand for master planned communities (over 1,000 acres) may not be attainable otherwise, due to private ownership patterns.

While the magnitude of these numbers appears high to many people, these forecasts are not out of line with developments reviewed or approved in the years 2005-2008. The Riverview project, proposed by the Moapa Development Group/Glendale Holding, anticipates approximately 6,000 residential units (Clark County 2007). Applying an average of 2.95 persons per household (PPH) to this one project alone would result in 17,700 new residents, more than twice the current population of Moapa/Glendale and Moapa Valley combined.

For planning purposes and to test the amount of land needed to be released, it was assumed that 11,000 new residents – 100% of the forecasted growth through 2035 in Table 4-1 – would occur on BLM land. Table 4-2 summarizes the amount of land necessary to accommodate 11,000 new residents in a new master planned community. It is estimated that approximately 3,800 acres would be needed to account for residential, commercial, and infrastructure requirements.

Land Use Classification	Acreage	Percent of Total Residential Land Use	Developable Land Acreage	Potential Number of Residential Units	Potential Population Based on 2.95 PPH
Residential Rural (1 du/2ac)	1,697	23.3	1,697	849	2,503
Residential Agriculture (1 du/1ac)	806	11.1	684	685	2,021
Residential Neighborhood (2 du/1ac)	2,725	37.4	2,316	4,633	13,666
Residential Low (3.5 du/1ac)	1,403	19.3	1,193	4,174	12,313
Residential Suburban (8 du/1ac)	560	7.7	476	3,803	11,234
Residential High (18 du/1ac)	92	1.3	78	1,408	4,152
TOTAL	7,283	100.0	6,445	15,556	45,889

Table 4-1. Adopted Residential Land Use Acreage and Potential Build Out Population based on the Northeast Land Use Plan (Moapa Valley Master Plan for Parks and Recreation, 2007).





Land Use	Population (at 2.95 PPH)	Acres Needed
Residential Rural (1 du/2ac)	1,000	670
Residential Agricultural (1 du/1ac)	2,000	640
Residential Low (3.5 du/1ac)	4,000	380
Residential Suburban (8 du/ac)	4,000	210
Commercial and Industrial Uses		1,000
Transportation and Infrastructure		900
TOTAL	11,000	3,800 acres

Table 4-2. BLM Disposal Area Population and Acreage Assumption for 10,000 People

Development Suitability

Identifying development opportunities and constraints is a critical step in preparing a land use concept. Natural features form the foundation for a healthy ecosystem, stormwater management, and recreational amenities. Integrating natural resources into a land use plan elevates any new development, from an environmental, cultural, and aesthetic perspective, making this step all the more important in the Moapa Valley.

Development Opportunities and Constraints

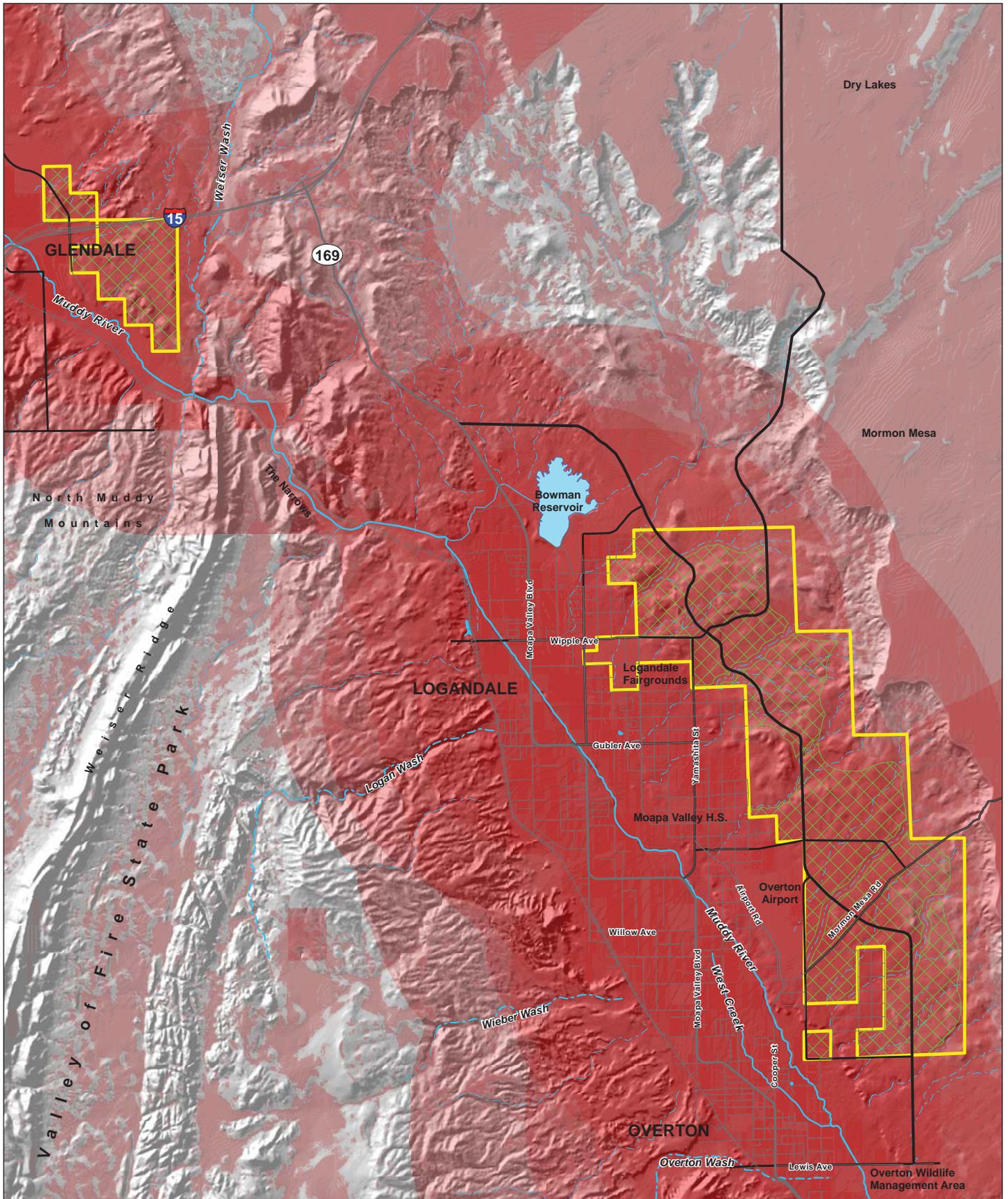
Constraints are often environmental assets, which occur within portion of the study area; however, they also include existing development, infrastructure limitations, and transportation plans. There are also constraints such as social and economic considerations that cannot be displayed on a map, but very much inform the planning framework. An example of an economic consideration is reserving land for public facilities (fairgrounds, detention basins, etc.) in the disposal area through the Recreation and Public Purpose Act at little or no cost to developers. Developers are also attracted to large landowners with contiguous holdings like the BLM rather than smaller, disjointed properties.

Accurately assessing constrained areas may occur at various scales, first at a high level of analysis to plan the general land use concept, and eventually down to individual site analysis at the time of permitting. For the purpose of forecasting development in Moapa Valley, the analysis is driven by the availability of resource data. As shown in the previous chapter, environmental data varies in accuracy and origin; data used for the constraints analysis is the best available, and site verification should precede any permitting or site development.

Development Attractiveness Factors

A development attractiveness model was designed to evaluate where development would most likely occur in the disposal area. The model uses an additive GIS overlay process to aggregate multiple types of GIS data into one composite GIS dataset. It does not subtract development constraints (i.e., steep slopes) but looks at the most attractive places to develop.

Table 4-3 summarizes the attractiveness criteria input into the GIS model, as shown in Figure 4-2, Development Attractiveness Criteria map. Following a review of the model outputs, the project team highlighted (in yellow) the most attractive, contiguous development opportunities in light of a future transportation network and natural resource constraints (Figure 4-3, Development Area Concept map). These highlighted areas total approximately 3,800 acres; the area necessary to accommodate 11,000 new residents in a new master planned community (see Table 4-2). Open space types (washes, desert edges, natural areas, etc.) are not included in the 3,800 acres.



*Moapa Valley
Open Space Plan
Figure 4-2. Development
Attractiveness Criteria*

□ Proposed BLM Disposal Area

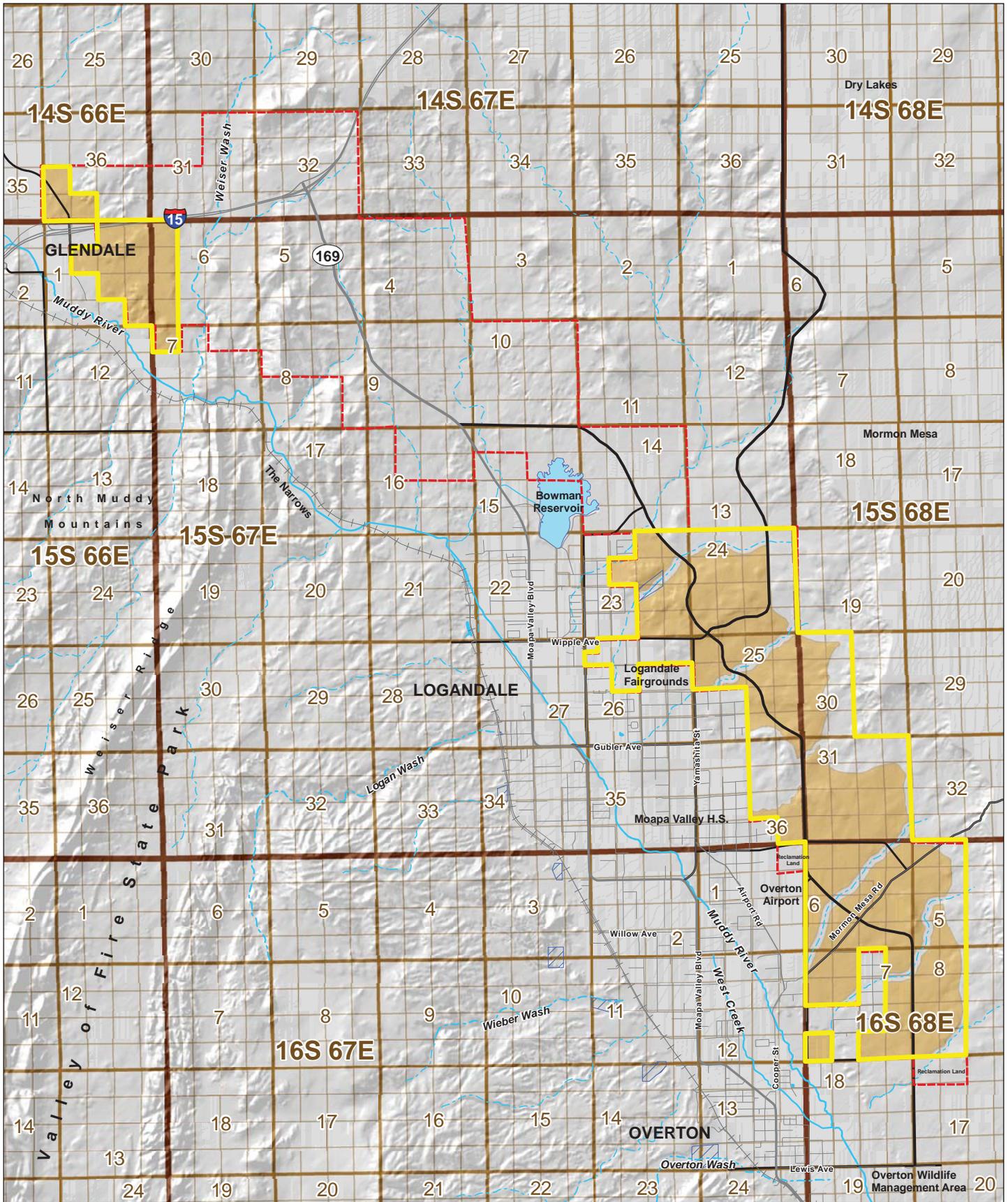
▨ Development Opportunities

Proposed Arterial Roads

~ Arterials (100+ ft R-O-W)

~ Arterials (120+ ft R-O-W)

* Areas with a deeper red hue have higher suitability values for development opportunities based on development attractors such as land use, slopes, schools and parks, and transportation, plus their respective buffers.



- | | | |
|-------------------------------------|--------------------------|--------------------------------|
| Proposed Disposal Area Boundary | Rivers and Washes | Proposed Arterial Roads |
| Current Disposal Area Boundary | River | Arterials (100+ ft R-O-W) |
| Development Areas (Total 3,886 ac.) | Major Wash | Arterials (120+ ft R-O-W) |
| PLSS Townships | Minor Wash | |
| PLSS Sections | Flood Control Basins | |
| PLSS Aliquot Parts | | |

**Moapa Valley
Open Space Plan**
**Figure 4-3. Development Area
Concept**

Factor	Buffer	Weight	Attractiveness Rationale
County Planned Land Use – all categories except Public Facilities/Public Conservation/Parks	None	1	Development proposals are more likely to be approved if consistent with existing regulations.
County Planned Land Use – Commercial, Planned Community, and Employment categories	1 mile	1	Commercial, planned community, and employment districts stimulate complimentary, adjacent development opportunities.
Private Ownership	None	1	Private lands can more readily respond to market demands, obtain approvals, and be “shovel-ready” than Federal lands.
Existing Roads	1 mile	1	Private and public costs from new development are less when sited near existing infrastructure.
Existing Schools	3 miles	1	Private and public costs from new development are less when sited near existing infrastructure.
Existing Parks	2 miles	1	Private and public costs from new development are less when sited near existing infrastructure.
Low slopes – 0-6% slope	None	1	Flat terrain has a lower cost to develop than steeper slopes.

Table 4-3. Development Attractiveness Criteria

Open Space in New Master Planned Communities

A number of developments have achieved protection of a substantial percentage of open space while remaining economically viable. Table 4-4 lists a number of case studies – all successful developments in the southwest – and the percentage of open space, one indicator in achieving the rural character desired by community leaders. New development in the disposal area could follow a similar model.

Development (# residential units)	Size (acres)	Percent Open Space	Location	Notes
Rancho Viejo	21,000	50%	Santa Fe, NM	Consists of multiple village clusters
Mesa Del Sol (39,000)	12,400	30%	Albuquerque, NM	Emphasis on sustainable practices, e.g. innovative stormwater management, low water use, etc.
Vistancia (17,000)	7,100	24%	Peoria, AZ	Includes a 900-acre desert preserve
DC Ranch (4-5,000)	8,281	54%	Scottsdale, AZ	Emphasis on preserving washes and natural desert. Incorporates scenic corridor design guidelines.
San Elijo Hills (3,398)	1,920	52%	San Diego, CA	Majority of open space is natural.
Summerlin (25,000+)	22,500	29%	Las Vegas, NV	About ½ of open space is natural, other ½ developed park sites.

Table 4-4. Open space percent in master planned communities (Lincoln Institute)



Natural Washes in New Master Planned Communities

Rarely are natural washes conserved in new developments in southern Nevada. However, this is not the case in new developments in Utah, Arizona, New Mexico, and California where many flood control projects complement the new community by providing a combination of aesthetic and recreational amenities, native vegetation, traditional park features, and infiltration.

The Clark County Regional Flood Control District has developed design standards for natural channels (704.1.1 Natural Unencroached Channels and 704.1.2 Natural Encroached Channels), which are consistent with local stakeholder preferences as they provide for aesthetic and trail opportunities. However, in most instances, these natural channel standards are not feasible in urban areas because development encroaches into the floodplain or upstream. The central issue becomes one of land use intensity and setbacks, rather than drainage design. Trail opportunities are also lost due to single-purpose road crossings.

As more development occurs within the Moapa Valley, the cost of necessary drainage improvements to protect these new developments increases, especially when the development occurs within the floodways, floodplain or areas of highest erosion potential adjacent to storm water conveyance facilities. Generally, 100-year floodplains and floodways are developed only through costly improvements (i.e., channelization, raising floor elevations, and constructing roads and bridges to withstand 100-year storm events). The single best way to keep the cost of storm water management to a minimum is to maintain smart growth guidelines, that is, locating development in areas safe from high erosion and flooding potential. Therefore, preserving the 100-year floodplain and wash system and integrating it into the built environment is a relatively inexpensive way to create a sustainable and valuable amenity, and to establish the basis of a cost-effective means of flood control.

Recommendations for Development Areas and Natural Washes

The following recommendations should be considered in evaluating development proposals within the Moapa Valley disposal area. These recommendations take into account previous Clark County Flood Control District master plan updates; however, they are not intended to be a master plan update with a complete listing of all drainage improvements required for each development scenario or a solution to ongoing flooding issues. They are also not intended to represent a

detailed hydraulic analysis or final drainage design. All future channel stabilization and other improvements will continue to be subject to review and approval by Clark County Flood Control District and or Clark County Development Review.

Instead, these recommendations present erosion control methods and best management practices (BMPs) for appropriate future development to reduce the risk of property damage from storm water flows within the dry washes during larger storm events, and maintain natural-appearing washes for trail access and habitat movement. Following these guidelines will further limit the risk of property damage downstream of the disposal area (Logandale and Overton communities), as they are intended to reduce maximum flows.

1. Recommended natural-appearing drainage BMP's for Moapa Valley Open Space Study are as follows:

Natural Channel BMPs

- a. New development should stay clear of existing channels and washes
- b. Use appropriately sized stone rip-rap from local sources or soil cement for channel stabilization
- c. Use buried structural erosion protection measures when development occurs within or adjacent to areas of high erosion potential.



Washes reinforced with soil cement provide an alternative to concrete-lined channels and provide non-motorized access.

Non-Natural (Improved) Channel BMPs

- a. Use structural erosion control measures when development occurs within or adjacent to areas of high erosion potential.

- b. Construct detention basins at strategic locations of channels to slow velocities and provide some settling of solids.
- c. Use drop structures within sub-critical and critical channels
- d. Use stilling basins and other velocity reducers

2. Proposed development setbacks from channels.

Major Washes (High Flow Channels over 500 cfs)

- a. Horizontal setback from edge of channel (wash) to property line (125' min.)
- b. Building setback inside property line per local zoning regulations.

- c. Development setback should be from edge of channel above the floodway. If a bench is present but undevelopable and or within the floodway/ floodplain, the setback shall be from the edge of channel above the bench.
- d. The edge of channel shall be determined based on limit of previous erosion activity into channel and shall be above the 100-year floodplain elevation, where applicable.
- e. The use of channel protection such as rip-rap, gabions, sheet pile walls, etc. may be necessary if development occurs within an area considered to have high erosion potential. These areas are described below.

