

3031665

LAKE PROFESSIONAL ENGINEERING SERVICES, INC.

CONSULTING ENGINEERS

P.O. Box 27

Camdenton, Mo. 65020

JAMES O. JACKSON, P. E.

573-881-0508

BOWDEN CAMPBELL, EIT 573-480-7100

FILED

APR 02 2007

November 22, 1998

Mr. Breck E. Summerford, P.E.
Chief, Engineering and Compliance Section
Public Drinking Water Program
P.O. Box 176
Jefferson City, MO 65102

Missouri Public
Service Commission

FULSON RIDGE Exhibit No. 78

Case No(s) LX-2006-0087/WO-2007-
Date 3-2-07 Rptr JF oen

RE: Your Letter of November 19, 1998, Review No. 31182-98

Dear Mr. Summerford:

As indicated in my letter of November 17, 1998 the developers at Big Island Home Owners Association have started installing water and sewer lines. The part of the lines have been installed in the same trench although the construction permit for the water system has not been approved. The application for the sewer system has come off the 30-day list and should be issued at any time. The developers decided to proceed with the water and sewer line construction in order to take advantage of the good weather and so the lines will be in before winter arrives. Also, the developers had a good bid from a local contractor that they wanted to take advantage of.

The original plans called for the water line to be placed on one side of the Camden County lake road and the sewer on the other side of the road. However, several problems have surfaced and the developers and the contractor decided to place the lines in the same trench. The problems encountered are as follows:

1. The lake road is very narrow and the construction equipment would cause the road to be completely close in several places during construction.
2. The Camden County Road Department wanted the lines to be off the road surface and outside the ditch line.
3. The right of way on the lakeside of the road is very close to the roadway and for the lines to be constructed on the lakeside of the road the developers and contractor would have to have tried to obtain easements from the owners. In some places this would have been impossible because there are garages and other existing structures in place and it would not have been possible to move off the right of way.
4. The road is cut into the hillside and a good portion of the road sets on solid rock.
5. The developers own the land on the side opposite the lake (and existing homeowners). They were willing to furnish an easement for the construction of the water and sewer lines.
6. The area where the sewer and water lines have been and are to be constructed is almost entirely in solid rock.

Date Rec'd 11-23-98 Plan # 31182-98
Public Drinking Water Program
Division of Environmental Quality

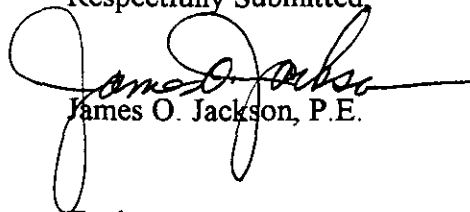
Based upon the above problems the developer and contractor decided to install the water and sewer lines in the same trench to minimize the amount of rock that would have to be removed. The developers have a copy of your letter of November 19, 1998 and as directed they have stopped construction and infact, have removed the construction equipment from the development. Work will not start up again until the construction permit is received.

The developers are sorry for the trouble caused by their starting construction with out a permit and for having to place the lines in the same trench. They are respectfully requesting that the permit be issued for the construction of the lines in the same trench, including the lines already constructed.

As requested in your letter a new plan sheet is being forwarded showing the requested construction of the lines in the same trench. Sheets 2 and 4 are the only ones changed. Sheet 3 did not change since no changes were requested in the well and storage plans. Two sets of the revised plans are provided.

Thank you for your time and consideration concerning this matter. If there are any additional questions please feel free to contact me.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "James O. Jackson", with a long horizontal stroke extending to the right.

James O. Jackson, P.E.

Enclosures

LAKE PROFESSIONAL ENGINEERING SERVICES, INC.

