AGENDA ITEM or FINAL CONTRACT REVIEW SUBMITTAL FORM

Agenda Item: Resolution; Amending Resolution No: 08-47, a Resol

Action Requested: Motion

Parties to the Agreement:

Term Begins: **Term Ends:** **Grant Contract #:**

Summary:

Proposed Resolution to address Fire Suppression and Code Compliance in the Riverland Industrial Park

Fiscal Impact:

Submitted by: Russell Forrest **Submitter's Email Address:** rforrest@gunnisoncounty.org

Finance Review: ○ Required ◉ Not Required

Comments:

Reviewed by: Discharge Date:

County Attorney Review: ◉ Required ○ Not Required

Comments:
ok db 12/31/15

Reveiwed by: GUNCOUNTY1\dBaumgarten Discharge Date: 12/31/2015 Certificate of Insurance Required

Yes ○ No ◉

County Manager Review:

Comments:

Reveiwed by: GUNCOUNTY1\khaase Discharge Date: 12/31/2015

○ Consent Agenda ◉ Regular Agenda ○ Worksession Time Allotted:

Agenda Date: 1/5/2016

Revised April 2015

BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF GUNNISON, COLORADO

RESOLUTION NO: 2016-____

A RESOLUTION AMENDING RESOLUTION NO: 08-47, *A RESOLUTION ADOPTING THE 2003 INTERNATIONAL FIRE CODE WITH AMENDMENTS THERETO AND THE CRESTED BUTTE FIRE PROTECTION DISTRICT'S "GUIDELINES, STANDARDS AND FEES FOR THE REVIEW OF FIRE PROTECTION IN PROPOSED INCLUSIONS TO THE CRESTED BUTTE FIRE PROTECTION DISTRICT, AND NEW SUBDIVISIONS, P.U.D.S OR ANY OTHER BUILDABLE PARCEL OF LAND WITHIN THE CRESTED BUTTE FIRE PROTECTION DISTRICT" AND AMENDMENTS THERETO, WITHIN THE CRESTED BUTTE FIRE PROTECTION DISTRICT*

WHEREAS, on November 11, 2008, the Board of County Commissioners of the County of Gunnison, Colorado ("Board") by virtue of Resolution No: 08-47 and pursuant to C.R.S. §32-1-1002(1)(d), authorized the Crested Butte Fire Protection District (the "District") to adopt and enforce the "2003 International Fire Code" with amendments and additions thereto, within that portion of unincorporated Gunnison County that is within the District; and

WHEREAS, the Board was informed of a concern that there potentially may not be an adequate water supply for fire suppression within Riverland Industrial Park Filings 1 and 2; and

WHEREAS, Riverland Industrial Park, Filing 1 is identified on the plat titled "Plat of Riverland – An Industrial Park, Filing 1" recorded in the records of the Office of the Clerk and Recorder of Gunnison County, Colorado on September 14, 1982, bearing Reception No: 369534 and Riverland Industrial Park, Filing 2 is identified on the plat titled "Plat of Riverland – An Industrial Park, Filing 2" recorded in the records of the Office of the Clerk and Recorder of Gunnison County, Colorado on May 24, 1996, bearing Reception No: 467881 (collectively "Riverland Industrial Park"); and

WHEREAS, fully exploring and inclusively addressing the concern of whether an adequate water supply for fire suppression exists within the Riverland Industrial Park is a matter of public health, safety and welfare; and

WHEREAS, the Board retained Deborah Shaner, P.E., Shaner Life Safety, a qualified and professional fire protection engineer, to evaluate the water supply and develop recommendations for fire safety and suppression within Riverland Industrial Park; and

WHEREAS, Deborah Shaner, P.E., Shaner Life Safety, provided a report to the Board titled: "Riverland Industrial Park Life Safety/Fire Protection Report", dated February 14, 2014 ("Shaner Report") attached hereto and incorporated herein by reference as Exhibit

“A”, which found that the water supply for Riverland Industrial Park did not meet the standards set forth in the 2003 International Fire Code; and

WHEREAS, the Shaner Report then provided recommendations for improving fire safety and suppression by making site improvements for a minimum water supply storage and distribution as recommended by, and which satisfies, the National Fire Protection Association (“NFPA”) Standard 1142, *Standard on Water Supplies for Suburban and Rural Fire Fighting* (“Site Improvements”); and

WHEREAS, the Riverland Industrial Park Homeowners’ Association fully constructed those Site Improvements identified by the Shaner Report; and

WHEREAS, on October 21, 2015, Shaner Life Safety independently inspected those Site Improvements and formally concluded and advised Gunnison County that those improvements were installed not only according to the specifications identified in the Shaner Report but exceeded those specifications. See: Shaner Life Safety Riverland Water Supply Test Report, dated October 26, 2015, attached hereto and incorporated herein by reference as Exhibit “B”; and

WHEREAS, alternative design methods have been used to develop and implement a private and adequate water supply for Riverland Industrial Park. This water supply has been installed, tested and accepted. Riverland has designated the proper water operator required by the state. This water supply is acceptable and meets the intent of NFPA 1142, and therefore, the alternative design approaches referenced in both the *2003 International Fire Code* (“IFC”) and the District standards. The Board finds that the concern for an adequate water supply for fire safety and suppression for Riverland Industrial Park has now been sufficiently addressed; and

WHEREAS, the Board finds, that, based on the installed Site Improvements, tested and accepted by Deborah Shaner, Shaner Life Safety, that Riverland Industrial Park can be safely exempt from certain portions of the IFC and amendments thereto which were authorized and identified in Resolution 08-47 as set forth in Exhibit “C” attached hereto and incorporated herein by reference; and

NOW THEREFORE, BE IT RESOLVED by the Board of County Commissioners of the County of Gunnison, Colorado that, given the Site Improvements within Riverland Industrial Park as recommended and approved by Shaner Life Safety, the Board withdraws its authorization, made in Resolution 08-47, for the Crested Butte Fire Protection District’s right to adopt and enforce in Riverland Industrial Park certain sections of the *2003 International Fire Code* with amendments and additions thereto, and hereby authorizes, within Riverland Industrial Park, the exemptions to the IFC and amendments thereto as identified in Exhibit “C” attached hereto and incorporated herein by reference.

FURTHERMORE, the authority of the District to adopt and enforce all other provisions of Resolution No: 08-47 shall be and hereby are ratified.

IN ADDITION THERETO, the Board shall and hereby does further require that:

1. Any and all future development within Riverland Industrial Park shall adhere to this Resolution, the *2003 International Fire Code*, as amended and authorized in this Resolution, and the fire safety and suppression recommendations identified in the Shaner Life Safety report titled: "Riverland Industrial Park Life Safety/Fire Protection Report", dated February 14, 2014 attached hereto as Exhibit "A" to the satisfaction of Gunnison County, Colorado; and

2. Review and inspection comments requested from Gunnison County Community Development Department of the Crested Butte Fire Protection District on any and all future development within Riverland Industrial Park shall be due within 30 days after said request is made or shall deemed a waiver of authorization from the Crested Butte Fire Protection District; and

3. Failure of compliance with this Resolution, the *2003 International Fire Code*, as amended and authorized in this Resolution, and the fire safety and suppression recommendations identified in the Shaner Life Safety report titled: "Riverland Industrial Park Life Safety/Fire Protection Report", dated February 14, 2014, may be considered to be a public nuisance.

INTRODUCED by Commissioner _____, seconded by Commissioner _____, and adopted this ___ day of January, 2016.

BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF GUNNISON, COLORADO

By _____
_____, Chairperson

By _____
_____, Vice Chairperson

By _____
_____, Commissioner

ATTEST:

_____
Deputy County Clerk

TO: Gunnison County Board of County Commissioners

FROM: Russell Forrest, Community Development Director

DATE: January 5, 2016

SUBJECT: International Fire Code and Amendments for the Crested Butte Fire Prevention District as applied to the Riverland Industrial Park

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On December 8, 2015 the BOCC directed staff to draft a resolution which would withdraw authorization of specific sections of the 2003 International Fire Code and its amendments which would be applied to Riverland Industrial Park so as to address the long standing issues in this industrial park related to fire suppression. Attachment A includes a Resolution to implement that direction. This Resolution was completed in cooperation with the County Attorney's office and Deborah Shaner, a professional fire protection engineer. If approved, the effect of this Resolution would be to withdraw authorization of specific sections of the 2003 International Fire Code and its amendments which would eliminate the authority of the Crested Butte Fire Protection District from regulating adequate water supply and fire flows in Riverland Industrial Park.

As mentioned in December, Riverland Industrial Park has completed the implementation of fire protection improvements recommended in the Shaner report which includes: 5 new Fire Hydrants, new water storage (70,000 gallons), and an improved delivery system to provide over 500 gallons per minute. Deborah Shaner from Shaner Life Safety (a professional fire protection engineer), inspected the improvements on October 26, 2015 and she concluded in Attachment A that "the water supply at Riverland meets or exceeds the design criteria outlined in my February 20145 report." The Crested Butte Fire Prevention District participated in the inspection conducted by Ms. Shaner and they did not express any operational concerns related to how the system was constructed.

At this time, staff would recommend approval of the resolution in Attachment A. This would allow building permits to be reviewed by the County without other additional improvement to Riverlands Industrial Park's water infrastructure. It should be noted that sprinkling of buildings in Riverland may still be required under the fire and building codes if certain hazardous uses are proposed by property owners.

Attachments:

Attachment A: Resolution withdrawing authorization for specific sections of the International Fire Code and its Amendments.
Attachment B: Letter from Shaner Life Safety from October 26, 2015
Attachment C: Memo from March 24, 2015
Attachment D: Memo from March 18, 2014 with Shaner Life Safety Report (excludes IFC Attachment)

Attachment A:
Resolution withdrawing authorization for specific sections of the International Fire Code and its Amendments.

BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF GUNNISON, COLORADO

RESOLUTION NO: 2016-____

A RESOLUTION AMENDING RESOLUTION NO: 08-47, *A RESOLUTION ADOPTING THE 2003 INTERNATIONAL FIRE CODE WITH AMENDMENTS THERETO AND THE CRESTED BUTTE FIRE PROTECTION DISTRICT'S "GUIDELINES, STANDARDS AND FEES FOR THE REVIEW OF FIRE PROTECTION IN PROPOSED INCLUSIONS TO THE CRESTED BUTTE FIRE PROTECTION DISTRICT, AND NEW SUBDIVISIONS, P.U.D.S OR ANY OTHER BUILDABLE PARCEL OF LAND WITHIN THE CRESTED BUTTE FIRE PROTECTION DISTRICT" AND AMENDMENTS THERETO, WITHIN THE CRESTED BUTTE FIRE PROTECTION DISTRICT*

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WHEREAS, the Board was informed of a concern that there potentially may not be an adequate water supply for fire suppression within Riverland Industrial Park Filings 1 and 2; and

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WHEREAS, fully exploring and inclusively addressing the concern of whether an adequate water supply for fire suppression exists within the Riverland Industrial Park is a matter of public health, safety and welfare; and

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WHEREAS, Deborah Shaner, P.E., Shaner Life Safety, provided a report to the Board titled: "Riverland Industrial Park Life Safety/Fire Protection Report", dated February 14, 2014 ("Shaner Report") attached hereto and incorporated herein by reference as Exhibit

"A", which found that the water supply for Riverland Industrial Park did not meet the standards set forth in the 2003 International Fire Code; and

WHEREAS, the Shaner Report then provided recommendations for improving fire safety and suppression by making site improvements for a minimum water supply storage and distribution as recommended by, and which satisfies, the National Fire Protection Association ("NFPA") Standard 1142, *Standard on Water Supplies for Suburban and Rural Fire Fighting* ("Site Improvements"); and

WHEREAS, the Riverland Industrial Park Homeowners' Association fully constructed those Site Improvements identified by the Shaner Report; and

WHEREAS, on October 21, 2015, Shaner Life Safety independently inspected those Site Improvements and formally concluded and advised Gunnison County that those improvements were installed not only according to the specifications identified in the Shaner Report but exceeded those specifications. See: Shaner Life Safety Riverland Water Supply Test Report, dated October 26, 2015, attached hereto and incorporated herein by reference as Exhibit "B"; and

WHEREAS, alternative design methods have been used to develop and implement a private and adequate water supply for Riverland Industrial Park. This water supply has been installed, tested and accepted. Riverland has designated the proper water operator required by the state. This water supply is acceptable and meets the intent of NFPA 1142, and therefore, the alternative design approaches referenced in both the *2003 International Fire Code* ("IFC") and the District standards. The Board finds that the concern for an adequate water supply for fire safety and suppression for Riverland Industrial Park has now been sufficiently addressed; and

WHEREAS, the Board finds, that, based on the installed Site Improvements, tested and accepted by Deborah Shaner, Shaner Life Safety, that Riverland Industrial Park can be safely exempt from certain portions of the IFC and amendments thereto which were authorized and identified in Resolution 08-47 as set forth in Exhibit "C" attached hereto and incorporated herein by reference; and

NOW THEREFORE, BE IT RESOLVED by the Board of County Commissioners of the County of Gunnison, Colorado that, given the Site Improvements within Riverland Industrial Park as recommended and approved by Shaner Life Safety, the Board withdraws its authorization, made in Resolution 08-47, for the Crested Butte Fire Protection District's right to adopt and enforce in Riverland Industrial Park certain sections of the *2003 International Fire Code* with amendments and additions thereto, and hereby authorizes, within Riverland Industrial Park, the exemptions to the IFC and amendments thereto as identified in Exhibit "C" attached hereto and incorporated herein by reference.

FURTHERMORE, the authority of the District to adopt and enforce all other provisions of Resolution No: 08-47 shall be and hereby are ratified.

IN ADDITION THERETO, the Board shall and hereby does further require that:

1. Any and all future development within Riverland Industrial Park shall adhere to this Resolution, the *2003 International Fire Code*, as amended and authorized in this Resolution, and the fire safety and suppression recommendations identified in the Shaner Life Safety report titled: "Riverland Industrial Park Life Safety/Fire Protection Report", dated February 14, 2014 attached hereto as Exhibit "A" to the satisfaction of Gunnison County, Colorado; and

2. Review and inspection comments requested from Gunnison County Community Development Department of the Crested Butte Fire Protection District on any and all future development within Riverland Industrial Park shall be due within 30 days after said request is made or shall deemed a waiver of authorization from the Crested Butte Fire Protection District; and

3. Failure of compliance with this Resolution, the *2003 International Fire Code*, as amended and authorized in this Resolution, and the fire safety and suppression recommendations identified in the Shaner Life Safety report titled: "Riverland Industrial Park Life Safety/Fire Protection Report", dated February 14, 2014, may be considered to be a public nuisance.