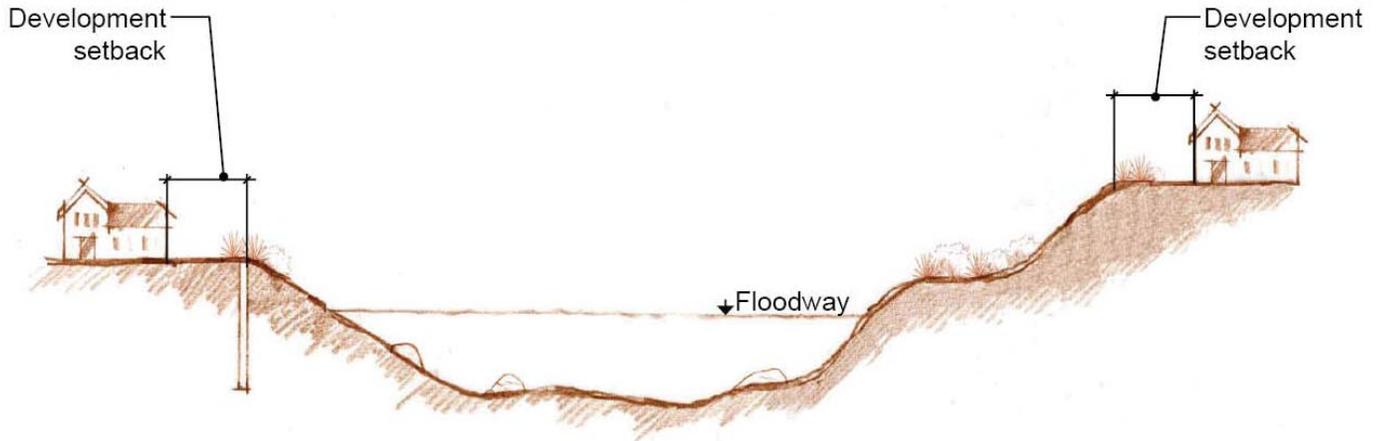


Figure 4-4. Major Wash Channel Setback (section)



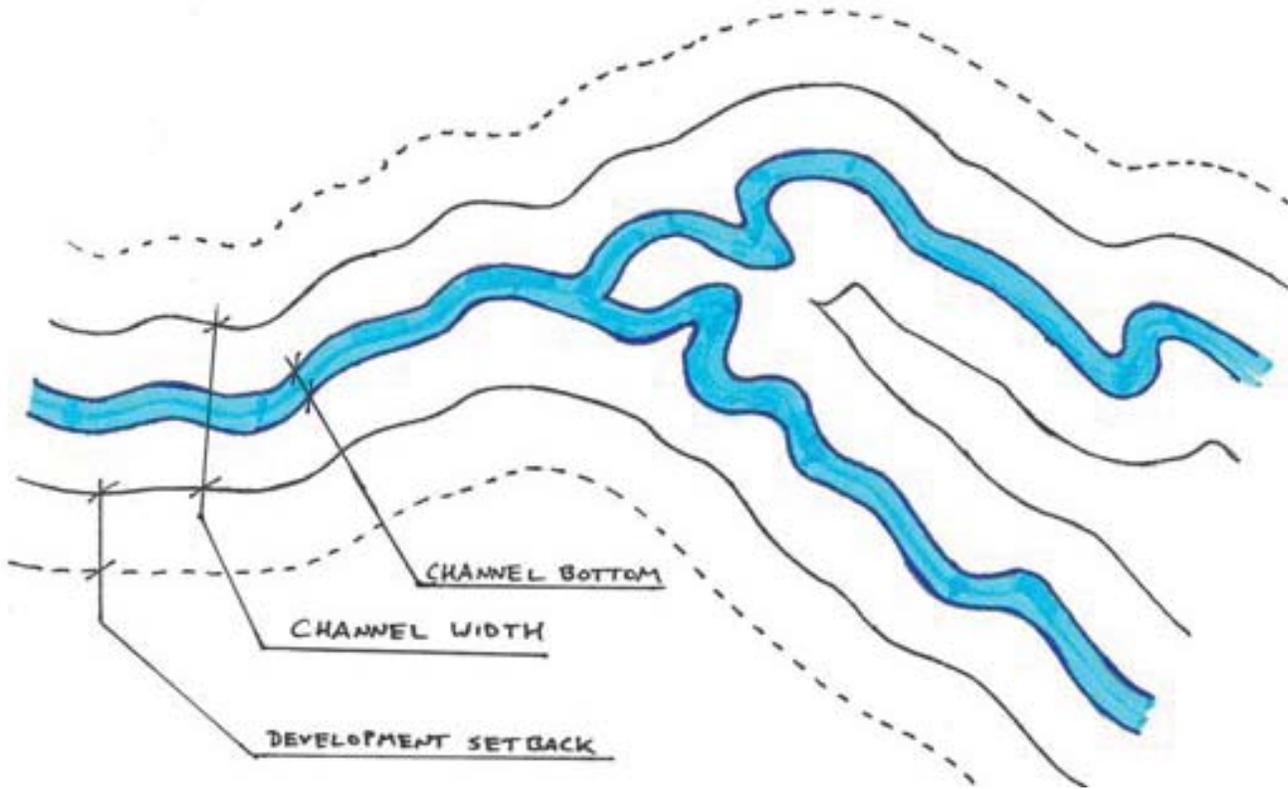


Figure 4-5. Major Wash Channel Setback (plan view)

Minor Washes (Low Flow Channels under 500 cfs)

- a. Horizontal setback from edge of channel (wash) to property line (75' min.)
- b. Building setback inside property line per local zoning regulations.

3. All future development should occur outside of areas considered to have high erosion potential. This recommendation may be above and beyond the site development requirements as stated in the Clark County development regulations "Areas of highest erosion potential" occur in one or more of the following circumstances:

- a. Areas containing sandy, unstable soils especially on steep slopes (as described in the SCS soil survey and the Clark County GIS data)
- b. Areas adjacent to meandering channels (development should be outside of areas where channel may be reshaped as a result of high velocity flood waters)
- c. Areas of steep longitudinal channel slopes (these create higher velocities and more potential for damage during flood event)
- d. Areas along channels conveying large volumes of storm water in large basins
- e. Areas of steep side slopes adjacent to channels (greater than 12% per Clark County Flood Control Manual)
- f. Areas within floodplain, floodway or buildings with a FF elev. below 18" above 100-year floodplain or elevation subject to flooding during a 100-year storm event.

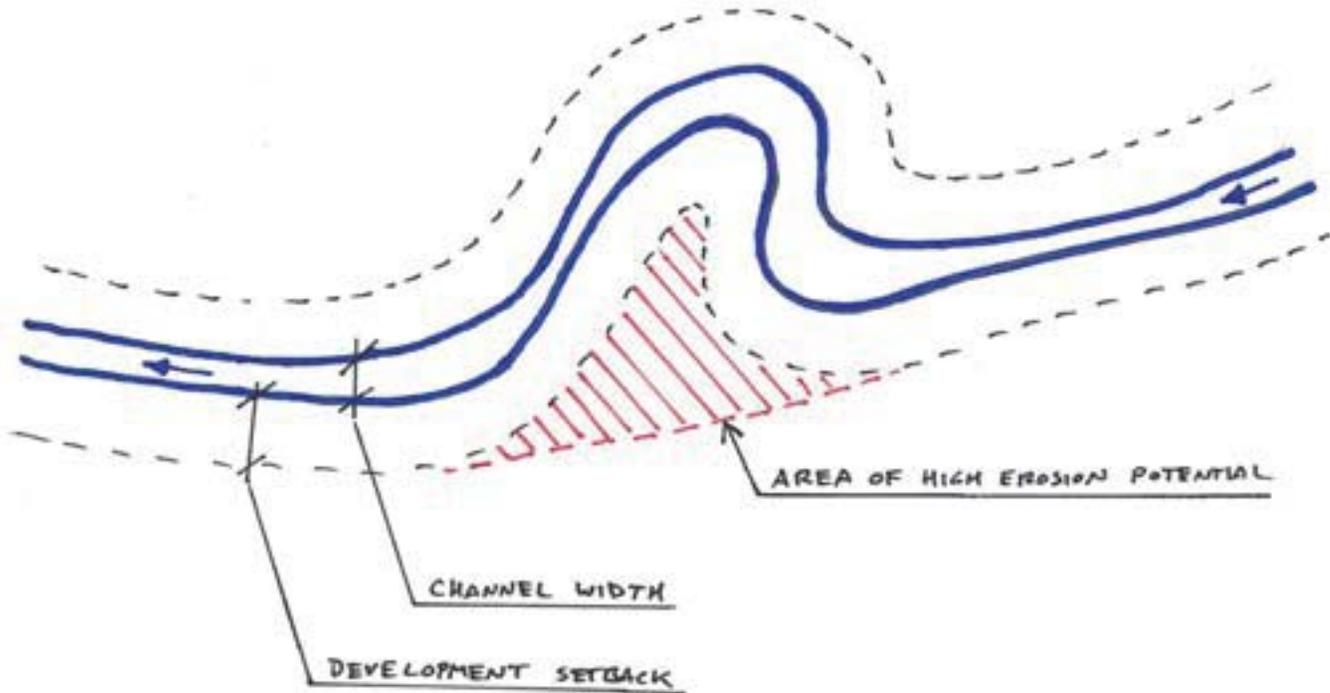


Figure 4-6. Areas of High Erosion Potential (plan view)

4. Options for Crossing Channels

Low flow (dry) crossings: Low flow channels of varying flows (i.e., Overton Wash and Moapa Valley Boulevard)

- a. The use of this method varies with specific channel conditions and soil stability.
- b. Stream bed crossings are most appropriate in areas where the channel flow potential is low to medium and the channel section is relatively flat so crossing it with a multi-purpose trail does not produce a large amount of additional erosion to the side slopes of the channel.
- c. This type of crossing does not function well where the channel is deep or side slopes are steep.
- d. This type of crossing may require maintenance after the larger storm events.
- e. Protection of the crossing may be provided using rip rap or gabion armoring.

Box culverts: Low to medium flows from medium sized sub-basins

- a. The use of concrete box culverts is preferred over the use of CMP, RCP, or HDPE and other types of pipe culverts.
- b. Some municipalities require the use of concrete culvert structures instead of other materials in all public ROW applications.

- c. The size and number of culverts is determined based on the potential flows that may be generated during a 100-year storm event upstream of the crossing.
- d. Even if lesser storms are required to size these types of conveyances, it is recommended that the 100-year storm event be used in order to provide the best possible survivability of the facility in larger rainfall events.
- e. Box culverts are best suited for small to medium sized basins and channel flows.
- f. This type of crossing will protect larger multi-use trails, dirt roads and local paved roads.
- g. If this structure is used, it is recommended that the dimensions of the structure also accommodate multi-use trails. This can be accomplished by providing a minimum width of 8 feet and a minimum height of 10 feet.





Figure 4-7. Floodway box culvert for flood and trail use

Higher channel flows from larger sub-basins

- a. Bridge structures, regardless of the number of spans, provide better stormwater conveyance for larger channels with higher flow volumes.
- b. This type of crossing is best suited for larger, more heavily used and permanent facilities such as major dirt roads and paved roads.
- c. Because of the costs associated with this option, it will more likely be used for the larger paved roadways.

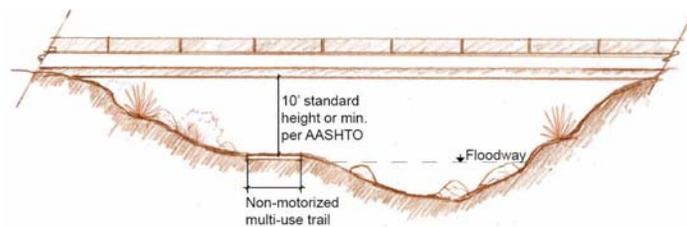


Figure 4-8. Bridge Structure Grade Separated Crossing

- a. A minimum of 10' clearance height shall be maintained, where applicable, for multi-use trails.
- b. The trail location shall be located on benches where possible to limit the effects of standing water and muddy ground within the trail during smaller precipitation events.



Figure 4-9. Bridge structures best maintain natural-appearing channels, trail access, and convey stormwater.

Additional Notes:

Clark County Flood Control Manual states the following:

- a. A minor storm is defined as a 10-yr storm event which usually only cause minor problems and inconvenience to the public.
- b. A major storm is defined as a 100-yr storm event which may cause major damage to public property and loss of life.
- c. Local flood control facilities are defined as smaller facilities which collect and convey stormwater from local area to regional flood control facility.
- d. Regional flood control facilities are all facilities which are included in the Regional Master Plan(s) as adopted by the CCRFCD.
- e. NDOT requires that the 10-yr to 50-yr storms be used to size culverts, not the 100-yr.
- f. FEMA has mapped 100-yr flood plains and floodways for the region. However, no 100-yr flood plains or floodways have been mapped for the disposal area.



05 Moapa Valley Trail Recommendations





Trail Recommendations

Trail planning for the BLM disposal area has been built on years of effort of community members, Clark County, Bureau of Land Management, and others. As described in Chapter 2, the process began with developing an understanding of past planning efforts and decisions, followed by an inventory of existing routes within and adjacent to the disposal area.

A few assumptions were defined to help frame options for the trail system:

- Routes on BLM lands outside the disposal area will stay open to OHV use. Current BLM regulations require that vehicles stay on existing roads and trails. Trails planned inside the BLM disposal area can be connected to these existing trails
- As new residential and commercial development and new arterial and highway alignments are planned in the disposal area, OHV access should be maintained while avoiding impacts to new developments.
- OHV trails should traverse the Moapa Valley from east to west as defined by this and the Moapa Valley Trails Plan (2010).
- Physical trail barriers to overcome include: Mormon Mesa rim, Weiser Ridge, Interstate 15, and Moapa Valley Boulevard (Hwy169)
- Proposed trails in this plan are limited to the BLM disposal area. If any trails are proposed on other Federal lands, they would require Federal approval and NEPA evaluation. If any trails are proposed on private land, they would require landowner permission.

Trail Planning Best Practices

Trail planning best practices were developed with the Open Space Committee:

- Diversity of trail types and experiences
 - Provide the right mix and balance of trail types: OHV, Hike, Bike, and Equestrian
 - Provide interesting and enjoyable routes based on the types of intended use
 - Provide the right mix of challenges
 - Avoid conflicts between trail users by providing both multi-use and individual use trails
- Interconnected and safe trail network with a hierarchy
 - Good distribution and diversity of trail lengths
 - Appropriate trail access locations with basic services
 - Appropriate areas to concentrate trails
 - Connections to trails outside the valley
 - Connection of trails to recreation resources

- Avoid conflicts with sensitive resource areas
- Opportunity for education and interpretation
- Well designed and constructed trails lead to a better experience, reduced impacts, and lower maintenance costs
- Consider trail network management requirements
- Criteria specific to motorized trails
 - Avoid conflicts with residential areas
 - Provide many curves and grade changes to control speed and improve safety
 - Provide long routes
 - Establish width to prevent trail widening
 - May be valuable to provide different classes: single-track, ATV and full-size
 - Establish designated routes to limit impacts to vegetation and other resources
 - Provide a safe OHV area for children and beginners
- Criteria specific to non-motorized trails
 - Separate from motorized trails where possible
 - Locate close to roads and neighborhoods for convenient use
 - Provide at least one “backcountry” trail
 - Locate away from more sandy soils (for hiking and biking)
 - The bottoms of washes provide good trail opportunities, but are sandy and difficult to use

Trails Suitability Model

A trail suitability model was then developed to evaluate the disposal area for trail alignment potential. The model uses a GIS overlay process to synthesize multiple types of GIS data into one composite GIS dataset. The composite dataset provides a straightforward ranking system from least to most suitable for trail development. The model does not attempt to predict alignments for trails, but rather serves as a base when evaluating each part of the disposal area for trail alignments. The model outcomes are oriented towards motorized trails but can also be used for selecting non-motorized trail alignments.

Table 5-1 summarizes the suitability criteria that were input into the GIS model. Figure 5-1 shows the outcomes of the trail

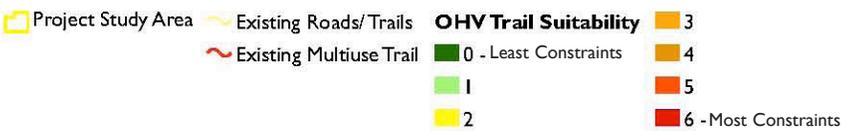
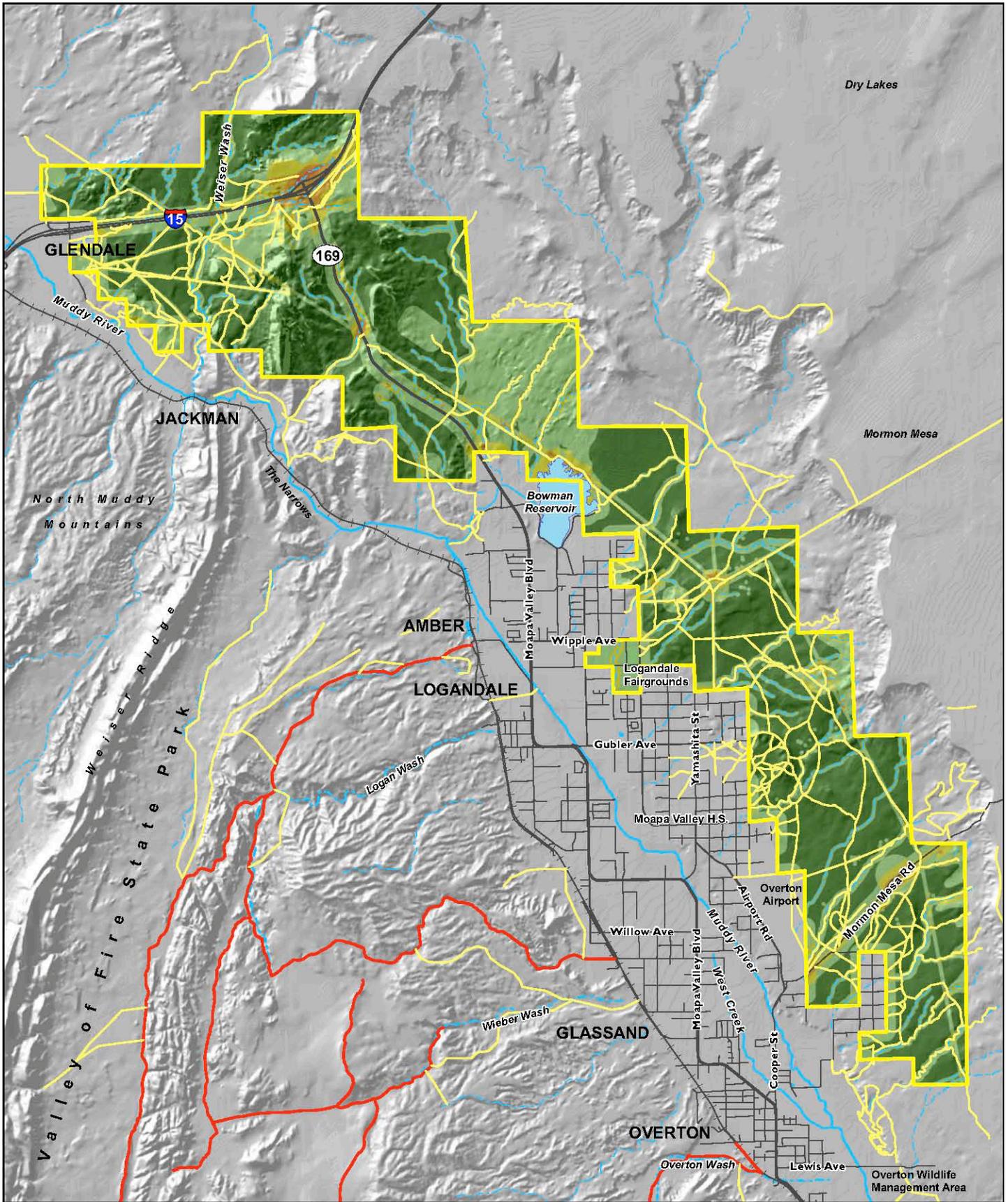
suitability model.

Factor	Buffer	Weight	Attractiveness Rationale
County Planned Land Use – all categories except Public Facilities/Public Conservation/Parks	None	1	Development proposals are more likely to be approved if consistent with existing regulations.
County Planned Land Use – Commercial, Planned Community, and Employment categories	1 mile	1	Commercial, planned community, and employment districts stimulate complimentary, adjacent development opportunities.
Private Ownership	None	1	Private lands can more readily respond to market demands, obtain approvals, and be “shovel-ready” than Federal lands.
Existing Roads	1 mile	1	Private and public costs from new development are less when sited near existing infrastructure.
Existing Schools	3 miles	1	Private and public costs from new development are less when sited near existing infrastructure.
Existing Parks	2 miles	1	Private and public costs from new development are less when sited near existing infrastructure.
Low slopes – 0-6% slope	None	1	Flat terrain has a lower cost to develop than steeper slopes.

Table 5-1. Trail Suitability Model Considerations

The topography and soils found in the disposal area are generally suitable for both motorized and non-motorized recreation. Some portions of the disposal area have steep slopes, which has prevented route establishment. Some areas have sandy or clay soils, which are more erodible and can be difficult to travel on at times, especially for mountain bikers. While these soils have some constraints for trail use, the limited precipitation in the area makes these soil types mostly usable for recreation. The moderate to steep topography found north of Bowman Reservoir is more suitable for OHV use due to the interest and challenge it provides.





Moapa Valley
Open Space Plan
Figure 5-1. Trail Suitability Model

Proposed Trail Network

The overall vision for a trail network is to provide high quality recreational experiences for both non-motorized and motorized trails. The following goals and objectives further elaborate on this vision.