CONSULTING ENGINEERS

P.O. Box 27

Camdenton, Mo. 65020

JAMES O. JACKSON, P. E. 573-480-0508 - BOWDEN CAMPBELL, EIT 573-480-7100
573-873-3898

RECEIVED

NOV 19 1998

PUBLIC DRINKING WATER
PROGRAM

November 17, 1998

Mr. Breck E. Summerford, P.E.
Chief, Engineering and Compliance Section
Public Drinking Water Program
P.O. Box 176
Jefferson City, MO 65102

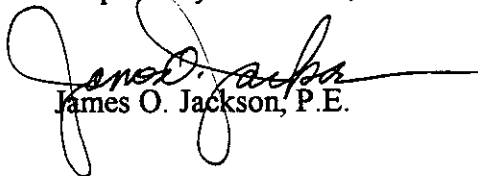
RE: Big Island Home Owners Association, Review No. 31182-98

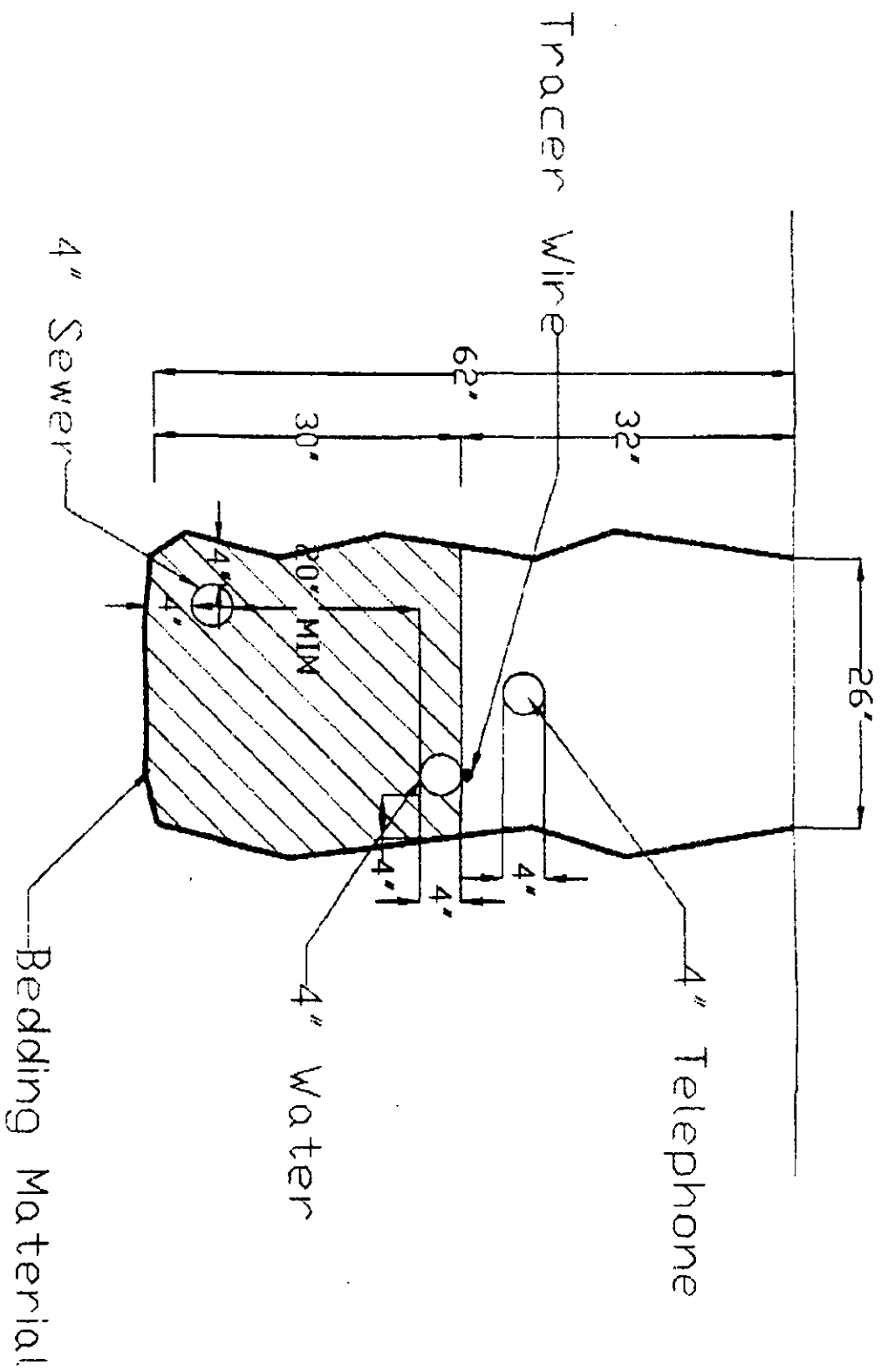
Dear Mr. Summerford:

Attached is a copy of the drawing furnished the Jefferson City Regional Office concerning how the water and sewer lines have been constructed in the same trench. You also asked for the amount of line already installed and that figure is 4600'. As I indicated to you on the telephone yesterday, I will be glad to furnish any additional information to you, at any time.

