



Lyons Fire Protection District Community Wildfire Protection Plan (CWPP)

August 3, 2011

**Lyons Fire Protection District
Community Wildfire Protection Plan
(CWPP)
Signature Page**



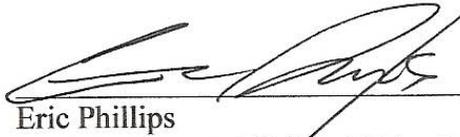
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Lyons FPD Chief



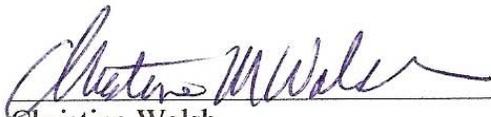
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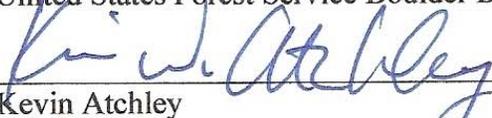
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INTRODUCTION

Purpose

A Community Wildfire Protection Plan (CWPP) is a collaboratively developed strategic plan that identifies specific wildfire hazards and risks facing Wildland Urban Interface (WUI) communities and neighborhoods. The CWPP development process allows the community to plan how it will reduce these wildfire hazards and risks. It provides prioritized mitigation recommendations that are designed to reduce those hazards and risks by identifying the most critical areas and effective methods for fuel reduction within the area of study.

The Lyons Fire Protection District (LFPD) was one of the last communities along the Colorado Front Range to develop a CWPP. Recent local fire activity such as the Four Mile Canyon Fire in September 2010 in the foothills west of Boulder is a stark reminder of the urgent need to develop a plan in preparation for a catastrophic fire that could strike at any time. The first step in wildfire prevention is to raise awareness of the responsibilities of living in a fire-prone environment. Individual and community action can ensure that homes and neighborhoods are better prepared for wildfire when it strikes.

This approved CWPP makes the district eligible for increased priority for mitigation projects through a variety of avenues. A certified CWPP creates a National Fire Plan funding priority to support the financing of projects identified in the assessment. Further, federal land management agencies (such as the U.S. Forest Service) may be able to expedite the implementation of fuel treatment projects identified in the CWPP. An approved CWPP is also a prerequisite for many mitigation grant opportunities for homeowners and communities. Also, we may be able to influence the priority and timing of potential Boulder County actions to treat identified areas in the County-owned open space in and adjacent to the district.

Goals and Objectives

1. Develop a CWPP for the LFPD that meets or exceeds the minimum state standards in order to qualify the community for wildfire mitigation grants.
2. Improve wildfire protection through community awareness and education.
3. Involve district firefighters in conducting community surveys to increase community interaction, and provide firefighters training and familiarity with roads, housing areas, and wildfire risks.
4. Prioritize hazardous fuel reduction projects for the district as well as USFS and Boulder County.
5. Improve fire department response by collecting information to support incident planning and future detailed pre-plan efforts.
6. Provide landowners information on practical and effective ways to reduce wildfire risk to their property.

7. Disseminate information to the community on actions to take in the event of an imminent wildfire incident.

Area of Study

The LFPD encompasses 66 square miles of principally dispersed residential housing with a population of approximately 6200. This includes 40 square miles in northern Boulder County and 26 square miles in southern Larimer County. Centrally located within the district is the historic town of Lyons, with a population of approximately 2000 and limited light commercial activity. The district includes several surrounding neighborhoods in unincorporated Boulder and Larimer counties, such as Lyons Park Estates, Apple Valley, Apple Ridge, Longmont Dam Road, Spring Gulch, Blue Mountain, X-Bar 7, Steamboat Valley, Eagle Ridge, Stone Canyon, Dakota Ridge, and several miles up the north and south St Vrain creeks. The total number of residences is approximately 1400. See Map 1, Appendix A, page A-1.

The entire LFPD is located in the Wildland Urban Interface (WUI) - defined as the area where structures and other human development meet or intermingle with undeveloped wildland. The topography is characterized by rugged foothill and mountainous terrain with numerous limited access dirt roads and minimal water resources for fire suppression. The majority of the district is in the Montane Zone of the eastern slope of the Northern Colorado Front Range, with elevation ranging from 5030 in the east to 9280 feet toward the west. The predominant vegetation is ponderosa forest and native grasses, with some Douglas fir on north facing slopes at the higher elevations. The district spans two major highways, Colorado State Routes 36 and 7, which are the primary access for residents living further up in the mountains, and the communities of Riverside, Allenspark, Pinewood Springs, and Estes Park. The district includes 19 square miles of US Forest Service lands and 16 square miles of Boulder County open space, and is bordered on the north, south and west by sparsely developed ponderosa forests and to the east by grass and agricultural lands.

This CWPP was conducted in coordination with the Hygiene Fire Protection District. Hygiene includes only two areas of foothills communities that are in the wildland urban interface, Rabbit Mountain and North Foothills. These communities are included in the study area.

The Hygiene FPD covers 50 square miles serving rural Boulder County west of Longmont, east of Highway 36, north of Nelson Road, and south of Yellowstone Road. Aside from the foothills areas included in this study, flat agricultural lands and rural residential areas characterize the remainder of the Hygiene FPD. The Rabbit Mountain Boulder County Open Space and several smaller parcels owned by Boulder County are included in the district.

The climate in the study area is semi-arid, with annual rainfall less of than 12 inches, and has been in a mild drought condition for the past 7 years. Several times per year, the area is swept by dry westerly Chinook winds with gusts frequently over 75 miles per hour.