Goals

Provide a non-motorized trail network that serves both current and future residents and visitors

- Provide multi-use non-motorized trails that accommodate hiking, running, bicycling and equestrian uses
- Provide a desert edge trail along the eastern edge of the disposal area to organize access, improve trail connectivity, and limit user-created trails on adjacent BLM land
- Connect trails to neighborhood streets, schools, parks, and open space
- Provide trails in settings when possible to appreciate nature and enjoy views
- Provide trail alignments that are safe

Provide a motorized network that serves current and future residences and visitors while limiting impacts to residential land uses

- Provide motorized trail connections to OHV trails to public land outside the BLM disposal area
- Provide an Open Play Area to accommodate creative and challenging riding opportunities
- Provide trail alignments that are safe and interesting

Several trail network alternatives were developed with varying degrees of emphasis on the status quo, new motorized routes, and new non-motorized routes. Overall, the committees were in favor of the alternative with a motorized trail emphasis.

Based on the previous input and comparison of the trail network alternatives, a preferred alternative was developed as shown on the Open Space and Trail Map (see also Table 5-2). This preferred alternative attempts to balance the desires of the community for motorized and non-motorized recreation with the eventual development of future residential and commercial areas and associated roads and utilities. The trail network also provides access to proposed open space areas.

Conceptual Trails in Study Area	Total Miles
Multi-Use Non-Motorized	12.5 miles
Desert Edge	8.24 miles
ATV	8.6 miles

Table 5-2. Length of Conceptual Trails in Proposed Disposal Area.



Trail Classes

The trail system, based around the physical features of Bowman Reservoir, Mormon Mesa, and network of washes, is relevant both before and after build out occurs. However, the eventual and complete design and construction of the system would occur during build out.

On-Street Trails

The primary focus is on off-street trails that are compatible with an open space recreational experience. As development is planned and constructed in the BLM disposal areas, on-street pedestrian and biking facilities should comply with AASHTO design standards and the Regional Transportation Commission standards for on-street pedestrian and bicycle facilities, which are described in the Alternative Transportation Mode Master Plan adopted by the RTC Board. Clark County Comprehensive Planning, Development Services and Public Works implement on-street pedestrian and bicycle facilities through the development review and conditioning process.

Off-Street Trails

New potential off-street trails (i.e., shared-use paths) must comply with the *Clark County Development Standards for Off-Street Trails* and be consistent with the intent of the Moapa Valley Trails Plan (2009) so that connectivity and trail standards are consistent throughout the community. The standards have been incorporated in the discussion that follows.

Proposed trails in the study area have been divided into 4 basic types. One of these is identical to a trail type included in the Moapa Valley Trails Plan. Each trail type is designed to promote a distinct experience and accommodate varying levels of use. It is anticipated that trails would be constructed as demand for their use increases and new development can fund their construction.

1. Multi-Use Non-Motorized – North-South Trail, Bowman Reservoir, Washes

- 4'-6' soft surface equestrian trail
- 2' shoulders on each side of multi-use trail
- 8' multi-use paved trail
- Where flood control access roads are utilized for trail use, RFCD standards must also be met

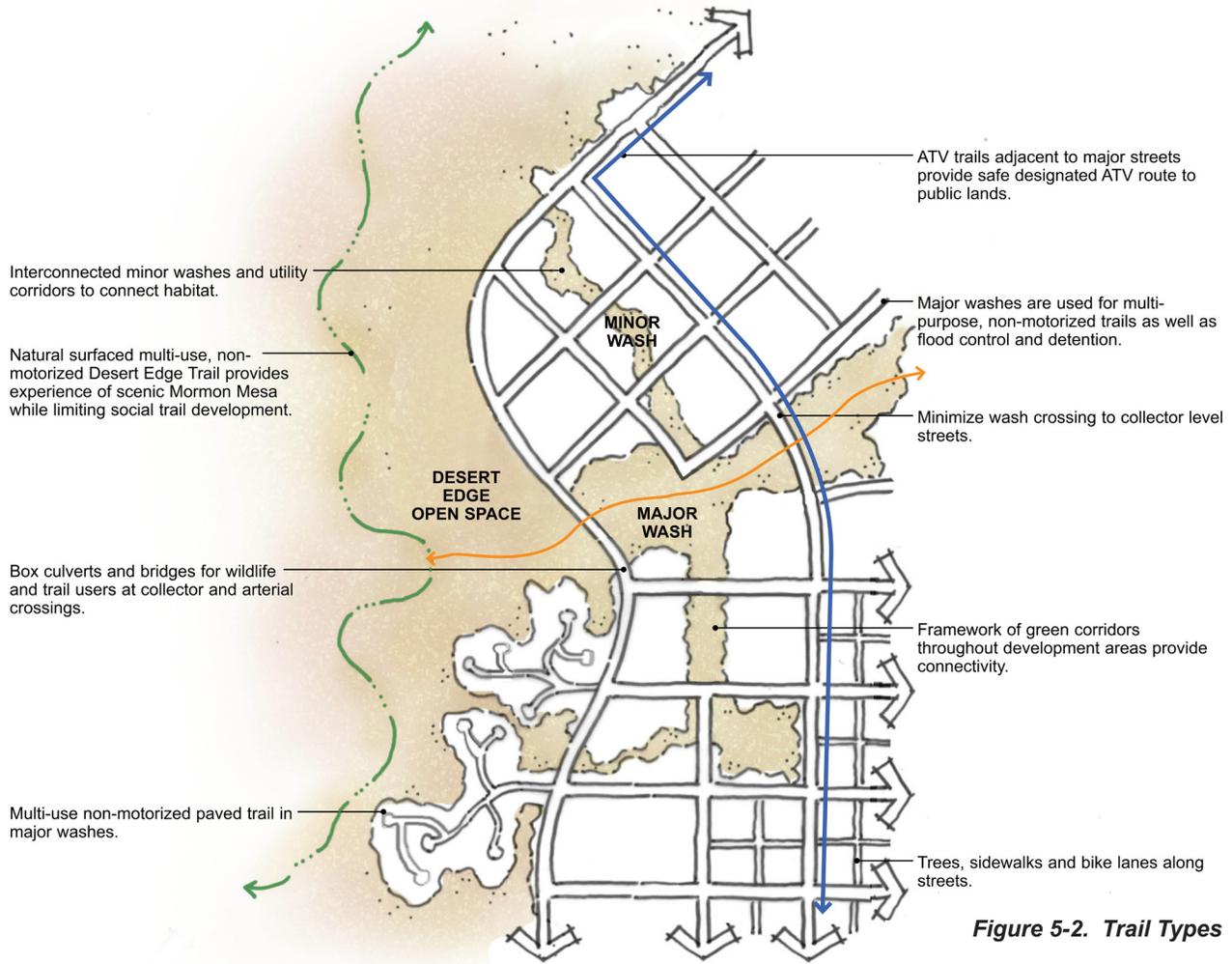


Figure 5-2. Trail Types

Primary off-street paved routes within development areas are intended to serve existing and future residents and to provide connections between neighborhoods and community properties such as schools and parks. These trails are designed to accommodate higher volumes of use and would be constructed of concrete or asphalt. A soft-surface shoulder is provided for horse and jogger use. Existing and future neighborhood sidewalks and trails would be connected to the primary trail network. This trail type would accommodate most types of non-motorized recreation including walking, jogging, bicycling, roller-blades, skateboarding, and equestrian riding.

A north-south Multi-Use Non-Motorized Trail is proposed along the west edge of the BLM disposal area and would extend from Mormon Mesa Road in the south to Bowman reservoir in the north.

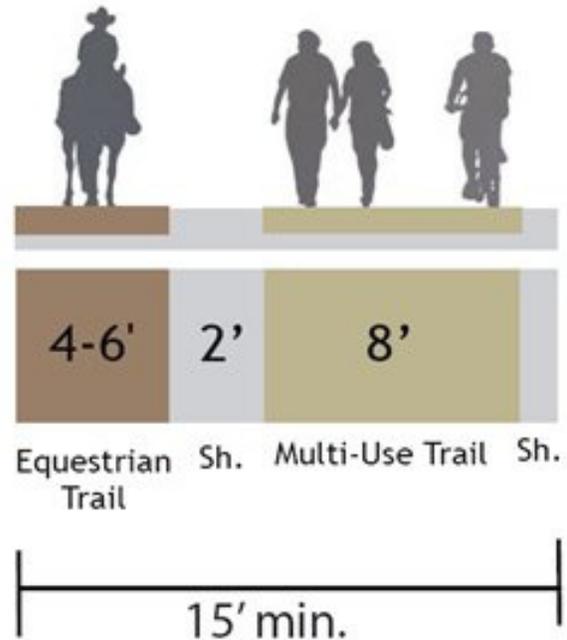


Figure 5-3. Multi-Use Non-Motorized Trail (see Moapa Valley Trails Study, Trail Design Standards)

The Bowman Reservoir trail would also loop around Bowman Reservoir and provide a route to enjoy the views to the reservoir and to access future recreational resources at the reservoir.

Wash trails would connect from the community-edge trail to new neighborhoods and a desert-edge trail. These trails would follow conserved wash corridors and would be typically located above the wash channel. Most wash trails will follow this standard, however, some may be soft-surface depending on the level of proposed development and the anticipated level of use.

This type of trail would not be open to motorized recreation.

2. Multi-use Non-motorized Desert Edge Trail

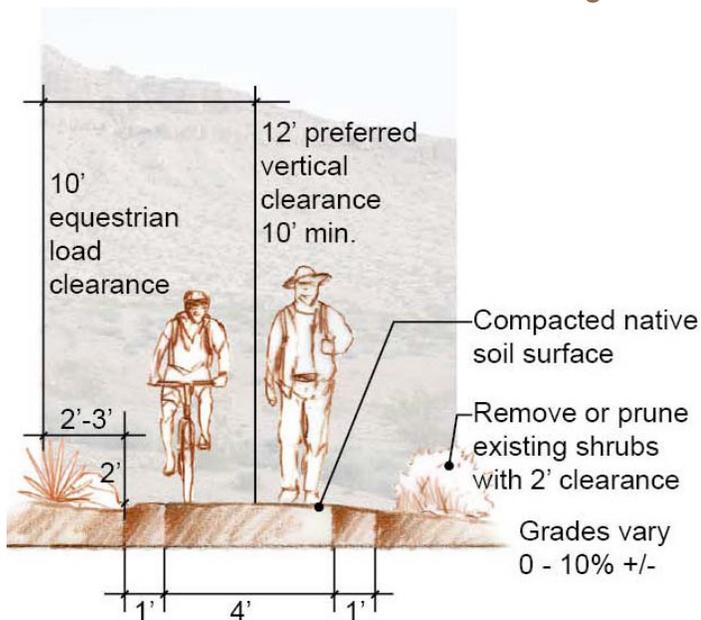


Figure 5-4. Multi-Use Non-Motorized Desert Edge Trail

- 4' soft-surface trail
- 1' clear shoulders

The trail is planned as an improved soft-surface trail but could be paved in the future if increasing levels of use warrant the investment. The trail would be 4 feet wide to accommodate side-by-side travel and for trail users to easily pass each other. Similar to a backcountry trail, the surface would be constructed of acceptable aggregate or gravel, suitable native soils, or soil cement, suitable for horses, walking, jogging, hiking, and mountain biking. The trail would wind through desert edge open spaces that would be conserved and provide a transition from development to the natural setting. Future neighborhood sidewalks and trails could tie into the desert edge trail. The trail

would accommodate most types of non-motorized recreation including walking, jogging, mountain biking, and equestrian riding. This trail would not be open to motorized recreation. Interpretation would be provided along the trail to educate users about natural and cultural resources of Moapa Valley and Mormon Mesa.

This trail would be located on the eastern edge of the BLM disposal area and future neighborhoods. The trail would provide a recreation corridor that would connect neighborhoods, open space areas and BLM lands together. The trail would extend from the southern edge of the disposal area to Bowman Reservoir and would tie into the multi-use non-motorized trail. The trail would also establish the edge between development and the desert to the east including Mormon Mesa.

3. Multi-Use Motorized Trail – Existing BLM Routes

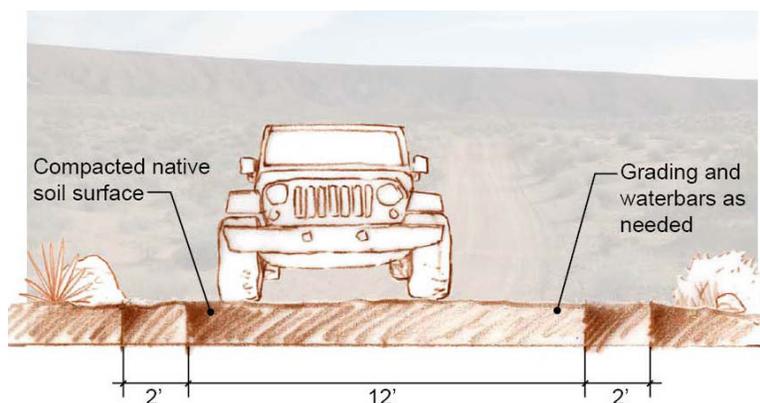


Figure 5-5. Multi-Use Motorized Trail (Existing BLM Routes)

OHV use is encouraged on existing BLM roads and trails and other lands managed by Federal agencies. Existing routes primarily follow existing utility corridors that also provide maintenance access. Multi-Use Motorized trails are primarily located in rural or undeveloped areas in the northern portion of the BLM disposal area. However, motorized trail connections may pass near the development areas with appropriate separation from development and non-motorized trails.

An opportunity exists to connect the OHV Open Riding Area to Deadman's Trail on the west side of Highway 169. A trail leaving the northern portion of the BLM disposal area would pass under Interstate 15 through the Weiser Wash box culvert and would follow Weiser Wash to the north. The trails will provide a somewhat limited challenge for OHV riders but will connect to other OHV trails in the region that provide more topography, challenge and distance. Trail crossings across Highway 169





would be at grade and would require stop signs on the trail as well as caution signs on the highway. Vehicles travel at a high rate of speed on this portion of the highway so it will be important to provide good sight-lines and signage to avoid accidents.

This type of trail would typically be 12-20 feet wide and would accommodate full-size OHVs, such as jeeps, to pass each other slowly. This type of trail will be popular for ATVs, UTVs and motorcycles.

Equestrians, hikers, and mountain bikers would share multi-use motorized trails and would yield to motorized users. Non-motorized users may be discouraged from using the trails during periods of high OHV use.

4. ATV Trail Parallel to Future Arterial (Alta 2.0 cross section)

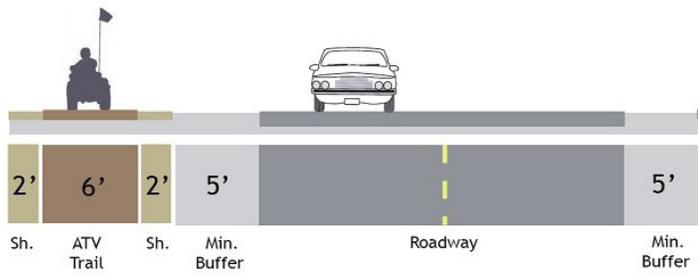


Figure 5-6. ATV Trail Parallel to Future Arterial (see Moapa Valley Trails Study, Trail Design Standards)

- 6' soft ATV trail (rock base or soil stabilization) with 2' shoulders
- Two-way vehicle roadway, with 5' buffers/shoulders min.

As the southern portion of the BLM disposal area is privatized and developed, OHV recreation will become less compatible with residential and commercial areas. For this reason, ATV (5-wheelers, mules, motorcycles, etc.) routes in the southern portion of the BLM disposal area are proposed to parallel arterial road corridors, to maintain connections from existing and future neighborhoods to OHV routes on BLM.

These trails would be natural surface trails and would be 6 feet wide to accommodate ATV, UTV and motorcycle travel. A 2 foot trail shoulder on both sides of the trail would allow wider OHVs to pass slowly. Full-size OHVs such as jeeps would use public roads to connect to OHV routes on BLM land. Road crossings would be at grade and would require stop signs on the trail as well as caution signs on the road. Vehicles may travel at a high rate of speed on these roads so it will be important to provide good sight-lines and signage to avoid accidents. Where possible, ATV Trails should cross Non-Motorized Multi-Use Trails at grade-separated crossings to avoid user conflicts.

As development occurs in the southern portion of the BLM disposal area, Mormon Mesa Road may need to be improved to create an ATV Trail on the shoulder due to the steep slopes of the Mesa. It will be important to warn vehicles on the road about the presence of ATVs on the road shoulder. ATVs would be required to stay on the road shoulder and yield to licensed vehicles when necessary. Speed limits should be very low on this portion of the road due to sharp turns, steep grades and presence of ATVs.





Chapter 6 - Implementation

The Open Space and Trails Concept Map sets out an ambitious yet achievable vision for public land transfer and future development, one that is strongly supported by local stakeholders. Whether in 5 years or 50 years, the Moapa Valley Open Space Study's inventory of the disposal area's natural and aesthetic resources, and concepts for creating an integrated open space and trails system will be relevant in the decision-making process.

Challenges to implementing the vision include refining mechanisms for protecting and managing open space and trails, maintaining active citizen and Town Advisory Board involvement, ensuring that development proposals conform to the vision, and creating long-term capital and operational funding arrangements. This chapter addresses each of these challenges sequentially.

Paramount to all of these challenges is the importance of creating and maintaining meaningful partnerships between the Bureau of Land Management, County Commissioners, County staff, Town Advisory Boards, developers, and local citizens. As the landowner, the BLM currently manages the disposal area and surrounding landscape for multiple uses – from energy development to endangered species. Once approved by County Commissioners, the BLM would treat this plan as an advisory document – no changes in land management or ownership would occur without BLM concurrence. Funding limitations and Federal priorities may at times limit the BLM's capabilities; some strategies will require County or community backing such as OHV stewardship and enforcement.

The recommendations that follow are not intended to provide a single method. In most cases, a variety of protection strategies can be employed by the BLM, state, and local governments working in tandem towards a common goal. They also require an optimistic long-view, one that is not overly focused on current economic conditions. In fact, the 2008-2009 recession offers an opportunity for conservation planning that may not have been acceptable if not for the economic downturn. As this plan may not be fully implemented in 20 years and the Resource Management Plan Update will be a multi-year process, an active and persistent citizenry is essential for continual progress.

Protection and Management of the Open Space and Trail Corridors

There are several strategies to protecting high resource lands identified in this study. A reactive and less effective method would be to wait until a land sale. A development proposal to purchase BLM land would require reviews by the Town Advisory Boards, public meetings, County and BLM staff, and the Board of County Commissioners. There is no schedule for such a sale, and negotiations with developers at a future date may not fully achieve the desired outcome.

Without a land sale, the community can work proactively with the BLM and County departments to implement a number of goals. These actions are referred to in the third column of Table 6-1. The update to the Las Vegas Field Office Resource Management Plan, scheduled to begin in 2010, provides a significant opportunity to consider modifying land management strategies and redraw the disposal boundary. Town Advisory Boards should make a formal request to the BLM regarding how the other two disposal areas should be addressed in the RMP Update. Table 6-1 lists the pros, cons, and near-term actions for each protection strategy.

Some strategies rely upon aliquot part mapping (an aliquot part, in the U.S. Public Land Survey System, is the standard subdivision of area of a section, e.g., a half section, quarter section, or quarter-quarter section). Figure 6-1 displays the aliquot parts available for the study area and a draft outline of a revised disposal area boundary.



