

# REQUEST FOR BOARD ACTION

## Henderson County Board of Commissioners

**Meeting Date:** July 2, 2007

**Subject:** Water Line Extension - Grand Highlands at Bear Wallow Mountain

**Attachments:** Staff Memorandum  
Vicinity Map  
Project Summary  
Engineer's Report  
Project Map  
County Review Sheet

### Summary of Request:

The City of Hendersonville has requested that the County comment on the proposed water line extension for Grand Highlands at Bear Wallow Mountain. A City of Hendersonville Project Summary Sheet, with backup documents and County Review Sheet with Staff comments, are attached for Board review and action.

### Board Action Request:

Action by the Board of Commissioners is needed to either grant or deny this request. If the Board decides to approve the requested extension the following motion has been provided.

### Suggested Motion:

I move that the Board approve Grand Highlands at Bear Wallow Mountain water line extension and direct Staff to convey the County's comments to the City of Hendersonville.

**HENDERSON COUNTY**  
**Planning Department**

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213 1<sup>st</sup> Avenue East • Hendersonville, NC 28792  
Phone 828-697-4819 • Fax 828-697-4533

**MEMORANDUM**

**TO: Henderson County Board of Commissioners**

**FROM: Planning Department**

**DATE: June 22, 2007**

**SUBJECT: Water Line Extension for the Grand Highlands at Bearwallow Mountain (2007-M20)**

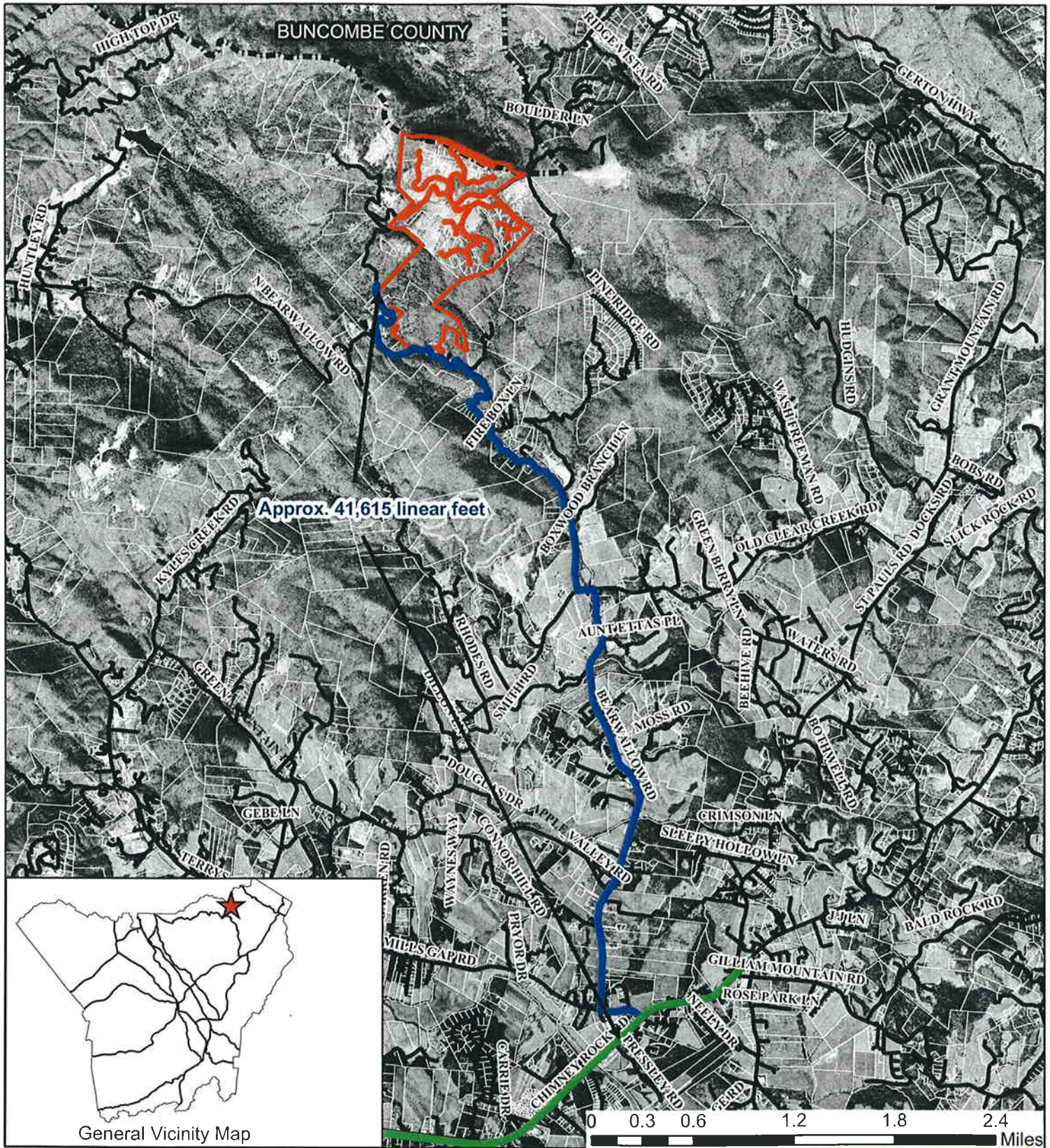
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At its meeting on June 21, 2007 the Planning Board approved a request to revise the Master Plan for the Grand Highlands at Bearwallow Mountain major subdivision. The subdivision was originally approved with 99 lots on 288 acres of land on April 19, 2005 by the Planning Board. The applicants have added additional adjacent tracts of land to the subdivision totaling 119 acres. The revised Master Plan shows a total of 320 single-family residential lots on 407.9 acres of land. Public water and individual septic systems will serve the lots. The project is located in the Open Use zoning district which does not regulate the residential use of land.