I there are any questions please feel free to contact me.

Respectfully Submitted,


James O. Jackson, P.E.



TRENCH DETAIL

Not To Scale



Engineers · Architects · Surveyors

TRANSMITTAL

Crowley, Wade, Milstead, Inc.

3200 South M-291 · Independence, Missouri 64057 816-373-4800 Fax 816-373-4803

Project No.: WA 2190.01

Date 13 NOVEMBER

TO: BRECK SUMMERFORD, PE, CHIEF
ENGINEERING AND COMPLIANCE
PUBLIC DRINKING WATER PROGRAM
205 JEFFERSON STREET
JEFFERSON CITY, MO 65101

RE: ENGINEERING REVIEW FOR DNR
REVIEW NO. 31182-98
CAMDEN CO.

WE ARE FORWARDING TO YOU

- | | | |
|---|---------------------------------------|---|
| <input type="checkbox"/> Estimates | <input type="checkbox"/> Proposals | <input type="checkbox"/> Specifications |
| <input type="checkbox"/> Plans | <input type="checkbox"/> Prints | <input type="checkbox"/> Submittal Data |
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Samples | <input type="checkbox"/> Diskettes |
| <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Change Order | <input type="checkbox"/> |

Number of copies	Date or Dwg No	Description
1		APPROVAL LETTER (SIGNED AND SEALED)
1		APPLICATION FOR A CONSTRUCTION PERMIT
1		LETTER FROM DNR TO OWNER
1		HYDRAULICS
1		ENGINEERING REPORT
1		PLANS AND SPECIFICATIONS

THESE ARE TRANSMITTED

- | | | | |
|---|-----------------------------------|-------------------------|---|
| <input type="checkbox"/> For Approval | <input type="checkbox"/> Resubmit | copies for review | <input type="checkbox"/> No exceptions taken (NE) |
| <input type="checkbox"/> For your use | <input type="checkbox"/> Submit | copies for distribution | <input type="checkbox"/> Make corrections noted (MCN) |
| <input type="checkbox"/> As requested | <input type="checkbox"/> Return | corrected prints | <input type="checkbox"/> Rejected see remarks (RSM) |
| <input type="checkbox"/> For review and comment | <input type="checkbox"/> | | <input type="checkbox"/> Amend and resubmit (AR) |

REMARKS:

Copies to:

Crowley, Wade, Milstead, Inc.

BY J. KENNETH ZELK, PE sa

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Mid Carnahan, Governor • Stephen M. Mahood, Director

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

(AR) Camden Co.
(Big Island Subd.)
Review No. 31182-98
PWS ID #MO 3031265

November 4, 1998

Mr. David Lees
Big Island Home Owners Association
HCR 67 Box 800
Roach, Missouri 65787

Dear Mr. Lees:

We are advising that detailed plans, specifications and an engineering report for a new well, storage tanks and a water distribution system for Big Island Subdivision, Camden County, Missouri, were submitted by Lake Professional Engineering Services, Inc., consulting engineers, Camdenton, Missouri, on October 13, 1998. Please make reference to Review Number 31182-98 when submitting documents pertinent to this proposal.

In an effort to further expedite our permit review process, these documents will be carefully reviewed as soon as possible by our contracted PRIVATE CONSULTANT. Our consultant will process the documents and discuss possible changes or necessary additions to the submittal with your engineers.

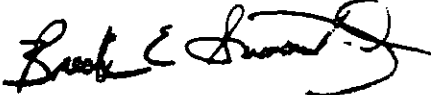
Regulations provide that our approval of the project must be secured in writing before construction work is started. This approval is your assurance that the proposed work complies with requirements of this Division.

You will receive copies of our report and approval of the documents for the proposed work, and this report will serve as your authorization to award contracts and begin construction.

Please be advised, this facility may be required to obtain other permits from the Water Pollution Control Program. It is your responsibility to insure that any and all necessary permits for this facility have been obtained. You should apply directly to that program for any necessary permits.