Background and Governing Directives

Recent catastrophic wildfires in the United States have highlighted the increasing threat of wildfires to urban and rural communities. For more than a decade, Congress has made the protection of communities from wildfire a national priority. The development of the National Fire

Plan in 2000 and passage of the Healthy Forests Restoration Act (HFRA) in 2003 addressed the issues regarding the deteriorating health of our forests and the need for greater community protection from wildfire. The HFRA provides communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A Community Wildfire Protection Plan (CWPP) is the most effective way to take advantage of this opportunity. Additionally, regions with Community Wildfire Protection Plans in place are given priority for funding of hazardous fuels reduction projects carried out under the HFRA.

The Boulder County foothills and mountain areas are listed in the Federal Register as Urban-Wildland Interface Communities in the Vicinity of Federal Lands That Are at High Risk from Wildfire (<http://www.forestsandrangelands.gov/resources/documents/423-437-en.pdf>).

The area is also shown in the Colorado State Forest Service WUI Hazard Assessment map as red, an area of high Hazard Value (an aggregate of Hazard, Risk and Value).

The Larimer County Fire Plan wildfire hazard map shows about 35% of the Larimer County portion of the district in the very high hazard range, 10% in the high hazard range, and the remainder as moderate hazard. The entire portion of the LFPD in Larimer County is in the WUI zone. Also, the entire area appears in the High Planning Area Priorities areas of Estes Valley, Thompson River, and Carter Lake.

It is generally acknowledged that decades of a policy of fire suppression along the Front Range has exacerbated the potential for high-intensity wildfire due to resulting overgrown and unhealthy forests.

In 2009, the Colorado Legislature passed SENATE BILL 09-001 “to facilitate and encourage the development of CWPPs in counties with fire hazard areas in their territorial boundaries and to provide more statewide uniformity and consistency with respect to the content of CWPPs in counties needing protection against wildfires.”

Subsequently, in November 2009, the Colorado State Forest Service (CSFS) provided the minimum standards for developing CWPPs. This plan was developed in accordance with those standards, utilizing the handbook, leaders guide and community guide provided by the CSFS.

Core Team

The following personnel attended one or more Core Team meetings as the designated representatives of the primary stakeholder organizations:

Colorado State Forest Service District Forester Allen Owen
Lyons FPD Chief J.J. Hoffman, Asst Chief Paul Davidovich
Boulder County: Chad Julian, Eric Phillips, Jim Webster
Larimer County: Tony Simons, Kevin Johnston
US Forest Service: Dave Niemi, Richard Edwards, Will Braggs
Hygiene FPD Chief Bill Nelson, Chief Bill Eliassen
Lyons FPD Mapping and Analysis: Maureen Davidovich

Stakeholders

The following stakeholders were identified. These are organizations that would be impacted by a wildfire in the district, as well as those with a defined or perceived interest in implementing the CWPP recommendations.

- US Forest Service: Boulder District and Canyon Lakes District
- Colorado State Forest Service: Boulder District and Fort Collins District
- Boulder County:
 - Emergency Services
 - Parks & Open Space
- Larimer County Emergency Services
- Town of Lyons
- City of Longmont Water (Buttonrock Preserve)
- CDOT
- Community Reps (HOAs, Road Associations)
- Utilities:
 - Excel Energy
 - Poudre Valley Electric
 - Longmont Electric
 - Lyons Electric
 - Qwest
- Adjacent Fire Protection Districts:
 - Left Hand FPD
 - Pinewood Springs FPD
 - Hygiene FPD
 - Allenspark FPD
 - Berthoud FPD
 - Larimer FPD

Local Fire History

Local fire history has only been recorded since settlement in the 1850s.

Old tree rings evidence fire scars from two particularly dry years in 1858-1859 and 1859-1860 during which wildfires raged in Boulder County. While there may have been many small fires or just a few large ones during those years, it is clear that the forests in Boulder County sustained large amounts of damage. Studies of the incidence of wildfire in local Ponderosa Pine forests show wide variation, with intervals from 1 to 96 years, and average intervals of 17 to 40 years.

As fire suppression efforts during the past 100 years in the foothills have contributed to dense, overgrown forests, there are significant parts of the LFPD that are long overdue for a fire. In addition to fire suppression efforts by the USFS and local agencies, local quarry activity and ranching may also have disrupted the local incidence of wildfire. The quarries brought several hundred men to the area that built houses, hotels, schoolhouses, boarding houses and saloons using the local timber and sandstone. They scraped large areas of the landscape for sandstone, leaving tailings, and temporarily limited the wildfire threat by eliminating much of the forest, clearing it or using it for firewood. Historic photos show large areas that are currently forested

that were devoid of trees in the 1880s. As a result of regeneration, some areas of the current forest are characterized by dense growth of similar aged trees.

As the mountains near Boulder have been developed since about 1960, there has been increasing pressure for effective fire suppression. Increased property values and growing populations have led to the establishment of fire protection districts taking responsibility for the populated and accessible portions of Boulder County.

According to the USFS, there have been 55 wildfires on Forest Service Land in the district since 1962, 34 class A (size less than ¼ acre), 16 class B (¼ - 10 acres), and 5 class C (10-100 acres).

The Class C fires were:

- These Roads, 1988, 23 acres
- Hells Canyon, 1994, 94 acres
- Cook Mountain, 1985, 52 acres
- Little Narrow, 1995, 32 acres
- 27 Mile, 1984, 32 acres

Lyons FPD has recorded 48 Class A wildfires, 49 Class B, 10 Class C, 1 Class D, and 1 Class E since 1998.

