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BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF GUNNISON, COLORADO

RESOLUTION NO: 2016-1

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 ("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 Chamberland, seconded by Commissioner Houck, 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

GUNNISON COUNTY SEAL COLORADO

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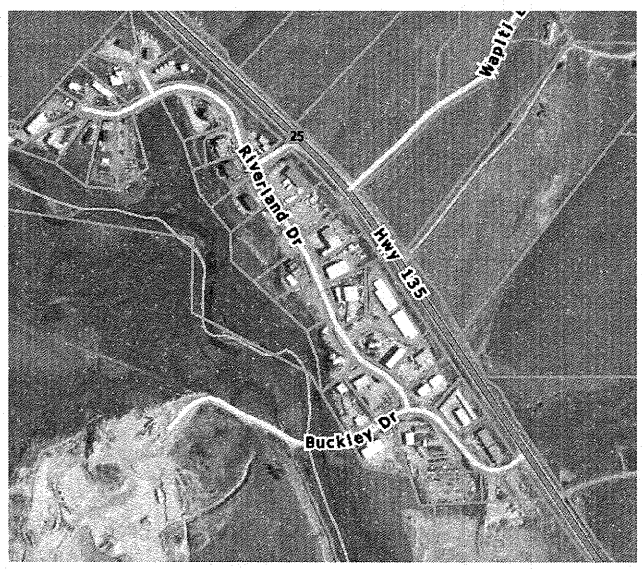
Riverland Industrial Park
Life Safety/Fire Protection Report



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**

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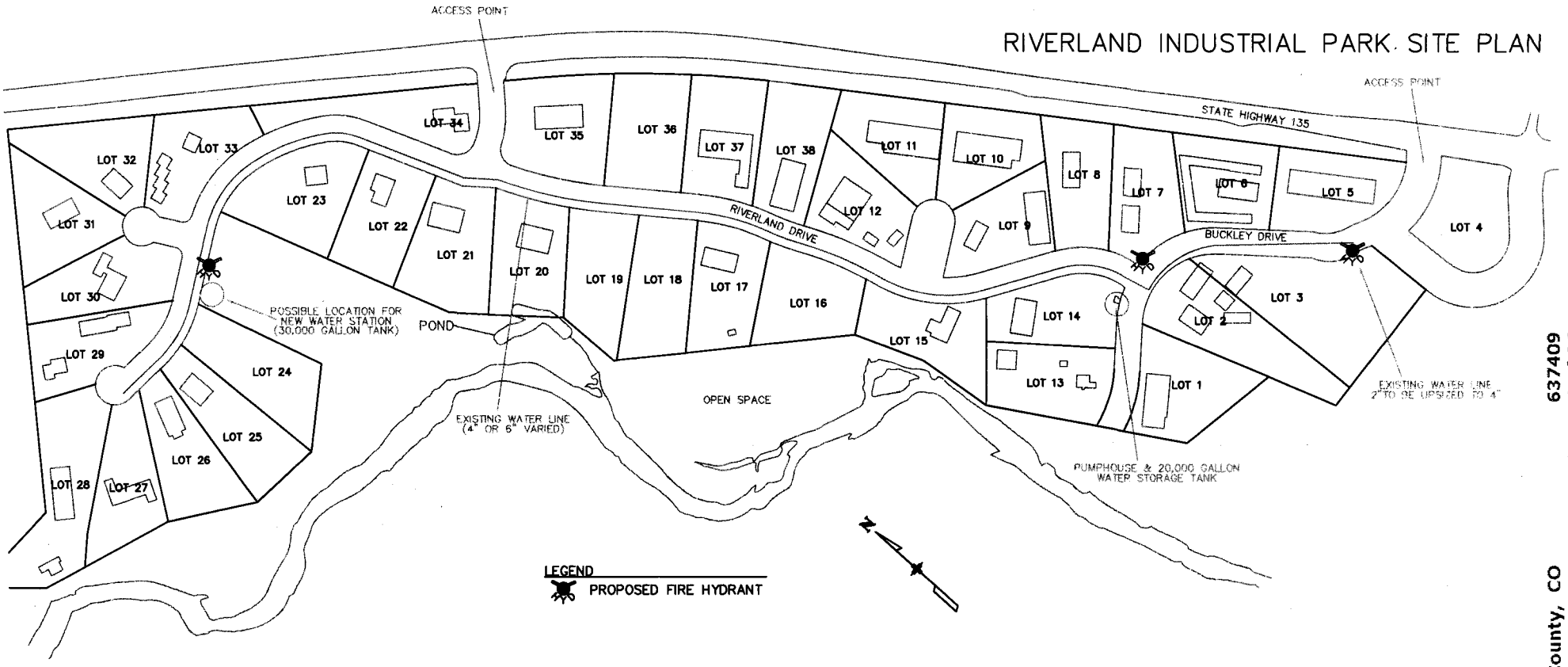
RIVERLAND INDUSTRIAL PARK SITE PLAN