INTRODUCED by Commissioner _____, seconded by Commissioner _____, and adopted this ___ day of January, 2016.

BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF GUNNISON, COLORADO

By _____
_____, Chairperson

By _____
_____, Vice Chairperson

By _____
_____, Commissioner

ATTEST:

_____
Deputy County Clerk

Riverland Industrial Park
Life Safety/Fire Protection Report

Prepared by:
Deborah Shaner, P.E.
Fire Protection Engineer

Shaner Life Safety

February 14th, 2014
(REVISION #1)

EXHIBIT "A"

Objective

The objective of this report is to address the following questions as presented by the Gunnison County Board of County Commissioners.

1. Is there an unacceptable fire/life safety risk associated with the Riverland Industrial development?
2. If there is an unacceptable risk at Riverland, what are the short term solutions, if any, to facilitate development on the final six undeveloped lots and improve life safety for the development?
3. What are long term solutions to provide a more permanent solution for life safety for the Riverland Industrial development?

The primary focus of this report is on the water supply available for fire protection purposes at the Riverland Industrial Park. Other fire protection factors and systems have been evaluated, considered and included in formulation of solutions as applicable.

Statement of Problem

Based on site observations, review of documentation and discussions with interested parties, the general statement of the problem at hand is as follows:

Riverland Industrial Park was developed prior to the International Fire Code being adopted within the Crested Butte Fire Prevention District. There was not a conflict between Riverland development and applicable Fire District regulations until 2008 when Gunnison County authorized the CBFPD to adopt the 2003 International Fire Code with amendments. Although a lack of fire flows to the projects had been documented by the CBFPD over the years, it was not until 2008 when the IFC went into effect for the District did new requirements come into play for construction in Riverland. The effect of this regulation has been that the six undeveloped lots and other new structures on the property require either a fire suppression system to be installed or must provide adequate fire flows to new structures. This to date has been cost prohibitive since the project as a whole lacks adequate water storage, water lines, and hydrants for fire suppression. This issue came to a head when a building permit was requested for a new building on the site and was not approved by the Fire District.

Existing conditions and infrastructure do not readily allow for quick improvements to be made to resolve the issue. Existing conditions must be acknowledged and accepted while entering into any solution agreements between interested parties. A solution must be cost effective to allow for actual implementation while meeting the intent of applicable codes to the extent possible.

Site Description

The Riverland Industrial Park is located approximately 3 miles south of the Town of Crested Butte and consists of 38 lots. Filing #1 (Lots 1-15) contains Heavy Industrial uses and Filing #2 (Lots 16-38) consists of Light Industrial uses. There are approximately one dozen residential units located throughout the site. Most buildings are constructed with metal materials, Type 5B construction, with square footages ranging from 1,500 – 10,000 square feet. The average size per building is approximately 4500 square feet.

Refer to Attachment #1, Riverland Lot Overview spreadsheet for a summary of building usage, size and construction throughout the industrial park.

In the event of a fire, the park is served by Crested Butte Fire Protection district, with station #1 located approximately 3.5 miles away. The fire department is capable of responding with an engine, pump truck, water tender truck and various EMS response vehicles. This fire department is primarily volunteer, so a successful response is dependent on the availability of necessary crew members.

Filing #1 has a maximum building size of 10,000 square feet and a height of 24' for flat lots. Filing #2 has a maximum building size of 4500 square feet at a 24' height for flat lots and 36' for sloped lots per the published covenants. There are no zoning restrictions in place for the industrial park.

There is a Pumphouse which serves the domestic water needs of the entire industrial park located at the corner of Riverland Drive and Buckley Drive. A storage tank providing approximately 20,000 gallons of water is installed underground at the Pumphouse location. The capacity of the tank is 30,000 gallons, but currently water levels are maintained at 20,000 gallons. This water is distributed throughout the development through underground water lines, which generally follows the path of Riverland and Buckley Drives. Water lines are sized at 2", 4" and 6", varying throughout the complex.

Code Basis

Gunnison County's Resolution 08-47 authorizes the Crested Butte Fire Protection District (CBFPD) to adopt the 2003 International Fire Code with amendments within their jurisdictional area. This adoption includes implementation of the Crested Butte Fire Protection District's "Standards and Guidelines Policy" dated December 14, 2010.

In evaluating the fire protection and life safety conditions at the Riverland Industrial Park, the goal of meeting the intent of CBFPD codes and standards has been considered. Of course, there are existing conditions in place which must be acknowledged and included in any solutions, but compliance with at least the intent of fire department codes should be a general goal. This removes any concern for undesirable precedents to be set, minimizes the request for waivers and shows good faith for future development.

Applicable sections of CBFPD Standards are noted below. These code sections are applicable to proposed solutions outlined later in this report.

Access

In general, Riverland Industrial Park has good fire department access to all lots in the complex. In accordance with CBFPD Standards Section 201C, two points of access into the development are provided. Most buildings are well marked with addresses and driveways are clear and provide for fire department and emergency vehicle access.

Water Supply

Per Section 301A, CBFPD Standards, "A central water supply is required when the subdivision density is greater than one dwelling unit per two acres." Because there are residential units in the park, a central water supply is required. The definition of a central water supply is "a water distribution system capable

of delivering the required fire flow as determined by Appendix B of the 2003 International Fire Code." If the 2003 International Fire Code (IFC) requirements are imposed on the complex, a *minimum* fire flow of 1500 gpm would be required. The Riverland site does not have adequate water storage and distribution in place to meet the requirements of the 2003 IFC. In fact, the water supply was not designed to provide fire protection water, only to meet domestic demands.

The presence of residential units creates the need for a central water supply throughout the subdivision. Any new development, regardless of whether the building contains residential units, would trigger the requirement for central water supply. In other words, this is a subdivision requirement, not a single lot or building requirement.

Crested Butte Fire Protection District standards do offer alternatives for water supply for subdivisions that do not have the infrastructure in place to meet IFC requirements. Section 303, CBFPD standards states "In subdivisions, P.U.D.s or any other buildable parcel of land within the Crested Butte Fire Protection District without a central water supply, an alternate water source approved by the Fire Chief shall be established to provide the required storage. NFPA 1142 Standard on Water Supplies for Suburban and Rural Fire Fighting, current edition, shall be used as a guide in establishing requirements."

An NFPA 1142 analysis is included later in this report.

Fire Sprinkler Systems

When water supply deficiencies exist, CBFPD Standards require fire sprinkler systems as follows:

Section 402, "New subdivisions and PUD's. An automatic fire suppression system shall be installed in all structures in all new subdivisions or PUD's where there is not installed a central water supply capable of providing the required fire flows per the IFC 2003 edition appendix B.

1. All structures shall have installed a fire suppression system in accordance with NFPA 13 Standard for the Installation of Sprinkler Systems, 13D Standard for the Installation of Sprinklers Systems in One- and Two-Family Dwellings and Manufactured Homes or 13R Standard for the Installation of Sprinklers Systems in Residential Occupancies up to and Including Four Stories in Height, current edition, by covenant and,
2. Installed fire protection systems shall be monitored and supervised by an approved central station fire alarm company and,
3. The size of the storage tank shall be double the required amount per the applicable NFPA standard or based on 30 gallons per minute response time, at posted speed limits, measured from the nearest fire station, whichever is greater.

The International Fire Code (IFC) and International Building Code (IBC) provide guidance for sprinkler requirements for buildings as well regardless of the available water supply. For the purpose of this report, it is important to note requirements for mixed use buildings with residential uses. Section 903.2.7, IFC states "An automatic sprinkler system...shall be provided throughout all buildings with a Group R fire area." A Group R fire area refers to Residential uses as defined by the building code. Basically, any building which houses a residential use must be sprinklered under the 2003 IFC. This includes mixed use buildings with only partial residential use.

Sprinkler requirements for non-residential buildings are determined through an allowable area analysis dependent on construction type, use, square footage and site conditions. Future buildings constructed at Riverland are subjected to this analysis and should be sprinklered accordingly as required.

Assessment of Risk

Several factors contribute to the level of risk present at Riverland. First and foremost, the presence of residential units has the most impact on the requirements for fire protection, water supply and general life safety at the complex. Model codes including the International Building Code and International Fire Code contain extensive provisions for fire and life safety requirements when residential occupancies are present.

In the event of a fire, the number one concern is occupant safety – getting people out of a building to safety is the most important goal in the design of fire protection systems and features. When persons are sleeping within a building, the added factor of waking them up, orienting them to their surroundings and notifying them of an emergency must be considered. There are multiple fire hazards associated with residential occupancy, namely cooking, candles, heating appliances and smoking. These activities are in the top ten causes of fire as reported by the National Fire Protection Association.

Another factor for establishing the level of risk at Riverland is the variety of occupancies present there. Additionally, the potential for new businesses and construction could bring additional hazards. Currently, there are businesses which house paint storage, tire storage, automobile repair and mini public storage. None of these businesses appear to house quantities of hazardous materials which would exceed that allowed for a non-hazardous occupancy (as defined by the Building Code).

There are conditions which exist at Riverland that reduce the risk associated with fire. Exterior housekeeping is generally good. Most buildings are constructed of metal and buildings are generally small. Adequate separation between buildings is present to reduce fire spread and trees and foliage are at a minimum.

The Riverland Industrial Park covenants limit the size and number of buildings allowed on each lot. This minimizes fire hazard and is an important factor in establishing a limited level of risk. Fire load and fire spread will be limited due to the restrictions written into the covenants.

Property owners in Riverland enter into possession with limited expectations for fire protection. The covenants acknowledge the absence of fire protection water. In the Declaration of Protective Covenants for Riverland Industrial Park, Section 4, Item P, sub item 1 states "This project is being developed in an essentially rural environment without the necessary water supply system to provide firefighting protection at urban levels. The owner or occupant of each site within the project must accept a rural level of fire protection. The primary responsibility for fire protection rests with such owner or occupant of a site within a project."

Due to several industrial uses present at Riverland, there is a risk of carbon monoxide poisoning to occupants, especially those sleeping in residential units. The short term solution outlines recommendations for mitigating this risk.

The Crested Butte Fire Protection District is primarily a volunteer fire department. The department is well equipped and can respond with a variety of trucks and tools for conducting firefighting operations. There is concern for available personnel, particularly with Fire Stations #2 & #3. Any long term solutions to be implemented at Riverland will be costly. Consideration must be given to the available budget, the cost for improvement to a prescriptive level of compliance and the cost-benefit associated with these improvements. In other words, improvements which will not be utilized or will not substantially improve life safety should not be executed.

Provided the short term solution as outlined below is implemented, with consideration of the existing conditions, it is reasonable to accept the level of risk at Riverland. The recommended immediate improvements are outlined in the "Short Term Solution" section below. Acceptance of this risk is contingent upon Riverland continuing to work towards a long term goal of compliance with Crested Butte Fire Protection District water supply requirements.

Short Term Solution

Assuming property owners, the Riverland HOA and governing authorities are willing to accept the level of risk in place due to existing conditions and past development, there are several improvements that could immediately be implemented to minimize this existing level of risk. As a long term solution will likely take time to fund, design and implement, this short term solution is proposed to allow for construction to proceed in the park. It is recommended that acceptance of this short term solution is dependent on a written plan for a long term solution being presented.

Note that if Riverland decides to move directly into implementation of the long term solution, the short term solution is not necessary or mandatory. This is simply here to provide an optional alternative to immediate implementation of the long term solution.

Recommendations for a short term solution are as follows:

1. *Install monitored fire alarm systems in all buildings housing residential units:* Per the IBC & IFC, residential units are required to have smoke detectors and carbon monoxide detectors installed. However, these detectors are not required to be monitored. Monitored fire alarm systems consist of a control panel with a dialer or other communicator to provide an automatic call to the responding fire department in the event of a fire alarm. These are common in several jurisdictions in Colorado and are a cost effective alternative to other required systems such as fire sprinklers in some cases. In Riverland, this item can provide for achieving the main goal of protecting sleeping occupants in the event of a fire. A monitored system would include supervised smoke detectors and carbon monoxide detectors in each residence. Additional devices could be installed in the commercial portions of the buildings. A separate system would be provided for each building.

2. *Evaluate egress for residential units:* Readily available, clear, well-marked egress is key in tending to the life safety of residential occupants. Each residential unit should have an egress analysis to ensure proper, safe exiting is available.

3. *Ensure covenant limitations are enforced:* One of the main factors which contribute to a lower level of risk at Riverland is the limitation of the size and height of buildings. Lower density is

equal to lower fire risk. Develop a plan with the building department to ensure building permit applications are within the limitations of the covenant.

4. *Prohibit Group H occupancies from moving into Riverland:* This is basically an unwritten rule due to covenants and building codes. However, rather than open Riverland up to increasing its existing level of risk, no Group H occupancies should be allowed. This will limit the quantity and use of flammable and combustible liquids, eliminate dangerous industrial processes which promote ignition of fire and keep control of hazardous materials present.

5. *Conduct walk throughs of each lot with the fire department to evaluate and improve housekeeping:* These site visits are intended to improve housekeeping on each lot and reduce the potential for a fire. The scope of these site visits needs to be carefully outlined prior to their start. They are not intended to evaluate sprinkler coverage or building construction issues. The walks would be intended to find immediate, low cost improvements to be made to the site. Results would be recommendations only. For example, issues which could be identified include presence of trash or debris which is combustible, blocked egress, poor ventilation of heating appliances, open or poorly stored hazardous materials, etc. Annual inspections by Crested Butte Fire Protection District are also recommended.

Long Term Solution

The recommended long term solution is compliance with CBFPD standards, specifically Section 303 for Alternative Water Supplies. This involves making site improvements to achieve a minimum water supply storage and distribution as recommended by NFPA 1142, *Standard on Water Supplies for Suburban and Rural Fire Fighting.*

An NFPA 1142 analysis is included as Appendix #2 of this report. The analysis suggests approximately 33,375 (round up to 35,000 for design purposes) gallons of water is necessary on site to satisfy the recommendations of this standard. This is based on analyzing Lot 12, Waste Management Building, which is the most demanding building with respect to site fire flow. In addition to the detailed analysis for Lot 12, the NFPA 1142 formula was applied to each lot to approximate the volume of water needed. These results can be found as part of the Appendix 1, Riverland Lot Overview. Water storage requirements range from 2000 gallons to 33,375 gallons.