Hygiene FPD has recorded 15 Class A wildfires, 24 class B, 7 Class C, 1 Class D, and 58 of unrecorded size since 2004.

Additionally, the following larger fires have been recorded in the foothills surrounding the district: Class E (300-1,000 acres); Class F (1,000 -5,000 acres); Class G (5,000 acres or more).

Fire	Date	Class	Acres	Deaths	Structures*	Cause
Four Mile Canyon	Sept 2010	G	6200	0	169	Human
Reservoir	Sept 2010	E	750	0	6	Human
Old Stage II	Jan 2009	F	3000	0	2	Power Line
Overland	Oct 2003	F	4000	0	31	Power Line
Big Elk	Jul 2002	F	4350	3	1	Human
Walker Ranch (Eldorado)	Sep 2000	F	1100	0	0	Human
Bobcat Gulch	Jun 2000	G	10,700	0	22	Human
Old Stage Fire	Nov 1990	F	3000	0	15	Human
Black Tiger	Jul 1989	F	2100	0	44	Human
Lefthand Canyon	Sep 1988	F	2300	0	0	Human

*Four Mile Canyon Fire destroyed 169 homes. Available data does not distinguish if structures destroyed in other fires are homes or other types of buildings.

Values at Risk

Values at Risk are the human and intrinsic values identified as important to the way of life of the study area. In any hazard and risk assessment, human life and welfare are the most important resources to protect. The WUI has inherent risks including development in areas historically prone to fire, hazardous fuels, and limited access. Both the immediate and long-term consequences of a wildland fire must be considered.

Life and safety: Area residents and firefighters.

Protection of Property: Homes, businesses and other structures.

Critical Community Infrastructure: Power, data, municipal water supply pumping station, water treatment plant, Longmont Power hydroelectric generating plant, electric towers, lines and substations, and various communication repeaters.

Local economy: Town of Lyons and area businesses, quarries.

Schools: Lyons Elementary School, Lyons Middle/High School.

Historic structures: 16 buildings in town of Lyons, plus homesteads and other archeological stone sites.

Tourism: 2 of 4 primary routes to Rocky Mountain National Park, the Scenic Peak to Peak Highway, and Estes Park.

Watershed health and water quality: Municipal watershed for Longmont and Ralph Price Reservoirs in the Button Rock Preserve (city of Longmont and Lyons water supply), North and South St Vrain Creek and Little Thompson River drainage, aqueduct from Carter Lake, Watershed for Carter Lake.

Recreation: Town of Lyons parks, Boulder County Open Space, Button Rock Preserve, and Roosevelt National Forest provide opportunities for hiking, mountain biking, rock climbing, tubing, white water rafting, fishing, horseback riding, road bike racing and training, while the Town of Lyons is renowned for its outdoor concerts, festivals, and art shows.

Air quality: Smoke from active fires is a threat to the long-term health of residents, particularly those with respiratory ailments.

Forest health: The ability of the forest to sustain itself ecologically and provide what society wants and needs. A healthy forest maintains its unique species and processes, while maintaining its basic structure, composition and function and has the ability to accommodate current and future needs of people for values, products and services. While fire is a natural part of the lifecycle of a forest, fires that reach extreme temperatures can sterilize the soil and adversely impact natural processes such as regeneration.

Native vegetation: Hall Ranch: four natural plant communities of cottonwood riparian forest, riparian shrubland, mixed foothill shrubland, and wet meadow. Heil Valley Ranch includes a ponderosa pine/mountain mahogany/big bluestem plant community. Natural Heritage Conservation Sites include Indian Lookout Mountain, Red Hill, and the Plumely Canyon.

Landscape: scenic views of the foothills from within the district as well as from the Cities of Longmont and Loveland, and from Boulder and Larimer County Open Space.

Wildlife habitat: Hall Ranch has been heralded as a crucial wildlife habitat. It is home to the tiny ruby-crowned kinglet, golden eagle, great horned owl, Cooper's hawk, nighthawk, mountain lion, elk, bighorn sheep, white-tailed deer, black-tailed prairie dog, coyote, fox, badger and bobcat, and prairie rattlesnake. Heil Valley Ranch has remained relatively undeveloped from prehistoric times through present day, making it premier wildlife habitat. The variety of ecosystems (grasslands, shrublands, woodlands, forests and canyons) supports an abundance of wildlife, including Abert's squirrels, cottontail rabbits, prairie dogs, marmots, red and gray foxes, mule deer, bobcats, black bears and mountain lions. It is also a rich breeding bird habitat. Heil Valley Ranch is now an important winter range for elk that migrate from the Indian Peaks Wilderness Area - the only herd along the Front Range who journey from the Continental Divide to the Plains. Roosevelt National Forest provides habitat for bighorn sheep, in addition to several of same species listed above. Button Rock Preserve provides habitat for mule deer, coyotes, mountain lions roam yellow-bellied marmots, cottontail rabbits, Abert's squirrels, black bear and prairie rattlesnakes. Birds include eagles and occasional osprey, ducks, geese, great blue heron, mountain bluebirds, Steller's Jays, and hummingbirds. The reservoir is stocked with brown and rainbow trout and splake, a brook and lake trout hybrid. North and South St Vrain Creeks also contain trout (brown, rainbow, and cutthroat).