The applicant is currently in the design and approval process with the City of Hendersonville for extending public water to the project site from US Hwy 64 East (Chimney Rock Road). The approximate route of the water line will follow Bearwallow Mountain Road to the project site (see attached map). This will be approximately a 7.88 mile (41,615 linear feet) water line extension. The water will be coming from the City of Hendersonville's 1.5 million gallon municipal water tank. The applicant is proposing a 107,000 gallon water tank which will be used to serve the subdivision.

The Future Land Use Map of the County Comprehensive Plan ("CCP") shows the subject property as being located within the Rural Agricultural Area (RAA) of the Growth Management Strategy. Through the year 2020 the RAA is expected to remain predominantly rural with low-density residential development because of the location, topography, and lack of public infrastructure for these areas. RAAs are usually so far from public water and sewer as to make extensions of such utilities economically unfeasible. The Planning Department is concerned about the impact this water line extension could have in this area of the County. However, according to staff's conversations with the City of Hendersonville Water and Sewer Department, expansion of this new line will be limited for multiple reasons. Apparently the water line will be a high pressure transmission line which limits adjacent properties from connecting to the line and capacity of this water line will be limited. Action by the Board of Commissioners is needed to either grant or deny this request. Such action should be made with consideration of the County's current plans, policies and ordinances. Staff further recommends that the Board of Commissioners give direction to staff on how to proceed with this water line extension.





## The Grand Highlands at Bearwallow Waterline Extension

**DEVELOPER:** SUMMERSET, INC  
**OWNER:** WESTSIDE LAND AND TIMBER CO., INC, HASSCO LANDS, INC., AND KHM INVESTMENTS LLC  
**AGENT:** ANDY OTTEN, MELROSE DESIGN GROUP, P.A.  
**ZONING:** OPEN USE  
**WATERSHED:** N/A  
**WATER SYSTEM:** PUBLIC  
**SEWER SYSTEM:** INDIVIDUAL  
**ROAD SYSTEM:** PRIVATE



Legend	
	Proposed Extension
	Existing Waterline
	Subject Area
	County Border
	Roads
	Parcels

HCPD 06.21.07  
 See Master Plan for exact location of project and additional information.



**City of Hendersonville - Project Summary  
Water Line Extension  
Grand Highlands at Bearallow Mountain**



Date: May 2, 2007

This is a project to extend existing water lines to provide water service to a

This project is under the reviewing jurisdiction of: **Henderson County.**

This project requires approximately **41,615** linear feet of water line sized as following:

Approximate Length	Description
2,323 lf	8" DIP
28,754 lf	6" DIP
2,964 lf	4" C900 DR14 PVC
4,085 lf	2" SDR 13.5 PVC

One (1) 107,000 gallon Aquastore Water tank, one (1) Hydro-pneumatic booster station and Three (3) Water lift pump stations.

Fire Protection will be provided by the installation of twelve (12) fire hydrant(s).

The entire cost of the proposed water line extension is to be paid for by Summerset, Inc. of Hendersonville, NC.

The undersigned represents this utility extension line request has been evaluated in light of the adopted land use plan for the municipality or Henderson County. In the absence of such a plan for the general area to be served, this extension has been evaluated in terms of its future impact on existing land uses.