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)

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.

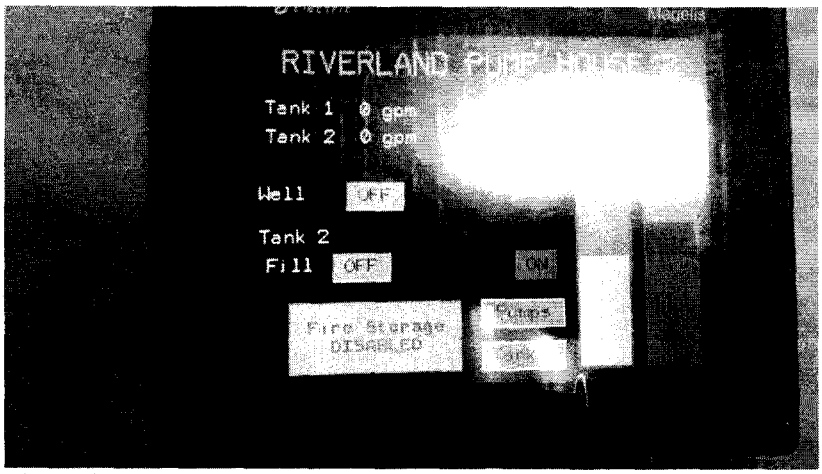


Photo #1: Red designates dedicated fire storage. Tank levels are monitored to ensure 35,000 gallons minimum is present at all times.

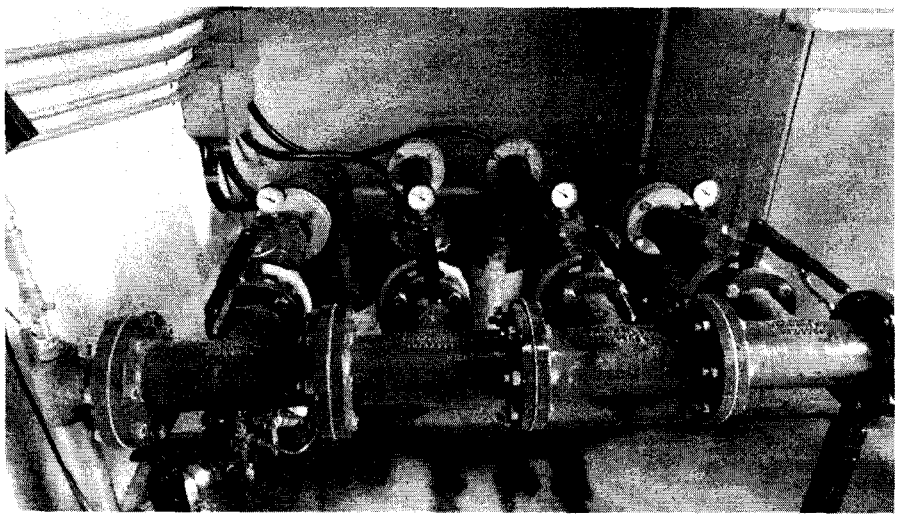


Photo #2: Pump installation in Pump House #2.