Lyons Fire Protection District Capabilities

Lyons Fire is staffed by an all-volunteer force with a full time Fire Chief. Lyons Fire responds to a range of emergency incidents including: structural fire, technical rescue, search and rescue, emergency medical services, hazardous materials, natural disaster response, and wildland fires. The District has two stations where volunteers report to staff applicable apparatus for emergency response. The primary station (Station 1) is located in the town of Lyons, and Station 2 is located near the Blue Mountain area of Larimer County. Volunteers are notified by Boulder County Communication Center of an incident over VHF pagers.

The district responds to and is aided by other nearby agencies for incidents beyond the equipment and personnel capabilities of a single district. Mutual Aid Agreements are in place, primarily for structural fires not served by fire hydrant systems, expanded wildland fire, technical rescue, and advanced life support medical services.

Apparatus: Emergency response apparatus owned by the LFPD are configured to provide capabilities to respond to a range of incidents. The following descriptions focus on the capabilities for response to a wildfire incident. In November of 2010, a Lyons Fire Protection District Bond Issue was presented to the voters of the district and passed with approval to move forward on the purchase of a new Wildland Urban Interface Engine, as well as new water tender and quick response vehicle. Also included in the recently approved bond issue was the purchase of a large generator and a large portable diesel water pump for serving areas in the district that do not have pressurized water supply from fire hydrants.

Type 1 Engines are main pumper engines designed to effectively respond to structure fires. During wildfire incidents, these engines are primarily assigned to the role of structure triage, preparation, and defense. These engines are the only apparatus that have the equipment and personnel to effectively engage a structure compromised by fire. The apparatus have the capability to pump large quantities (500-1250 gallons/minute) of water and water/foam mixtures to extinguish intense concentrated fires. To support an effective flow rate of Type 1 Engines, an adequate water supply is required. Water is supplied by connection to a municipal fire hydrant system, or by shuttling water to the engine using water tenders. Lyons Fire has four Type 1 Engines that are pictured in figure 1 with the capabilities listed in Table 1. Two of the engines are nearly 30 years old, and do not have the personnel capacity to allow safe entry into burning structures. The fire district is working to replace two aging engines with a new Type 1 Engine with wildland/urban interface capabilities.

Type 3, 4, 5, & 6 Wildland Engines are specifically designed and equipped to respond to wildfire incidents. The Wildland engines are configured with equipment to allow various response capabilities and tactics. The types of actions that can be taken include pump and roll direct attack, hose lays, fire line construction using hand tools and chainsaws, and burnout operations with ignition devices. The wildland engines may be assigned roles of structural triage, preparation and defense, as well as direct or indirect fire line construction. Direct fire line operations can only be accomplished in lower intensity fires where flame lengths are less than four feet for dismounted personnel or eight feet for engine use (provided an adequate water supply is available). Lyons Fire has one Type 4 Engine (4030), one Type 5 Engine (4031), and one Type 6 Engine (4032) pictured in figure 1. Primary capabilities are listed in Table 1. The new quick response vehicle will be designed to be rapidly reconfigured for wildfire response.

Water tenders are used to supply water to engines engaged in firefighting roles. The tenders are equipped with portable ponds that may be set up and filled for use by the engines. Tenders continue to shuttle water, refilling from a pressurized source (such as a hydrant), or suctioning water from cisterns, ponds, or any other adequate static water source. The LFPD has 2 water tenders depicted in figure 1. Their capabilities are listed in Table 1. One of the tenders is nearly 30 years old with a limited water tank capability. The fire district will replace the aging Tender with the purchase of a larger capacity tender using the funds approved by the Bond Issue. The new tender will be equipped to provide limited direct attack capabilities during wildfire response.

Other apparatus may be assigned roles during a wildfire incident. Rescue apparatus will be assigned medical support roles for resources assigned to the fire. Command and utility vehicles provide mobile command center to direct operations, logistic support and transporting supplies and personnel.

Table 1: Wildland Capability of LFPD Apparatus

Apparatus	Type	# Personnel	Water Capacity (gal)	Pump Capability (gpm)	Other
4010	1	2-3	500		4x4
4011	1	2-3	1000		
4012	1	3-6	750	1250	Class A&B Foam
4015	1	3-6	1000	1250	Class A&B Foam
4030	4	2-3	900		4x4 Class A Foam Pump & Roll
4031	5	2-5	435		4x4 Class A Foam
4032	6	2-5	400		4x4 Class A Foam
4040	Tender	1-2	1600		Portable Pond
4041	Tender	1-2	2500		Portable Pond
4020	Medical	2-3	-	-	Basic Life Support 4x4
4027	Medical	2-3	-	-	Basic Life Support 4x4
4050	Command	1-2	-	-	4x4
4051	Utility	1-4	-	-	4x4
UTV	Utility	1-3	-	-	4x4
ATV	Utility	1-2	-	-	4x4

Personnel: Lyons Fire has an authorized staffing level of one full time paid chief and 43 volunteer firefighters: 9 officers, 24 regular members and 10 reserve members. Officers and regular members are volunteers living in the district, within 5 miles of a Lyons Fire Station, or work at least 30 hours per week in the district. Reserve members live within 15 miles of a Lyons Fire Station. Volunteers are a dedicated mix of civic minded, motivated men and women, most of whom have families and other full time employment. September 2010 regular membership was approximately 60% of staffing. Members are annually required to attend 48 hours of scheduled training, many additional hours of duty crew conducting training or equipment upkeep, and respond to a percentage of emergency response calls. The greatest challenge for the district is the recruitment, retention and training of qualified volunteers, particularly to staff apparatus at Station 2.