Reviewing Jurisdiction: Henderson County

Signing Official: \_\_\_\_\_

Date of Review: \_\_\_\_\_

Approved  Disapproved

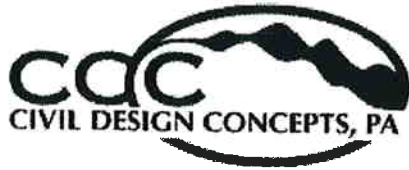
Narrative Comments Provided:  Yes  No

Based on the above information, the Water & Sewer department has the capacity to support this additional infrastructure and associated connections and hereby recommends approval of said project.

A motion is needed to approve and accept this project. Suggest wording is as follows:

**I move to accept this water line extension project and to authorize the City manager to execute the water line extension agreement on behalf of the City.**

Water & Sewer Department:	<input type="checkbox"/> Approved	<input type="checkbox"/> Disapproved	Date: _____
Hendersonville City Council:	<input type="checkbox"/> Approved	<input type="checkbox"/> Disapproved	Date: _____



## **Engineers Report Water System Operational Summary**

**Project Name: Grand Highlands at Bear wallow Mountain**  
**Project Location: Henderson County**  
**CDC Project No. 10634**  
**Date: March 23, 2007**

### **System conditions**

- Water level in Subdivision tank (107,000-gallons) is half full
- Pressure in Well-X-Trol bladder tank in (PS#3) is 50 psi
- Pressure in Well-X-Trol bladder tank in (PS#2) is 50 psi
- Water level in Main Hendersonville tank (1.5 million-gallon) is half full
- Pump station #1 transfers water from elevation 2,445 to PS#2(elev. 2,920)
- Pump station #2 transfers water from PS#2 (elev. 2,920) to PS#3 (elev. 3,380)
- Pump station #3 transfers water from PS#3 (elev. 3,380) to subdivision tank (elev. 3812, half full)
- Pressure Distribution system (PS#4) provides service for elevations above 3,753

### **System Procedure**

Water to the proposed subdivision shall be provided from the 1.5 million gallon tank owned by the City of Hendersonville. Water for the service demand for the subdivision tank will be provided from a dedicated 6" transmission line installed between pump station #1 and the proposed 107,000-gallon tank. Pressures are obtained by force of the pump output and the hydraulic pressure from the water tank. The water level in the tank is controlled by a pressure switch at the tank set to control the pumps in pump stations #1-#3. Power supplied to the pump stations will be controlled by variable frequency drive controls. The controls are necessary to act as a phase conversion for the 3-Phase motors since only single-phase power is available in this area of Henderson County.

#### **Summary:**

- The water level in the subdivision tank is normally full and is regulated by a pressure switch set near the critical water level (fire demand), but was modeled as half full. Once the water level reaches the critical level, the pressure switch signals the pumps in pump station #1 to start and provide water from the main 1.5 million gallon tank
- A signal is then sent to the motor controls in pump station (#2) to turn on and draw the water from pump station (#1) and draw water through the transmission line to pump station (#2).
- A signal is then sent to the motor controls in pump station (#3) to turn on and draw the water from pump station (#2) and draw water through transmission line to pump station (#3).

- Once the water reaches pump station (#3), it is then pumped through the transmission line to the 107,000-gallon subdivision tank located at an elevation of 3,812 feet (half full).
- Water in the 1.5 million gallon tank is provided by a direct connection to the City of Hendersonville Municipal Water System.

### **Domestic Demand**

The proposed subdivision water tank was sized to provide capacity of 47,000 gallons per day for domestic demand at final build-out of 235 gallons per minute for 250 proposed single/multi-family homes. The calculated tank size was obtained by adding the projected maximum domestic demand to the required 60,000 gallon fire demand for a total of 100,000 gallons, however, due to the expected part-time occupancy of most of the lots, the size of the subdivision tank was chosen from a standard size (107,000 gallon) as provided by the manufacturer and requested by the City of Hendersonville in an effort to help turn the water over more readily under low demand conditions through the build-out process.

### **Fire Demand**

The proposed 107,000-gallon tank is sized to provide capacity of 60,000 gallons for fire demand at 500 gallons per minute for 2 hours of fire flow. In the event that the demand drops below the level for adequate flow, the pressure switch will send a signal to the (3) pump station pumps to cut on and to provide additional flow to maintain water levels in the 107,000-gallon tank.