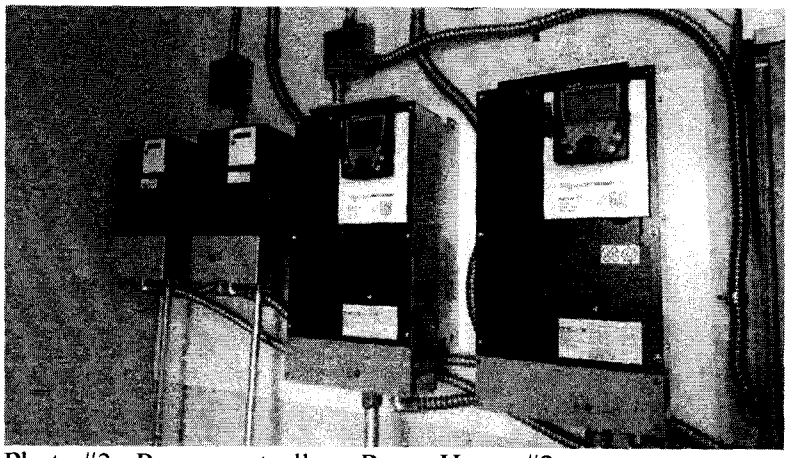


Photo #3: Pump controllers, Pump House #2.

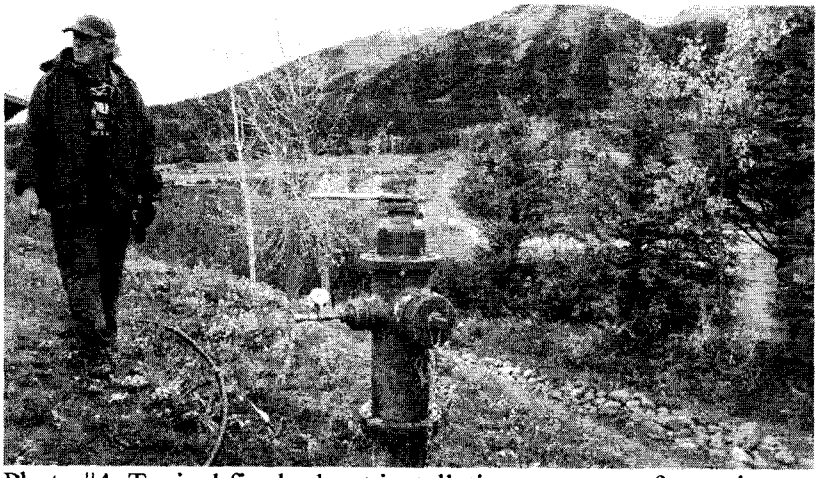


Photo #4: Typical fire hydrant installation; gauge set for testing.

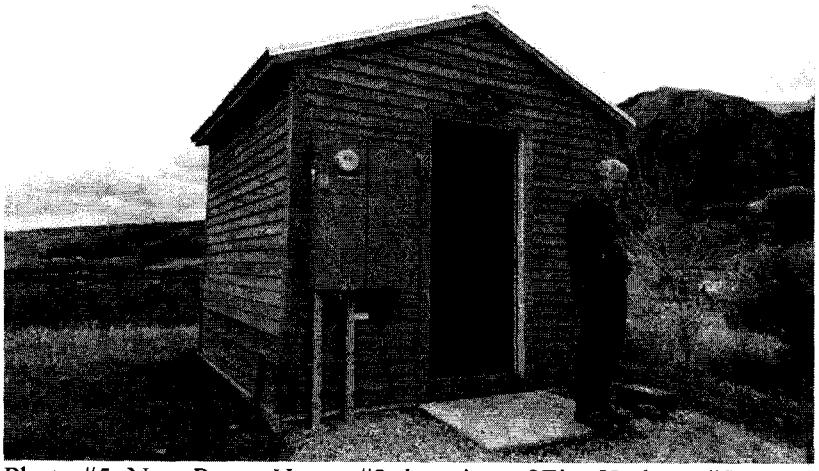


Photo #5: New Pump House #2, location of Fire Hydrant #5.

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.