Training: The district provides funding for training of personnel for qualifications that directly support emergency response roles of Lyons Fire. In order to provide adequate, all hazard response to residents of the LFPD, the training goal is to have all members qualified to Emergency Medical First Responder, Structural Firefighter 1/Hazardous Materials Operation and Basic Wildland Firefighter. Additional qualifications (technical rescue, vehicle extrication, emergency medical technicians, etc.) are provided based on district needs and member experience and desires. Training requirements for wildland firefighting are defined by the National Wildfire Coordinating Group (NWCG). NWCG qualifications are obtained by a combination of required courses and experience/demonstrated performance. The focuses of wildland qualifications are for operational positions up to and including squad boss, crew/engine boss and strike team/task force leaders.

Emergency Response: Response begins with receipt of an emergency page and varies with the availability of personnel, time of day and environmental conditions. Most of the volunteers live in the unincorporated portions of the district and have travel times to a fire station of 5-8 minutes. Many of the volunteers are employed outside the district during the workday. Once adequate personnel have arrived, the first apparatus will respond to the incident; other apparatus will respond as additional personnel become available. Access on steep mountainous roads, many unpaved, results in typical enroute times in excess of 20 minutes in the unincorporated areas of the district, and may be 30 minutes or longer to the furthest extents of the district.

Water Supply: The Town of Lyons provides a pressurized hydrant system within the town limits and several hydrants along Apple Valley Road and Ute Highway. The remainder of the district relies on other non-municipal sources of water. Non-municipal water supplies are static (non-pressurized) sources that require apparatus to draft (suction) water into a pump. Most fire apparatus have the capability of drafting to a maximum lift of 20-25 vertical feet and carry 10 to 25 feet of suction line, restricting potential sources of water that can be used for fire response to those readily accessible from a roadway or safe parking area. The North and South St Vrain Creeks and river have seasonal water supply possibilities at a few access points. Several ponds are also available as seasonal water sources, again with access issues. Current building codes require new rural homes to provide dedicated fire cisterns (1600-2400 gallon), however most homes in the district were built before such cisterns were required. Many homes use small (500-1000 gallon) cisterns for drinking water storage, and these may be used for firefighting in extreme circumstances, if accessible. The lack of adequate water supply throughout much of the district is a critical issue that needs to be improved through a combination of municipal hydrant system extension and installation of large (15,000 gallon) community cisterns. The District has mutual aid agreements with surrounding agencies to provide water tender support in the event of a fire incident.

Hygiene Fire Protection District Capabilities

Hygiene Fire is staffed by an all-volunteer force. Hygiene Fire responds to a range of emergency incidents including: structural fire, technical rescue, search and rescue, emergency medical services, hazardous materials, natural disaster response, and wildland fires. The District has one station, located at the corner of 75th Avenue and Hygiene Road in Hygiene, where volunteers report to staff applicable apparatus for emergency response. Volunteers are notified by Boulder County Communication Center of an incident over VHF pagers.

The district responds to and is aided by other nearby agencies for incidents beyond the equipment and capabilities of a single district. Mutual Aid Agreements are in place, primarily for structural fires not served by fire hydrant systems, expanded wildland fire, technical rescue, and advanced life support medical services.

Apparatus: Hygiene fire equipment includes 3 engines, 2 Brush Trucks, 2 Tankers, Ladder Truck and a Medical Unit. They also have a rescue boat for water related incidents.

Personnel: Hygiene FPD has an authorized staffing level of 35 volunteers.

Training: The district provides funding for training of personnel for qualifications that directly support emergency response roles of Hygiene Fire Department. In order to provide adequate, all hazard response to residents of the HYFD, the training goal is to have all members qualified to Emergency Medical First Responder, Structural Firefighter 1/Hazardous Materials Operation and Basic Wildland Firefighter. Additional qualifications (technical rescue, vehicle extrication, emergency medical technicians, etc.) are provided based on district needs and member experience and desires. Training requirements for wildland firefighting are defined by the National Wildfire Coordinating Group (NWCG). NWCG qualifications are obtained by a combination of required courses and experience/demonstrated performance. The focuses of wildland qualifications are for operational positions up to and including squad boss, crew/engine boss and strike team/task force leader.

Emergency Response: Response begins with receipt of an emergency page and varies with the availability of personnel, time of day and environmental conditions. Most of the volunteers live in the unincorporated portions of district and have travel times to a fire station of 5-8 minutes. Many of the volunteers are employed outside the district during the workday. Once adequate personnel have arrived, the first apparatus will respond to the incident; other apparatus will respond as additional personnel arrive. Response times are an average of 10-20 minutes for the outlying portions of the District.

Water Supply: The vast majority of the fire district is not protected by fire hydrants. Only Hygiene proper and 3-4 sub-divisions have the standard fire hydrant placement. A large amount of the district is considered rural/ agriculture, with fire hydrant placements sometimes in excess of 1- 1.5 miles apart from each other, thus the need to set up a water tender shuttle operation to supply engines with water for fire suppression. Hygiene currently has 2 water tenders capable of carrying 1800 gallons each to supply an engine in the event of a fire. Additionally, mutual aid agreements are in place for other agencies to provide water support with tender operations.

ASSESSMENT

Process

The district was divided into 12 communities for purposes of conducting the assessment. The boundaries were drawn to enclose structures and residences, based on access, terrain and similar fuel models. The communities do not necessarily correspond to specific subdivisions or road/homeowner association areas, although these were followed to some extent to facilitate the identification of points of contact and simplify communication. The communities are shown on Map 1, Page A-1, identified as follows:

- Town of Lyons (Central)
- Town of Lyons (New Developments)
- Lyons Park Estates
- Stone Canyon/Eagle Ridge
- Steamboat Valley
- North St Vrain/Longmont Dam Rd
- South St Vrain
- N Foothills/Ute Highway/Rabbit Mountain*
- Dakota Ridge*
- Apple Valley
- Spring Gulch
- Blue Mountain/X Bar 7

* Indicates areas of mutual aid response with Hygiene and Berthoud Fire Protection Districts, based on primary access routes.