In addition to water storage, the rate of delivery must be established. Table 4.6.1, NFPA 1142 provides recommended water flow rates in gpm depending on the volume of water storage required. As noted in the Appendix 1 spreadsheet, the volume of delivery recommended varies from 250 gpm to 1000 gpm throughout the various lots at Riverland. The recommended flowrates are quantified as follows:

1 lot = 250 gpm
18 lots = 500 gpm
7 lots = 750 gpm
3 lots = 1000 gpm
Average demand = 600 gpm

Based on Riverland's existing pipe infrastructure, a reasonable improvement plan can be developed in order to provide 500 gpm distributed throughout the subdivision. Based on the numbers above, most lots in the subdivision are assigned a demand of 500 gpm. An economically achievable solution rests at

500 gpm. Considering that the existing water distribution capability throughout the Riverland subdivision is currently 0 gpm, achieving 500 gpm is a vast improvement, one that is beneficial to all parties involved.

Section 4.1.4, NFPA 1142 states " The AHJ shall be permitted to specify how the water supplies required in this document are provided, giving consideration to local conditions and need.". CBFPD could likely provide addition gallons per minute using water tender trucks in the event more than 500 gpm is needed for firefighting efforts.

In order to comply with the recommendations of NFPA 1142, and thus, meet the intent for Alternative Water Supply as allowed by Section 303, CBFPD standards, the following design criteria is proposed:

1. A minimum of 35,000 gallons of fire protection water storage in the Riverland subdivision
2. Distribution of the water at 500 gpm
3. Distribution system is pressurized at a minimum of 20 psi
4. A minimum of 3 fire hydrants are installed spaced to provide water distribution throughout the subdivision. Placement is subject to review by CBFPB.

The above design criteria may be achieved in a variety of ways. Suggested improvements include upsizing the existing water pump, expanding the existing water tank, upsizing any existing 2" lines to 4" or 6". Details of the design to achieve this long term solution will be developed by Riverland and presented for approval to Gunnison County and Crested Butte Fire Protection District.

Note that the proposed improvements would also greatly enhance the domestic water distribution in the park.

Future Development

The overall direction of the Riverland Industrial Park infrastructure should consider potential for development on adjacent parcels of land, specifically to the North. Adjacent development could facilitate extension of the Crested Butte municipal water supply into the Riverland Park. Should that opportunity present itself, Riverland infrastructure should be improved to a point in which the complex could receive this water. This would likely require a minimum 8" line to be run through the complex. The path of the existing water distribution is a good one. Recommendations for long term future improvement would be to replace and upsize the existing 2", 4" and 6" lines to 8" lines as opportunities arise.

Statement of Solution

In summary, this report offers a recommended approach to facilitate reinstatement of the issuance of building permits for the Riverland subdivision. Implementation consists of both a short term solution, to be completed prior to allowing the issuance of building permits and a long term solution, to be incorporated into a development agreement between Riverland and the Crested Butte Fire Protection District. Successful completion of these solutions will achieve compliance with the CBFPD standards and provide an effective level of life safety for the occupants of the subdivision.

If the Riverland HOA opts for immediate implementation of the long term solution as described in this report, the short term solution may be omitted from the improvement plan. The short term solution is

not mandatory if the long term solution is implemented and was crafted simply to provide an interim alternative while funding for the long term solution was determined. The short term solution was offered as a bargaining tool to allow for construction to continue while the long term solution was in development. Achievement of the long term solution would bring Riverland into compliance with current codes and standards related to central water supply.

Appendix #1: Riverland Industrial Park Lot Overview

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
1	337 Buckley Drive	Premier Painting	Paint Shop	2500	Metal	15	37500	4	0.5	4688	500
2,3	305 Buckley	Residential Unit	Residential	1512	Metal	10	40320	5	0.5	4032	500
		Rocky Mountain Trees	Workshop	2520	Metal						
4		Undeveloped									
5	337 Buckley Drive, Unit 1		Workshop	1164	Metal/Stucco	10	92690	5	0.5	9269	500
	337 Buckley Drive, Unit 2		Workshop	1135	Metal/Stucco						
	337 Buckley Drive, Unit 3	Spellbound Furniture	Workshop	1130	Metal/Stucco						
	337 Buckley Drive, Unit 4	Peak Property Management	Workshop	1145	Metal/Stucco						
	337 Buckley Drive, Unit 5	Residential Unit	Residential	1145	Metal/Stucco						
	337 Buckley Drive, Unit 6		Workshop	1200	Metal/Stucco						
	337 Buckley Drive, Unit 7		Workshop	1200	Metal/Stucco						
	337 Buckley Drive, Unit 8		Workshop	1150	Metal/Stucco						
6	244/246 Buckley	Residential Unit	Residential	1000	Metal/Stucco	10	166740	4	0.5	20843	1000
		Altitude Auto	Workshop	6200	Metal						
		Buckley Valley Storage	Mini Storage	9474	Metal						
7	296 Buckley	Residential Unit	Residential	1600	Metal	10	64500	5	0.5	6450	500

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
			Workshop	2450	Metal						
			Storage	2400	Metal						
8	396 Riverland	Colorado Paint Supply	Tire Storage/ Paint Supply	6200	Metal	18	111600	3	0.5	18600	750
9	398 Riverland	Residential Unit	Residential	1480	Wood	12	157440	3	0.5	26240	1000
			Paint Shop	1800	Metal						
		JCI	Workshop	9840	Metal						
10,11	444 Riverland		Warehouse	9510	Metal	10	196350	5	0.5	19635	750
			Mini Storage	10125	Metal						
12	467 Riverland	Waste Management	Warehouse	8200	Metal	30	267000	4	0.5	33375	1000
			Office	700	Metal						
13	336/366 Buckley	Residential Unit	Residential	1930	Stucco	10	48600	5	0.5	4860	500
		CB Ironworks	Workshop	1000	Metal						
		Oh Be Dogful	Kennels	1930	Stucco						
14	357 Riverland	Gears Inc	Office/Workshop	4823	Metal	10	48230	7	0.5	3445	500
15	455 Riverland, Unit #1	Parker Dirtworks	Garage	2286	Wood	18	69948	6	1.5	17487	750
	455 Riverland, Unit #2	Residential Unit	Residential	1600	Wood						
16	469 Riverland	Undeveloped									

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
17	475 Riverland	Residential Unit	Residential	2240	Concrete/Wood	15	81585	7	1	11655	750
		Concrete Shop	Workshop	3199	Concrete/Wood						
18,19	497 Riverland	Undeveloped									
20	515 Riverland, Units 201/202/203	Blind Faith, etc.	Office/Workshop	3500	Metal w/Wood Framing	10	35000	7	1	5000	500
21	523 Riverland	Various	Office/Workshop	4000	Metal w/Wood Framing	10	40000	7	1	5714	500
22	539 Riverland		Workshop	3072	Wood	10	30720	7	1.5	6583	500
23	571 Riverland	CB Rental Center		3500	Metal w/Wood Framing	10	35000	7	1	5000	500
24		Crested Butte RV Resort	RV Sites								
25		Crested Butte RV Resort	Office								
26	733 Riverland	Residential Unit	Residential	1512	Metal	10	43920	7	0.5	3137	500
			Workshop	2880	Metal						
27	744 Riverland	European Auto Interests	Auto Storage	8000	Metal	12	96000	6	0.5	8000	750
28	738 Riverland	Colorado Barnwood	Office	963	Metal	12	50556	6	0.5	4213	500
		Auto Storage	Garage	3250	Metal						
29	736 Riverland	Residential Unit	Residential	1500	Stucco	12	62640	5	0.5	6264	500
		Beckwith Brickworks	Workshop	3720	Stucco						
30	110 Andreas Circle	Wheatstone/Paradise Computer		2500	Metal	12	30000	5	0.5	3000	500

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
31	122 Andreas Circle	Crawfords		2500	Metal	15	37500	5	0.5	3750	500
32	2 Andreas Circle	Timberline/Zimmerman		6500	Metal	15	97500	5	0.5	9750	500
33	Andreas Circle, Unit 622		Garage	552	Metal	12	50160	4	0.5	6270	500
	Andreas Circle, Unit 624		Garage	552	Metal						
	Andreas Circle, Unit 626		Garage	552	Metal						
	Andreas Circle, Unit 628		Garage	552	Metal						
	Andreas Circle, Unit 630A	Residential Unit	Residential	986	Metal						
	Andreas Circle, Unit 630B	Residential Unit	Residential	986	Metal						
34	544 Riverland	Thurston Kitchen & Bath	Workshop	2370	Stucco	12	28440	7	0.5	2031	250
35	510 Riverland	Alpine Express	Auto Storage	8000	Metal	20	160000	6	0.5	13333	750
36	496 Riverland	Undeveloped									
37	482 Riverland	CB Motorsports		9308	Metal	15	139620	6	0.5	11635	750
38	470 Riverland	Omnicom Public Storage	Storage	6000	Metal	12	72000	5	0.5	7200	500

Appendix #2: NFPA 1142 Analysis

Crested Butte Fire Protection District Standards, Section 402 allows for Alternative Water Supplies developed in accordance with NFPA 1142 Standards. To determine the proper design criteria for Riverland Industrial Park's alternative water supply, the following analysis and calculation is presented.

NFPA 1142, *Standard for Water Supplies for Suburban and Rural Fire Fighting* provides a method for calculating the minimum water supply required for a rural facility. The standards states that on a multiple building site, only the most restrictive building's water supply as calculated is required. In other words, the water supply is not sized assuming all buildings are in a fire condition. Rather, it is sized assuming the most demanding building is in a fire condition. Based on site observations, the Waste Management Building on Lot 12 is the most demanding.

The Waste Management building is approximately 8,900 square feet with an average building height of 30'.

NFPA 1142's formula for determining minimum recommended water supply is as follows:

> Minimum Water Supply = (Total Volume of Structure)/(Occupancy Hazard Classification Number) x Construction Classification Number

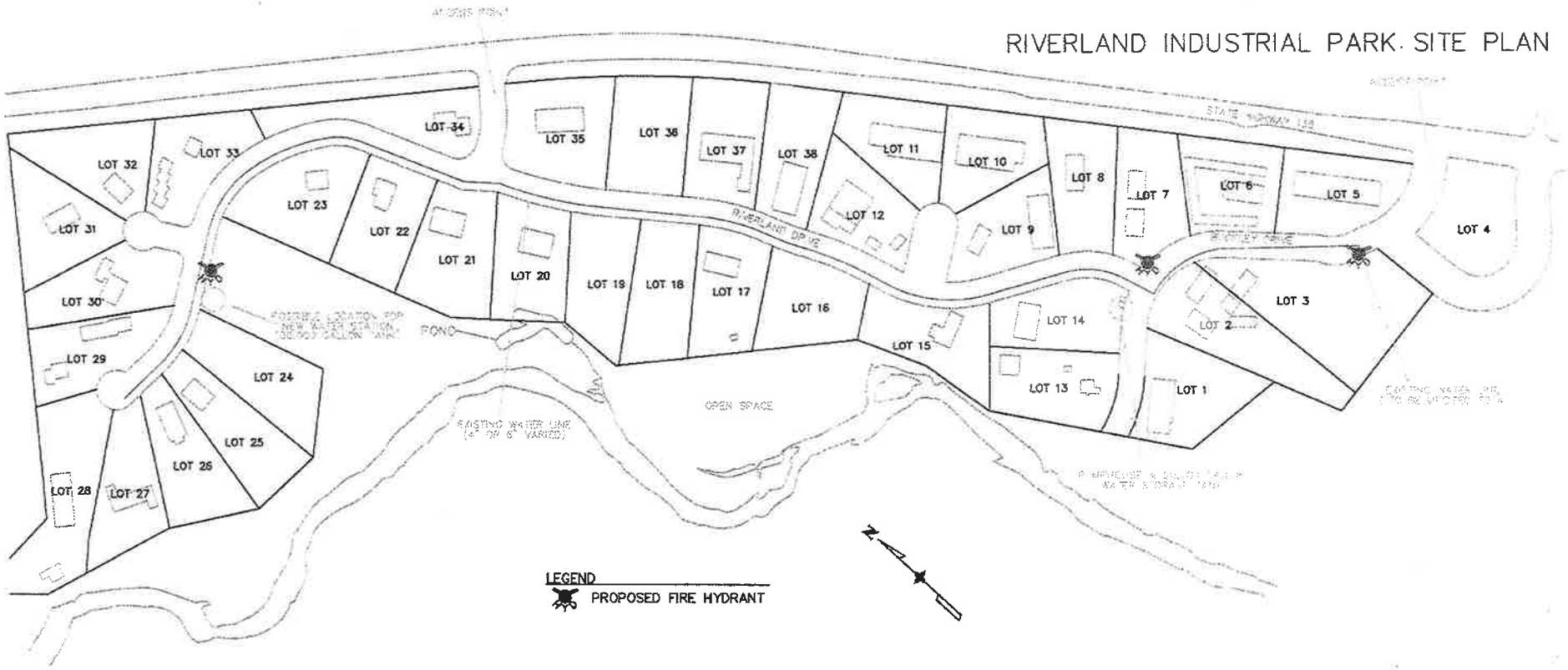
The Occupancy Classification numbers are assigned by Section 5.2 NFPA 1142 and are based on the specific use of the building. The Waste Management building has been assigned an Occupancy Classification of 4 which includes General Storage and Warehouses.

The Construction Classification number is assigned by Section 6.2 and is based on the materials of building construction. Because this building is metal and of non-combustible construction, a Construction Classification of Type I is assigned, which carries a .5 Classification Number.

Occupancy Hazard Classification Number = 4
Construction Classification Number = .5
Approximate Building Volume = 267,000 cubic feet

Minimum Water Supply = 267,000 cu.ft./4 x .5 = **33,375 gallons**

RIVERLAND INDUSTRIAL PARK SITE PLAN



Shaner Life Safety
PO Box 1073, Frisco, CO 80443
970.409.9082; fax 970.797.1898

Date: October 26, 2015
To: Russ Forrest, Assistant County Manager, Gunnison County
From: Deborah Shaner, Fire Protection Engineer

Re: Riverland Water Supply Test Report

On Wednesday, October 21st, I witnessed testing of the new water supply for the Riverland Industrial Park. Test data is attached.