STRATEGY	PROS	CONS	ACTIONS
RETAIN IN FEDERAL OWNERSHIP...			
Modify the BLM Disposal Boundary through the Las Vegas FO Resource Management Plan Update	<p>The size of the disposal area far surpasses development demand for the foreseeable future. This strategy would redraw the disposal area to include those areas most suitable for development, focusing on areas adjacent to existing development and lacking constraints to development, e.g. steep slopes, high resource value, etc.). See Figure 6-1.</p> <p>With agency and political support, this could be accomplished at a low initial cost through the BLM planning process. Implementation of this strategy would retain public lands less suitable for development and with higher resource values in public ownership, at least until the subsequent RMP Update (revised in a 7-10 year cycle).</p> <p>Reduces BLM's management responsibilities of the urban interface.</p>	<p>Does not dissolve BLM's management responsibilities of the urban interface.</p> <p>The Moapa Valley Open Space Study's recommendations may not wholly or in part be reflected in the RMP Update.</p> <p>A large disposal area provides maximum flexibility. Areas not within a defined disposal area would not be available until the next RMP.</p>	<p>The BLM will consider the adopted plans of local governments in its resource management planning. However, stakeholders should not rely entirely on adopted plans. They should actively and consistently involve themselves and their elected officials in the RMP Update.</p> <p>Town Advisory Boards, citizens, and/or Board of County Commissioners to submit written requests that the disposal area boundary be modified during the RMP Update per this study.</p> <p>The Moapa Town Advisory Board should make a formal request to the BLM regarding how the other two disposal areas should be addressed in the RMP Update.</p> <p>2010 will be a critical period to participate in the RMP Update, as scoping and alternatives are developed by the BLM.</p>
Administrative Designations as a Special Recreation Management Area (SRMA) through the Las Vegas FO Resource Management Plan Update	<p>The disposal area is not specifically treated as a Special Recreation Management Area, as is the Logandale Trails area. A SRMA may be a good vehicle for further clarifying the trails system. In theory, a special designation can be easily accomplished through upcoming Las Vegas Field Office Resource Management Plan Revision.</p> <p>There are multiple precedents for the establishment of ACEC's and other administrative designations.</p>	<p>May not solve the problem of inadequate resources to effectively manage the area.</p> <p>May not provide permanence and long-term protection. Despite the designation, a Recreation Area Management Plan (RAMP) may not be prepared for several years.</p> <p>Special Recreation Management Areas and other special administrative designations may not have "teeth," and could be trumped by renewable energy or other initiatives.</p>	<p>Town Advisory Boards, citizens, County staff and Board of County Commissioners should actively and consistently engage the BLM in discussing SRMA or other protection strategies during the RMP Update.</p>



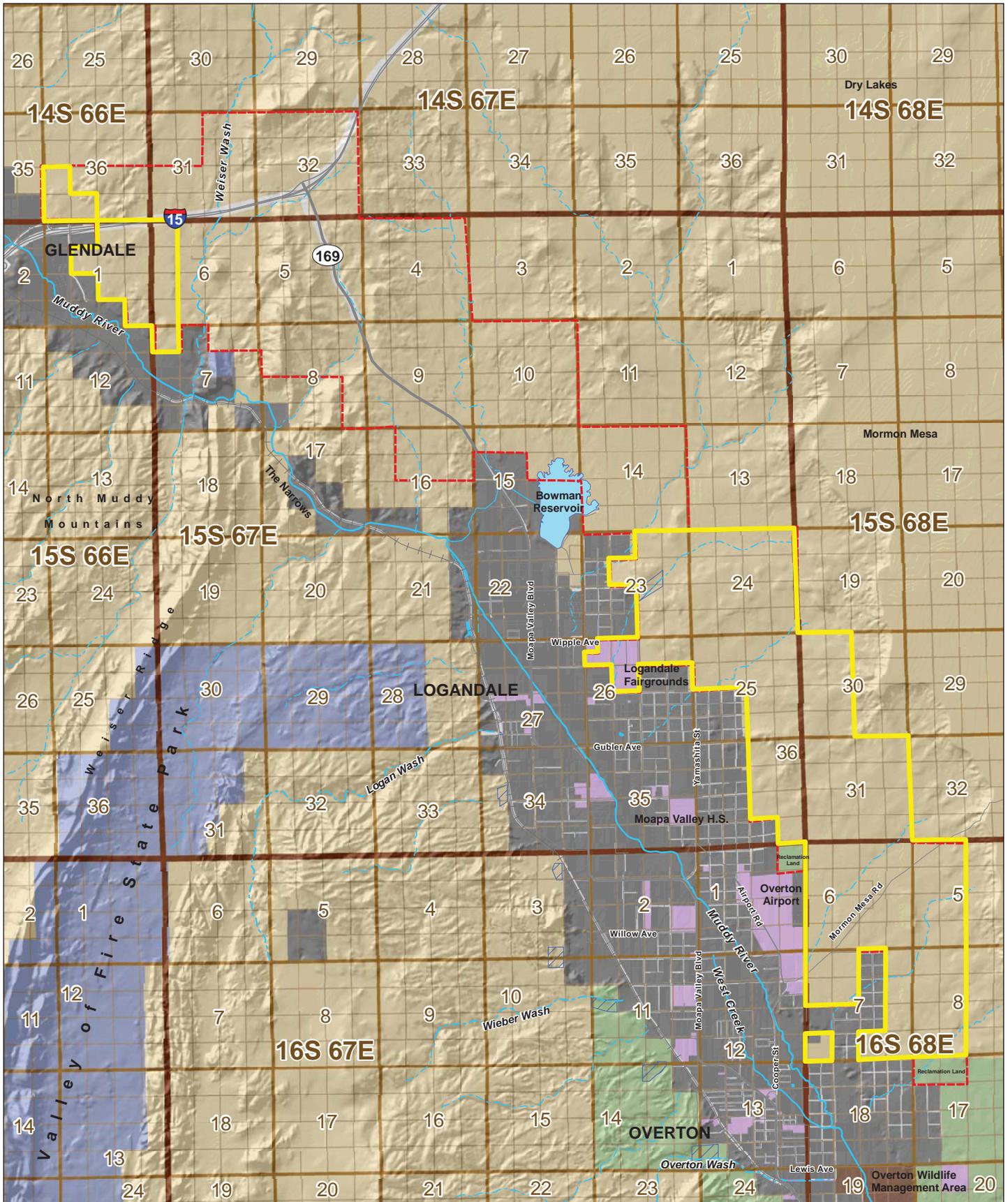
STRATEGY	PROS	CONS	ACTIONS
RETAIN IN FEDERAL OWNERSHIP...			
Retain in Federal ownership and protect through additional management partnerships	<p>Many precedents exist for BLM land managed cooperatively by other agencies or local governments. For example, Clark County Wetlands Park contains lands owned by Clark County, BLM, and Reclamation but it is managed cooperatively as a unit.</p> <p>The Desert Conservation Program focuses on high value lands outside of the path of valley expansion and has acquired or supplemented Federal agency protection and management of tens of thousands of acres. The MSHCP will soon be updated and may incorporate portions of the Moapa Valley where critical habitat values can be demonstrated. The Desert Conservation Program does not own, but does manage land. It provides ESA mitigation for habitat disturbance, and open space conservation would qualify as a mitigation measure.</p>	<p>Would require another organization – most likely Clark County, unincorporated towns, or a capable citizen group (i.e., non-profit) – to establish a partnership. For example, Reclamation land along the River Mountains Loop Trail in Henderson and Boulder City is managed by municipalities through a cooperative agreement.</p>	<p>Management partnerships are most needed for high OHV use areas, such as the dunes north of Bowman Reservoir and washes. Evaluate Moapa Valley and Moapa TAB's and citizen group's ability to lead certain management activities, such as illegal dumping or shooting enforcement and cleanup.</p> <p>Support a local community group in supplementing BLM's management capabilities in areas such as illegal dumping, shooting, OHV use, habitat restoration, and user conflicts.</p> <p>Request Nevada State Parks efforts in managing Bowman Reservoir recreational activities.</p>

STRATEGY	PROS	CONS	ACTIONS
OWNERSHIP TRANSFER OR LEASE...			
R&PP Purchase	<p>Gives local government or school district greatest ability or control to restrict use of the land.</p> <p>Transfer to city/county at no cost. Permanent strategy.</p>	<p>Requires a willing public partner with capital and operational funding resources.</p> <p>Public partner assumes responsibility for all maintenance and management.</p>	<p>R&PP would be an applicable strategy to the Bowman Reservoir, OHV Play Area, Washes, Parks, and Special Use Parks.</p>
R&PP Lease	<p>Similar to R&PP Purchase.</p> <p>City of Mesquite utilized an R+PP lease to transfer 690 acres, including the 'scenic viewshed' of a mesa, for development of a 100-acre sports complex, hiking trails, and passive recreation.</p> <p>Provides greater flexibility.</p>	<p>May not provide a long-term solution.</p>	<p>R&PP would be an applicable strategy to the Bowman Reservoir, OHV Play Area, washes, Desert Edge, Parks, and Special Use Parks.</p>
Acquisition through R-O-W	<p>Flood control channels, transmission lines, roads are all established on BLM land by ROW (still held in ownership by BLM). Trails on BLM lands (in advance of a land sale, or outside of the disposal area) would likely require a ROW.</p>	<p>Could only be used for trails or (potentially) wash preservation. Would likely remain protected regardless of a change in ownership.</p>	<p>Determine how to protect specific trails and washes in consultation with the BLM.</p> <p>County to prepare ROW or R&PP applications. County can request a ROW from BLM for natural drainage corridors. The Flood Control District would be willing to write a support letter for preserving the natural drainages.</p>
Rezoning, Overlay Zoning Districts, and Other County Plans	<p>Future development must comply with existing zoning on federal lands that are disposed.</p> <p>Current land use guidance (Open Lands) is in line with the intent of this plan in conservation areas but is not consistent with potential future development.</p>	<p>Zoning can be evaded or repealed, depending on political climate.</p>	<p>Amend the Northeast Land Use Plan update.</p> <p>Amend the Master Transportation Plan.</p>



STRATEGY	PROS	CONS	ACTIONS
OWNERSHIP TRANSFER OR LEASE...			
Development Code	As lands are privatized, County codes could require preservation of natural features and construction of trails.	<p>No specific open space, conservation, or wash preservation requirements and standards exist for development in the County. Would require specific, clearly defined standards.</p> <p>Developers out-negotiate local governments at the expense of natural resources (Crystal Ridge in Henderson).</p> <p>Developers would bear the cost of the land devoted to open space. There is an economic incentive to reduce or limit the amount of open space.</p>	<p>County to evaluate pursuing specific open space and wash preservation requirements and standards.</p> <p>County to demonstrate how open spaces can be kept open through the development review process in other areas to promote confidence in stakeholders.</p>
Others?	Other options include an act of Congress, as in the case of Gypsum Ridge. The proposal would specify that the open space would be a restricted conveyance, with conditions such as a reversal clause that ownership reverts back to the BLM if provisions not met.		

Table 6-1. Protection Strategies and Actions



- | | | |
|---------------------------------|------------------------|--------------------------|
| Proposed Disposal Area Boundary | Land Management | Rivers and Washes |
| Current Disposal Area Boundary | BLM | River |
| PLSS Townships | NPS | Major Wash |
| PLSS Sections | Reclamation | Minor Wash |
| PLSS Aliquot Parts | State | Flood Control Basins |
| | Other Public | |
| | Private/ ROW | |

*Moapa Valley
Open Space Plan*
**Figure 6-1. Draft Disposal Area Boundary for
Consideration in the LVFO-RMP Update.**



The Open Space Categories presented in Chapter 3 provide a basis for land management requirements. It is proposed that a portion of the current Multiple-Use Management Area be retained by the BLM (i.e., not subject to disposal), hence the BLM would have primary responsibility for managing these 4,300 acres. Future management would be similar to existing management unless modified during the RMP Update.

All other open space types assume Clark County or another party would take a primary role in managing – or at minimum a supplementary role – as the BLM is not equipped to manage open space within urban areas. This will require the County to dedicate resources and build expertise in open space maintenance, or support a capable partner in doing so.

Intense OHV use in the dunes north of Bowman Reservoir must be squarely addressed. It is a community issue, and not the BLM's alone. BLM direction for the area is that OHV's be limited to existing roads and trails, and enforcement is not feasible given the high level of use and terrain. Therefore, it is recommended that the BLM and Clark County partner with OHV groups to prepare an OHV Recreation Management Plan that define the boundaries of the play area (including fencing or signage), enforcement, emergency response, parking and restroom facilities, erosion and water quality BMPs, and land ownership. One option is for approximately one-square mile to be transferred to Clark County as it resides within the disposal area, and suggests the County take the lead in preparing the plan. Lessons learned at Nellis Dunes Recreation Area can apply to the OHV Play Area.

An alternative would be to allow the status quo. Open riding would continue without enforcement, adequate facilities, or a defined boundary. Over time, new trails would continue to be created over an enlarged area. Accidents and user conflicts would likely increase. Water quality flowing into Bowman Reservoir and native shoreline vegetation would continue to degrade. The scenic quality of Bowman Reservoir, the Hills, and Mormon Mesa would continue to deteriorate.

The following County policies will apply to trail corridor protection and management (Clark County Off-Street Trail Standards):

- Trails should be located on public lands, in public rights-of-way, or within dedicated easements.
- Trails located on private land shall be built by the developer. Routine cleaning and maintenance is the responsibility of the developer, land owner or HOA. Clark County would typically be granted a public access easement for performing heavy

maintenance and to assume liability for public users of the trail.

- Trail operation, maintenance and security are provided by Clark County Department of Parks and Recreation.
- Flood control maintenance roads used as trails will be maintained through a cost sharing partnership between Clark County Regional Flood Control District (RFCD) and Clark County.





Chapter 7 - Supplementary Information for the Glendale and Moapa Disposal Areas

Two BLM disposal areas, referred to as Moapa and Glendale, are located west and northwest of the Moapa Valley BLM disposal area on lands primarily overseen by the Moapa Town Advisory Board (Figures 7-1A and B). As a supplement to the Moapa Valley Open Space Plan, which was approved December 2009, this section presents the existing conditions and general observations regarding the development and conservation opportunities and constraints in these two areas. However, it does not make specific recommendations regarding future development or open space areas, nor does it contemplate changes to disposal area boundaries. Its purpose is to inform the Moapa and Glendale communities, the Moapa Town Advisory Board, Clark County, and the BLM as they determine long-term approaches to community development, open space, trails and land management.

While all three disposal areas are located in the Northeast County and were created at the same time through the 1998 Las Vegas Field Office Resource Management Plan, these two western disposal areas are quite different than Moapa Valley which is sandwiched between the toe of Mormon Mesa and the rural town interfaces of Overton, Logandale, Glendale, and Moapa. In contrast, the Glendale disposal area is defined by the Valley of Fire State Park on the east, Moapa River Reservation to the west, and remains relatively intact, despite being bisected by Interstate 15. The Moapa disposal area is wrapped by the towns of Glendale and Moapa on three sides and fragmented by roads and ROWs. However, both disposal areas possess similar development attributes; they have less topographical change, fewer drainages and unstable soils, and a smaller adjacent population than the Moapa Valley disposal area.

The following is an analysis of the factors that will influence future conservation and development in the area, categorized into the following resources:

- Clark County Planned Land Uses
- Environmentally Sensitive Lands
- Species Richness and TNC Action Sites
- Landcover and Species Observations
- Soils Erodibility
- Physical Resources
- Transmission Corridors and Existing and Pending Right-Of-Ways
- Development Suitability

The most accurate, available resource GIS information was collected and analyzed for both disposal areas. Sources included Clark County, BLM and multiple non-profit, state and federal agencies. Specific questions about each dataset should be referred to the appropriate county department or source agency.

Clark County Planned Land Uses

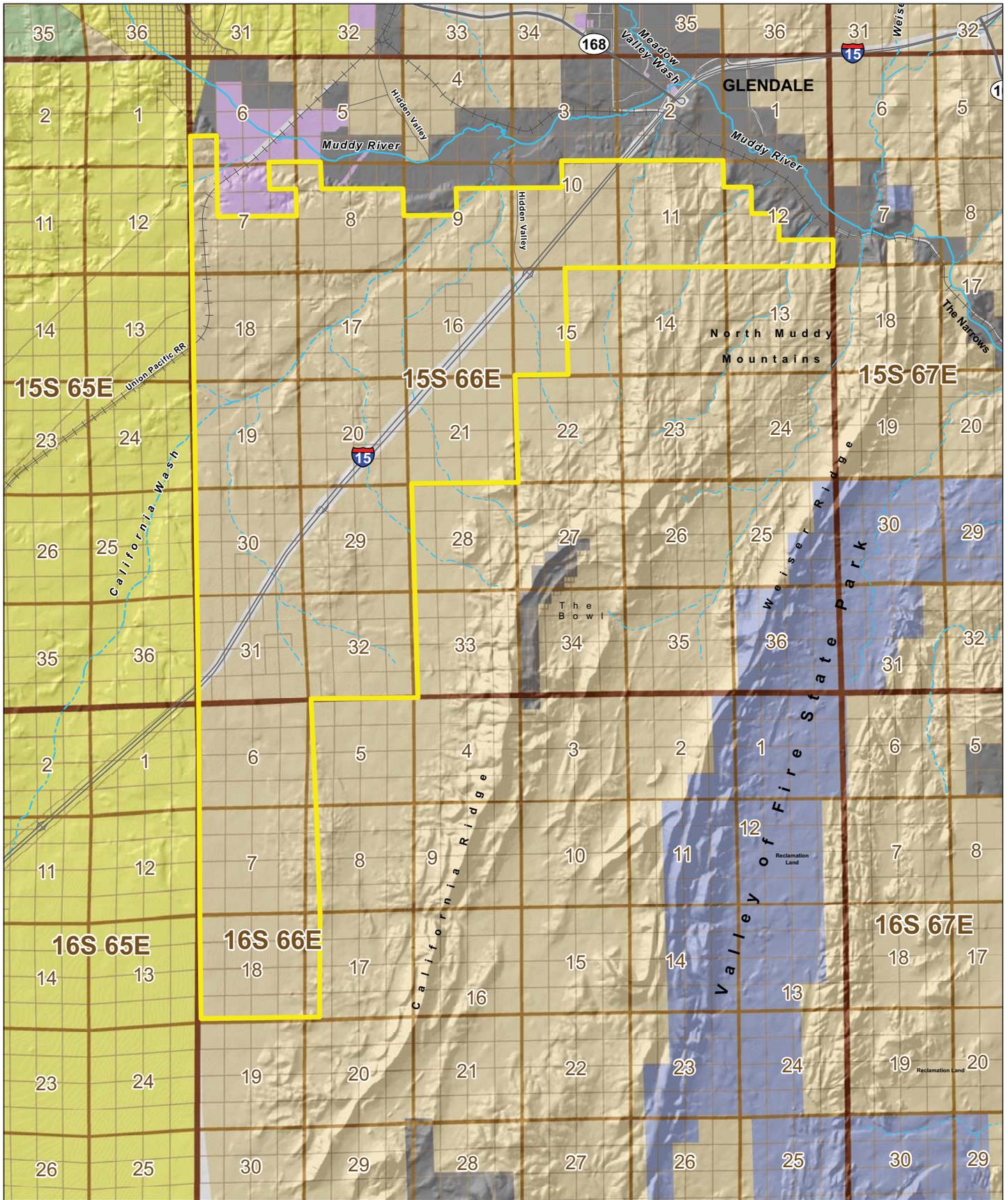
The two BLM disposal areas are approximately 11,460 acres. Lands are primarily managed by the BLM, with small parcels held by the Bureau of Reclamation (Reclamation) and the Moapa River Reservation, as shown in Table 7-1.

As required by state law, the 2006 Northeast County Land Use Plan establishes the regulatory land use goals, policies and maps as a guide for decisions by the private sector, Moapa Town Advisory Board, Planning Commission, and Board of County Commissioners concerning growth and development. It states, "The Northeast Clark County Plan seeks to establish a network of protected open spaces that correspond to significant regional natural features. Protecting open space provides regional, environmental, economic, social, educational, and recreational benefits."