An initial overview of the district was conducted using LANDFIRE data for slope, aspect, elevation, and Anderson's 13 fuel models for estimating fire behavior.

The Core Team met November 5, 2009 and approved the approach for the CWPP process.

Community surveys were conducted by the Lyons volunteer firefighters. The survey form (see Appendix B) was developed using the rating criteria provided by the National Fire Protection Authority (NFPA) *1144* Standard for Protection of Life and Property from Wildfire, with minor modifications for local conditions. For example, the NFPA criteria uses road mileage from fire station, but due to the condition of local roads, many of which are unpaved and privately maintained, it was determined that travel time from the fire station was a more relevant criteria.

The surveys were conducted at the house level, but aggregated at the community level to achieve an overall community hazard rating. Only residences were surveyed, other structures such as businesses, barns, garages and outbuildings were not evaluated, except to the extent they posed a hazard to the residence. The exception is that residences in the town of Lyons were not individually evaluated; they were evaluated as a group based on predominant conditions.

As part of the survey, neighborhood conditions such as evacuation routes, fire department access, and water sources were evaluated, and safety zones, staging areas and helicopter landing zones were identified.

Issues were identified during the survey process, and preliminary recommendations were developed.

During this same time frame, Chief Hoffman conducted initial public outreach to identify points of contact, and briefed town officials and several of the communities on the process.

The core team met on March 29, 2011 to review the draft CWPP document, results of community assessments, and recommendations. Changes have been incorporated into this report.

Preliminary Assessment

Preliminary data was obtained from LANDFIRE (also known as Landscape Fire and Resource Management Planning Tools), an interagency program for vegetation, fire, and fuel characteristics mapping, sponsored by the United States Department of the Interior (DOI) and the United States Forest Service.

Housing density: see Map 2, page A-2.

Fuel Model: see Map 3, page A-3. Fuel models are a collection of vegetation types, grouped into 4 primary categories (grass, shrub, timber, and slash) which have similar properties with regard to fire behavior, and can be quantified and used as an input for fire behavior models. Anderson's 13 Fire Behavior Fuel Models identified in the district were used, as described below:

Fuel Model 1 Short grass (1 foot)
Fuel Model 2 Grass and understory
Fuel Model 4 Chaparral (6 feet)
Fuel Model 5 Brush (2 feet)
Fuel Model 6 Dominant brush, hardwood slash
Fuel Model 8 Open Crown timber
Fuel Model 9 Closed Crown with Hardwood litter
Fuel Model 10 Timber (litter and understory)
Agricultural
Water
Rock (quarries)
Urban

The primary fuel models occurring in the district and the portion of area covered are: approximately 55% timber, 25% grass, 12% brush, and 8% urban/rock/water. Field surveys showed a significant difference from the satellite fuel model imagery in one case: a large portion of what shows as grass fuel models on these maps is in reality brush fuel model 4 or 6. The main areas where this difference was noted are in X Bar 7/Blue Mountain, Stone Canyon, Dakota Ridge, and Steamboat Valley.

Slope: see Map 4, page A-4. Slopes greater than 30 percent significantly increase wildfire risk. Slope generally increases as you move toward the west across the district.

Combined Risk: see Map 5, page A-5.

The combination of Fuel Model and Slope were used to depict combined risk. Fuel Model and slope were classified based on NFPA point values, and then the values were added to obtain the combined risk.

Aspect: see Map 6, page A-6. Aspect is the direction of the slope, and significantly impacts the density and curing of vegetation. North facing slopes tend to have denser, but moister vegetation. South and west facing slopes are generally the driest.

Elevation: ranges from 5030 to 9280 feet. See Map 7, page A-7.

Assessment methodology

Individual houses were assessed by the firefighters using the scoring sheet shown in Appendix B. This scoring sheet was adapted from NFPA 1144, with minor modifications for local conditions. The total number of points available is 188. The overall rating scale is shown below.

Hazard Rating Scale	
Low	< 40
Moderate	41-70
High	71-120
Extreme	> 121

The neighborhood access and fire service access items were assessed for the community as a whole. Where different conditions exist within a community, the predominant condition was used, and then adjusted proportionately to incorporate the worst-case scenario.

Each house was evaluated and the results were averaged for the community. There is no intention at this point to provide individual scoring results for a particular residence. Only residences were evaluated. Other structures were considered only to the extent they impacted the risk to the residence. The long-term goal is to prepare individual pre-plans for each business and residence at a future date. Where access to individual property could not be obtained due to locked gates, the assessment was made based on the extent to which the property was visible from accessible areas and from aerial photographs. Houses in the Town of Lyons were not surveyed individually; the predominant conditions were evaluated.

This assessment is intended for educational purposes and is not a tactical firefighting assessment.

Summary of Results of Neighborhood Assessments

The following table shows the summary of survey results. All of the neighborhoods were rated high or moderate wildfire risk. This seems to make sense when you place the study area in context of the entire Colorado Wildland Urban Interface. There are areas in the mountains and canyons which pose more extreme risk, with steeper slopes, denser vegetation, less setback, more wood roofs and construction, etc. On the other hand, the foothills location of the district is at higher risk than the grassy plains.