Shaner Life Safety had provided a report dated February 14, 2014 which outlined recommendations for water supply design criteria for the Riverland Industrial Park. The design criteria noted was:

"In order to comply with the recommendations of NFPA 1142, and thus, meet the intent for Alternative Water Supply as allowed by Section 303, CBFPD standards, the following design criteria is proposed:

1. *A minimum of 35,000 gallons of fire protection water storage in the Riverland subdivision*
2. *Distribution of the water at 500 gpm*
3. *Distribution system is pressurized at a minimum of 20 psi*
4. *A minimum of 3 fire hydrants are installed spaced to provide water distribution throughout the subdivision. Placement is subject to review by CBFPB."*

Based on the test conducted on October 21st, this design criteria was met as follows:

1. 70,000 gallons of water storage capacity is now provided on site. This is maximum capacity. Per the report, 35,000 gallons of this water has been designated "minimum fire storage" and is reserved for fire department use only. This is tracked via a display at the pump house. (See photo #1)
2. Water distribution is provided at 500 gpm. In fact, the lowest delivery observed was 580 gpm out of a single hydrant. The average flow was 615 gpm based on testing of single hydrants only. This is a baseline flow using only the two fire pumps. If the system is maximized, it is expected that flow rates between 640-700 gpm would be available at any given hydrant. (See attached test data)
3. Minimum pressure of 20 psi has been achieved. During testing, the lowest residual pressure observed was 24 psi. Static pressures in the system vary between 65 – 80 psi. (See attached test data)
4. A total of 5 fire hydrants have been installed distributed throughout the Riverland Complex. (See photo #5)

EXHIBIT "B"

Based on my observations, the water supply at Riverland meets or exceeds the design criteria outlined in my February 2014 report. This system is acceptable.

The Fire Department has requested as built drawings of the system which will be provided by Norman Whitehead. I will review these once they are available. Please ensure that these plans include hydrant and pump house numbers.

The water supply at Riverland Industrial Park must be properly maintained. Annual testing is required. Proper monitoring and care of the system is key to ensure it will be readily available and effective in the event of a fire incident.

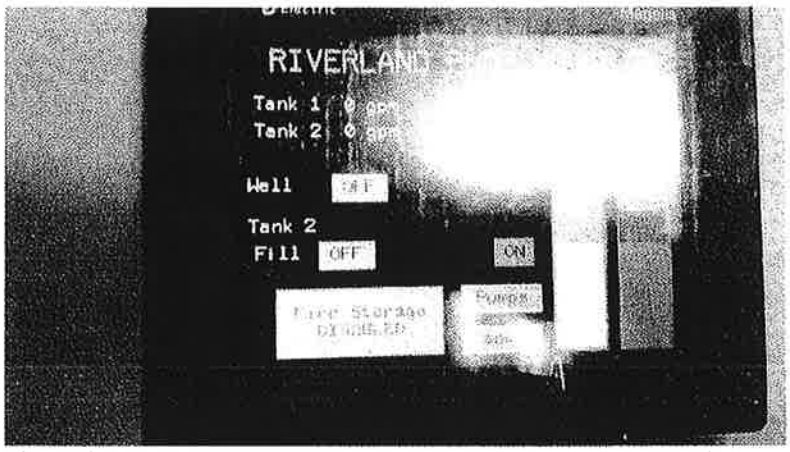


Photo #1: Red designates dedicated fire storage. Tank levels are monitored to ensure 35,000 gallons minimum is present at all times.

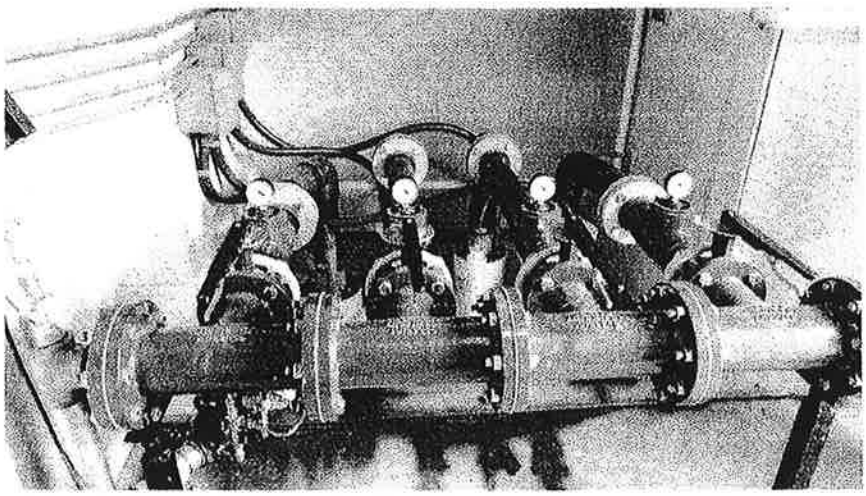


Photo #2: Pump installation in Pump House #2.

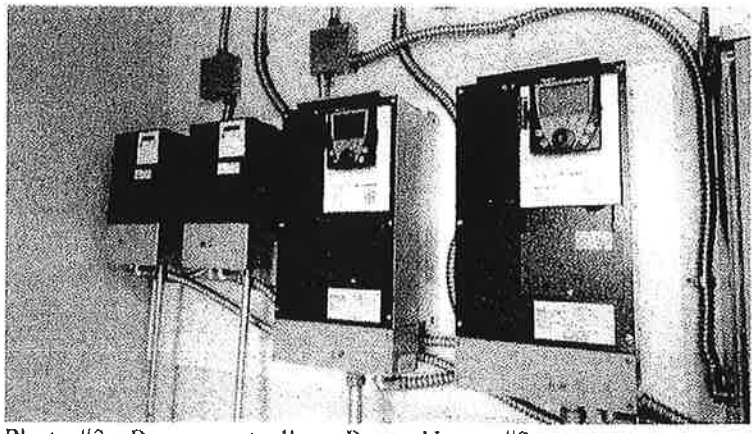


Photo #3: Pump controllers, Pump House #2.

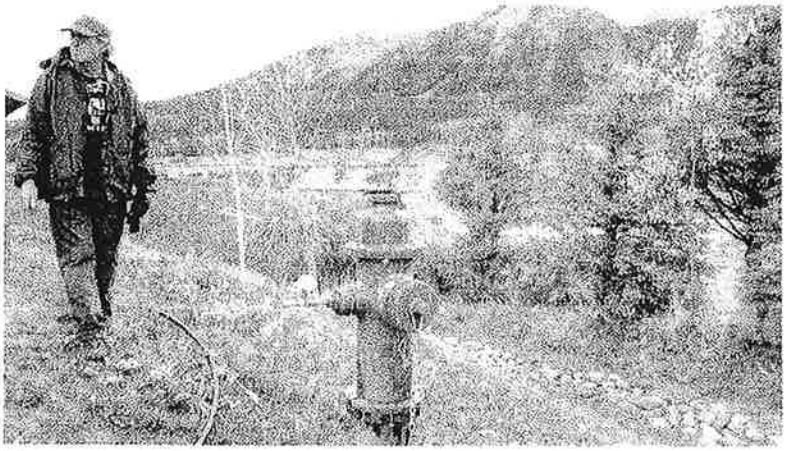


Photo #4: Typical fire hydrant installation; gauge set for testing.

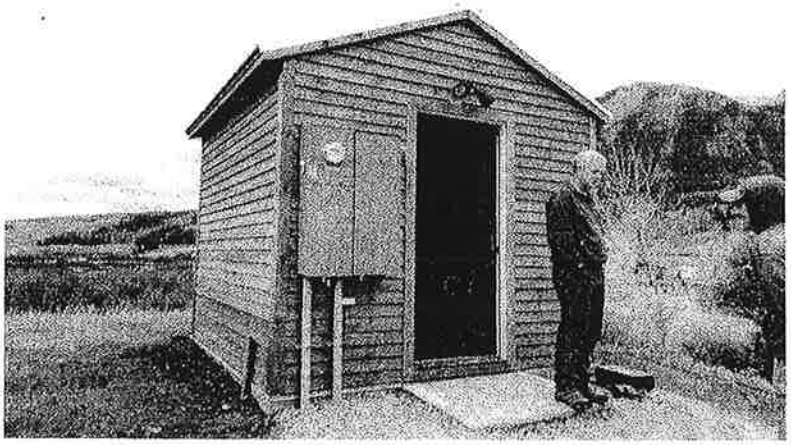


Photo #5: New Pump House #2, location of Fire Hydrant #5.

Riverland Flow Test Data

Date: Wednesday, October 21, 2015
Time: 12:15 pm - 3:00 pm

Site Information:
Pump House #1: 30,000 gallons capacity water storage; south end of subdivision
Pump House #2: 40,000 gallons capacity water storage, north end of subdivision

Hydrants are labeled #1 through 5 with #1 being the southermost hydrant near Pump House #1 and #5 being the northernmost near Pump House #2

Testing Gauge/Equipment: By Pollard Water

Hydrant #	Coefficient (note 3)	Static Pressure (psi)	Residual Pressure (psi)	Average Pitot Reading	Test Flow Observed (gpm)	Expected Max Flow (gpm) (Calculated at 20 psi residual)
1	0.9	75	30	14	625	700
2*	0.9	65	24	13	605	640
3	0.9	65	25	14	625	670
4	0.9	80	30	12	580	650
5	0.9	67	26	14	630	675

2* = Hydrant #2 was retested due to one pump being disabled during 1st test.

Notes:

1. Static pressures were observed to be changing between 65-80 psi during testing. Pump settings were being adjusted during testing to ensure maximum efficiency of system.
2. Calculations were based on pitot readings and were completed using the calculation program from firehydrant.org.
3. A coefficient of .9 was used based on smooth radius edge of fire hydrant opening.
4. Calcuations were checked against flow test chart provided with testing equipment. Available at pollardwater.com
5. Fire hydrants are Kennedy model, year 2015 (with the exception of hydrant #2 which is a 2013 model).

EXHIBIT "C"

International Fire Code [2003]

1. Chapter 5 – Fire Services Features:

A. **Section 508 Fire Protection Water Supplies:**

1. **Section 508.1 Required water supply** is deleted in its entirety for the Riverland Industrial Park.

2. **Section 508.2 Type of water supply** the words "capable of providing the required fire flow." are deleted in their entirety for the Riverland Industrial Park.

3. **Section 508.2.1 Private fire service mains** the words "in accordance with NFPA 22." are deleted in their entirety for the Riverland Industrial Park.

4. **Section 508.3 Fire flow** is deleted in its entirety for the Riverland Industrial Park.

5. **Section 508.4 Water supply test** the words "prior to final approval of the water supply system" are deleted in their entirety for the Riverland Industrial Park.

6. **Section 508.5 Fire hydrant systems:**

1) **Section 508.5.1 Where required** is deleted in its entirety for the Riverland Industrial Park.

2. Chapter 14 Fire Safety during Construction:

A. **Section 1412 Water Supply For Fire Protection:**

1. **Section 1412.1 When required** is deleted in its entirety for the Riverland Industrial Park.

3. Appendix A: Amendment to 2003 International Fire Code Chapter 7 Fire-Resistance-Rated Construction:

A. **Section 508 Fire Protection Water Supplies:**

1. **Section 508.1.1: Inadequate Water Supply** is deleted in its entirety for the Riverland Industrial Park.

4. Appendix B Fire-Flow Requirements for Buildings:

A. **Section B103 Modifications:**

1. **B103 Modifications:**
   a) **Section B103.1.1: Inadequate Water Supply** is deleted in its entirety for the Riverland Industrial Park.

2. **Section B103.2 Increases** is deleted in its entirety for the Riverland Industrial Park.

B. **Section B105 Fire-Flow Requirements for Buildings** is deleted in its entirety for the Riverland Industrial Park.

5. Appendix B: Amendment to 2003 International Fire Code Appendix B Fire-Flow Requirements for Buildings Section B103 Modifications:

A. **B103.4 Buildings without minimum fire-flow requirements** is deleted in its entirety for the Riverland Industrial Park.

B. **B103.4.1 New Buildings** is deleted in its entirety for the Riverland Industrial Park.

C. **B103.4.2 Existing Buildings** is deleted in its entirety for the Riverland Industrial Park.

D. **B103.4.3 Change of Occupancy** is deleted in its entirety for the Riverland Industrial Park.

6. Appendix C: Guidelines, Standards And Fees For The Review Of Fire Protection In Proposed Inclusions To The Crested Butte Fire Protection District, And New Subdivisions, P.U.D.s Or Any Other Buildable Parcel of Land Within The Crested Butte Fire Protection District:

A. **Section 3 Water Supply Requirements: Section 301: Central Water Supply** is deleted in its entirety for the Riverland Industrial Park.

B. **Section 3 Water Supply Requirements: Section 302: Hydrants:**

1. **Section A** is deleted in its entirety for the Riverland Industrial Park.

2. **Section B** is deleted in its entirety for the Riverland Industrial Park.

C. **Section 3 Water Supply Requirements: Section 303: Alternate Water Sources** is deleted in its entirety for the Riverland Industrial Park.

D. **Section 4 Fire Suppression Systems Requirements: Section 402: Water Supply Deficiencies** is deleted in its entirety for the Riverland Industrial Park.

7. Appendix E: Proposed language for Automatic Fire Sprinkler System requirements in CBFPD Guidelines & Standards:

A. **Section 402: Water Supply Deficiencies: Section 402 B: New Projects other than New Subdivisions and PUD's**:

1. **[new section] Section 402 B New Projects other than new subdivisions and PUD's** is deleted in its entirety for the Riverland Industrial Park.

Attachment B: Letter from Shaner Life Safety from October 26, 2015

Shaner Life Safety
PO Box 1073, Frisco, CO 80443
970.409.9082; fax 970.797.1898

Date: October 26, 2015
To: Russ Forrest, Assistant County Manager, Gunnison County
From: Deborah Shaner, Fire Protection Engineer

Re: Riverland Water Supply Test Report

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Shaner Life Safety had provided a report dated February 14, 2014 which outlined recommendations for water supply design criteria for the Riverland Industrial Park. The design criteria noted was:

"In order to comply with the recommendations of NFPA 1142, and thus, meet the intent for Alternative Water Supply as allowed by Section 303, CBFPD standards, the following design criteria is proposed:

1. *A minimum of 35,000 gallons of fire protection water storage in the Riverland subdivision*
2. *Distribution of the water at 500 gpm*
3. *Distribution system is pressurized at a minimum of 20 psi*
4. *A minimum of 3 fire hydrants are installed spaced to provide water distribution throughout the subdivision. Placement is subject to review by CBFPB."*

Based on the test conducted on October 21st, this design criteria was met as follows:

1. 70,000 gallons of water storage capacity is now provided on site. This is maximum capacity. Per the report, 35,000 gallons of this water has been designated "minimum fire storage" and is reserved for fire department use only. This is tracked via a display at the pump house. (See photo #1)
2. Water distribution is provided at 500 gpm. In fact, the lowest delivery observed was 580 gpm out of a single hydrant. The average flow was 615 gpm based on testing of single hydrants only. This is a baseline flow using only the two fire pumps. If the system is maximized, it is expected that flow rates between 640-700 gpm would be available at any given hydrant. (See attached test data)
3. Minimum pressure of 20 psi has been achieved. During testing, the lowest residual pressure observed was 24 psi. Static pressures in the system vary between 65 – 80 psi. (See attached test data)
4. A total of 5 fire hydrants have been installed distributed throughout the Riverland Complex. (See photo #5)

Based on my observations, the water supply at Riverland meets or exceeds the design criteria outlined in my February 2014 report. This system is acceptable.