Sincerely,

PUBLIC DRINKING WATER PROGRAM



Breck E. Summerford, P.E., Chief
Permits Section

BES:cbt

c: Lake Professional Engineering Services, Inc.
Jefferson City Regional Office
Big Island Home Owners Association, Inc.
DGLS

60M
11-5-98
OK



MISSOURI DEPARTMENT OF NATURAL RESOURCES
PUBLIC DRINKING WATER PROGRAM
APPLICATION FOR A CONSTRUCTION PERMIT

P.O. BOX 176
JEFFERSON CITY, MO 65102

DNR USE ONLY

REV. NO.	3182-98
DATE RECD.	10-13-98
DATE APPD.	

INSTRUCTIONS

- Please type or print in ink.
- A completed and signed application form must accompany each set of plans and specifications that is submitted to the department for review and approval.
- No fee is required for a construction permit.
- Please direct inquiries to the above address or call (573) 751-5924.

1. NAME OF PROJECT (TYPE OF CONSTRUCTION, FOLLOWED BY EITHER THE NAME OF DEVELOPMENT, CITY, WATER DISTRICT OR OTHER.)

BIG ISLAND HOME OWNERS ASSOCIATION, INC.

NOTE FOR NUMBER 2 ► FOR A SOLE PROPRIETORSHIP - THE NAME OF THE PROPRIETOR, FOR A CORPORATION - THE NAME OF AN OFFICER OF AT LEAST THE LEVEL OF A PLANT MANAGER; FOR A PARTNERSHIP - THE NAME OF A PRINCIPAL PARTNER; FOR A CITY, STATE, FEDERAL OR OTHER PUBLIC FACILITY - THE NAME OF EITHER A PRINCIPAL EXECUTIVE OFFICER OR A RANKING PUBLIC OFFICIAL.

2. OWNER OR OFFICIAL CUSTODIAN

BIG ISLAND HOME OWNERS ASSOCIATION, INC.

TELEPHONE NUMBER

303 776 1003

ADDRESS 90 REGGIE GOLDEN
P.O. BOX 328

CITY LONGMONT

STATE CO

ZIP CODE 80501

3. LIST OF DOCUMENTS SUBMITTED (CHECK APPROPRIATE BOX OR BOXES. TWO SETS ARE REQUIRED FOR EACH DOCUMENT.)

- | | |
|--|--|
| <input checked="" type="checkbox"/> ENGINEERING REPORT*
IF THE REPORT IS APPROVED, WRITE THE
REVIEW NUMBER OF THE REPORT _____ | <input checked="" type="checkbox"/> HYDRAULICS ANALYSIS*
<input type="checkbox"/> PRODUCT/EQUIPMENT LITERATURE
<input type="checkbox"/> LETTER OF ACCEPTANCE FROM SUPPLY SOURCE
<input type="checkbox"/> OPERATION AND MAINTENANCE MANUAL
<input type="checkbox"/> OTHER (SPECIFY) _____ |
| <input checked="" type="checkbox"/> DETAILED PLANS* | |
| <input checked="" type="checkbox"/> TECHNICAL SPECIFICATIONS* | |
| <input checked="" type="checkbox"/> LAYOUT MAP* | |

*MUST BE AFFIXED WITH THE PROFESSIONAL ENGINEER'S SEAL

4. PROJECT IS FOR

- ☒ DEVELOPMENT OF NEW WATER-SUPPLY SYSTEM
☐ MODIFICATION OF EXISTING WATER-SUPPLY SYSTEM

5. SCOPE OF THE PROJECT (DESCRIBE THE PROJECT COMPLETELY. ATTACH ADDITIONAL SHEETS IF NECESSARY.)

CONSTRUCT DEEP WELL - CASE & GROUT TO 350' - 8" CASING - DRILL 250 FEET BELOW CASING. INSTALL 10 H.P. PUMP TO SUPPLY 140 GPM. INSTALL 3 NON PRESSURE TANKS (4,500 GAL EACH) & 6 PRESSURE TANKS (350 GAL EACH) - USE CENTRIFUGAL PUMP TO FEED PRESSURE TANKS - INSTALL 7,950' OF 4" LINES AND 5,450' OF 3" LINE. INSTALL 3 - 3" VALVES & 9 - 4" VALVES - INSTALL CLEANOUTS ON EACH END OF LINE. PLACE CLEAN OUT ON EACH END OF LINE. PROVIDE STUBOUTS & VALVES FOR HOUSES. BUILD WELL HOUSE

6. LOCATION OF PROJECT: U.S. GEOLOGICAL SURVEY LOCATION NW x SW x SECTION 6 T 38N R 17W
CAMDEN COUNTY, MISSOURI

MAILING ADDRESS (IF OUTSIDE CITY BOUNDARIES, INCLUDE NAME OF NEAREST CITY.)