With few exceptions, most of the BLM disposal area is designated as Open Land zoning on the Clark County Planned Land Use Maps (Figures 7-2A and B). The Open Land category provides "for permanent open space in the community; to prevent

Table 7-1. Land Ownership in the BLM Disposal Areas (in acres)

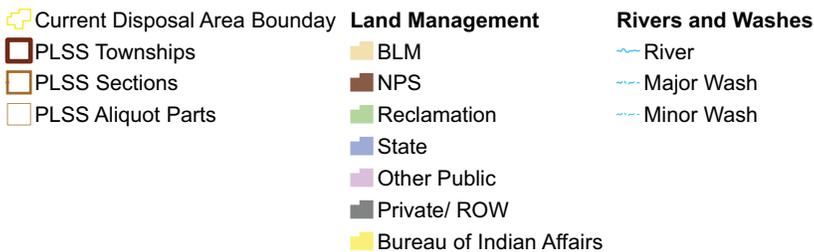
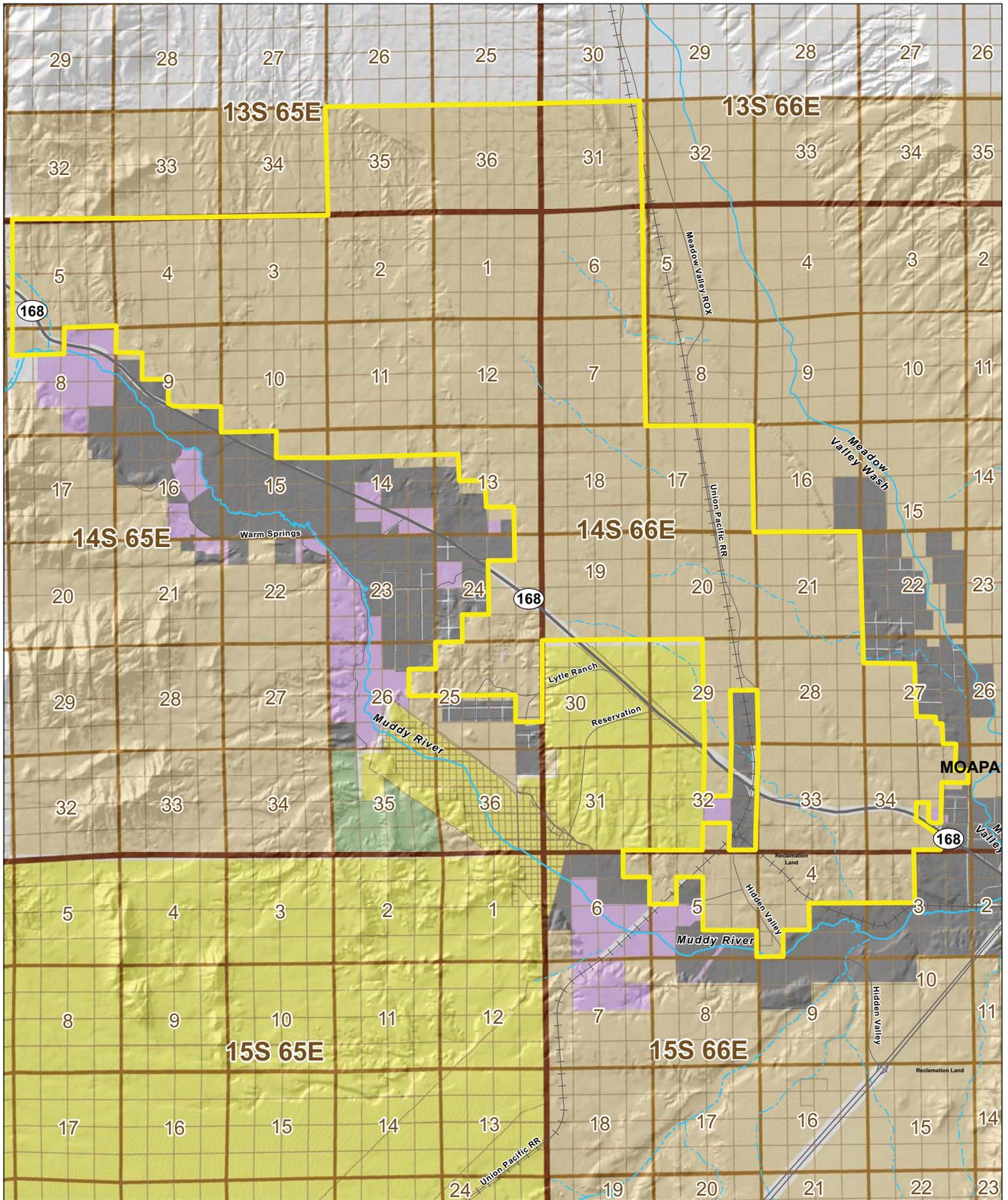
	BLM	Clark County	Private	Moapa Band of Paiute Indians	Reclamation	Total Acres
Glendale	11,712	0	0	0	0	11,712
Moapa	16,851	9	1	4	0	16,865



- | | | |
|--------------------|--------------------------|--------------------------|
| PLSS Townships | Land Management | Rivers and Washes |
| PLSS Sections | BLM | River |
| PLSS Aliquot Parts | NPS | Major Wash |
| | Reclamation | Minor Wash |
| | State | |
| | Other Public | |
| | Private/ ROW | |
| | Bureau of Indian Affairs | |

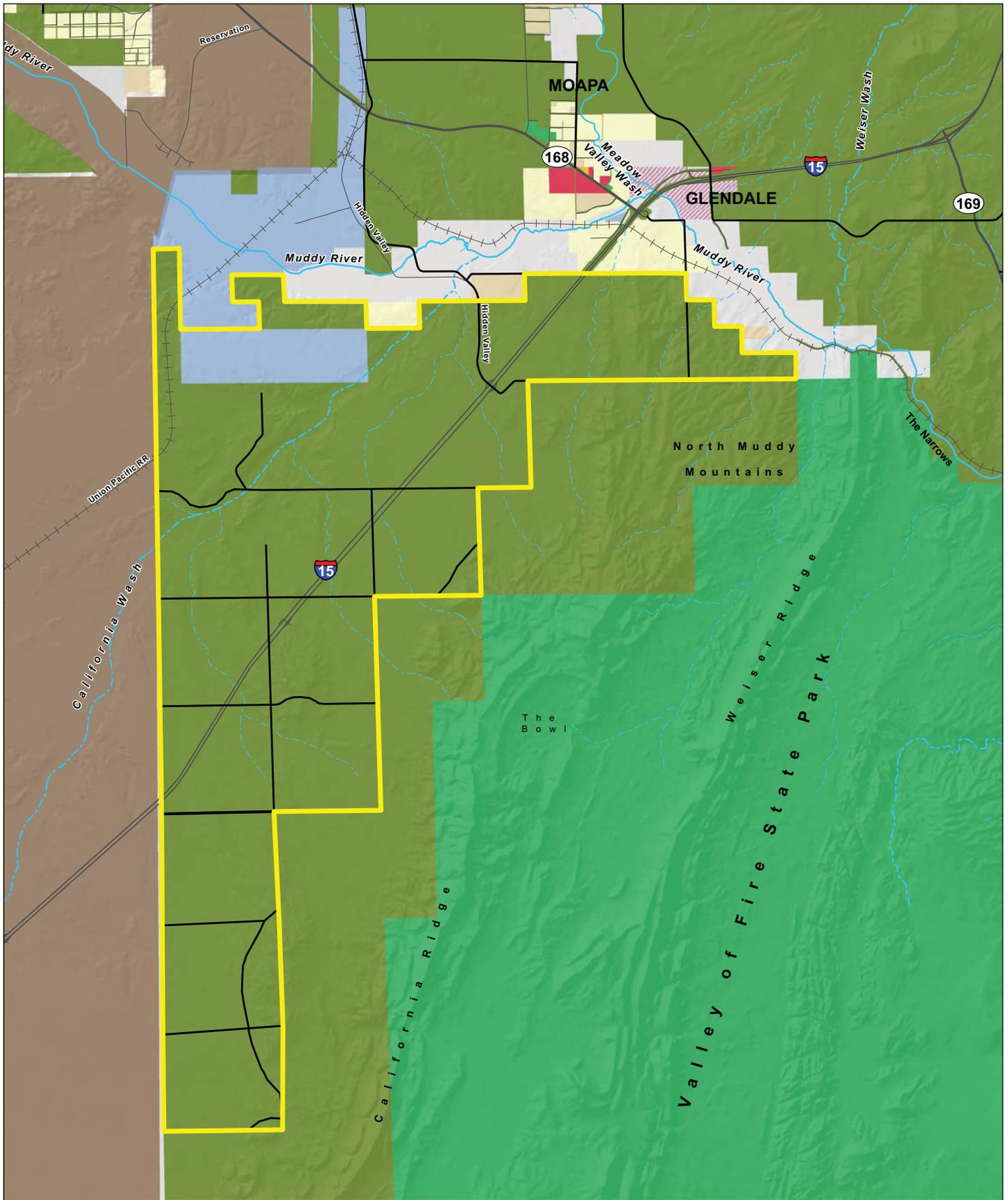
Glendale
Figure 7-1A. Disposal Area Boundary





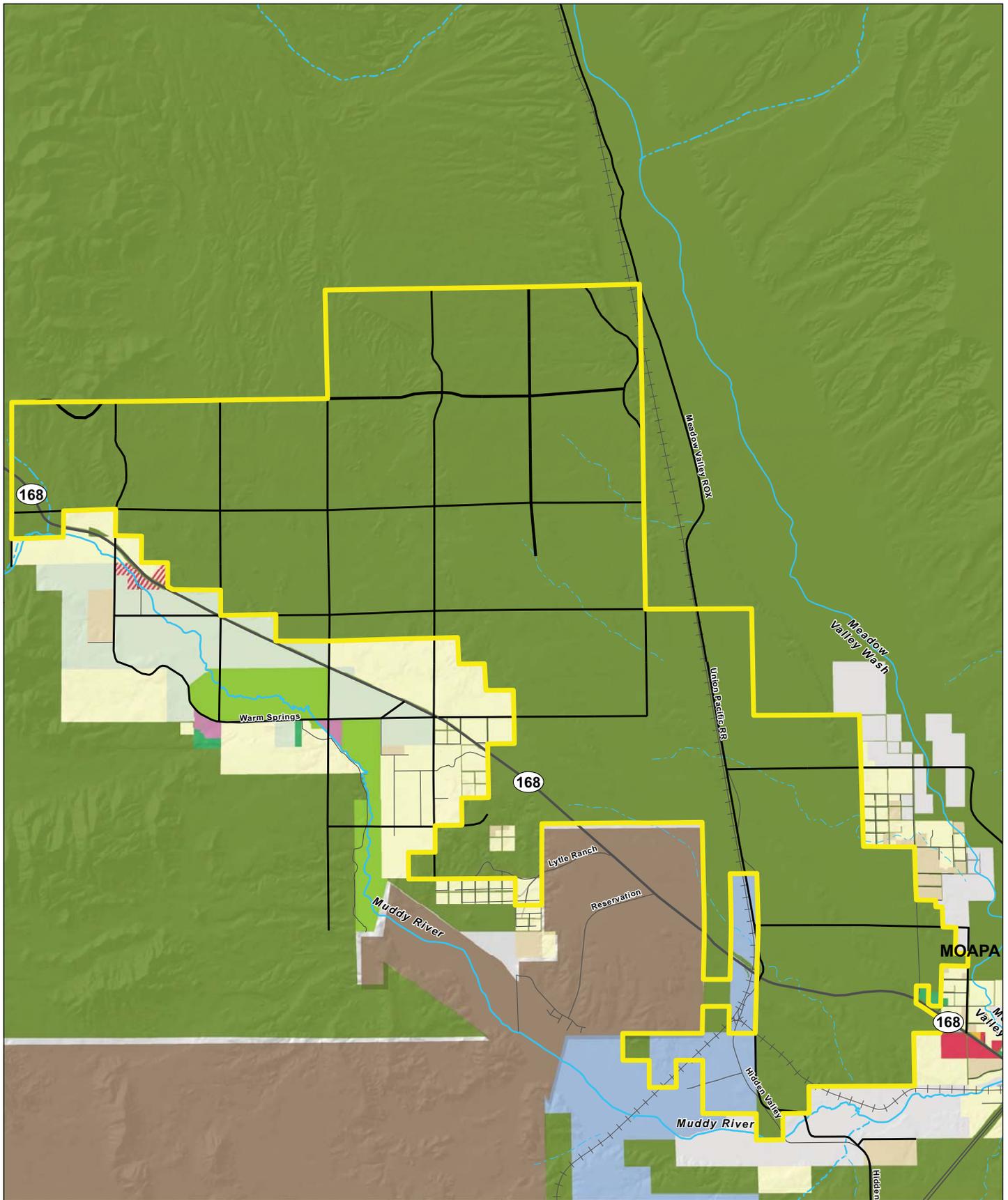
Moapa
Figure 7-1B. Disposal Area Boundary





Project Study Area	Residential Suburban	Heavy Industrial	Planned Arterials	Glendale Figure 7-2A. Planned Land Use
Planned Land Use	Residential High	Public Facilities	Arterials (100+ ft R-O-W)	
Open Lands	Office Professional	Major Development Projects	Arterials (120+ ft R-O-W)	
Residential Rural	Commercial Neighborhood	Agriculture		
Residential Agricultural	Commercial General	Right-of-Way		
Rural Neighborhood	Commercial Tourist	Bureau of Indian Affairs		
Residential Low	Industrial			





- | | | |
|--------------------------|-------------------------|----------------------------|
| Project Study Area | Residential Suburban | Heavy Industrial |
| Planned Land Use | Residential High | Public Facilities |
| Open Lands | Office Professional | Major Development Projects |
| Residential Rural | Commercial Neighborhood | Agriculture |
| Residential Agricultural | Commercial General | Right-of-Way |
| Rural Neighborhood | Commercial Tourist | Bureau of Indian Affairs |
| Residential Low | Industrial | |

- Planned Arterials**
- Arterials (100+ ft R-O-W)
 - Arterials (120+ ft R-O-W)

Moapa
Figure 7-2B.
Planned Land Use



irreversible environmental damage to sensitive areas; and to deter development in areas with highly limited availability of public services and facilities; or severe natural constraints (i.e. areas with 12% or greater slope)...Grazing, open space, and recreational uses may occur.” This land use plan recommends further studies for land use, water, and limited resources prior to any disposal actions. One exception is the industrial area that straddles the Muddy River reaching into both disposal areas.

In addition, with few exceptions, the County Transportation Master Plan envisions a grid arterial system spaced every mile throughout the disposal areas in the anticipation of full build-out.

The Planned Land Uses are consistent with BLM ownership and give credence to the public open land nature of the area. This County plan re-iterates the purpose of BLM land disposal boundaries (to promote an orderly method of land disposal between public and private stakeholders) but adds that limiting factors to this boundary include federally designated lands, slope, environmentally sensitive lands, cultural resources, and appropriate transitions to sensitive areas. As adjacent property owners, the Moapa Band of Paiute Indians should be consulted regarding changes to the BLM disposal areas.

Environmentally Sensitive Lands

Environmentally sensitive lands were modeled by Clark County in 2004 to identify areas of the county that had high combined levels of the following desired resources: ecosystem level biodiversity, aesthetic areas, administrative areas, and cultural and historic areas (Figures 7-3A and B). ESL areas are classified and ranked into seven levels of priority, one being the lowest and seven being the highest.

The Glendale disposal area contains two levels of priority; the northern Muddy Mountains are ranked 7 – the highest ranking possible, and the California Wash corridor is ranked 4 (as is the northeastern most portion).

The Muddy and Meadow Valley washes and the northeastern-most portion are ranked 4 in the Moapa disposal area. Mountains in the northwest are ranked 1.

Species Richness and TNC Action Sites

The project team identified locations within the disposal area which contain, or have a high likelihood of containing, species or habitats of importance or special significance on the Species Richness Maps (Figures 7-4A and B). Species which are listed as rare or endangered by one or more agencies, and landscapes that provide crucial linkages, habitat, or refugia, may warrant additional protections within the planning framework.

A predicted habitat species richness model was prepared from the 37 Mojave Desert vertebrate species covered by the Clark County MSHCP. The source for the habitat models was the Southwest Regional GAP Analysis Project, led by the U.S. Environmental Protection Agency. The selected species are all endemic Mojave Desert ecoregion species. The richness model shows the areas with potentially low, moderate, and high concentrations of the 37 terrestrial species (i.e., fish, insects, plants are not included in the SW ReGAP model). Species richness is calculated by overlaying every species model and counting the number of species whose predicted habitat occurs in each cell. The purpose of creating a species richness model is to spatially determine those areas that contain the highest concentration of species habitats.

The Species Richness Map also shows TNC of Nevada’s “action sites. TNC created a model of “portfolio sites” to indicate goals for the conservation of target species and communities in the Mojave Desert in “whose protection would ensure the long-term survival of viable, vulnerable species and representative natural communities in the ecoregion”¹. The target areas identified by TNC “were established by considering the relative rarity and distribution of targets across the ecoregion and where relevant, community patch size. Goals were also based upon the Conservancy’s desire to secure geographic variability of targets.”

Both the Glendale and Moapa disposal areas are overlapped by the Muddy River Complex functional aggregation along major drainages.

¹ The Nature Conservancy. 2001. Ecoregion-Based Conservation in the Mojave Desert





Major findings include:

- Every 30 square meter of land within the disposal area contained between a minimum of two predicted species and a maximum of 24 predicted species out of a total of 37 modeled species.
- The majority of the disposal area contains predicted species richness values in the 19-24 species range; comparatively, this is a high value. The highest richness values occur in the Sonora-Mojave Creosotebush-White Bursage Desert Scrub vegetation community type. This is a common community type in northeast Clark County and covers a majority of the upland habitat in the disposal area and local vicinity.
- Both the highest and lowest predicted species richness values occurred along washes in the northern portion of the disposal area where landform and vegetation variation is the greatest.

In summary, relatively high species richness values exist over the majority of the disposal area. These values are predicted based on habitat models and site-specific surveys will be needed to determine species presence if development proposals were submitted.

Landcover and Species Observations

Data sources for the Landcover and Species Observations Maps (Figures 7-5A and B) include threatened and endangered species from the MSHCP; rare and tracked species observations from the Nevada Natural Heritage Program (NNHP); and landcover data from the US Geological Survey.

The NNHP's mission is to help coordinate the resource needs of Nevada's diverse biological heritage with human activities. The NNHP maintains an inventory and current databases on the locations, biology, conservation, and management status of all threatened, endangered, sensitive, and at-risk species and biological communities and of noxious weed infestations in the state. To this end, the NNHP tracks the populations and distribution of 172 species of animals, insects, and plants, which includes rare, endemic, and Federal and State listed species. Observation data from the US Fish and Wildlife Service, The Nature Conservancy and Clark County were also reviewed.

There are a number of threatened or endangered species in Clark County. The MSHCP has been developed to address these species and other species of concern in Clark County. Several threatened and endangered species of plants, animals, invertebrates, and numerous species of fish and birds are found in northeast Clark County. An example of protection measures for threatened and endangered species in Clark County includes

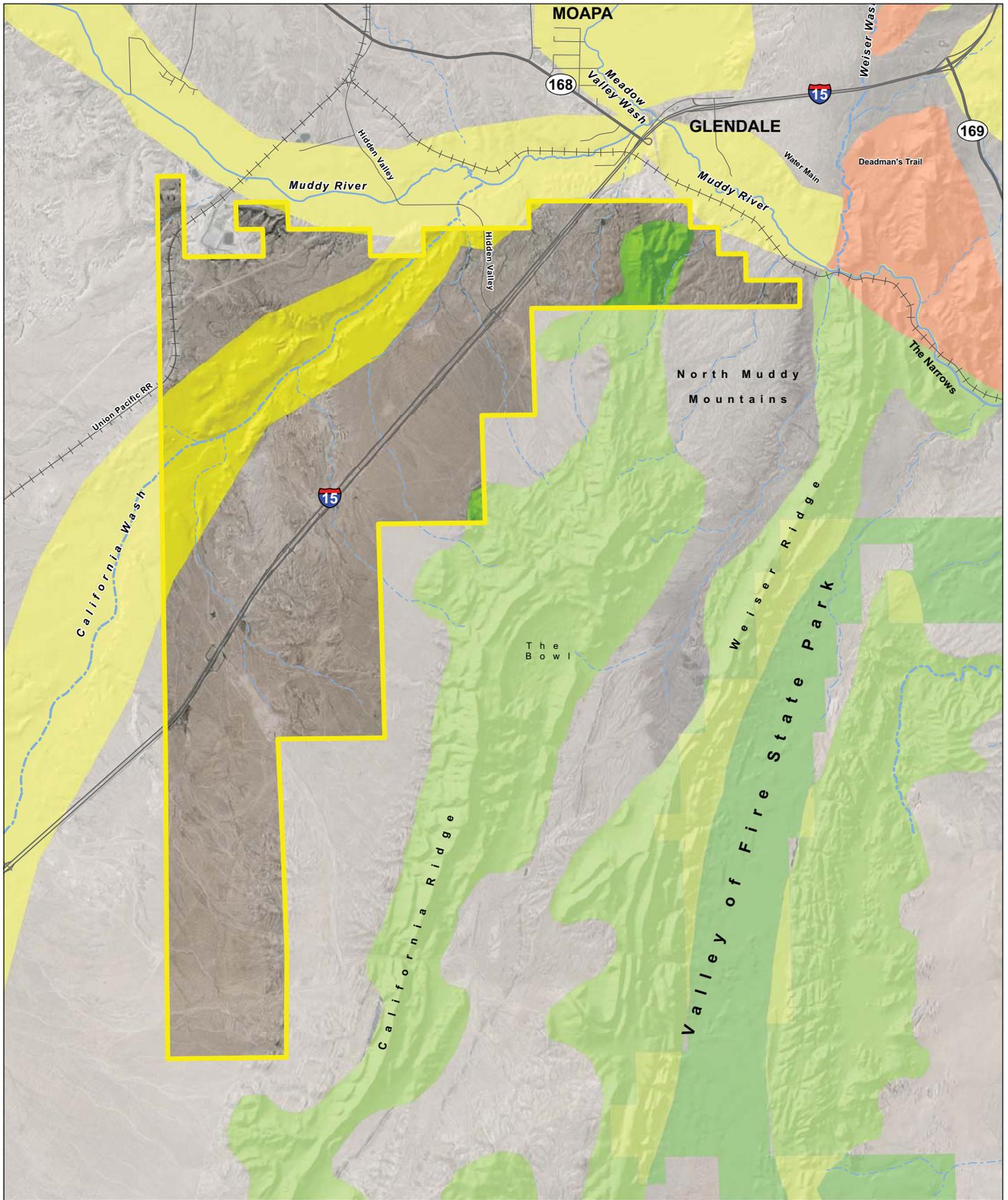
buffer areas of 2,000 meters around private land outside of the Las Vegas Valley to reduce impacts to desert tortoise populations associated with high levels of vehicular traffic. These buffers were created to guide discussion of potential risks from the proximity of human development and prioritization of conservation actions.