The Fire Department has requested as built drawings of the system which will be provided by Norman Whitehead. I will review these once they are available. Please ensure that these plans include hydrant and pump house numbers.

The water supply at Riverland Industrial Park must be properly maintained. Annual testing is required. Proper monitoring and care of the system is key to ensure it will be readily available and effective in the event of a fire incident.

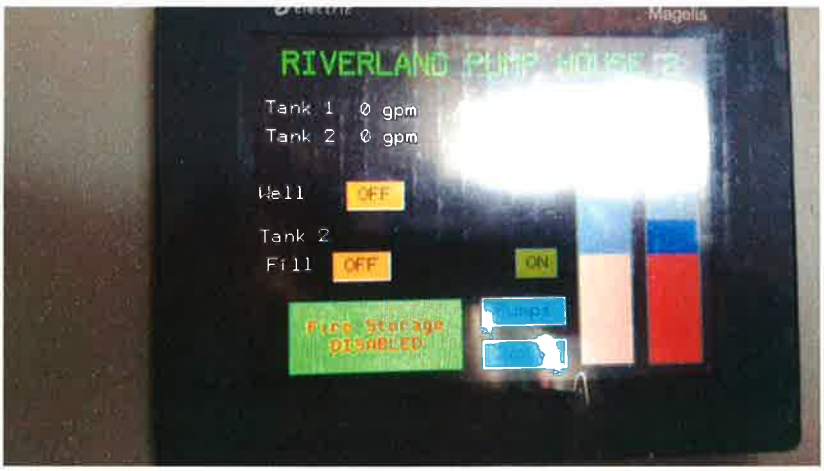

Photo #1: Red designates dedicated fire storage. Tank levels are monitored to ensure 35,000 gallons minimum is present at all times.

Photo #2: Pump installation in Pump House #2.

Photo #3: Pump controllers, Pump House #2.

Photo #4: Typical fire hydrant installation; gauge set for testing.

Photo #5: New Pump House #2, location of Fire Hydrant #5.

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Notes:

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2. Calculations were based on pitot readings and were completed using the calculation program from firehydrant.org.
3. A coefficient of .9 was used based on smooth radius edge of fire hydrant opening.
4. Calcuations were checked against flow test chart provided with testing equipment. Available at pollardwater.com
5. Fire hydrants are Kennedy model, year 2015 (with the exception of hydrant #2 which is a 2013 model).

Attachment C: Memo from March 24, 2015

TO:	Gunnison County Board of County Commisioners
FROM:	Russell Forrest, Community Development Director
DATE:	March 24,2015
SUBJECT:	Update on Riverland

Staff wanted to provide a brief update on the progress on Fire Protection at Riverland Industrial Park. On January 20, staff provided several policy option for the BOCC to consider to move forward with a solution at Riverland with regard to fire protection. The BOCC at that meeting directed staff to withdraw Riverland Industrial Park from the geographic area of unincorpated Gunnison County in which the International Fire Code (IFC) is applicable. In consideration of this action, Riverland would complete fire infrastructure improvmenets to comply with the Shaner Life Safety Report. Riverland has progressed in the implmentation of these improvements. Based on input from the County Attorney's office, staff would bring forward a Resolution to change the geographic applicaton of the the Crested Butte Fire Prevention Districts International Fire Code at the time the physical improvement to the site have been completed and tested (to ensure compliance with the Shaner report) so that Riverland would be excluded from the application of the IFC.

The Board of County Commisioners also wanted to discuss and further understand the District's policy on granting waivers and variances to the IFC. The Fire District provided a letter to respond to that question and has indicated that it would be willing to have a discusion with the BOCC on this matter. In the letter dated February 23rd the Fire District also raised questions about whether the Shaner report was being complied with in terms of both recommended short and long term recommendations provided in the report. Staff asked Ms. Shaner to respond to that question which she did in the letter dated March 5, 2015. She has concluded that the improvements currently being constructed will comply with her recommendations.

In the letter from the CBFPD, the District summarizes three waiver requests that have occurred since 2007 (one of which is the Riverland waiver request). *Staff would like to ask whether after reviewing this letter, would the BOCC would like to schedule time with the CBFPD to further disucss this matter?*

CRESTED BUTTE FIRE PROTECTION DISTRICT
306 MAROON AVENUE
P.O. BOX 1009
CRESTED BUTTE, COLORADO 81224
(970) 349-5333 FAX: (970) 349-0438

Date: February 23rd, 2015

To: Russell Forrest
Assistant County Manager

RE: History of Code Adoption, CBFPD Waiver Policy and Formal Waiver Requests,

Dear Mr. Forrest,

I have been asked to provide you with a copy of CBFPD's waiver policy and along with a history of formal waiver requests presented to our Board of Directors (BOD).

History of the code adoption/process:
In 2007 was the last code adoption by the Gunnison County Board of County Commissioners who adopted the 2003 IFC and amendments within the boundaries of the Crested Butte Fire Protection District. The 2003 IFC adoption process took seven years to get through the adoption process. There were numerous agencies who supported CBFPD's code adoption and assisted in multiple presentations to the Gunnison County Planning Commission. Over the seven year approval process included a lot of public hearing presentations. Upon feedback from the public and the Gunnison County Planning Commission several changes to the document were made. In cooperation with the Gunnison County Planning Commission several compromises were made and have been reflected in Section 4. Fire Suppression System Requirements in CBFPD's Standards and Guideline Policy and another being Section 7. 703 Waivers and another being Section 5. Wildland Fire Mitigation.

Waivers:
Since the last code/amendment adoption, in 2007, there have been three formal requests presented to our Board of Directors requesting a waiver from our Standards and Guideline Policy.
Two of the formal requests to the BOD were from owner/contractors who were not aware of the fire suppression requirement within the CBFPD. One of the formal waivers came after the individual started building his home and became aware of the fire suppression requirement. The other formal request came from a contractor who was not aware of the requirement and did not include it in his bid. Both of these formal waiver requests were based on the financial reasons. The Board of Directors denied these two waiver requests. At this point, the Fire Division worked in conjunction with the Gunnison Building Department to update the information process to ensure citizens readily receive access to our Standards and Guidelines requirements at the earliest part of the planning stage. Gunnison County has provided links on their website where builders, contractors and owners can access our CBFPD Standards and Guidelines/Builders Packet. We have upgraded our CBFPD website to ensure it's more convenient for all users to obtain our requirements along with providing links to Gunnison County's Building requirements.

The third formal request, to our BOD, was from the Riverland Industrial Park Homeowners Association. Their formal waiver request included a proposal to install a dry hydrant with year round access to provide a water source for firefighting. On April 9th, 2013, due to the relationship that a dry hydrant (static water source) does not meet the required "fire flows" (pressurized water system), the BOD denied Riverland Industrial Park Homeowners' formal waiver request, which has led us to where we are today.

The three formal waiver requests, listed above, are the only ones presented to our BOD since 2007. The CBFPD Standards and Guideline Policy does state "Only the Board may approve a waiver of this Standard and Guidelines Policy except that the Fire Chief has the limited authority to waive this Standard and Guidelines Policy only for a driveway or for an insignificant extension of an existing road; the Fire Chief may refer such waivers to the Board."

Since 2007 the Fire Chief has reviewed numerous requests for a waiver concerning driveways or an insignificant extension of a road. In a cooperative manner the majority of these requests have be approved by the Fire Division. In conclusion, the Fire Division would be more than willing to copy Gunnison County officials on all formal waiver requests presented to our Board along with the outcome.

As per your letter written to Mike Miller on 2/4/15,, the letter refers to Gunnison County BOCC accepting the Shaner report to allow the required fire flows within Riverland Industrial Park to be 500 gpm. The Shaner report references a "Statement of Solution", on page 8. This statement references the implementation of both the "Short Term" and "Long Term" solutions to be completed prior to the issuance of building permits. Per your letter, we understand, the County is now willing to approve the "Long Term" solution. Is the BOCC adhering to the "Short Term" solution as presented in the Shaner Report?

Please call me if I can clarify any of the issues surrounding formal waiver requests.

Respectfully,

Ric Ems

Ric Ems, Chief
Crested Butte Fire Protection District

Attached: CBFPD Standards and Guidelines Policy Section 703. Waivers

703. Waivers

A. No waiver of this Standards and Guidelines Policy shall be valid unless approved by the Board in writing as set forth in this section.

B. Only the Board may approve a waiver of this Standards and Guidelines Policy except that the Fire Chief has the limited authority to waive this Standards and Guidelines Policy only for a driveway or for an insignificant extension of an existing road; the Fire Chief may refer such waivers to the Board. The Board, or if applicable, the Fire Chief, may place special conditions on the approval of a waiver. Such conditions may relate to the following:
   1. Access and,
   2. Water Supply and,
   3. Seasonal use and,
   4. Number of structures and,
   5. Size of structures and,
   6. Location of structures and,
   7. Defendable space and,
   8. Type of use and,
   9. Existence of public utilities and,
   10. No increased risk to emergency services personnel, without limitation.

C. A waiver shall be project specific and shall not establish a precedent for any other proposed waiver.

D. No waiver shall be granted unless and until all applicable review fees have been paid to the Crested Butte Fire Protection District.

E. A request for a waiver must be made in writing and identify the following:
   1. The name, address and telephone number of the applicant and,
   2. Identification of the subject property and road and,
   3. A specific description of the requested waiver (including relevant, proposed construction plans) and,
   4. A detailed explanation of why the proposed waiver is warranted by site specific conditions that make compliance with this Standards and Guidelines Policy technically unfeasible and,
   5. A detailed explanation of why the proposed waiver:
      a. Would not adversely affect the safe, efficient and orderly movement of motorized and non-motorized traffic and,
      b. Would not adversely affect health or safety and,
      c. Would not cause substantial injury to the owner or occupant of adjacent land(s) and,
      d. The waiver will not cause an increased risk to emergency services personnel, without limitation and,
      e. Would not cause substantial injury to the environment and,
      f. Would provide the functional equivalent of this Standards and Guidelines Policy and,
   6. Any other information required by the Board or Fire Chief (e.g. survey or technical opinion and report).

F. No public hearing is required for a determination of a waiver by the Fire Chief.

G. Within fourteen days of receipt by the Board of a complete petition for waiver, to be determined by the Board, the Board shall set a date, time and place for a public hearing on that petition. The Board shall publish, at a minimum, notice of such hearing once a week, for the two consecutive weeks immediately before the hearing. The applicant for the waiver must notify all adjacent property owners, no later than fourteen days before the hearing, by mailing to each of them, by certified mail, return receipt requested, a complete copy of the request for a waiver and a copy of the notice of the public hearing; the applicant must provide proof of such notification to the Fire Chief at least seven days prior to the public hearing.

H. No waiver shall be granted unless the Board, or if applicable the Fire Chief, determines in writing the applicant has established by clear and convincing evidence that:

1. The waiver is warranted by site specific conditions which create an unusual aspect or feature not shared by property in general and,
2. The waiver will not adversely affect the safe, efficient and orderly movement of motorized and non-motorized traffic and,
3. The waiver will not adversely affect health or safety and,
4. The waiver will not cause substantial injury to the owner or occupant of adjacent land(s) and,
5. The waiver will not cause an increased risk to emergency services personnel, without limitation and,
6. The waiver will not cause substantial injury to the environment and,
7. The proposal will provide the functional equivalent of this Standards and Guidelines Policy.

I. No access waiver, within unincorporated Gunnison County, shall be valid unless approved by the Board of County Commissioners or the Public Works Director of Gunnison County pursuant to Section 1.9 of the Gunnison County Standards and Specifications for Construction of New Roads and Bridges. The Crested Butte Fire Protection District may provide comments pertaining to additional life safety requirements for the Board of County Commissioners or the Public Works Director of Gunnison County to take under consideration.

Shaner Life Safety
PO Box 1073, Frisco, CO 80443
970.409.9082; fax 970.797.1898

Date: March 5, 2015

To: Russ Forrest, Assistance County Manager, Gunnison County

From: Deborah Shaner, Fire Protection Engineer

Re: Response to CRFPD letter dated 2/23/15

I have received and reviewed a copy of the letter to Russ Forrest from the Crested Butte Fire Protection District dated February 23, 2015.

In the final paragraph of the letter, Chief Ems inquires as to the status of the solutions presented my report dated February, 2014. In the report, both a short term and long term solution were proposed. The short term solution was crafted simply to improve life safety while funding and design of the long term solution were pursued. This was expected to occur over a substantial time frame. However, Riverland opted to forgo the short term solution and move straight into implementation of the long term solution. It is my understanding that construction on this solution is in progress.

Excerpt from Shaner Life Safety repory (page 8):

> *"If the Riverland HOA opts for immediate implementation of the long term solution as described in this report, the short term solution may be omitted from the improvement plan. The short term solution is not mandatory if the long term solution is implemented and was crafted simply to provide an interim alternative while funding for the long term solution was determined. The short term solution was offered as a bargaining tool to allow for construction to continue while the long term solution was in development. Achievement of the long term solution would bring Riverland into compliance with current codes and standards related to central water supply."*

The excerpt from my report above explains the intent of both the short and long term solutions. Because the long term solution is in the implementation phase, adherence to the short term solution is unnecessary.