### **Subdivision Service**

Water from the subdivision tank will provide domestic and fire demands through a dedicated draw system of 8", 6", and 2" main lines that will be gravity fed from the subdivision tank to services and hydrants located throughout the proposed subdivision. The water system within the subdivision has been designed to provide a demand of 235 gallons per minute at total build-out. The calculated demands for the Phase I portion of the subdivision show a domestic demand of 94 gallons per minute at 42.36 psi at the most hydraulically deficient point and a fire demand of 500 gallons per minute at 28.86 psi at the most hydraulically deficient point in the system. The main draw line from the tank to the first significant demand point is proposed as 8" to assure adequate pressure during fire flow conditions at the further most hydrant in the future Phase 2 system. The remaining water lines were designed to be 6" main lines with the last 1,000 feet to be 2" to help reduce the cost of the system. Fire hydrants were provided on all mains greater than 2" to provide fire protection to all of the proposed lots within Phase I. Fire hydrants are located within 1,000 feet of all lots, with the exception of the extreme eastern lots on Snow Ridge Drive.

### **Pressure system**

Water service within the subdivision will be provided from the tank to all lots with an elevation of less than 3,753 feet. Lots with an elevation greater than 3,753 feet will be provided service from a pressure system pump station (PS#4) located near the proposed subdivision tank. The proposed pressure system will draw water from the subdivision tank and service the lots with a calculated demand of 63.5 gallons per minute at a minimum pressure of 40psi. The pumps will have a cut-in @ 40psi and a cut out @65psi. The pump station (PS#4) will consist of duplex pumps operated by variable frequency drives to control the variable demands. The effective storage volume of the tanks at the proposed pressure range (45-65psi) will be 168 gallons,

which will provide a minimum run time of two (2) minutes. Service lines from the pressure system shall be 4" to provide effective demand with minimal head loss throughout the system.

**Addendum to Engineer's Report  
Proposed Water Line Improvements  
For  
Grand Highlands at Bearwallow Mountain  
Henderson County, North Carolina**

The proposed project is an extension of the existing public water distribution system owned and maintained by The City of Hendersonville Water and Sewer Department. The project will include approximately 1,817 lf of 8" DIP waterline, 28,480 lf of 6" DIP waterline, 3,100 lf of 4" C900 DR14 PVC waterline, 8,218 lf of 2" SDR 13.5 PVC waterline, 1-107,000 gallon Aquastore water tank, 3 water lift pump stations, 1 pressurized water distribution system, 22-6" gate valves and boxes, 10-2" gate valves and boxes, 1-6" blow-offs, 9-1" air release valve assemblies, 18-2" post flush hydrants, 12 fire hydrant assemblies, 95-5/8" water meter assemblies, and all appurtenances necessary to serve the Phase I portion of the proposed subdivision.

This project entails connecting to the existing public water system located on Bearwallow Mountain Road in Henderson County. The proposed water system extension will provide domestic service and fire protection for the proposed single/multi-family development.

Existing water systems

An existing 16" water line from a proposed 1.5 million gallon municipal water tank (by the City of Hendersonville) located on the shoulder of Bearwallow Mountain Road in Hendersonville, NC which is owned and maintained by The City of Hendersonville Water and Sewer Department

Name and address of the applicant

Summerset, Inc.  
Dean Anderson and Scott Shirley, Managing Members  
512 North Main Street  
Hendersonville, NC 28792

Description of future service areas

The proposed water line extension is to provide both domestic and fire service for the proposed single/multi-family subdivision known as Grand Highlands at Bearwallow Mountain. Water service for the future phases within the subdivision will also be served by The City of Hendersonville.

Financial Considerations

NA

Present and anticipated water demand

The anticipated **total** domestic water demand at build out of 250 residential units for the development is approximately 47,000 GPD with a peak demand of 235 GPM.

Source of supply

NA

Agreements to purchase water

NA

Useful life of sources

Proposed improvements are to be constructed of ductile iron with a design life of 50 years.

Demand

The anticipated domestic water demand for the development is approximately 47,000 GPD with a peak demand of 94 GPM for the Phase I portion of service connections. A fire flow storage of 60,000 gallons will be maintained at all times within the subdivision tank.



Existing System Expansion Considerations

The City of Hendersonville operates a 12 MGD water treatment facility with an average demand of 7.2 MGD and an average daily peak of 9.5 MDG (for the year).

Existing Pressure and Flow at the Point of Connection

The proposed dedicated fill line that will follow Bearwallow Mountain Road to make a final connection to the proposed 107,000 gallon will be turned over to the City of Hendersonville with the agreement that the line shall only serve as a high pressure transmission line to transfer water from the 1.5 million gallon municipal water tank to the proposed subdivision tank located within the Grand Highlands project.