All of the observed TNC or NNHP tracked species found within or near the disposal areas occur along the Muddy River. These include the Las Vegas bear poppy, threecorner milkvetch, and sticky buckwheat (three vascular plant species of concern covered by the MSHCP in northeast Clark County²); the Mojave Gypsum bee, the red-tailed blazing star bee, and Mojave poppy bee; Allen's big-eared bat, rough fringemoss, Gold Butte moss, Virgin River thistle, Las Vegas buckwheat, Beaver Dam breadroot and rosy twotone beardtongue. If any of these species becomes listed as a state or federal threatened or endangered species, they may present challenges to land use activities in the planning area. The observations of NNHP tracked species within the disposal area are dominated by plant species of concern. Observations of rare reptile and insect species have also been recorded within the disposal area.

Soil Erodibility

Soils and slopes are an important planning consideration that can greatly impact the cost of construction and a region's scenic quality. The U.S. Department of Agriculture soil survey identifies potential limitations of soil series types for development uses. Soils within northeast Clark County are primarily erosion remnants (sand, silt, etc.) from the surrounding mountains that have been deposited by flowing water to form alluvial fans and river valleys. Isolated areas are listed as Highly Erodible (Figures 7-6A and B). The Clark County Department of Development Services requires on-site soil analysis of proposed development sites in order to provide site-specific information that Soil Survey maps do not show.

2 Clark County Department of Comprehensive Planning. 2000. Final Clark County Multiple Species Habitat Conservation Plan and Environmental Impact Statement for Issuance of a Permit to Allow Incidental Take of 79 Species in Clark County, Nevada.



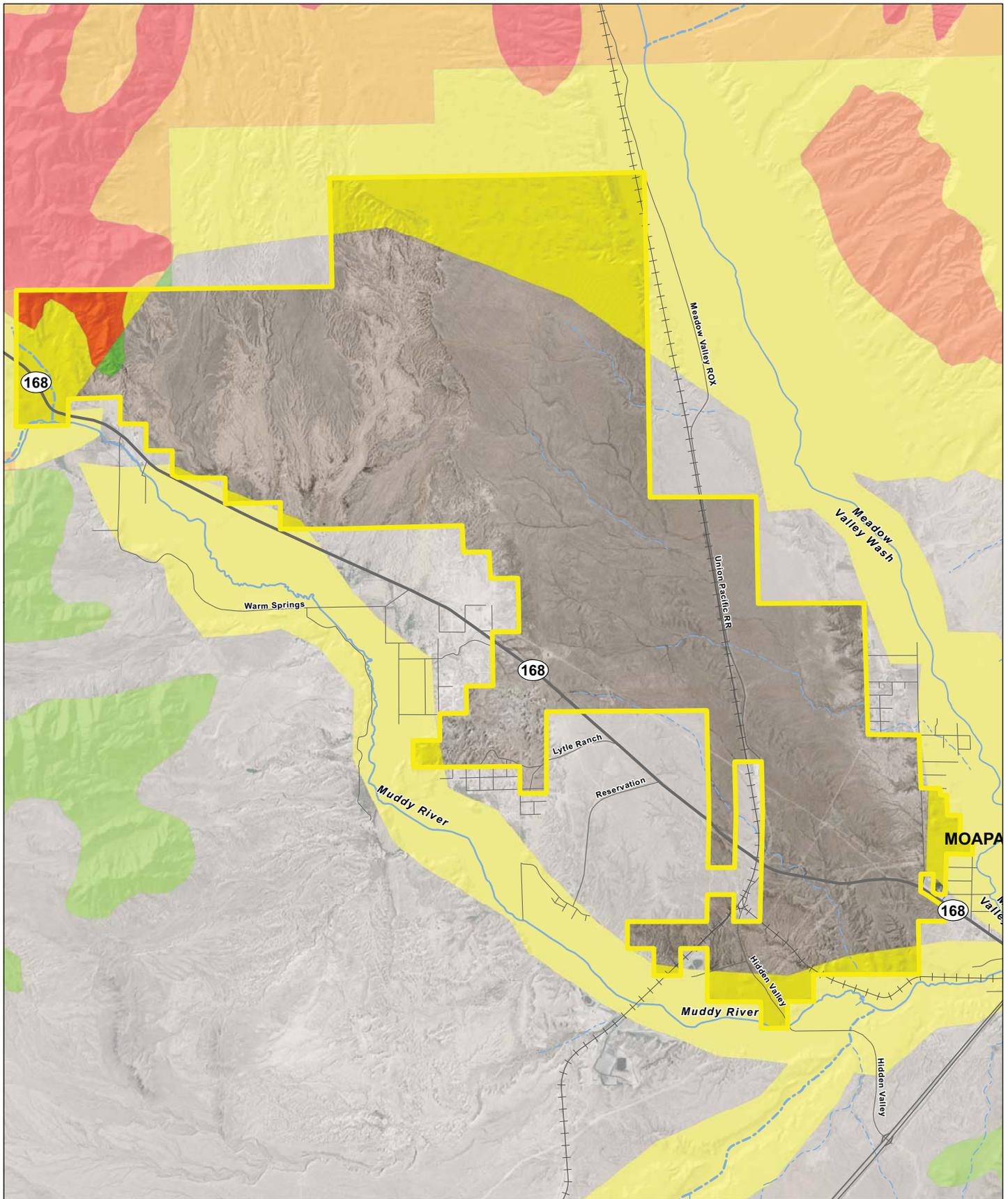
Study Area - Outline

Priority Lands

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Glendale
Figure 7-3A. Environmentally
Sensitive Lands





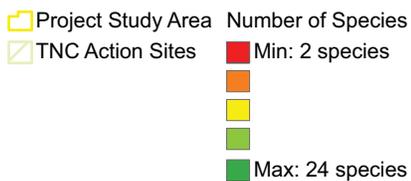
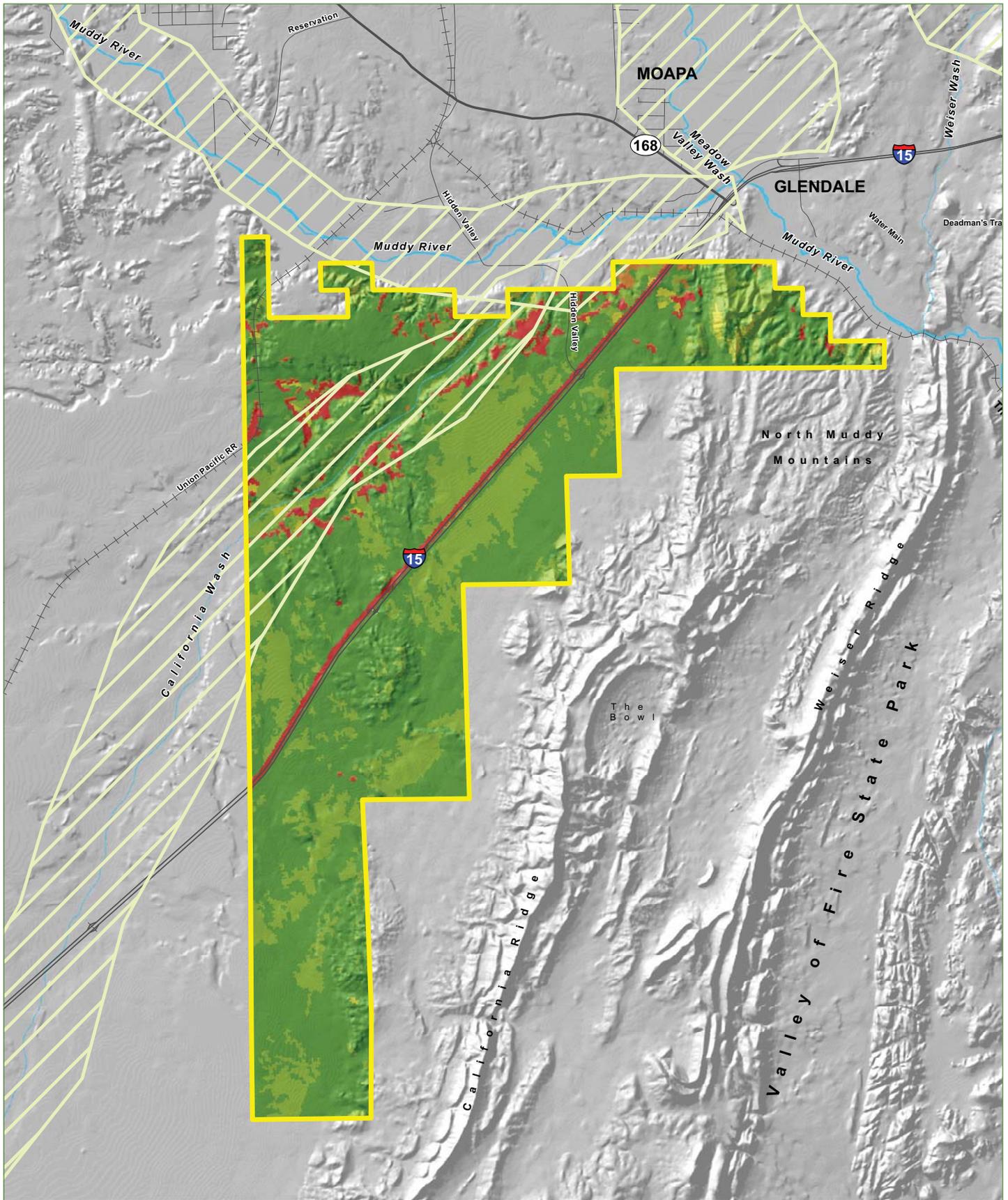
Study Area - Outline

Priority Lands

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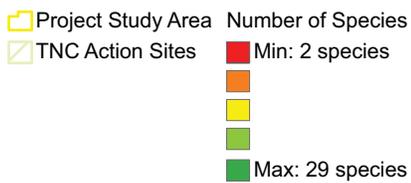
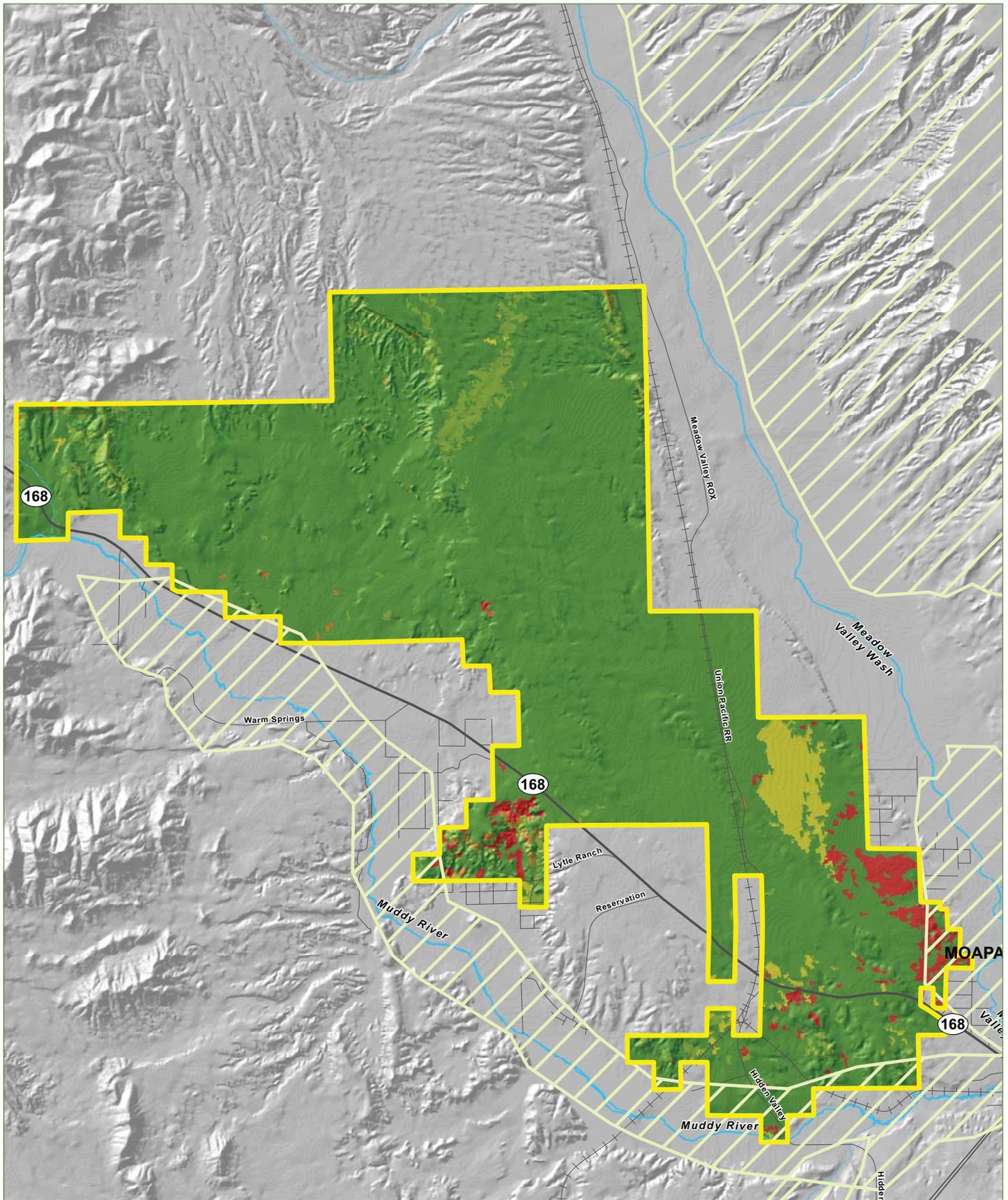
Moapa
Figure 7-3B. Environmentally Sensitive Lands



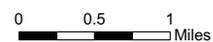


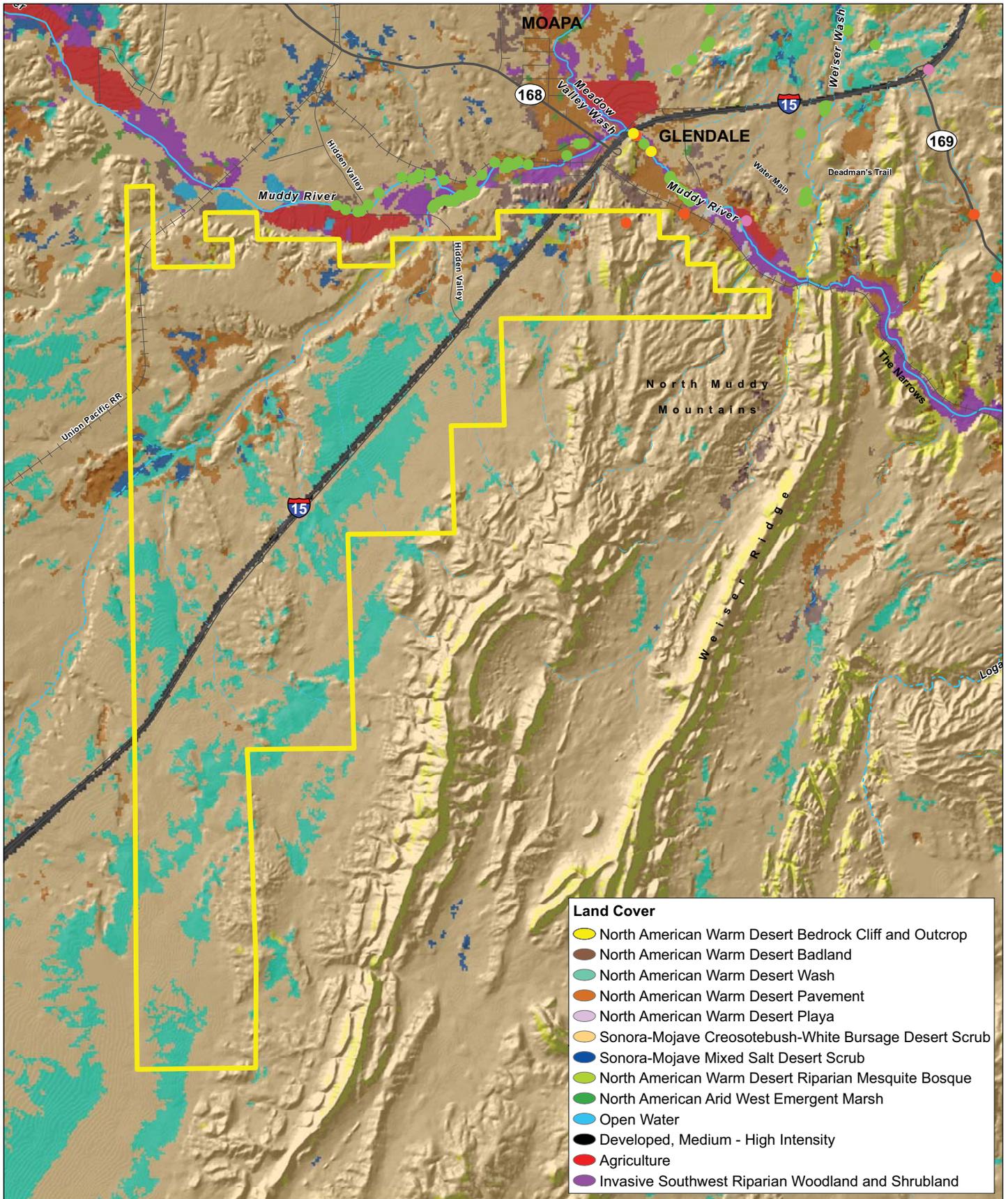
Glendale
Figure 7-4A. Species Richness and TNC Action Sites





Moapa
Figure 7-4A. Species Richness and TNC Action Sites



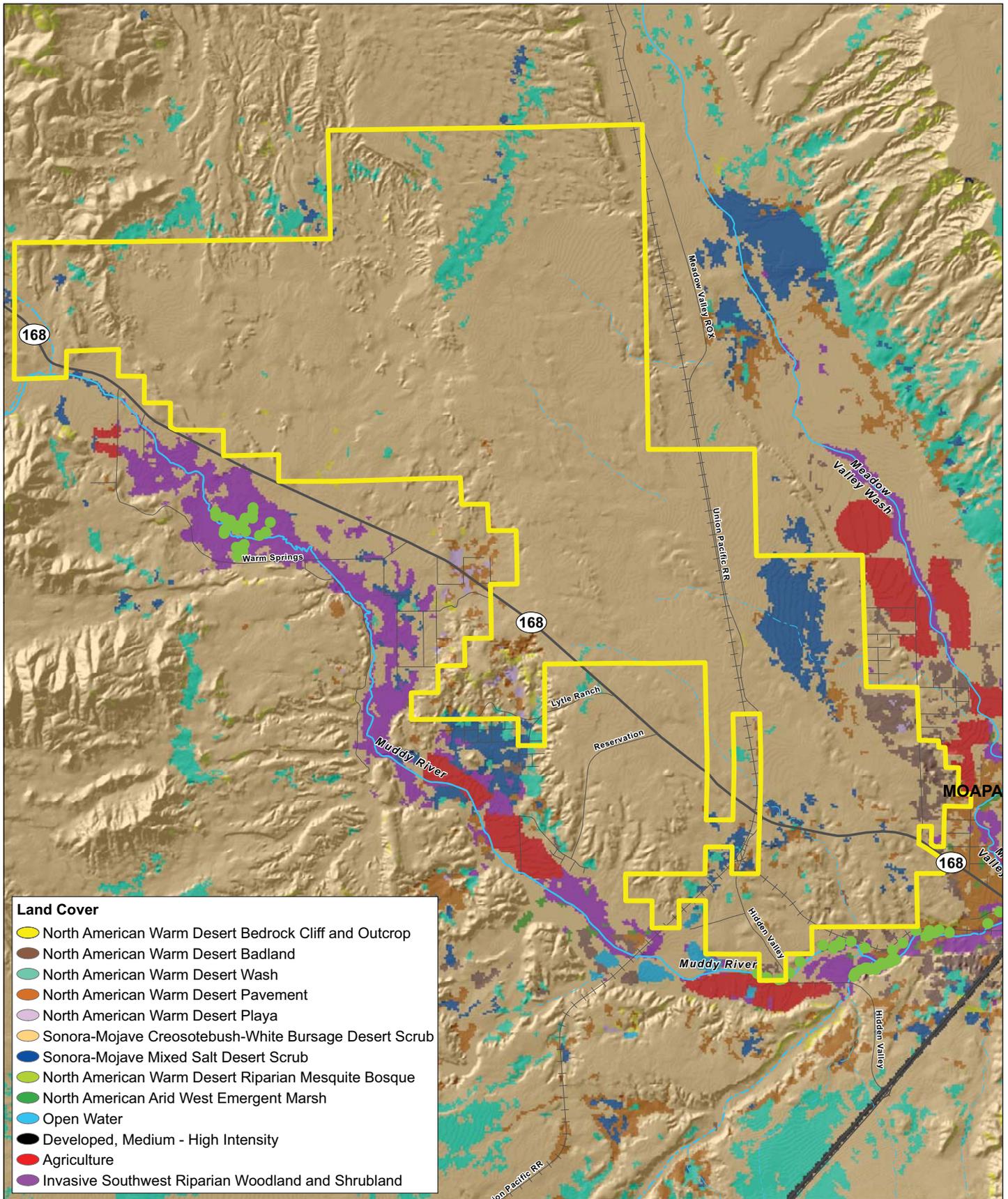


Study Area - Outline

● Plant Species
 ● Insect Species
● Animal Species
 ● Fish Species

*Includes NNHP, TNC and Clark County species observation points within a half mile of the study area boundary.