STATE HIGHWAY AA, ROACH, MO.

7. PROPOSED WATER-SUPPLY SOURCE

- ☒ WELL OR WELLS
☐ STREAM, RIVER, LAKE, OR RESERVOIR (TWO-STATE TREATMENT IS REQUIRED)
☐ EXISTING WATER-SUPPLY SYSTEM

IDENTIFICATION NUMBER _____

NAME OF OWNER OR OFFICIAL CUSTODIAN _____

ADDRESS _____

CITY _____

STATE _____

ZIP CODE _____

TELEPHONE _____

LINE SIZE AT POINT OF CONNECTION _____

AVAILABLE FLOW AND PRESSURE _____

- ☐ OTHER (SPECIFY) _____

LAKE PROFESSIONAL ENGINEERING SERVICES, INC.

CONSULTING ENGINEERS

P.O. Box 27

Camdenton, Mo. 65020

JAMES O. JACKSON, P.E.

573-480-0508

- BOWDEN CAMPBELL, EIT

573-480-7100

573-873-3898

September 30, 1998

Mr. Steve Jones, P.E.
Jefferson City Regional Office
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102



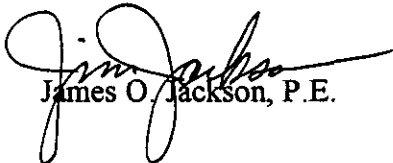
RE: Construction of Deep Well at Big Island Subdivision

Dear Mr. Jones:

Attached are two copies of the Application For a Construction Permit, the engineering report, detailed specifications (including a layout map), calculations and a map showing the location of the project. This project will furnish water for 80 lots. There is land available for future expansion and an application will be made when the well pump and/or water lines are expanded.

If you have any questions please feel free to contact me.

Respectfully Submitted,


James O. Jackson, P.E.

Enclosures

Date Rec'd 10-13-98 Plan # 31182-98
Public Drinking Water Program
Division of Environmental Quality

RECEIVED
OCT 13 1998
PUBLIC DRINKING WATER
PROGRAM

31182-98



MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
INVENTORY PUBLIC WATER SYSTEM RECORD - FORM #1

Proposed

- ☐ NEW PWS
☐ REACTIVATE PWS
☐ CHANGE PWS
☒ PROPOSED PWS

PWS ID NUMBER 3031265	PWS NAME BIG Island SUBDIVISION
COUNTY CAMDEN Co.	R.O. 3

ACTIVITY STATUS:

- ☐ A - Active 1 0 1 3 1 9 9 8
M M D D C C Y Y
- ☐ D - Deactivate 1 0 1 4 1 9 9 8
M M D D C C Y Y

PWS TYPE:

- ☒ C - Community
☐ P - Non-transient non-community
☐ N - Non-community

FACILITY TYPE: 0 3 (See Table 1)SERVICE AREA - Primary: _____
(See Table 2) Other: _____

OPERATION LEVEL: _____ (A, B, C, D, E, or X)

OWNERSHIP TYPE:

- ☐ 1 - Federal Government
☒ 2 - Private
☐ 3 - State Government
☐ 4 - Local Government

OTHER GOVERNMENT AGENCY: _____
(See Table 3)DATE SYSTEM BEGAN: / /
M M D D C C Y YSEASON-BEGIN/END: / ← Blank
thru / ← Blank
M M D D C C Y YOPERATING PERMIT: / /
M M D D C C Y Y

SOURCE CATEGORY

- ☒ P - Primary
☐ S - Secondary
☐ B - Both

SOURCE TYPE

- ("M" for major, A for additional)
☐ 1 - Steam
☐ 2 - Impoundment
☒ 3 - Well (cons)
☐ 4 - Well (uncons)
☐ 5 - Secondary

PERCENTAGE SOURCE TYPE:

- _____ % Surface
_____ % Ground
_____ % Purchased Surface
_____ % Purchased Ground

SYSTEM ADDRESS - NOTE: USE LOCATION SUCH AS STREET, RT., ETC.