The calculated pressures at the most deficient points in the system (for peak daily domestic demands) in the development for fire flow and domestic flow conditions are **28.86 PSI** while flowing **500 GPM** and **42.36 PSI** while flowing **94 GPM**.

Identification of service area

The proposed service area is 406.6± acres.

Description of area

The property is 406.6± acres in size and is located in Henderson County, off of Bearwallow Mountain Road.

Considerations to Alternatives

NA

Population trends

NA

Present and future yield from supply

NA

Proposed water treatment processes

NA

Design basis of the source, treatment and distribution systems

NA

Prioritized list of infrastructure improvements

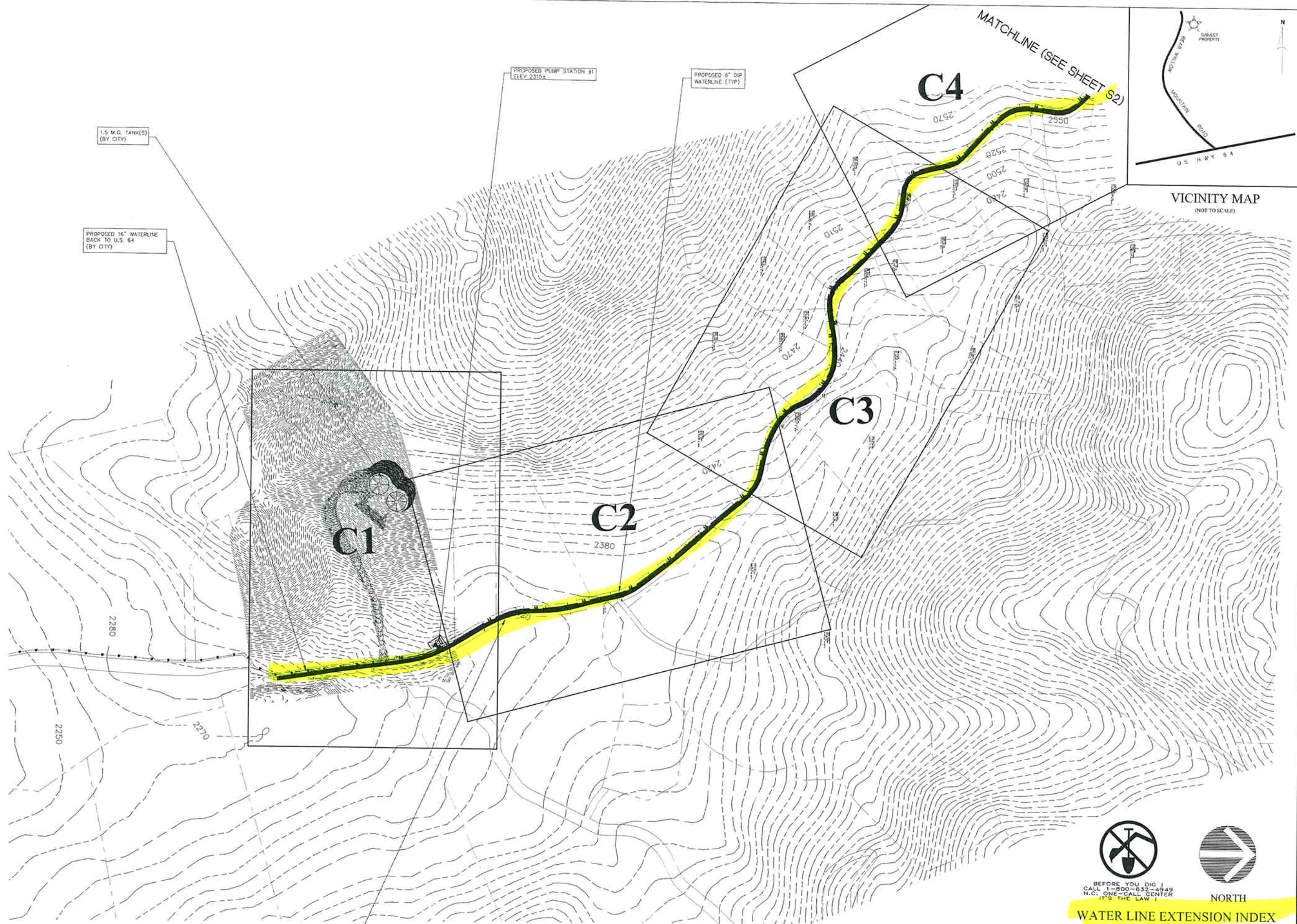
NA

The above information is believed to be accurate for the proposed development entitled **Grand Highlands at Bearwallow Mountain** as designed and specified in the construction documents entitled Water Extension Plans prepared by **Mark Cathey, P.E.** of Civil Design Concepts, Inc. and dated **March 23, 2007**.