The detailed score sheet and write-up for each community are included in Appendices D through O. Homeowners are requested to review the Appendix which pertains to their particular community, along with Appendix C which contains detailed explanations of the terms and recommendations.

Wildfire Risk and Hazard Severity Assessment Neighborhood Results Summary			
Neighborhood	# Houses	Score	Rating
North St Vrain	76	100.2	High
Lyons Park Estates	65	99.1	High
Spring Gulch	130	94.3	High
Dakota Ridge	34	89.6	High
X-Bar 7/Blue Mountain	132	88.2	High
Stone Canyon/Eagle Ridge	42	86.6	High
Steamboat Valley	16	85.5	High
Town of Lyons (Central)	350	79.5	High
North Foothills/Ute Highway/Rabbit Mountain	43	71.3	High
South St Vrain	38	66.3	Moderate
Apple Valley	129	57.5	Moderate
Town of Lyons (New Developments)	346	41.4	Moderate

Overall neighborhood priorities should be weighted by factoring in the number of residences. Accordingly, Spring Gulch is considered the number one priority due to the number of residences impacted.

Summary of Findings

Average Lot Size: About 13 acres. Varies from less than one acre to 35 acres; very few lots with 40 or more acres.

Access Ingress/Egress, Response Time: Nearly all communities have single ingress/egress routes. Response times in many areas of the district are in excess of 20 minutes along privately maintained, reasonably well-graded narrow dirt roads, some of which are also steep. Four-wheel drive is a necessity for fire apparatus in most areas. A few areas in Dakota Ridge, X-Bar 7, and the western portion of Longmont Dam Road are extremely remote from responding station.

Predominant Fuel Models: 55% timber (Fuel Models 8 and 9), 25% grass (Fuel Model 2), 12% brush (Fuel Models 4 and 8), and 8% urban/rock/water.

Terrain/Topography: Foothills. Average slope for unincorporated areas is 16%. Slopes range from generally flat for Town of Lyons, up to an excess of 60%.

Home Construction: Varies by age of home and building codes in effect at the time of construction. Many homes were built prior to the 1990s when Firewise building construction codes began to be implemented. Only a few houses have wood shake shingles, but over 50% have wood siding, and open wood decks.

Defensible Space: Much more work needs to be done throughout the district. A few newer houses have completed basic mitigation, but most need improvement in all zones. Many residences have combustible structures, firewood piles and other debris within 30 feet of homes.

Water Supply: Severely inadequate, major issue. The only pressurized water sources are in the Town of Lyons, and along Apple Valley Road and Ute Highway, serving just over half of the residences and less than 2 square miles, or 3% of the district. Very few cisterns are installed in the unincorporated areas.

Special Hazards: Electric power lines over roadways, combustible material adjacent to above ground propane tanks. Close exposures of adjacent wood houses and structures in central Town of Lyons. Unknown weight capacity and/or unsafe bridges prevent access by fire apparatus to several residences.

Other Issues:

Insufficient water supply in unincorporated areas of the district.

Potential for entrapment in event of a wildfire for residents in neighborhoods with single ingress/egress route.

Need to identify Safety Zones for all communities.

Ingress/egress hazards due to vegetation along access roads.

Delayed fire department access due to locked gates.

Insufficient defensible space around residences.

Ambiguous, missing, and poorly visible street and address markings, and some addresses with numbers out of sequence, not following right/left conventions, or not adhering to the mountain addressing system.

Inadequate turnarounds and pullouts for fire apparatus on some narrow roads and many long driveways.

Unknown weight capacity and/or unsafe bridges prevent access by fire apparatus to several residences.

Dense and unhealthy forest in surrounding open space and undeveloped lands threatens adjacent communities.

RECOMMENDATIONS

Priority 1: Safety of Residents and Firefighters

Ensure Safe Ingress/Egress:

Work with residents and HOAs to identify and maintain safety zone for each community with possible egress issues.

Prioritize mitigation products to reduce encroaching trees and brush to allow safe ingress/egress along primary access roads, particularly:

- Spring Gulch: Boulder County portion of Blue Mountain Road, Spring Gulch Drive, Colard Lane, and Pioneer Road.
- Lyons Park Estates: all roads.
- North St Vrain: Longmont Dam Road in Button Rock Preserve.
- Dakota Ridge: Indian Mountain Road, Moss Rock Court, Redstone Court and Thunder Road.
- X-Bar 7/Blue Mountain: Grey Mountain Drive and Blue Mountain Trail.
- Stone Canyon/Eagle Ridge: Eagle Ridge Road, Lewis Lane, north end of Stone Canyon Road.
- Foothills/Ute: Rabbit Mountain Rd, Pointe View, and Highland Drive.

Investigate emergency evacuation routes from the following communities that have only one ingress/egress: Spring Gulch, X-Bar 7, Lyons Park Estates, Longmont Dam Road, Dakota Ridge, and Eagle Ridge. Proposed evacuation routes discussed in the detailed community sections have not been evaluated and ARE NOT OPEN AT THIS TIME.

For proposed evacuation routes: Obtain permissions, improve road surface, mitigate vegetation and label emergency evacuation routes for communities with only one ingress/egress route. Evacuation routes may cross private property. They should be clearly marked and only used in case of emergency.

Current evacuation routes are shown in blue on the individual community aerial maps. Sections of evacuation routes requiring mitigation are shown in red on maps A-8 through A-14 at the end of this section.