ADDRESS BIG Island Home Owners Association			
ADDRESS HCR 67 Box 800			
CITY ROACH	STATE MO	ZIP CODE 65787	TELEPHONE NUMBER ()

GEOGRAPHIC AREA(S) SERVED	
COUNTY	CITY/AREA SERVED
029	BIG Island SUBDIVISION

SIGNATURE	DATE

11-2-99

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Michael J. Givens • Stephen M. Mathias, Director

DIVISION OF GEOLOGY AND LAND SURVEY

P.O. Box 250 • 111 Fairgrounds Rd. Rolla, MO 65402-0250

(573) 368-2100

FAX (573) 368-2111

June 3, 1998

Mr. David Lees
c/o Willie Harker
HCR 67, Box 800
Roach, MO 65787

Camden County
NE SE Sec. 1, T38N, R18W
Big Island Estates (community well)

Dear Mr. Lees:

This letter is regarding your request for information, through Lake Professional Engineers, concerning a community (public) well at the above location in Camden County.

Since this well is to be a public water supply well, construction of the well must conform to the standards of the Division of Environmental Quality, Department of Natural Resources as outlined in their publication Design Guide for Community Public Water Supplies 10 CSR 60-3, 10 CSR 60-10.

One requirement of the Department of Natural Resources' Division of Environmental Quality is that the engineer's plans and specifications for water works projects be submitted to them for their review and approval before the start of construction. If the completed project does not conform to the published standards, a Permit of Approval cannot be issued as provided for in Part VI, Book V of the Sanitary Code, a part of the Regulations developed under Section 640.115 - 10 CSR 60 - 10.010, Revised Statutes of Missouri.

Copies of the Regulations and Design Standards are available upon request from the Division of Environmental Quality, Public Drinking Water Program, Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102.

One other requirement for such a water supply is that the well casing depth be determined by this office. The required casing depth for a well at this location is estimated to be 350 feet, into the Eminence Dolomite. This is based on a surface elevation of 760 feet above sea level. To help in establishing a final approved casing depth, rock cuttings must be submitted to the total depth of the well. In this instance it could be to your advantage to have a "pilot hole" drilled to total depth before casing is set and grouted. In this way, the casing depth could be approved with good data and you would be assured that no surprises would occur below the final casing depth. The casing (19 pound or equivalent weight per foot for a 6 inch hole, for example) must be placed into a drill hole that is a nominal four (4) inches larger in diameter, and then pressure grouted (Haliburton method or equivalent). Once the grouting is complete, operations must be

Date Rec'd. 10-13-98 Plan # 31182-98
Public Drinking Water Program
Division of Environmental Quality

Mr. David Lees
Big Island Estates (community well)
Page 2
June 3, 1998

suspended for a minimum period of seventy-two (72) hours. Pressure grouting of the casing is to be witnessed by DNR/Regional Office personnel in Jefferson City (please give 48 hours notice of intent to grout).

A total drilled depth of 600 feet, which should be near the base of the Eminence/Potosi Dolomite and possibly into the Derby Doerun Dolomite, should furnish you with approximately 150 gallons of water per minute. If the desired yield is not obtained at this total depth, you may be able to obtain additional yield by drilling deeper or by acidizing the well.

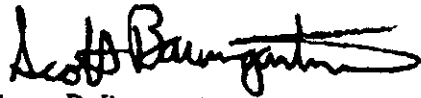
Persons in Missouri with a well or wells capable of producing at least 100,000 gallons per day (70 gallons per minute) are required to register as major water users. Since the proposed well will be capable of producing that amount, it will be necessary for the well owner to file a form each year showing water use for the preceding year. A form and instructions are enclosed for your convenience. Should you have any questions concerning this form or the purpose of identification of high-yield wells, please feel free to contact Ms. Jeanette Barnett at (573)368-2188 or at this letterhead address.