\_\_\_\_\_  
Engineer's Signature

\_\_\_\_\_  
Engineer's Seal & Date





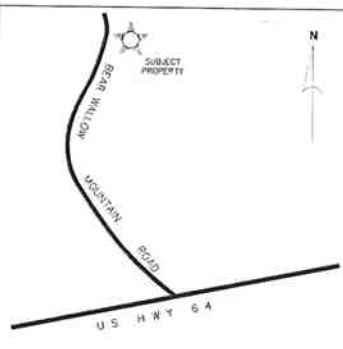
1.5 M.G. TANK(S)  
(BY CITY)

PROPOSED 16" WATERLINE  
BACK TO U.S. 64  
(BY CITY)

PROPOSED PUMP STATION #1  
ELEV. 2315±

PROPOSED 6" DIP  
WATERLINE (TYP)

EXISTING BEARWALLOW  
MOUNTAIN ROAD  
(SR 1594)



BEFORE YOU DIG  
CALL 1-800-832-4349  
N.C. ONE-CALL CENTER  
(IT'S THE LAW)

**NORTH**

**WATER LINE EXTENSION INDEX PLAN FOR  
GRAND HIGHLANDS AT  
BEARWALLOW MOUNTAIN**

GRAPHIC SCALE  
( IN FEET )  
1 inch = 200 ft.

200 SWANNOGA RIVER RD.  
ASHEVILLE, NC 28805  
PHONE (828) 252-5388  
FAX (828) 252-5385  
www.civildesignconcepts.com



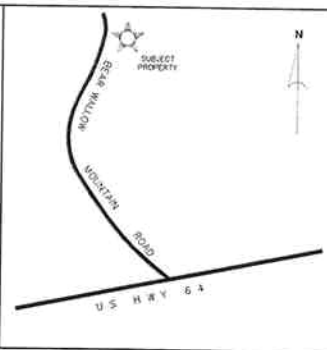
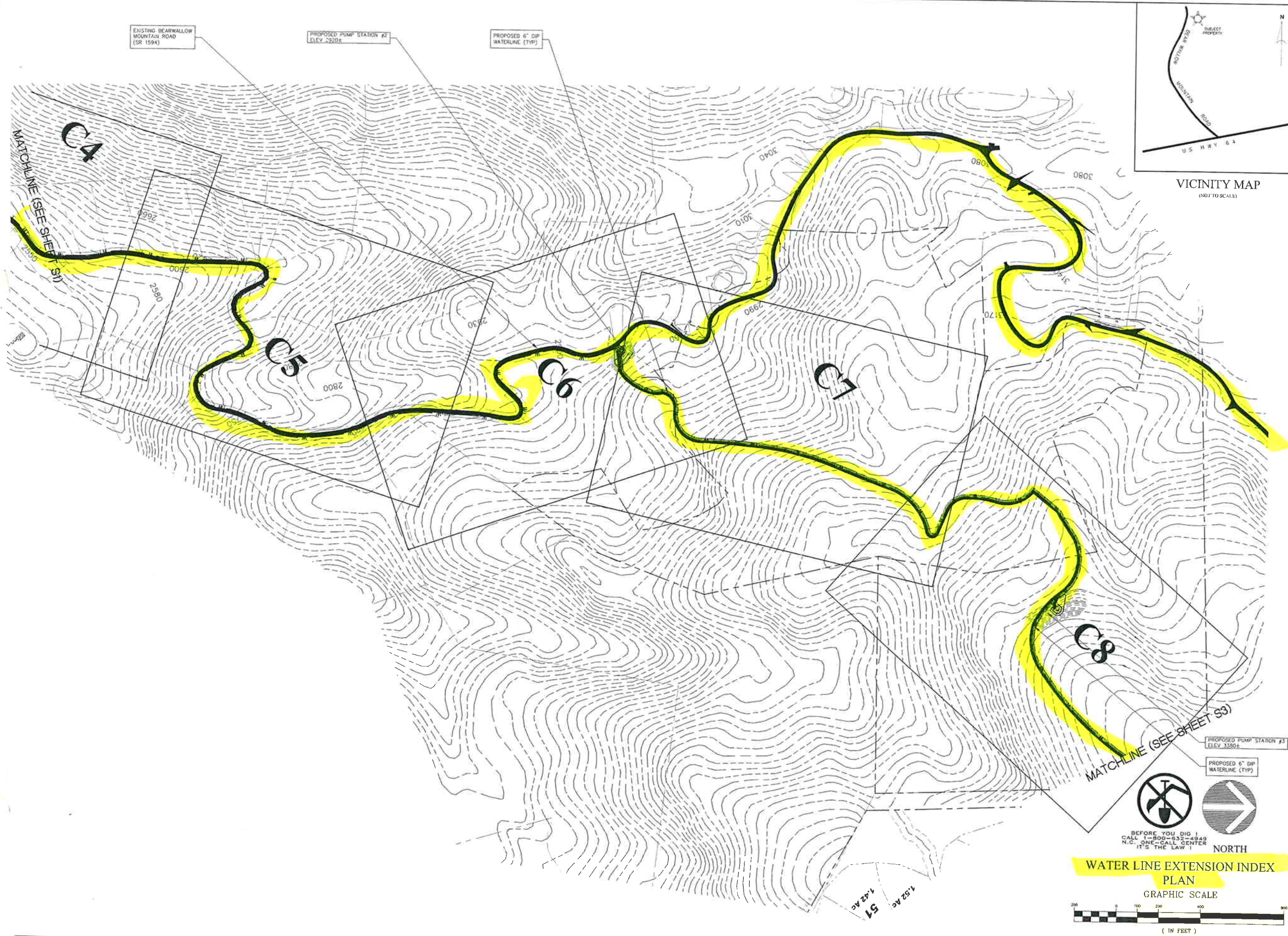
NO.	DATE	DESCRIPTION	BY
1	3-26-07	ADDITIONAL WATER SUBMITTAL	SMR