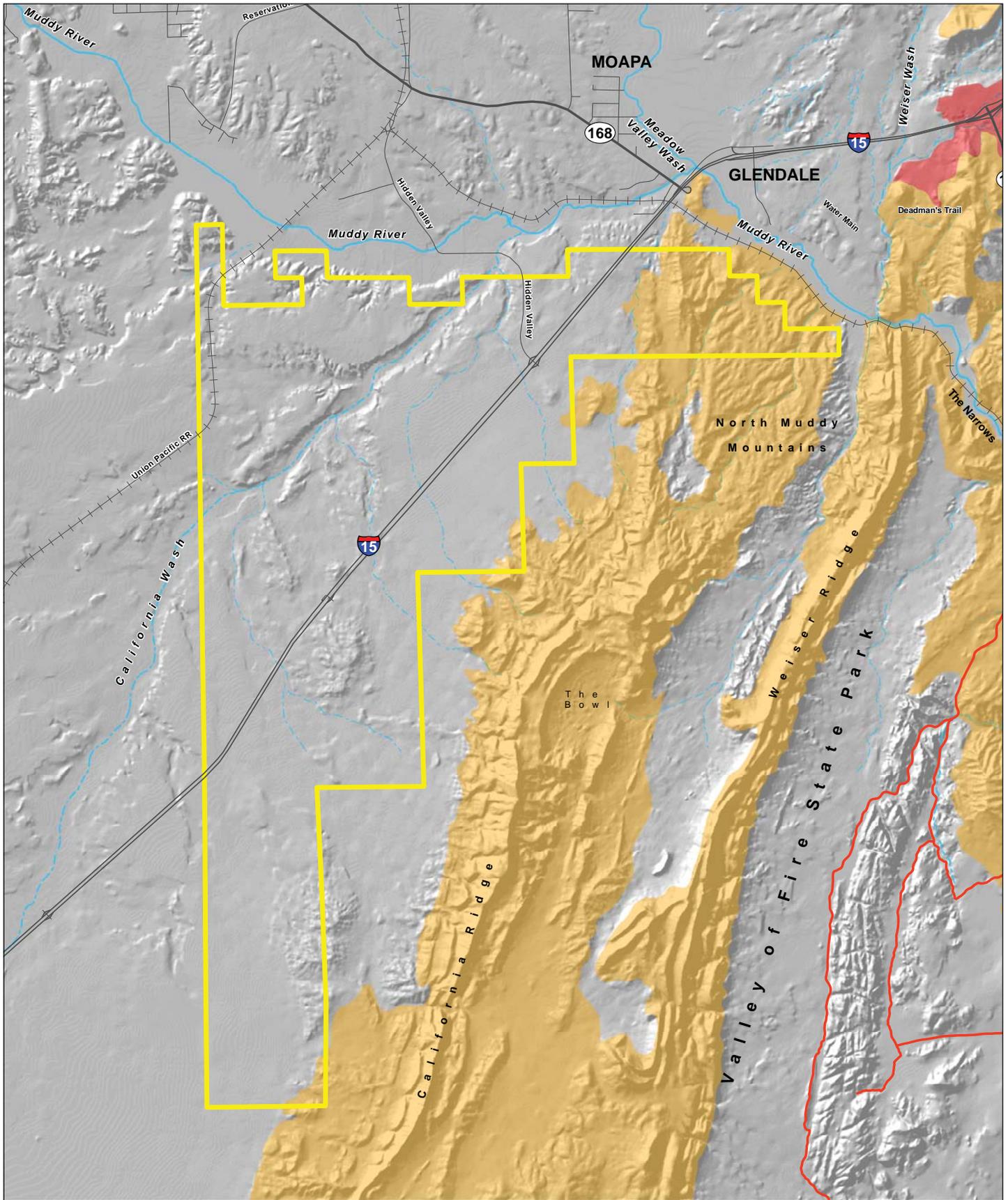
Glendale
Figure 7-5A. Landcover and Species Observations



- Study Area - Outline
- Species Observations*
 - Plant Species
 - Animal Species
 - Insect Species
 - Fish Species

*Includes NNHP, TNC and Clark County species observation points within a half mile of the study area boundary.

Moapa
Figure 7-5B. Landcover and Species Observations



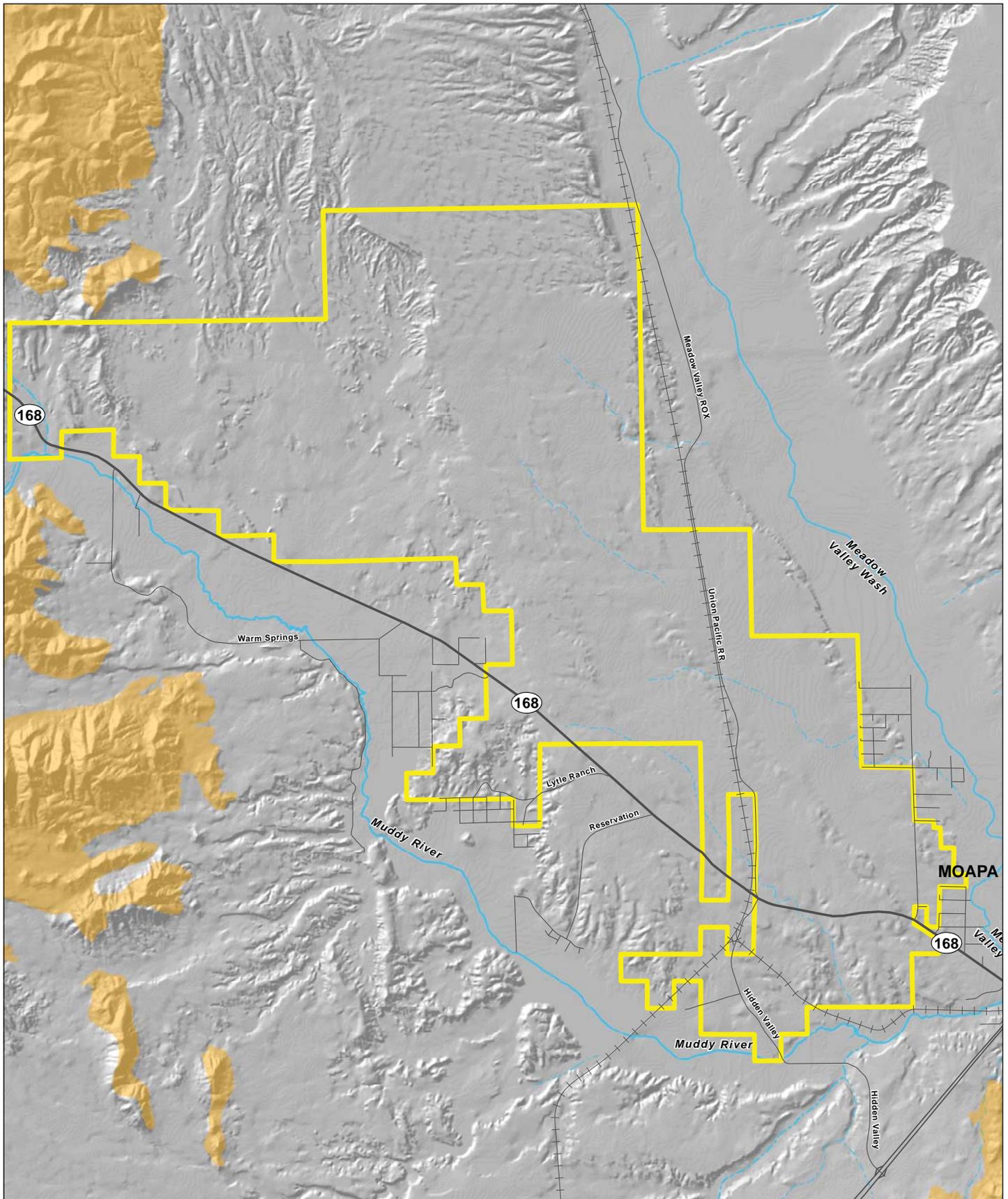
- Study Area - Outline
- Soil Series Erodibility**
- Moderate Erodibility
- Very Severe Erodibility
- Existing Multiuse Trail

Glendale
Figure 7-6A. Soil Erodibility

0 0.5 1 Miles



EDAW | AECOM



- Study Area - Outline
- Soil Series Erodibility**
- Moderate Erodibility
- Very Severe Erodibility
- Existing Multiuse Trail

Moapa
Figure 7-6B. Soil Erodibility

Physical Resources

As evidenced by the face of the Mormon Mesa and Valley of Fire, water has and will have a major bearing on the character of the disposal area. Multiple washes bisect the study area with a northeast to southwesterly direction, providing habitat diversity, connectivity, and movement opportunities for both human and animal species. As both disposal areas drain into the Glendale / Moapa communities along the Muddy and Meadow Valley washes, development upstream will cause alterations in channel characteristics downstream, with immediate, delayed, and far-reaching consequences that can be propagated for long distances. Future development proposals must carefully assess effects to both natural channel characteristics and downstream interests.

Both disposal areas have isolated yet steep slopes of 12% or greater. Development in areas with severe slopes can be very expensive and is not recommended³. The steepest slopes occur in and around the North Muddy Mountains, along California Wash, along the Muddy River bluffs, and along minor hills and washes. Steep areas over 15% slope hinder development opportunities while providing scenic amenities.

The Physical Resources Maps (Figures 7-7A and B) displays the Valley's topography, emphasizing steep slopes, washes, and floodplains. Important data sources include:

- A digital elevation model has been used to illustrate areas with high slopes. Clark County Title 30.56.100 places conditions on or prevents development of lands with slopes from 12-25% and above 25%.
- Floodplain data shows the location and extent of 100-year floodplain, from FEMA.
- Multiple drainages that braid together to form a wash, from the EPA. Most washes only carry water during storm events, and most watersheds extend over 2 square miles.

3 Clark County, 2006. Northeast Clark County Land Use Plan

Transmission Corridors and Existing and Pending Right-Of-Ways

Nearly half of the Moapa disposal area and one-quarter of the Glendale disposal area is already encumbered by existing and pending rights-of-way for public or private uses. The Transmission Corridors and Existing and Pending Right-Of-Ways Maps (7-8A and 7-8B) displays all publicly available, existing and pending rights-of-way on lands managed by the BLM. Most of these are for existing or future powerlines and existing roads. The ROWs are recorded by the BLM on an aliquot-part level (or quarter-quarter section), even though the actual ROW may be much smaller (such as 150 feet for a transmission line).

There are no records of solar plant applications having been submitted to the BLM for either disposal area.

Development Suitability

The first step in planning for growth or conservation is to answer the question, "What is our community's long-term vision?" The answer should be informed by demographic, or growth, projections and an understanding of physical constraints / opportunities. Pages 4.1-2 in the *Moapa Valley Open Space Plan* present demographic projections for Moapa / Glendale / Moapa Valley (combined) and suggests that either sufficient private land is available or that only a small proportion of the BLM disposal areas would be required to meet projected growth.

Market trends, proximity and land constraints are useful in identifying where development would likely occur. Natural features form the foundation for a healthy ecosystem, stormwater management, recreational amenities, and a community's sense of place. Integrating natural resources into a land use plan enhances any new development, from an environmental, cultural, and aesthetic perspective, making this step all the more important in Glendale and Moapa.

Constraints are often environmental assets, which occur within a portion of the study area; however, they also include existing development, infrastructure limitations, and transportation plans. Additionally, there are constraints such as social and economic considerations that cannot be displayed on a map, but very much inform the planning framework. An example of an economic consideration is reserving land for public facilities (fairgrounds, detention basins, etc.) in the disposal area through the Recreation and Public Purpose Act at little or no cost to developers. Developers are also attracted to large landowners with contiguous holdings like the BLM rather than smaller, disjointed properties.

Accurately assessing constrained areas may occur at various scales, first at a high level of analysis to plan the general land use concept, and eventually down to individual site analysis at the time of permitting. For the purpose of forecasting development in Moapa Valley, the analysis is driven by the availability of resource data. As environmental data varies in accuracy and origin; data used for the constraints analysis is the best available, and site verification should precede any permitting or site development.

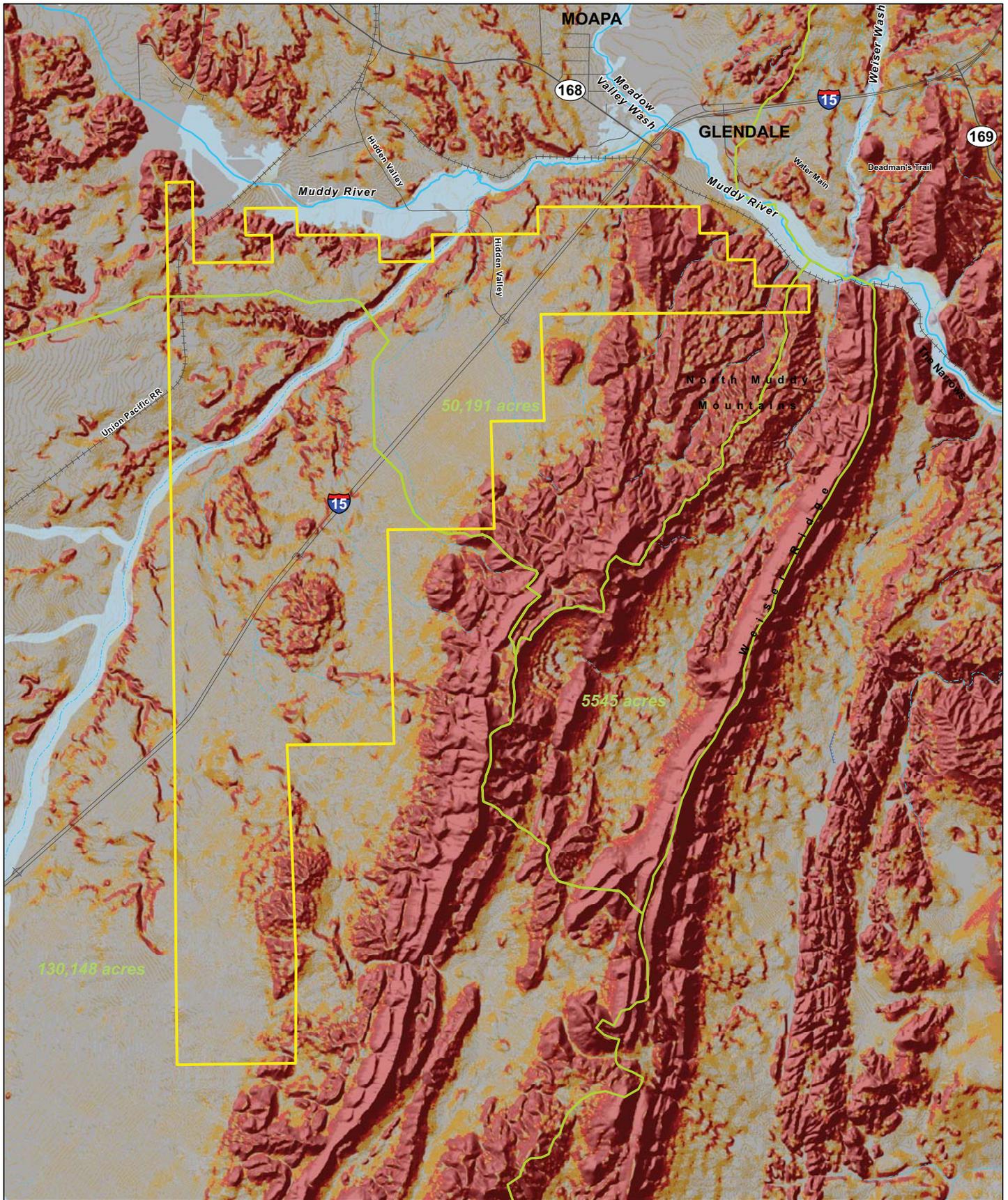
In conclusion, the disposal areas are quite different and contain distinctive resources, though in isolated areas. With this information the Moapa TAB and Clark County may identify areas that should be developed (through land disposal) or conserved (by retaining them in BLM management), or other scenarios and communicate those to the BLM for consideration in the Las Vegas Field Office Resource Management Plan revision currently underway.

For the Development Suitability Map (Figures 7-9A and B), a development attractiveness model was designed to evaluate where development would most likely occur in the disposal area. The model uses an additive GIS overlay process to aggregate multiple types of GIS data into one composite GIS dataset. It does not subtract development constraints (i.e., steep slopes) but looks at the most attractive places to develop.