Since passage of the Water Well Drillers Act (RSMo 256.600, effective October 1, 1986) it is a legal requirement that all water wells be drilled and pumps installed by persons permitted by the Department of Natural Resources' Division of Geology and Land Survey. It is in your best interests to contract with a permitted water well driller/pump installer to complete your well installation. The law also requires that all new wells (or old wells that need major reconstruction) must be registered and a Water Well Record completed on each well. A \$35.00 fee, which is to be paid by the well owner, must accompany the completed form. The well driller and well owner must sign the form, and a copy returned to this office by the well driller. You will receive a tag and a card with a registration number upon our receipt of the form and fee.

When I may be of further assistance, please do not hesitate to contact me.

Sincerely,

WATER RESOURCES PROGRAM



Scotty D. Baumgartner
Hydrologist
Groundwater Geology Section
(573)368-2190



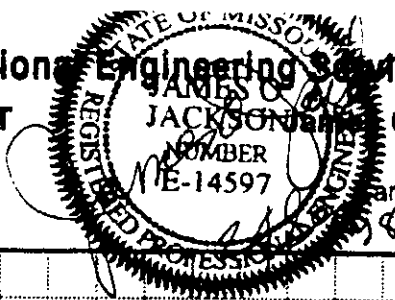
June 3, 1998

SD8/sh

c. Jerry Lane, DEQ/PDWP
DNR/Jefferson City Regional Office
Jeanette Barnett, DGLS/Major Water Users
James O. Jackson, Lake Professional Engineering Services, Inc., P.O. Box 27, Camdenton, MO 65020

LAKE Professional Engineering Services, Inc.

Bowden Campbell, EIT
HCR 30 Box 59
Warsaw, MO 65355
Phone #:



JACKSON, James O. Jackson, P.E.
P.O. Box 27
Camdenton, MO 65020
573-480-0508

PROJECT RIG ISLAND SUBDIV
CAL FOR WATER SYS
SHEET 1 OF 3
CALCULATION BY JOL
DATE 24 SEP 98

GIVEN: TOTAL OF 80 LOTS - MORE MIGHT BE CONSTRUCTED LATER

ASSUME ALL HOMES TO BE 3 B/R

FIND GROSS WATER

$$80 \times 3.7 = 296 = PE$$

WELL TO BE AT ELEVATION 760'

ASSUME ELEVATION OF HIGHEST HOUSE TO BE (TOP FLOOR) = 700'

USE 4" & 3" LINES - TO BE CONSTRUCTED SO THEY CAN BE LOOPEL DURING FUTURE DEVELOPMENT

$$\text{LENGTH 4" LINES} = 7,950'$$

$$\text{LENGTH 3" LINES} = 5,450'$$

$$\text{LOSS IN 4" LINE @ 100 GPM} = 0.54' / 100'$$

$$\text{LOSS IN 3" LINE @ 50 GPM} = 0.51' / 100'$$

$$\text{HEAD LOSS 4" LINE} = 0.54' / 100'$$

$$\frac{7,950}{100} \times 0.54 = 43 \text{ HEAD}$$

$$\text{HEAD LOSS 3" LINE} = 0.51$$

$$\frac{5,450}{100} \times 0.51 = 28 \text{ HEAD LOSS}$$

MAX LOSS IS IN 4" LINE

$$\text{HEAD} = 700 + 43 = 743$$

$$\text{WELL @ 760} \therefore \text{HEAD} = 743 - 760 = -17'$$

Date Recd 10-13-98 Plan # 31182-98
Public Drinking Water Program
Division of Environmental Quality

LAKE Professional Engineering Services, Inc.

Bowden Campbell, EIT

HCR 30 Box 59
Warsaw, MO 65355
Phone #:

James O. Jackson, P.E.

P.O. Box 27
Camdenton, MO 65020
573-480-0508

PROJECT BIG ISLAND WATER

CAL. FOR WATER SYS.