WATER LINE EXTENSION INDEX PLAN FOR  
**GRAND HIGHLANDS AT  
BEARWALLOW MOUNTAIN**  
SUMMITSET, INC. - HENDERSON COUNTY, NORTH CAROLINA

DATE: OCTOBER 17, 2005  
DRAWN BY: RJC  
CDD PROJECT NO: 10634  
SHEET  
**S1**

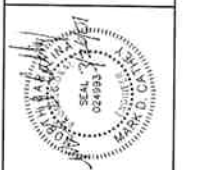




200 SWANNANOVA RIVER RD.  
 ASHEVILLE, NC 28805  
 PHONE (828) 252-6886  
 FAX (828) 252-5965  
 www.civildesignconcepts.com

**CDC**  
 CIVIL DESIGN CONCEPTS, PA

NO.	DATE	DESCRIPTION	BY
1	3-29-07	WATER LINE EXTENSION INDEX PLAN FOR GRAND HIGHLANDS AT BEARWALLOW MOUNTAIN	



WATER LINE EXTENSION INDEX PLAN FOR  
**GRAND HIGHLANDS AT BEARWALLOW MOUNTAIN**  
 SUMNERGILT, INC. - HENDERSON COUNTY, NORTH CAROLINA

DATE: OCTOBER 17, 2006  
 DRAWN BY: WJS  
 CDC PROJECT NO.: 10634

SHEET  
**S2**

PROPOSED PUMP STATION #3  
 ELEV. 3380E

PROPOSED 6" DIP WATERLINE (TYP)