Improve Emergency Response Time:

Homeowners ensure address markings are readily visible from both directions (with large, contrasting, preferably reflective numbers), located at the base of the driveway, and for remote locations, at every turnoff or fork in the road leading to the house. Both Lyons and Hygiene Fire Departments will investigate obtaining standardized, large, reflective address signs and will work with road boards, HOAs and private homeowners to initiate a standardized address marking system. These signs may be available for sale from either of the departments or available for individuals to purchase through a web site link posted on both the districts web pages.

Owners with locked gates install Knox box (preferred), or provide gate codes or keys to the applicable fire department.

Verify and post weight limits on all bridges, particularly 28300 block of South St Vrain Drive, 16000 block of North St Vrain Highway, all driveways along Longmont Dam Road that cross the river, and Highland Drive (which affects both fire districts). This process will be done in conjunction with Boulder County Transportation Department.

Replace missing street signs in Lyons Park Estates, County Road 69/Bradford St, and Groover St. Standardize Street signs in Spring Gulch. Clearly label ambiguous road directions at all intersections in Spring Gulch, Lyons Park Estates, Eagle Ridge and Dakota Ridge. This will be a cooperative effort with the following agencies, organizations or individual homeowners in the affected area:

Lyons Park Estates- Boulder County Transportation Department
County Road 60/ Bradford St- Boulder County Transportation Department
Groover St- Town of Lyons
Spring Gulch, Dakota Ridge and Eagle Ridge- Applicable Road Associations

Homeowners and Road Associations install turnarounds and pullouts for fire apparatus on narrow roads and long driveways.

Lyons FPD Provide updated map info to Boulder County; Boulder County update mountain address maps for countywide mutual aid assistance.

Priority 2: Reduce Wildfire Risk

Improve Community Awareness:

Promulgate CWPP

Brief community, stakeholders, and HOAs regarding CWPP results and recommendations.

An educational effort will be put together for both fire districts which include community meetings as well as working with road boards, HOAs, and individual home owners, discussing the dangers of wildfires, fire prevention and education, healthy forest practices and well as the needs of the fire districts to improve defensible space, fuel breaks and other mitigation practices. Both Districts will also post a copy of the CWPP on their web site with information and links to provide further education.

Homeowners take advantage of free wildfire assessments offered by fire department personnel.

Improve Defensible Space and Mitigation:

Homeowners need to improve defensible space and implement Firewise maintenance practices, especially zones 1 and 2 and those with wood sided houses, wood decks and other combustible structures. See Appendix C for more detailed information.

Boulder County Parks and Open Space prioritize a mitigation project for a fuel break in Heil Valley Ranch around Lyons Park Estates, and in the County open space south of Spring Gulch.

USFS prioritize a mitigation project for a fuel break west of Spring Gulch and the proposed projects north of Spring Gulch and north of Button Rock reservoir.

Proposed mitigation projects for community firebreaks in the most hazardous areas are shown in yellow on maps A-8 through A-14 following this section. Provide mitigation assistance for homeowners such as grant information and paid services of the Lyons Fire Mitigation Team.

In addition to the county programs detailed in the Homeowners Appendix, work to develop ways to locally sell, dispose of or donate the left over biomass from mitigation efforts. These include such things as fire wood sales, chipping and selling or donating chips to homeowners, nurseries or other commercial vendors, working with landowners to either do prescribed slash pile burns, or disperse chips/ limbs on the property itself, as well as looking for grant possibilities to assist the fire department and or home owners with the disposal of all products.

Homeowners are encouraged to improve ignition resistant construction of residences. Where possible or when remodeling, replace wood shake shingles, siding, decks, connecting fences and structures with ignition resistant materials.

Priority 3: Improve Wildland Firefighting Capability

Improve Water Supply:

Identify specific locations for drafting from North and South St Vrain Creek and reservoirs.

Consider dry hydrants for year round water sources such as ponds.

Community cisterns are needed throughout the district, particularly for the following communities: Spring Gulch, Lyons Park Estates, Stone Canyon/Eagle Ridge, Apple Ridge, Dakota Ridge, and Xbar7/Blue Mountain. Work with HOAs to pursue locating, grants and funding opportunities.

Install additional hydrant on Ute Highway at North 53rd Street in vicinity of water supply tank.

Poll homeowners to update cistern list in Appendix C.

Improve Fire District Capabilities:

Fire districts should develop detailed preplans for improved fire and other emergency response. This is a time consuming task that will require homeowner participation. Lyons fire will develop a homeowner survey for distribution during CWPP educational events to begin to collect information for this purpose. Field surveys will be prioritized based on areas and properties of highest risk.

The fire districts should continue training personnel in wildland fire operations, both training of additional personnel in basic skills and advanced training for the more experienced individuals.

Lyons fire plans to further develop and add personnel to the Lyons Mitigation Crew, and continue training on mitigation practices. They should continue efforts to obtain grants to assist with the purchase of mitigation equipment such as chippers, saws, and crew trucks, and provide personal protective equipment for the mitigation crew members.

Both districts should stress public information campaigns to improve wildfire preparedness, as well as mitigation efforts and healthy forest and fuels reduction. They will continue to update the public of any needs or changes that may arise in the future.

Lyons fire should continue recruitment efforts for new firefighters to respond to both stations, particularly for daytime response, and continue training all new recruits in the areas of fire suppression, EMS and mitigation.

Lyons fire is establishing an auxiliary group to assist the district in a support role for emergencies, special events, public education, grant writing and other non-firefighting roles.

Both districts should continue to pursue funding for firefighting equipment and training to ensure a high state of readiness in the event of a wildland fire incident.