Attachment D: Memo from March 18, 2014 with Shaner Life Safety Report (excludes IFC Attachment)

To: Gunnison County Board of County Commissioners

From: Russell Forrest

Date: March 18, 2014

Subject: Riverland and Fire Protection Options

1. PURPOSE AND SUMMARY OF ISSUES:

The purpose of this item is to follow-up from direction received from the Board of County Commissioners from their October 15, 2013 meeting regarding the status of fire suppression requirements for the remaining undeveloped lots in Riverland and to discuss next steps if any related to this issue. On October 15th, the Board of County Commissioners directed staff to engage a Fire Engineer to provide recommendations to the following questions:

1) Is there an unacceptable fire/life safety risk associated with the Riverland industrial development?
2) If there is an unacceptable risk at Riverland, what are short-term solutions, if any, to facilitate development on the final six undeveloped lots (along with addtions and remodels) and improve life safety for the development?
3) What are long term solutions to provide a more permanent solution for life safety for the Riverland Industrial development?

The Board choose Shaner Life Safety to complete the study which has been done and is attached to the memorandum. Also in this process, the consultant, staff, Riverland representatives, and the Fire District engaged in discussions to find a long term solution that was acceptable to all parties involved. Ms. Shaner recomended both short term and long term solutions for Riverland to improve life safety for the project. Riverland has indicated their interest in moving forward with the long range solution in Ms. Shaners report (Attachment A). Although, staff believes that there were several very constructive discussions with Fire District personnel that help lead to Ms. Shaner's conclusions, we regret that the District has concluded that they cannot accept a solution which is not consistent with the prescriptive sections of the Fire Code, even though both staff and Ms. Shaner believes the amended fire code allows for flexibility to consider the alternative fire flow solution proposed Ms. Shaner report.

The key point of policy contention is whether a section of the amended Fire Code is applicable in this situation. Section 303 in the Crested Butte Fire Protection District amendments which references NFPA 1142 provides a reasonable, alternative standard to the water supply rate and storage requirements prescribed by the International Fire Code. Right now there is not a predictable available water supply for fire suppression with the existing 30,000 gallon domestic tank. The heart of the issue is whether 1500 gallons/minute would be required (this is the requirement the Fire District is utilizing based on the prescriptive requirement of the IFC) or whether Ms. Shaner's recommendation of 500 gallons per minute would be adequate to both improve the existing life safety situation of Riverland and allow building permits to be issued on the 6 remaining undeveloped lots and future remodels/additions. The cost of 1500 gallons per minute solution

could be seven figures. The cost of the solution Ms. Shaner is proposing would be in the neighborhood of $200,000. Riverland as an existing project is not is a position for a million dollar improvement. However, Ms. Shaner's recommendation has a strong possibility of implementation. The real issue is whether a solution to improve the existing fire safety issues of Riverland should be embraced and implemented or should 1500 gallons per minute be required and the existing life safety issues of the development will most likely continue to occur in to the future. In addition, the six remaining undeveloped lots will remain undeveloped or build with a sprinkler system or figure out a way to provide 1500 gallons per minute to their individual property.

2. **BACKGROUND**:

C.R.S. 32-1-1002(1)(d) authorizes a fire protection district to adopt and enforce a fire code EXCEPT that no such code shall apply within the unincorporated portion of a county unless the respective BOCC adopts a resolution stating that such code is applicable within the fire protection district's boundary.

On August 9, 2005 the Crested Butte Fire Protection District (CBFPD) adopted Resolution 1 Series of 2005 which adopted the 2003 International Fire Code. The CBFPD also approved amendments to the International Fire Code on March 21, 2008.

On November 11th of 2008 the Gunnison Board of County Commoners approved Resolution 08-47 which authorized the Crested Butte Fire Protection District to adopt the 2003 International Fire Code, with amendments, within the Fire District's Boundary. Resolution 08-47 also authorizes the Crested Butte Fire Protection District's "Guidelines, Standards and Fees for Review of Fire Protection in Proposed Inclusions to the Crested Butte Fire Protection District, and New Subdivision, P.U.D.'s or Any Other Buildable Parcel of Land within the Crested Butte Fire Protection District".

If the 2003 International Fire Code had not been adopted (and authorized by the BOCC), the remaining code applied to commercial occupancies in Riverland would be the 2009 IBC which is currently what is applied to all commercial/industrial buildings in Gunnison County.

It is useful to note that the Fire District had historically reviewed building permits issued for the existing 33 units and approved those structures based on the applicable adopted building codes adopted by the County. After a meeting with the Fire District on September 13th, it was also discovered that there had been correspondence between the Fire District and Riverland on the need for adequate fire flows for the development.

Over the last several years the ownership of Riverland began working with the Fire District on ways of improving life safety and the ability to fight a fire at Riverland. Representatives of Riverland presented several ideas and a request for a waiver to sprinkle the remaining properties to the Fire District Board on March 12, 2013. The request for a waiver was denied by the District at that meeting. On May 28th and June 11th, 2013 the County Commissioners met with the Fire District to discuss how to address approval of building permits for the remaining 6 lots at Riverland. These meetings resulted in the County Commissioners requesting that this issue be further explored with participation by the CBFPD, Riverland, and County staff. The group met on July 9th where the issues were discussed. No progress on the issues was made.

Over the last six months the Community Development Director attempted to facilitate additional communication between Riverland and CBFPD. A reasonable request from the Fire District was made that Riverland should provide a specific proposal to improve fire protection for the development. Previously, multiple ideas had been discussed and one specific proposal in writing from Riverland had not be provided.

On September 12, 2013, Riverland provided a specific proposal to the Fire District and the County on how to improve fire suppression for the development. Gunnison County was informed by the chair of the Fire District Board that the proposal was not significantly different than what was discussed at the March 12th CBFPD meeting and that this proposal would also not be acceptable to the Board. Therefore, a waiver of the sprinkler requirement would not be approved. Staff requested that the CBFPD provide this decision in a written form. Minutes from the March meeting were provided by the District but a written response to Riverland's proposal was not provided to Riverland or the County.

3. ACTION REQUESTED FROM BOCC AND OPTIONS FOR CONSIDERATION:

The County retained the services of a professional fire engineer. Shaner Life Safety provided a solution to improve fire safety for the 33 developed lots and the 6 remaining undeveloped lots. In addition this solution improved the domestic water supply for the project. It is important to note that **the most significant life safety issue at Riverland is the 33 developed lots and the residential units that exist on those lots**. Obtaining building permits for the 6 remaining lots is also certainly a valid goal for Riverland. Ms. Shaners report focused on the pragmatic need to improve life safety for the entire project in a way that was potentially implementable by Riverland. We believe if Ms. Shaners recommendations are implemented, we would achieve that goal and the residential units at Riverland would be safer. It is also important to note that families with school aged children live at Riverland.

The Fire District has been invited to the meeting on March 18th so that they can share their position on the solution. They have also provided a written response to the Shaner Life Safety report (Attachment B).

The options available to the Board of Commissioners as staff sees them include:

1) Take no further action. The County has retained a professional fire engineer and she has provided options which Riverland and the District can utilize in future discussions if they so desire. Based on the written response from the Fire District, there should be no expectation that this will happen in the foreseeable future. The net result of this option is that the 33 existing lots are no safer and the 6 undeveloped lots must either providing sprinkling or adequate fire flows.

2) Amend the Code: The County cannot grant a waiver as discussed last fall. However, the Board can modify or eliminate the Fire Code that was adopted in 2008. Staff believes there is adequate flexibility in the existing code to provide unique solutions for improving the life safety of existing projects. However, there has to be the will to use that flexibility so that unique solutions from a professional in this field can be considered for unique problems. It should be emphasized that, staff believes if we were discussing a new subdivision, then a prescriptive

approach is most likely the best. However, for an existing project that was approved prior to the adoption of an applicable code, a more programmatic approach is often needed. Alternatives to consider related to a code change include:

A) Riverland Specific: With the specific study from Ms. Shaner write a specific amendment to require/allow that solution.
B) Appeal Process. The BOCC could make itself the final board of appeal for a Crested Butte Fire Prevention District. This obviously creates a governance issue in that the District receives public funding to administer the code and is responsible for that code. It also has technical expertise to consider appeals. A proposed amendment could require an applicant to pay for an independent fire professional to review the merits of a proposed appeal so that the County is not out of pocket for that expense and has the benefit of a professional independent opinion.
C) Repeal the Fire Code from 2008: The unincorporated area of Gunnison County not in the Crested Butte Fire Prevention District does not use the International Fire Code. Builders simply comply with the County's adopted building codes. The County coordinates with the Gunnison Fire Prevention District on every commercial building permit and other technical code questions that relate for fire prevention. So the effect of repealing the IFC would be that our rules for construction would be consistent throughout the County. However, the IFC does bring with it a higher standard for fire safety.

A clear recommendation is difficult in this case in that there is not a perfect solution to this impasse. However, by moving forward with an independent consultant, the County now has an independent solution from a fire protection engineer. In addition, staff has been exploring grant opportunities to assist with infrastructure improvements with Riverland. The current Fire Code and its amendments do provide flexibility and the ability to find pragmatic workable solutions. This is a highly technical area of code that should be addressed at a staff level. Given, its not staffs position to critique the governance of another governmental entity, staff would recommend using the Shaner reports recommendation and crafting a surgical code solution for Riverland. The door that opens to this approach is that other existing projects could retain their own fire prevention professional and request the same consideration.

Attachments

Attachment A: Shaner Life Safety Report
Attachment B: Response from Crested Butte Fire Prevention District
Attachment C: Additional letter from Shaner Life Safety
Attachment D: Approved International Fire Code and Amendments

Attachment A: Shaner Life Safety Report

Riverland Industrial Park
Life Safety/Fire Protection Report

Prepared by:
Deborah Shaner, P.E.
Fire Protection Engineer

Shaner Life Safety

February 14th, 2014
(REVISION #1)

Objective

The objective of this report is to address the following questions as presented by the Gunnison County Board of County Commissioners.

1. Is there an unacceptable fire/life safety risk associated with the Riverland Industrial development?
2. If there is an unacceptable risk at Riverland, what are the short term solutions, if any, to facilitate development on the final six undeveloped lots and improve life safety for the development?
3. What are long term solutions to provide a more permanent solution for life safety for the Riverland Industrial development?

The primary focus of this report is on the water supply available for fire protection purposes at the Riverland Industrial Park. Other fire protection factors and systems have been evaluated, considered and included in formulation of solutions as applicable.

Statement of Problem

Based on site observations, review of documentation and discussions with interested parties, the general statement of the problem at hand is as follows:

Riverland Industrial Park was developed prior to the International Fire Code being adopted within the Crested Butte Fire Prevention District. There was not a conflict between Riverland development and applicable Fire District regulations until 2008 when Gunnison County authorized the CBFPD to adopt the 2003 International Fire Code with amendments. Although a lack of fire flows to the projects had been documented by the CBFPD over the years, it was not until 2008 when the IFC went into effect for the District did new requirements come into play for construction in Riverland. The effect of this regulation has been that the six undeveloped lots and other new structures on the property require either a fire suppression system to be installed or must provide adequate fire flows to new structures. This to date has been cost prohibitive since the project as a whole lacks adequate water storage, water lines, and hydrants for fire suppression. This issue came to a head when a building permit was requested for a new building on the site and was not approved by the Fire District.

Existing conditions and infrastructure do not readily allow for quick improvements to be made to resolve the issue. Existing conditions must be acknowledged and accepted while entering into any solution agreements between interested parties. A solution must be cost effective to allow for actual implementation while meeting the intent of applicable codes to the extent possible.

Site Description

The Riverland Industrial Park is located approximately 3 miles south of the Town of Crested Butte and consists of 38 lots. Filing #1 (Lots 1-15) contains Heavy Industrial uses and Filing #2 (Lots 16-38) consists of Light Industrial uses. There are approximately one dozen residential units located throughout the site. Most buildings are constructed with metal materials, Type 5B construction, with square footages ranging from 1,500 – 10,000 square feet. The average size per building is approximately 4500 square feet.

Refer to Attachment #1, Riverland Lot Overview spreadsheet for a summary of building usage, size and construction throughout the industrial park.

In the event of a fire, the park is served by Crested Butte Fire Protection district, with station #1 located approximately 3.5 miles away. The fire department is capable of responding with an engine, pump truck, water tender truck and various EMS response vehicles. This fire department is primarily volunteer, so a successful response is dependent on the availability of necessary crew members.

Filing #1 has a maximum building size of 10,000 square feet and a height of 24' for flat lots. Filing #2 has a maximum building size of 4500 square feet at a 24' height for flat lots and 36' for sloped lots per the published covenants. There are no zoning restrictions in place for the industrial park.

There is a Pumphouse which serves the domestic water needs of the entire industrial park located at the corner of Riverland Drive and Buckley Drive. A storage tank providing approximately 20,000 gallons of water is installed underground at the Pumphouse location. The capacity of the tank is 30,000 gallons, but currently water levels are maintained at 20,000 gallons. This water is distributed throughout the development through underground water lines, which generally follows the path of Riverland and Buckley Drives. Water lines are sized at 2", 4" and 6", varying throughout the complex.

Code Basis

Gunnison County's Resolution 08-47 authorizes the Crested Butte Fire Protection District (CBFPD) to adopt the 2003 International Fire Code with amendments within their jurisdictional area. This adoption includes implementation of the Crested Butte Fire Protection District's "Standards and Guidelines Policy" dated December 14, 2010.

In evaluating the fire protection and life safety conditions at the Riverland Industrial Park, the goal of meeting the intent of CBFPD codes and standards has been considered. Of course, there are existing conditions in place which must be acknowledged and included in any solutions, but compliance with at least the intent of fire department codes should be a general goal. This removes any concern for undesirable precedents to be set, minimizes the request for waivers and shows good faith for future development.

Applicable sections of CBFPD Standards are noted below. These code sections are applicable to proposed solutions outlined later in this report.

Access

In general, Riverland Industrial Park has good fire department access to all lots in the complex. In accordance with CBFPD Standards Section 201C, two points of access into the development are provided. Most buildings are well marked with addresses and driveways are clear and provide for fire department and emergency vehicle access.

Water Supply

Per Section 301A, CBFPD Standards, "A central water supply is required when the subdivision density is greater than one dwelling unit per two acres." Because there are residential units in the park, a central water supply is required. The definition of a central water supply is "a water distribution system capable

of delivering the required fire flow as determined by Appendix B of the 2003 International Fire Code." If the 2003 International Fire Code (IFC) requirements are imposed on the complex, a *minimum* fire flow of 1500 gpm would be required. The Riverland site does not have adequate water storage and distribution in place to meet the requirements of the 2003 IFC. In fact, the water supply was not designed to provide fire protection water, only to meet domestic demands.

The presence of residential units creates the need for a central water supply throughout the subdivision. Any new development, regardless of whether the building contains residential units, would trigger the requirement for central water supply. In other words, this is a subdivision requirement, not a single lot or building requirement.