**BEFORE YOU DIG 1 CALL 1-800-632-4848 N.C. ONE-CALL CENTER IT'S THE LAW 1**

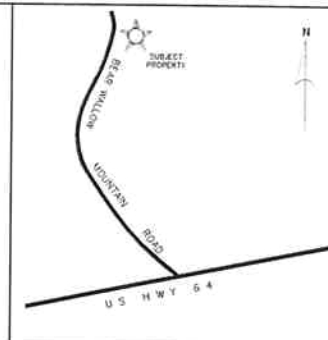
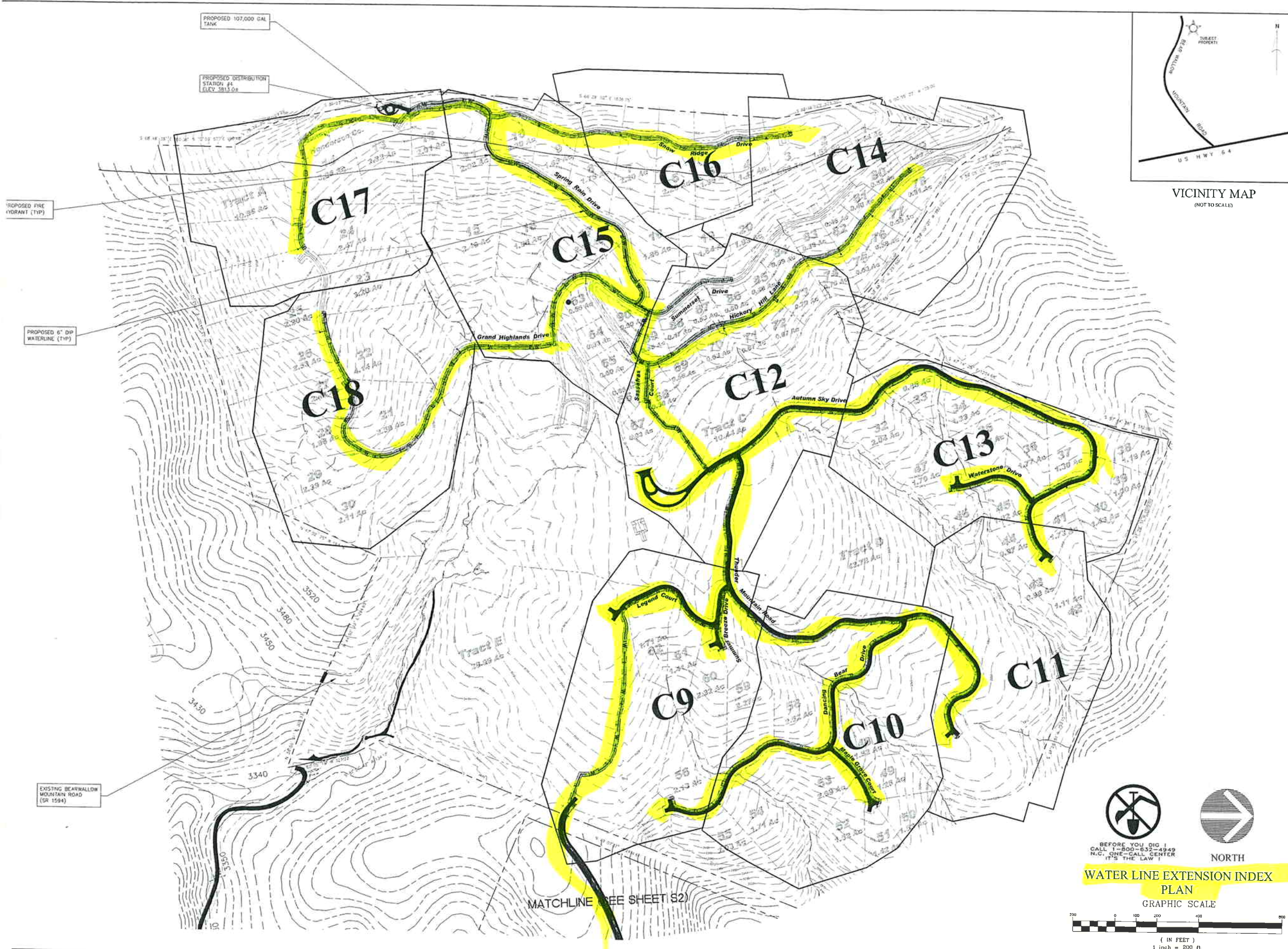
**WATER LINE EXTENSION INDEX PLAN**

GRAPHIC SCALE

( IN FEET )  
 1 inch = 200 ft

1.52 AC  
 1.42 AC  
 S1

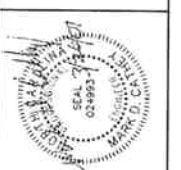




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 FAX (828) 252-5365  
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**CDC**  
 CIVIL DESIGN CONCEPTS, PA

NO.	DATE	DESCRIPTION	BY
1	11-26-07	NEEDHAM WATER SUBMITTAL	SRP



WATER LINE EXTENSION INDEX PLAN TYP.

**GRAND HIGHLANDS AT BEARWALLOW MOUNTAIN**

SUMMERSET, INC. - HENDERSON COUNTY, NORTH CAROLINA

DATE: OCTOBER 17, 2008  
 DRAWN BY: JWG  
 PROJECT NO: 10654  
 SHEET

**S3**

BEFORE YOU DIG  
 CALL 1-800-632-4949  
 N.C. ONE-CALL CENTER  
 IT'S THE LAW!

**NORTH**

**WATER LINE EXTENSION INDEX PLAN TYP.**

**PLAN**

GRAPHIC SCALE

( IN FEET )  
 1 inch = 200 ft