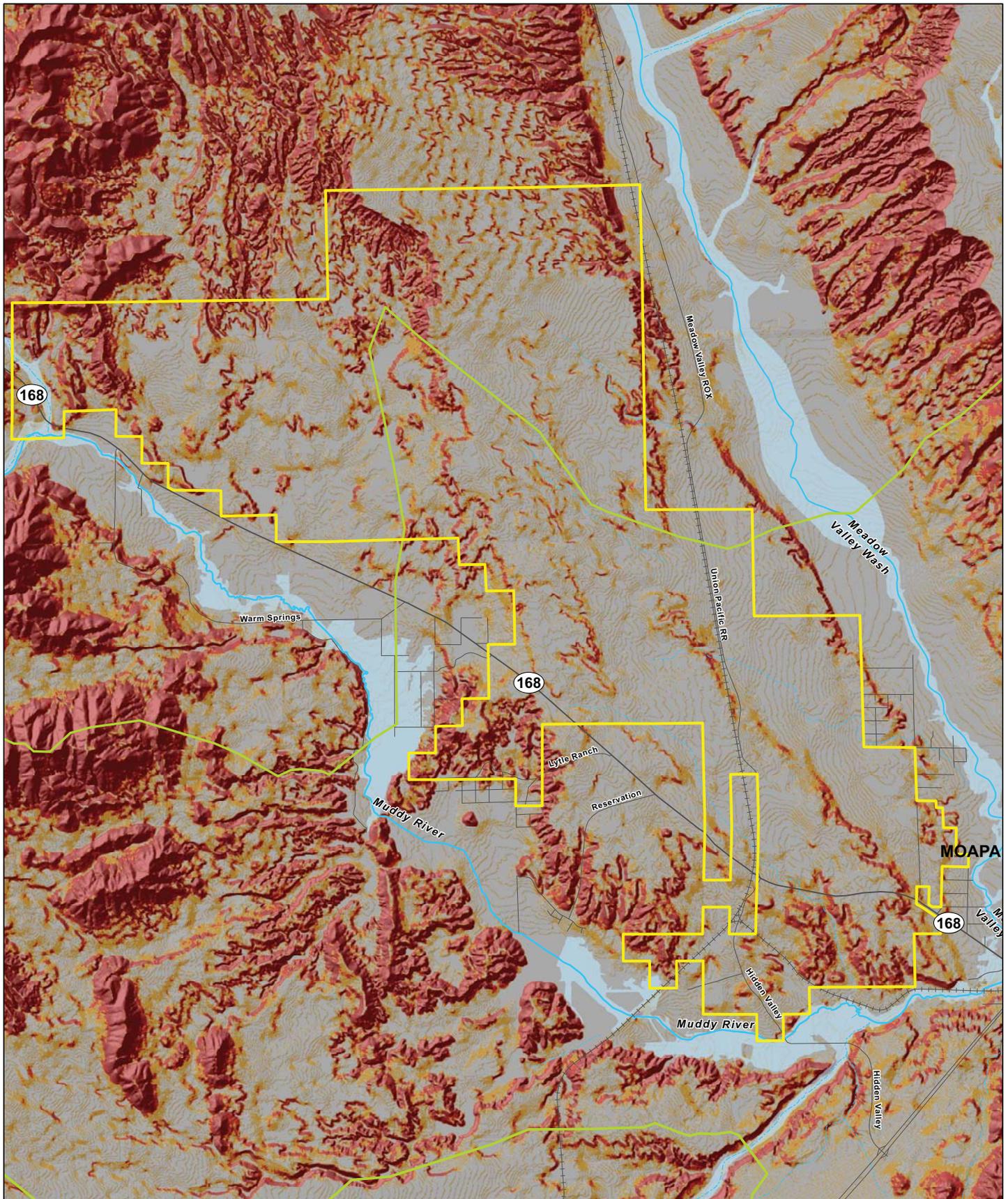
Table 7-2 summarizes the attractiveness criteria input into the GIS model. The darkest red areas could be used by the Moapa TAB in identifying the most attractive, contiguous development opportunities in light of a future transportation network and natural resource constraints.

Table 7-2. Development Attractiveness Criteria

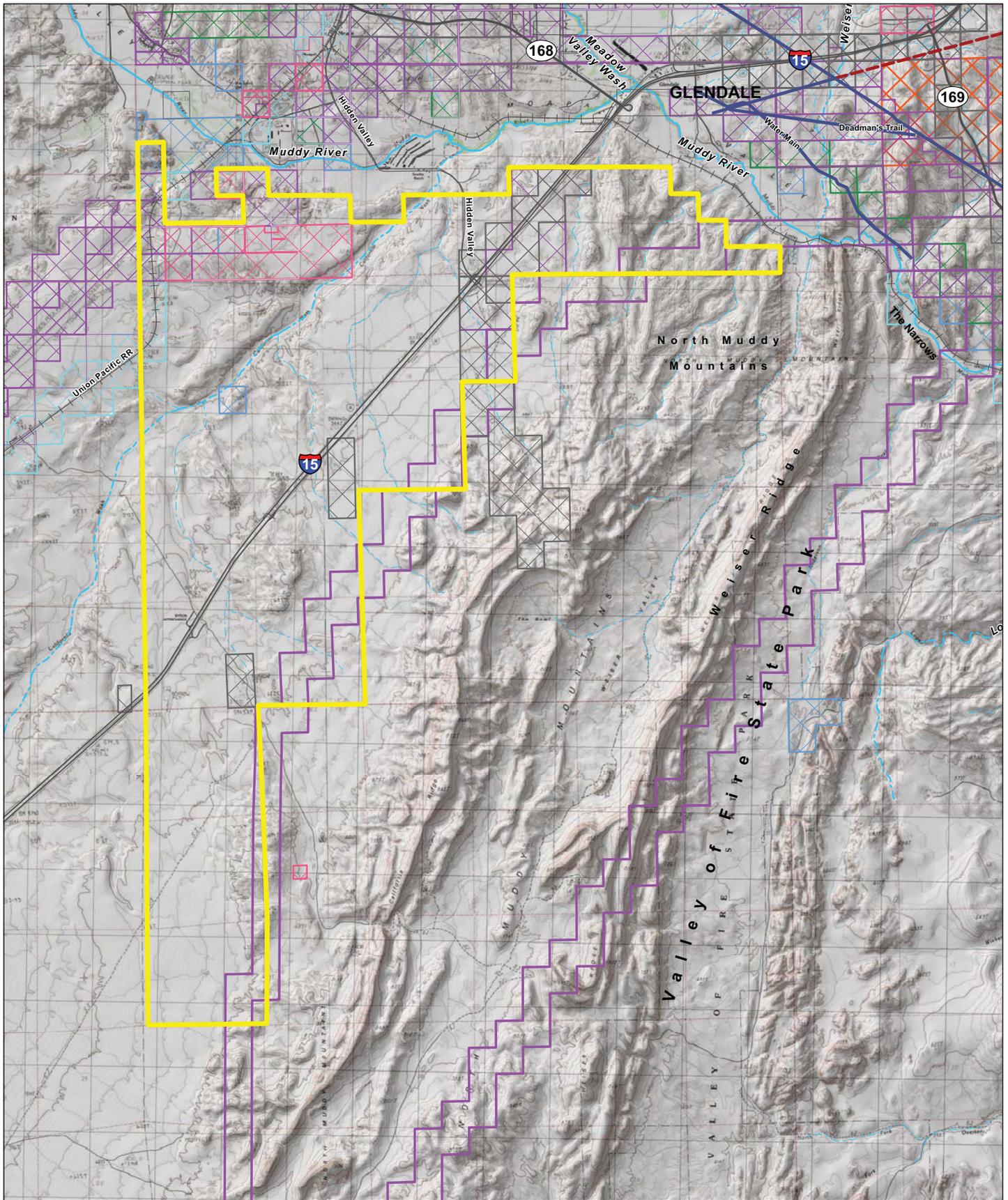
Factor	Buffer	Weight	Attractiveness Rationale
County Planned Land Use – all categories except Public Facilities/Public Conservation/Parks	None	1	Development proposals are more likely to be approved if consistent with existing regulations.
County Planned Land Use – Commercial, Planned Community, and Employment categories	1 mile	1	Commercial, planned community and employment districts stimulate complimentary, adjacent development opportunities.
Private Ownership	None	1	Private lands can more readily respond to market demands, obtain approvals, and be “shovel-ready” than Federal lands.
Existing Roads	1 mile	1	Private and public costs from new development are less when sited near existing infrastructure.
Existing Schools	3 miles	1	Private and public costs from new development are less when sited near existing infrastructure.
Existing Parks	2 miles	1	Private and public costs from new development are less when sited near existing infrastructure.
Low slopes – 0-6% slope	None	1	Flat terrain has a lower cost to develop than steeper slopes.



Glendale
Figure 7-7A. Physical Resources

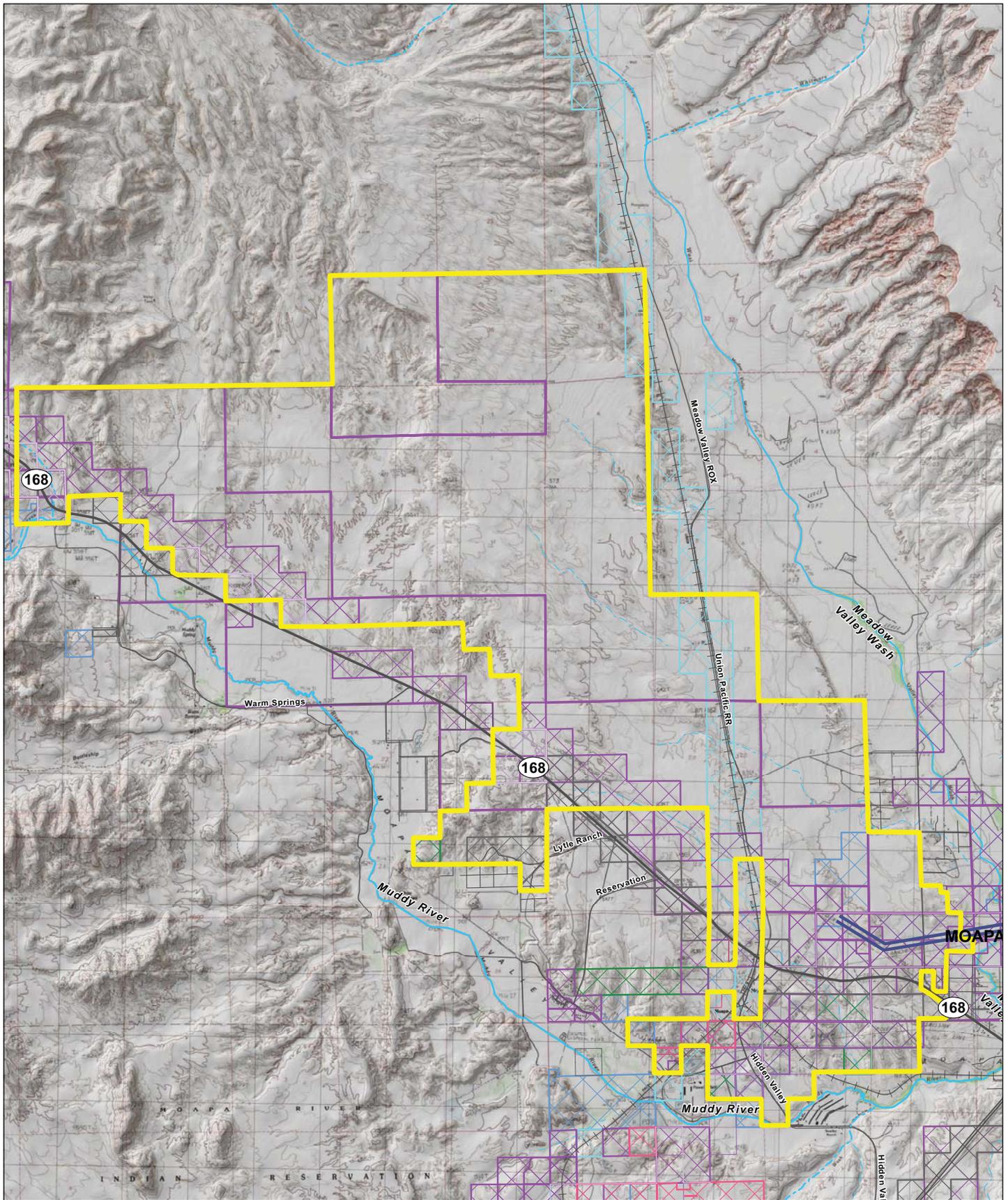


Moapa
Figure 7-7B. Physical Resources



- | | | | | |
|---------------------------------|---------------------|------------------|----------------------|------------------------------|
| Study Area - Outline | Other ROW | Road ROW | Railroad ROW | Water ROW |
| Proposed Transmission Corridors | Pending | Pending | Pending | Pending |
| Existing Transmission Corridors | Authorized | Authorized | Authorized | Authorized |
| General ROW | Pipeline ROW | Power ROW | Telephone ROW | Solar Energy Projects |
| Pending | Pending | Pending | Pending | Pending |
| Authorized | Authorized | Authorized | Authorized | Authorized |

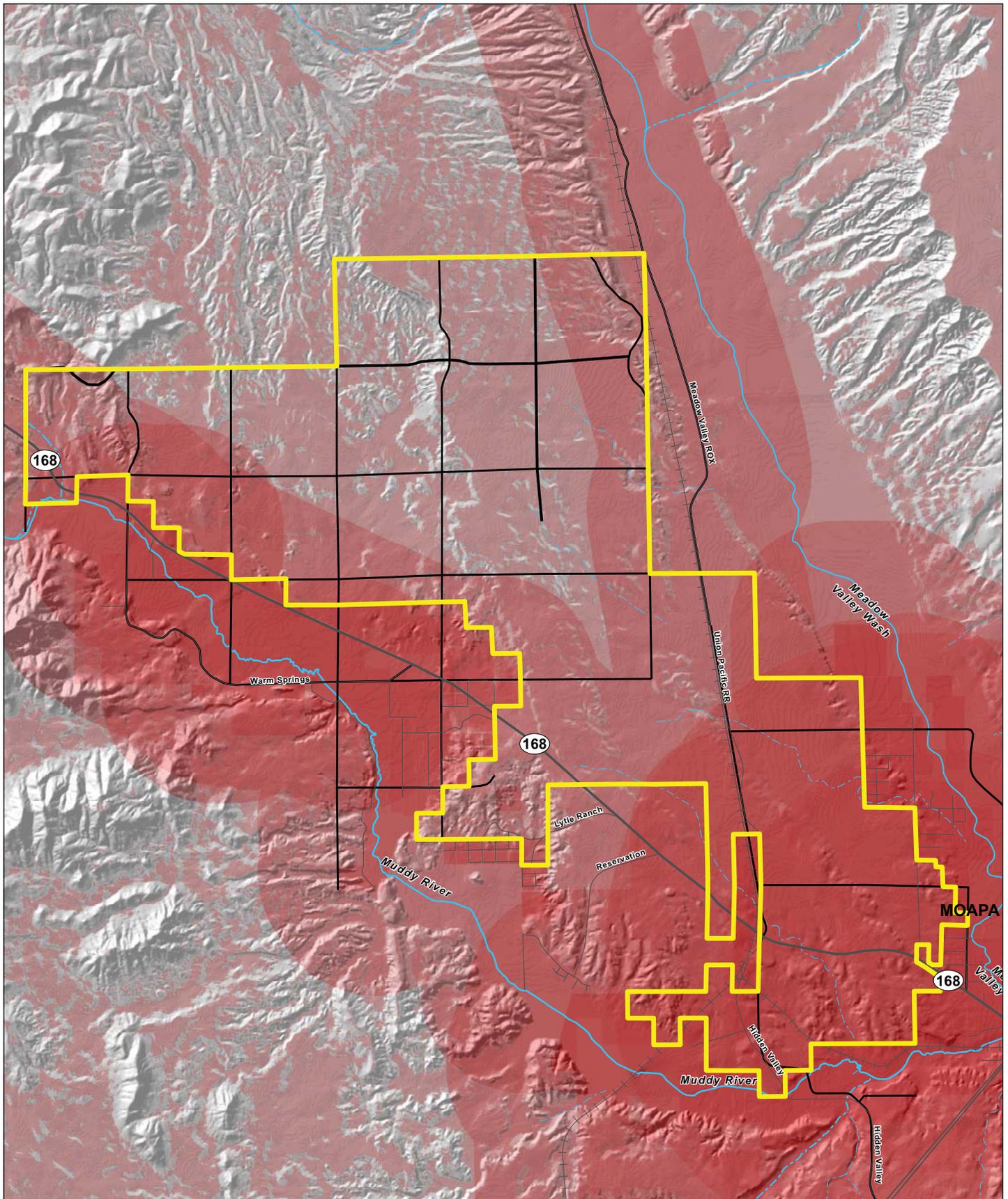
Glendale
Figure 7-8A. Transmission Corridors and Existing and Pending Right-of-Ways



- | | | | | |
|---------------------------------|---------------------|------------------|----------------------|------------------------------|
| Study Area - Outline | Other ROW | Road ROW | Railroad ROW | Water ROW |
| Proposed Transmission Corridors | Pending | Pending | Pending | Pending |
| Existing Transmission Corridors | Authorized | Authorized | Authorized | Authorized |
| General ROW | Pipeline ROW | Power ROW | Telephone ROW | Solar Energy Projects |
| Pending | Pending | Pending | Pending | Pending |
| Authorized | Authorized | Authorized | Authorized | Authorized |

0 0.5 1 Miles EDAW | AECOM

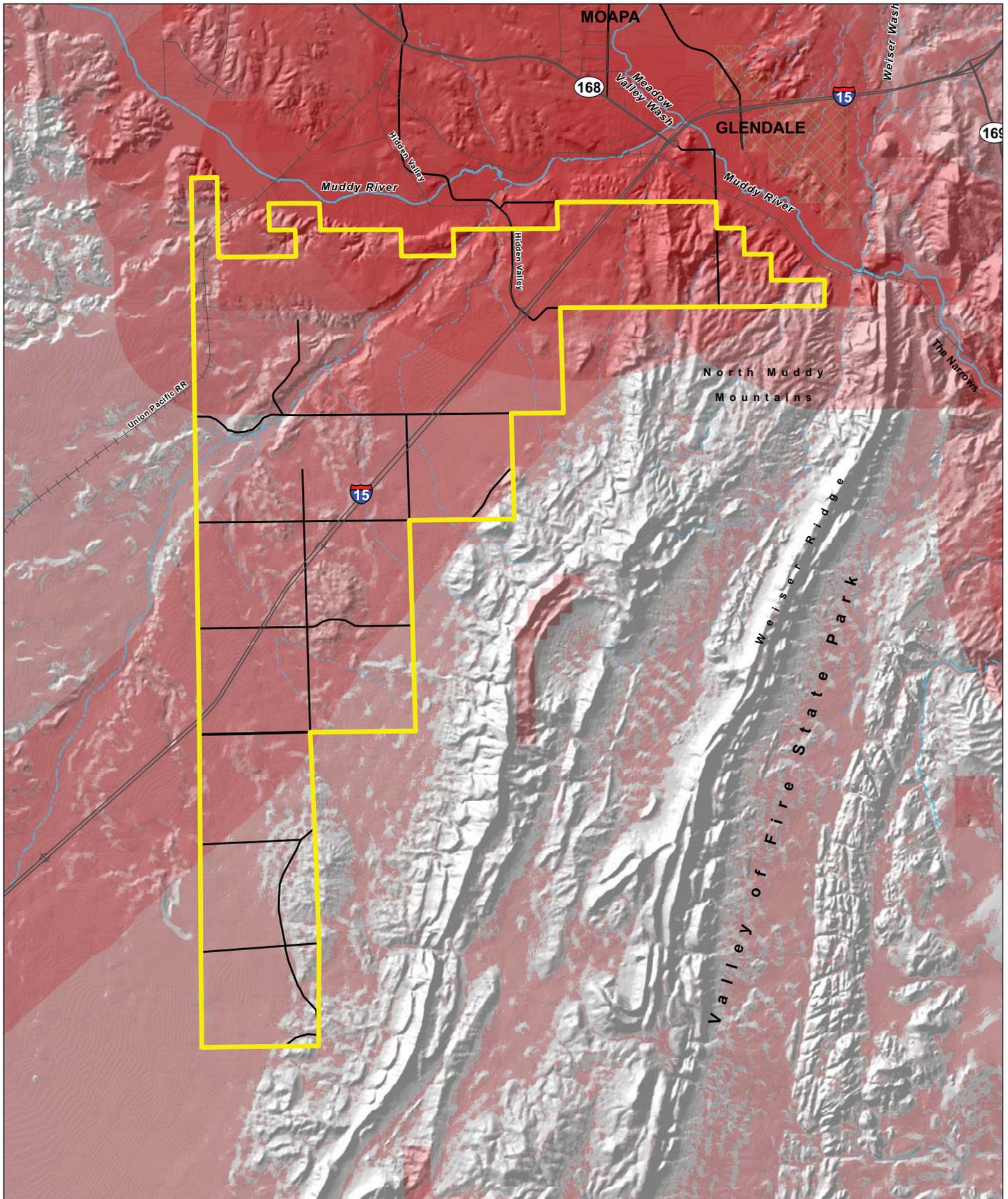
Moapa
Figure 7-8B. Transmission Corridors and Existing and Pending Right-of-Ways



Moapa
Figure 7-9A. Development Suitability

- Proposed BLM Disposal Area
- ⊗ Development Opportunities
- Proposed Arterial Roads**
- Arterials (100+ ft R-O-W)
- Arterials (120+ ft R-O-W)

* Areas with a deeper red hue have higher suitability values for development opportunities based on development attractors such as land use, slopes, schools and parks, and transportation, plus their respective buffers.



- Proposed BLM Disposal Area
- Development Opportunities
- Proposed Arterial Roads**
- Arterials (100+ ft R-O-W)
- Arterials (120+ ft R-O-W)

* Areas with a deeper red hue have higher suitability values for development opportunities based on development attractors such as land use, slopes, schools and parks, and transportation, plus their respective buffers.

Glendale
Figure 7-9B. Development Suitability