Crested Butte Fire Protection District standards do offer alternatives for water supply for subdivisions that do not have the infrastructure in place to meet IFC requirements. Section 303, CBFPD standards states "In subdivisions, P.U.D.s or any other buildable parcel of land within the Crested Butte Fire Protection District without a central water supply, an alternate water source approved by the Fire Chief shall be established to provide the required storage. NFPA 1142 Standard on Water Supplies for Suburban and Rural Fire Fighting, current edition, shall be used as a guide in establishing requirements."

An NFPA 1142 analysis is included later in this report.

Fire Sprinkler Systems

When water supply deficiencies exist, CBFPD Standards require fire sprinkler systems as follows:

Section 402, "New subdivisions and PUD's. An automatic fire suppression system shall be installed in all structures in all new subdivisions or PUD's where there is not installed a central water supply capable of providing the required fire flows per the IFC 2003 edition appendix B.

1. All structures shall have installed a fire suppression system in accordance with NFPA 13 Standard for the Installation of Sprinkler Systems, 13D Standard for the Installation of Sprinklers Systems in One- and Two-Family Dwellings and Manufactured Homes or 13R Standard for the Installation of Sprinklers Systems in Residential Occupancies up to and Including Four Stories in Height, current edition, by covenant and,
2. Installed fire protection systems shall be monitored and supervised by an approved central station fire alarm company and,
3. The size of the storage tank shall be double the required amount per the applicable NFPA standard or based on 30 gallons per minute response time, at posted speed limits, measured from the nearest fire station, whichever is greater.

The International Fire Code (IFC) and International Building Code (IBC) provide guidance for sprinkler requirements for buildings as well regardless of the available water supply. For the purpose of this report, it is important to note requirements for mixed use buildings with residential uses. Section 903.2.7, IFC states "An automatic sprinkler system...shall be provided throughout all buildings with a Group R fire area." A Group R fire area refers to Residential uses as defined by the building code. Basically, any building which houses a residential use must be sprinklered under the 2003 IFC. This includes mixed use buildings with only partial residential use.

Sprinkler requirements for non-residential buildings are determined through an allowable area analysis dependent on construction type, use, square footage and site conditions. Future buildings constructed at Riverland are subjected to this analysis and should be sprinklered accordingly as required.

Assessment of Risk

Several factors contribute to the level of risk present at Riverland. First and foremost, the presence of residential units has the most impact on the requirements for fire protection, water supply and general life safety at the complex. Model codes including the International Building Code and International Fire Code contain extensive provisions for fire and life safety requirements when residential occupancies are present.

In the event of a fire, the number one concern is occupant safety – getting people out of a building to safety is the most important goal in the design of fire protection systems and features. When persons are sleeping within a building, the added factor of waking them up, orienting them to their surroundings and notifying them of an emergency must be considered. There are multiple fire hazards associated with residential occupancy, namely cooking, candles, heating appliances and smoking. These activities are in the top ten causes of fire as reported by the National Fire Protection Association.

Another factor for establishing the level of risk at Riverland is the variety of occupancies present there. Additionally, the potential for new businesses and construction could bring additional hazards. Currently, there are businesses which house paint storage, tire storage, automobile repair and mini public storage. None of these businesses appear to house quantities of hazardous materials which would exceed that allowed for a non-hazardous occupancy (as defined by the Building Code).

There are conditions which exist at Riverland that reduce the risk associated with fire. Exterior housekeeping is generally good. Most buildings are constructed of metal and buildings are generally small. Adequate separation between buildings is present to reduce fire spread and trees and foliage are at a minimum.

The Riverland Industrial Park covenants limit the size and number of buildings allowed on each lot. This minimizes fire hazard and is an important factor in establishing a limited level of risk. Fire load and fire spread will be limited due to the restrictions written into the covenants.

Property owners in Riverland enter into possession with limited expectations for fire protection. The covenants acknowledge the absence of fire protection water. In the Declaration of Protective Covenants for Riverland Industrial Park, Section 4, Item P, sub item 1 states "This project is being developed in an essentially rural environment without the necessary water supply system to provide firefighting protection at urban levels. The owner or occupant of each site within the project must accept a rural level of fire protection. The primary responsibility for fire protection rests with such owner or occupant of a site within a project."

Due to several industrial uses present at Riverland, there is a risk of carbon monoxide poisoning to occupants, especially those sleeping in residential units. The short term solution outlines recommendations for mitigating this risk.

The Crested Butte Fire Protection District is primarily a volunteer fire department. The department is well equipped and can respond with a variety of trucks and tools for conducting firefighting operations. There is concern for available personnel, particularly with Fire Stations #2 & #3. Any long term solutions to be implemented at Riverland will be costly. Consideration must be given to the available budget, the cost for improvement to a prescriptive level of compliance and the cost-benefit associated with these improvements. In other words, improvements which will not be utilized or will not substantially improve life safety should not be executed.

Provided the short term solution as outlined below is implemented, with consideration of the existing conditions, it is reasonable to accept the level of risk at Riverland. The recommended immediate improvements are outlined in the "Short Term Solution" section below. Acceptance of this risk is contingent upon Riverland continuing to work towards a long term goal of compliance with Crested Butte Fire Protection District water supply requirements.

Short Term Solution

Assuming property owners, the Riverland HOA and governing authorities are willing to accept the level of risk in place due to existing conditions and past development, there are several improvements that could immediately be implemented to minimize this existing level of risk. As a long term solution will likely take time to fund, design and implement, this short term solution is proposed to allow for construction to proceed in the park. It is recommended that acceptance of this short term solution is dependent on a written plan for a long term solution being presented.

Note that if Riverland decides to move directly into implementation of the long term solution, the short term solution is not necessary or mandatory. This is simply here to provide an optional alternative to immediate implementation of the long term solution.

Recommendations for a short term solution are as follows:

1. *Install monitored fire alarm systems in all buildings housing residential units:* Per the IBC & IFC, residential units are required to have smoke detectors and carbon monoxide detectors installed. However, these detectors are not required to be monitored. Monitored fire alarm systems consist of a control panel with a dialer or other communicator to provide an automatic call to the responding fire department in the event of a fire alarm. These are common in several jurisdictions in Colorado and are a cost effective alternative to other required systems such as fire sprinklers in some cases. In Riverland, this item can provide for achieving the main goal of protecting sleeping occupants in the event of a fire. A monitored system would include supervised smoke detectors and carbon monoxide detectors in each residence. Additional devices could be installed in the commercial portions of the buildings. A separate system would be provided for each building.

2. *Evaluate egress for residential units:* Readily available, clear, well-marked egress is key in tending to the life safety of residential occupants. Each residential unit should have an egress analysis to ensure proper, safe exiting is available.

3. *Ensure covenant limitations are enforced:* One of the main factors which contribute to a lower level of risk at Riverland is the limitation of the size and height of buildings. Lower density is

equal to lower fire risk. Develop a plan with the building department to ensure building permit applications are within the limitations of the covenant.

4. *Prohibit Group H occupancies from moving into Riverland:* This is basically an unwritten rule due to covenants and building codes. However, rather than open Riverland up to increasing its existing level of risk, no Group H occupancies should be allowed. This will limit the quantity and use of flammable and combustible liquids, eliminate dangerous industrial processes which promote ignition of fire and keep control of hazardous materials present.

5. *Conduct walk throughs of each lot with the fire department to evaluate and improve housekeeping:* These site visits are intended to improve housekeeping on each lot and reduce the potential for a fire. The scope of these site visits needs to be carefully outlined prior to their start. They are not intended to evaluate sprinkler coverage or building construction issues. The walks would be intended to find immediate, low cost improvements to be made to the site. Results would be recommendations only. For example, issues which could be identified include presence of trash or debris which is combustible, blocked egress, poor ventilation of heating appliances, open or poorly stored hazardous materials, etc. Annual inspections by Crested Butte Fire Protection District are also recommended.

Long Term Solution

The recommended long term solution is compliance with CBFPD standards, specifically Section 303 for Alternative Water Supplies. This involves making site improvements to achieve a minimum water supply storage and distribution as recommended by NFPA 1142, *Standard on Water Supplies for Suburban and Rural Fire Fighting.*

An NFPA 1142 analysis is included as Appendix #2 of this report. The analysis suggests approximately 33,375 (round up to 35,000 for design purposes) gallons of water is necessary on site to satisfy the recommendations of this standard. This is based on analyzing Lot 12, Waste Management Building, which is the most demanding building with respect to site fire flow. In addition to the detailed analysis for Lot 12, the NFPA 1142 formula was applied to each lot to approximate the volume of water needed. These results can be found as part of the Appendix 1, Riverland Lot Overview. Water storage requirements range from 2000 gallons to 33,375 gallons.

In addition to water storage, the rate of delivery must be established. Table 4.6.1, NFPA 1142 provides recommended water flow rates in gpm depending on the volume of water storage required. As noted in the Appendix 1 spreadsheet, the volume of delivery recommended varies from 250 gpm to 1000 gpm throughout the various lots at Riverland. The recommended flowrates are quantified as follows:

1 lot = 250 gpm
18 lots = 500 gpm
7 lots = 750 gpm
3 lots = 1000 gpm
Average demand = 600 gpm

Based on Riverland's existing pipe infrastructure, a reasonable improvement plan can be developed in order to provide 500 gpm distributed throughout the subdivision. Based on the numbers above, most lots in the subdivision are assigned a demand of 500 gpm. An economically achievable solution rests at

500 gpm. Considering that the existing water distribution capability throughout the Riverland subdivision is currently 0 gpm, achieving 500 gpm is a vast improvement, one that is beneficial to all parties involved.

Section 4.1.4, NFPA 1142 states " The AHJ shall be permitted to specify how the water supplies required in this document are provided, giving consideration to local conditions and need.". CBFPD could likely provide addition gallons per minute using water tender trucks in the event more than 500 gpm is needed for firefighting efforts.

In order to comply with the recommendations of NFPA 1142, and thus, meet the intent for Alternative Water Supply as allowed by Section 303, CBFPD standards, the following design criteria is proposed:

1. A minimum of 35,000 gallons of fire protection water storage in the Riverland subdivision
2. Distribution of the water at 500 gpm
3. Distribution system is pressurized at a minimum of 20 psi
4. A minimum of 3 fire hydrants are installed spaced to provide water distribution throughout the subdivision. Placement is subject to review by CBFPB.

The above design criteria may be achieved in a variety of ways. Suggested improvements include upsizing the existing water pump, expanding the existing water tank, upsizing any existing 2" lines to 4" or 6". Details of the design to achieve this long term solution will be developed by Riverland and presented for approval to Gunnison County and Crested Butte Fire Protection District.

Note that the proposed improvements would also greatly enhance the domestic water distribution in the park.

Future Development

The overall direction of the Riverland Industrial Park infrastructure should consider potential for development on adjacent parcels of land, specifically to the North. Adjacent development could facilitate extension of the Crested Butte municipal water supply into the Riverland Park. Should that opportunity present itself, Riverland infrastructure should be improved to a point in which the complex could receive this water. This would likely require a minimum 8" line to be run through the complex. The path of the existing water distribution is a good one. Recommendations for long term future improvement would be to replace and upsize the existing 2", 4" and 6" lines to 8" lines as opportunities arise.

Statement of Solution

In summary, this report offers a recommended approach to facilitate reinstatement of the issuance of building permits for the Riverland subdivision. Implementation consists of both a short term solution, to be completed prior to allowing the issuance of building permits and a long term solution, to be incorporated into a development agreement between Riverland and the Crested Butte Fire Protection District. Successful completion of these solutions will achieve compliance with the CBFPD standards and provide an effective level of life safety for the occupants of the subdivision.

If the Riverland HOA opts for immediate implementation of the long term solution as described in this report, the short term solution may be omitted from the improvement plan. The short term solution is

not mandatory if the long term solution is implemented and was crafted simply to provide an interim alternative while funding for the long term solution was determined. The short term solution was offered as a bargaining tool to allow for construction to continue while the long term solution was in development. Achievement of the long term solution would bring Riverland into compliance with current codes and standards related to central water supply.

Appendix #1: Riverland Industrial Park Lot Overview

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
1	337 Buckley Drive	Premier Painting	Paint Shop	2500	Metal	15	37500	4	0.5	4688	500
2,3	305 Buckley	Residential Unit	Residential	1512	Metal	10	40320	5	0.5	4032	500
		Rocky Mountain Trees	Workshop	2520	Metal						
4		Undeveloped									
5	337 Buckley Drive, Unit 1		Workshop	1164	Metal/Stucco	10	92690	5	0.5	9269	500
	337 Buckley Drive, Unit 2		Workshop	1135	Metal/Stucco						
	337 Buckley Drive, Unit 3	Spellbound Furniture	Workshop	1130	Metal/Stucco						
	337 Buckley Drive, Unit 4	Peak Property Management	Workshop	1145	Metal/Stucco						
	337 Buckley Drive, Unit 5	Residential Unit	Residential	1145	Metal/Stucco						
	337 Buckley Drive, Unit 6		Workshop	1200	Metal/Stucco						
	337 Buckley Drive, Unit 7		Workshop	1200	Metal/Stucco						
	337 Buckley Drive, Unit 8		Workshop	1150	Metal/Stucco						
6	244/246 Buckley	Residential Unit	Residential	1000	Metal/Stucco	10	166740	4	0.5	20843	1000
		Altitude Auto	Workshop	6200	Metal						
		Buckley Valley Storage	Mini Storage	9474	Metal						
7	296 Buckley	Residential Unit	Residential	1600	Metal	10	64500	5	0.5	6450	500

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
			Workshop	2450	Metal						
			Storage	2400	Metal						
8	396 Riverland	Colorado Paint Supply	Tire Storage/ Paint Supply	6200	Metal	18	111600	3	0.5	18600	750
9	398 Riverland	Residential Unit	Residential	1480	Wood	12	157440	3	0.5	26240	1000
			Paint Shop	1800	Metal						
		JCI	Workshop	9840	Metal						
10,11	444 Riverland		Warehouse	9510	Metal	10	196350	5	0.5	19635	750
			Mini Storage	10125	Metal						
12	467 Riverland	Waste Management	Warehouse	8200	Metal	30	267000	4	0.5	33375	1000
			Office	700	Metal						
13	336/366 Buckley	Residential Unit	Residential	1930	Stucco	10	48600	5	0.5	4860	500
		CB Ironworks	Workshop	1000	Metal						
		Oh Be Dogful	Kennels	1930	Stucco						
14	357 Riverland	Gears Inc	Office/Workshop	4823	Metal	10	48230	7	0.5	3445	500
15	455 Riverland, Unit #1	Parker Dirtworks	Garage	2286	Wood	18	69948	6	1.5	17487	750
	455 Riverland, Unit #2	Residential Unit	Residential	1600	Wood						
16	469 Riverland	Undeveloped									

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
17	475 Riverland	Residential Unit	Residential	2240	Concrete/Wood	15	81585	7	1	11655	750
		Concrete Shop	Workshop	3199	Concrete/Wood						
18,19	497 Riverland	Undeveloped									
20	515 Riverland, Units 201/202/203	Blind Faith, etc.	Office/Workshop	3500	Metal w/Wood Framing	10	35000	7	1	5000	500
21	523 Riverland	Various	Office/Workshop	4000	Metal w/Wood Framing	10	40000	7	1	5714	500
22	539 Riverland		Workshop	3072	Wood	10	30720	7	1.5	6583	500
23	571 Riverland	CB Rental Center		3500	Metal w/Wood Framing	10	35000	7	1	5000	500
24		Crested Butte RV Resort	RV Sites								
25		Crested Butte RV Resort	Office								
26	733 Riverland	Residential Unit	Residential	1512	Metal	10	43920	7	0.5	3137	500
			Workshop	2880	Metal						
27	744 Riverland	European Auto Interests	Auto Storage	8000	Metal	12	96000	6	0.5	8000	750
28	738 Riverland	Colorado Barnwood	Office	963	Metal	12	50556	6	0.5	4213	500
		Auto Storage	Garage	3250	Metal						
29	736 Riverland	Residential Unit	Residential	1500	Stucco	12	62640	5	0.5	6264	500
		Beckwith Brickworks	Workshop	3720	Stucco						
30	110 Andreas Circle	Wheatstone/Paradise Computer		2500	Metal	12	30000	5	0.5	3000	500

Lot #	Address	Business Name/Description	Building Use	Size	Building Material	Approx Height (ft)	Volume (cu ft)	Occup Class #	Const Class #	Water Volume (gallons)	Flow Rate (gpm)
31	122 Andreas Circle	Crawfords		2500	Metal	15	37500	5	0.5	3750	500
32	2 Andreas Circle	Timberline/Zimmerman		6500	Metal	15	97500	5	0.5	9750	500
33	Andreas Circle, Unit 622		Garage	552	Metal	12	50160	4	0.5	6270	500
	Andreas Circle, Unit 624		Garage	552	Metal						
	Andreas Circle, Unit 626		Garage	552	Metal						
	Andreas Circle, Unit 628		Garage	552	Metal						
	Andreas Circle, Unit 630A	Residential Unit	Residential	986	Metal						
	Andreas Circle, Unit 630B	Residential Unit	Residential	986	Metal						
34	544 Riverland	Thurston Kitchen & Bath	Workshop	2370	Stucco	12	28440	7	0.5	2031	250
35	510 Riverland	Alpine Express	Auto Storage	8000	Metal	20	160000	6	0.5	13333	750
36	496 Riverland	Undeveloped									
37	482 Riverland	CB Motorsports		9308	Metal	15	139620	6	0.5	11635	750
38	470 Riverland	Omnicom Public Storage	Storage	6000	Metal	12	72000	5	0.5	7200	500

Appendix #2: NFPA 1142 Analysis

Crested Butte Fire Protection District Standards, Section 402 allows for Alternative Water Supplies developed in accordance with NFPA 1142 Standards. To determine the proper design criteria for Riverland Industrial Park's alternative water supply, the following analysis and calculation is presented.

NFPA 1142, *Standard for Water Supplies for Suburban and Rural Fire Fighting* provides a method for calculating the minimum water supply required for a rural facility. The standards states that on a multiple building site, only the most restrictive building's water supply as calculated is required. In other words, the water supply is not sized assuming all buildings are in a fire condition. Rather, it is sized assuming the most demanding building is in a fire condition. Based on site observations, the Waste Management Building on Lot 12 is the most demanding.

The Waste Management building is approximately 8,900 square feet with an average building height of 30'.

NFPA 1142's formula for determining minimum recommended water supply is as follows:

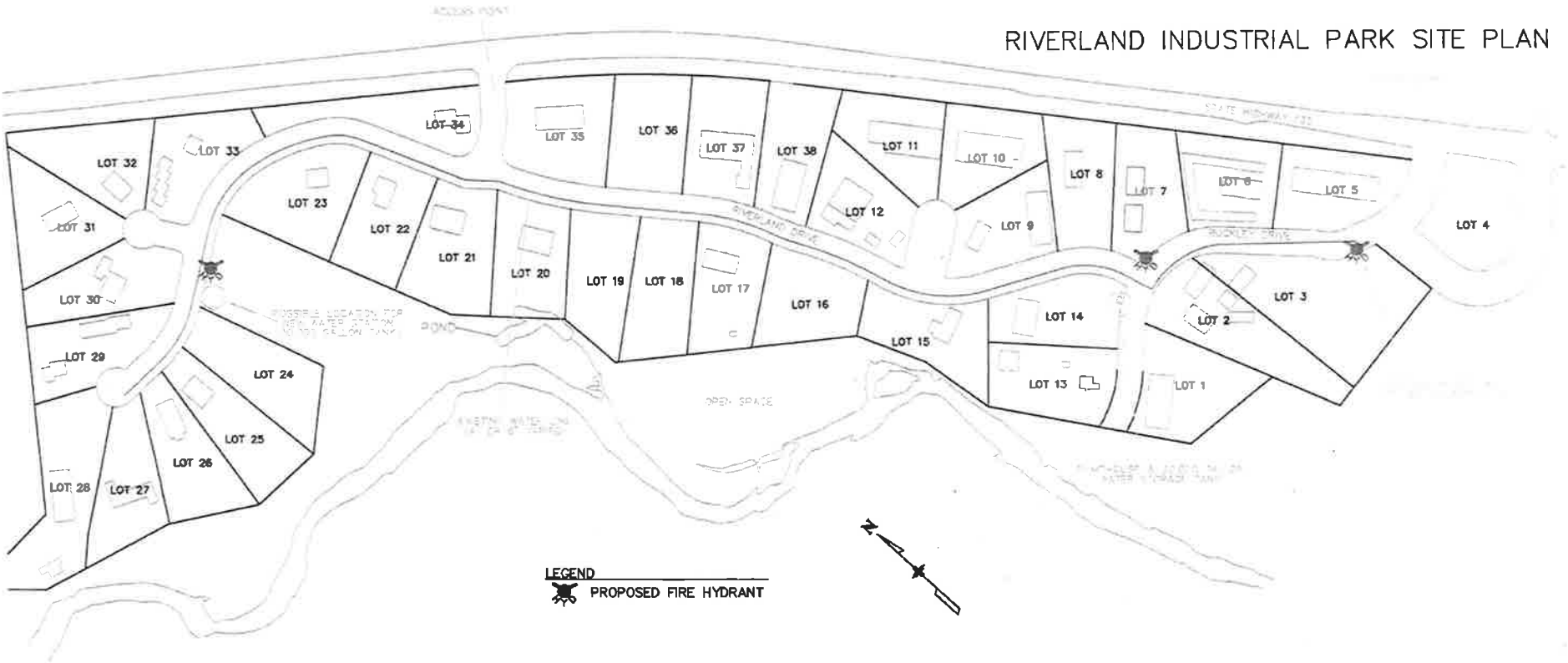
> Minimum Water Supply = (Total Volume of Structure)/(Occupancy Hazard Classification Number) x Construction Classification Number

The Occupancy Classification numbers are assigned by Section 5.2 NFPA 1142 and are based on the specific use of the building. The Waste Management building has been assigned an Occupancy Classification of 4 which includes General Storage and Warehouses.

The Construction Classification number is assigned by Section 6.2 and is based on the materials of building construction. Because this building is metal and of non-combustible construction, a Construction Classification of Type I is assigned, which carries a .5 Classification Number.

> Occupancy Hazard Classification Number = 4
> Construction Classification Number = .5
> Approximate Building Volume = 267,000 cubic feet
>
> **Minimum Water Supply** = 267,000 cu.ft./4 x .5 = **33,375 gallons**

RIVERLAND INDUSTRIAL PARK SITE PLAN



Attachment B: Response from Crested Butte Fire Prevention District

POSITION STATEMENT OF CBFPD REGARDING RIVERLAND SUBDIVISION

The development of an alternate water source pursuant to NFPA 1142 is not a substitute for buildings complying with fire-flow requirements according to Appendix B of the International Fire Code.

In most cases, the alternate water source will not supply sufficient water to meet the required fire flow standards as provided by Appendix B of the International Fire Code and the building will need a fire sprinkler system.

The development of alternate water sources in conjunction with fire sprinkler systems has been used throughout the CBFPD as the best alternative for buildings not served by an approved central water system.

The NFPA 1142 analysis provided on page 7 of the Shaner report does not provide the minimum required fire flows according to Appendix B of the International Fire Code for buildings in Riverland. All new buildings within Riverland would still need an approved fire sprinkler system.

Regarding Statement of Solution, page 8 of Shaner report: *"This report offers a recommended approach to facilitate reinstatement of the issuance of building permits for the Riverland subdivision."* The issuance of building permits has not been suspended within Riverland subdivision. Building proponents have pursued waivers from requirements to include fire sprinkler systems in their commercial buildings. The one formal waiver request was denied by the CBFPD Board of Directors. Commercial buildings including fire sprinkler systems in their design would routinely be approved and building permits would be issued.

Regarding Statement of Solution, page 8 of Shaner report: *"Successful completion of these solutions will achieve compliance with CBFPD standards..."* , and
Regarding Statement of Solution, page 9 of Shaner report: *"Achievement of the long term solution would bring Riverland into compliance with current codes and standards related to central water supply."*
If buildings within Riverland incorporate fire sprinkler systems, these statements are correct. However, it is not correct if buildings are proposed without fire sprinkler systems.

The CBFPD has consistently enforced the required fire flow requirements of Appendix B of the International Fire Code. We firmly believe the interests of public safety are best served by adhering to this standard. Subdivisions such as Crested Butte South, Skyland, and Meridian Lake have made considerable capital investments in infrastructure to comply with this standard. The CBFPD will not voluntarily reduce this standard.

3/12/2014

Attachment C: Additional letter from Shaner Life Safety

Shaner Life Safety
PO Box 1073, Frisco, CO 80443
970.409.9082; fax 970.797.1898

Date: March 12, 2014

From: Deborah Shaner, Fire Protection Engineer

Re: Update on Riverland subdivision water supply issue

The Crested Butte Fire Protection District (CBFPD) has responded to my report on the Riverland subdivision. Basically, CBFPD indicated that the approach outlined in the report was not acceptable and that NFPA 1142 is not a valid, applicable standard except when coupled with sprinklered buildings. Per their comments, Riverland is expected to meet requirements set forth by the International Fire Code, Appendix B - minimum of 1500 gpm for 2 hours, equating to 180,000 gallons of water storage or sprinkler all new construction. This response conflicts with previous direction given by CBFPD, during our meeting with them in December to discuss this approach. In response to our discussion, they were supportive of using NFPA 1142 to determine an alternative solution for water supply at Riverland.

During our meeting, CBFPD referenced an IFC code section, from the 2003 edition, Section 508.1. This section reads: "*An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.*" The remainder of Section 508 is very vague and basically notes that water supplies must be "approved" by the local authority having jurisdiction.

To determine what is required by CBFPD to achieve compliance with the above section, I referenced their standards. These standards are unique to and created by CBFPD. This document contains a section dedicated to water supply. The two applicable sections are as follow (taken directly from CBFPD standards):

"*301. Central Water Supply*

A. A central water supply is required when the subdivision density is greater than one dwelling unit per two acres.

B. The system shall supply the required fire flow as determined by the Fire Chief in accordance with computations using the currently adopted Fire Code appendix, as amended.

C. The minimum pipe size serving fire hydrants and domestic systems shall be 8 inches in diameter, unless an engineered study can provide certification that a looped 6-inch system will deliver adequate fire flows.

D. The system shall be approved, installed and tested prior to the issuing of any building permits

303. Alternate Water Sources

> *A. In subdivisions, P.U.D.s or any other buildable parcel of land within the Crested Butte Fire Protection District without a central water supply, an alternate water source approved by the Fire Chief shall be established to provide the required storage. NFPA 1142 Standard on Water Supplies for Suburban and Rural Fire Fighting, current edition, shall be used as a guide in establishing requirements."*

Based on Section 301, Riverland is required to have a central water supply due to the presence of residential units. Because the existing conditions do not achieve the requirements of section 301, section 303 provides an alternative solution, pointing directly to NFPA 1142, which was used as a basis for my report and associated solution. There is no mention in this section that buildings must be sprinklered to supplement the use of NFPA 1142.

I believe that CBFPD standards clearly allow for NFPA 1142 to be applied to Riverland for the design and installation of an alternative water supply. This was acknowledged by CBFPD in our December meeting and even after their first review of my report. Recently, direction was given by the CBFPD board to require the IFC to be used instead of 1142. I believe this is in direct conflict with the standards of the CBFPD.

Further, NFPA 1142 is a nationally accepted standard. It is developed and published by the National Fire Protection Association which is the leading authority in creating standards for the fire protection and life safety industry. I have personally used it on multiple projects in Colorado including the Crestone Charter School in Crestone, the Aspen Music School in Aspen, the Holy Cross campus in Glenwood Springs and Gateway Canyons Resort in Mesa County. In addition, I developed a similar report for the City of Cheyenne, Wyoming for the Overland Trails Annexation in which the City was evaluating an existing subdivision in preparation for annexation. The situation in Cheyenne was similar to Riverland in that a subdivision was being "inherited" by the local jurisdiction, with existing conditions that did not meet the prescriptive requirements of the adopted codes. Through an NFPA 1142 analysis, accompanied by site visits and extensive research and discussions, the City of Cheyenne was able to determine the risk at the annexed property and reach a level of life safety, utilizing existing conditions that was in conformance with the spirit of adopted codes and standards.

My report dated 2/14/14 provided a solution that enhanced the level of life safety at Riverland while meeting the intent of CBFPD written standards. This solution carried a budget that was feasible to Riverland's HOA and was intended to be a compromise for all parties involved. Of course, all new construction would be susceptible to International Building Code requirements regarding sprinklers. However, per CBFPD standards, the use of NFPA 1142 is not tied to a requirement for sprinklering buildings. Water supply and sprinklers should be approached separately in this subdivision.