SHEET 2 OF 2

CALCULATION BY JO

DATE _____

SET LOW PRESSURE SWITCH AT 25 PSI

$$\text{HEAD} = 25 \text{ PSI} + \frac{17}{2.31} = 25 \text{ PSI} + 7.4 \text{ PSI} = 32 \text{ PSI}$$

SET HIGH PRESSURE AT 95 PSI \therefore MAX = 52 PSI

OPERATING RANGE FOR UPPER FLOOR = 32 PSI TO 52 PSI

WATER REQUIRED FOR 80 HOUSES

$$80 \text{ HOUSES} \quad PE = 296$$

$$\text{ASSUME } 100 \text{ GPD/PER} = 296 \times 100 = 29,600$$

ASSUME WELL PUMPS @ 100 GPM

$$29,600 / 100 \text{ GPM} = 296 \text{ MIN/DAY} = 4.93 \text{ HRS/DAY}$$

PUMPING

STORAGE WILL BE IN MONTGOMERY METAL CRAFT
TANKS @ 4,500 GAL CAP - NO PRESSURE

DESIGN WELL

WELL @ 760'

$$\text{ASSUME STATIC AT } 125' \quad (760 - 125 = 635')$$

$$\text{ASSUME DRAW DOWN AT } 50' \quad (635 - 50 = 585')$$

$$\text{EST ELEV OF PUMP} = 585' = 225' \text{ BELOW SURFACE}$$

EST TOTAL PUMPING HEAD:

(STORAGE TANKS = 12' HIGH) - VENTED TO AIR

LAKE Professional Engineering Services, Inc.

Bowden Campbell, EIT

HCR 30 Box 59
Warsaw, MO 65355
Phone #:

James O. Jackson, P.E.

P.O. Box 27
Camdenton, MO 65020
573-480-0508

PROJECT BIG ISLAND

CAL. FOR WATER SYS

SHEET 3 OF 3

CALCULATION BY JOJ.

DATE _____

$$12' + 125' + 50' + \text{PIPE LOSSES} = 187' + \text{PIPE LOSSES.}$$

100 GPM AT 187' HEAD

USE RED JACKET PUMP

140 GPM SERIES "H.B." PUMPS

INSTALL 10 HP - 1 HB

AT 190' HEAD PUMPS \approx 140 GPM

DESIGN STORAGE TANKS:

35 GAL/PER/DAY (MIN STORAGE)

$$296 \times 35 = 10,360 \text{ GAL}$$

TANKS STORE 4,500 GAL

$$10,360 \div 4,500 = 2.3 \text{ TANKS, USE } \underline{\underline{3}}$$

BLADDER TANKS - USE CENTRIFUGAL PUMP WITH 150 GPM CAP.

INSTALL 4X 350 TANKS - WELL-X-TROL BLADDER
PRESSURE TANKS - OPERATING RANGE = 43 GAL/UNIT

$$\text{USE SIX TANKS: } 4 \times 43 = 258 \text{ GAL}$$

GREEN BAY TERRACE QUAD

Date Rec'd 10-13-98
Public Drinking Water Program
Division of Environmental Quality
Plan # 31182-98



STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Mel Carnahan, Governor • Stephen M. Mahfood, Director

DIVISION OF ENVIRONMENTAL QUALITY

P.O. Box 176 Jefferson City, MO 65102-0176

Camden County
Big Island Home Owners Association
Review No. 31182-98
PWS ID # MO 3031265

November 19, 1998

Lake Professional Engineering Services, Inc.
P.O. Box 27
Camdenton, MO 65020

ATTN: James O. Jackson, P.E.

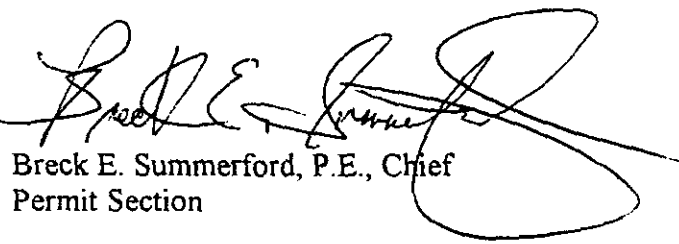
Dear Mr. Jackson:

We are in receipt of your letter dated November 17, 1998 and plan sheet of a trench detail for the water and sewer line construction for the Big Island Home Owners Association, Camden County, Missouri. In cases where it is not practical to maintain a ten foot separation, the department may allow deviation on a case-by-case basis, if supported by data from the design engineer. The supporting data must be provided. Also, any revisions to the plans and specifications must have the seal of a professional engineer affixed.

Please be advised that construction of the water and sewer must be stopped immediately, until such time a construction permit is issued. Should you have any questions with regard to this matter, feel free to give me a call.

Sincerely,

PUBLIC DRINKING WATER PROGRAM



Breck E. Summerford, P.E., Chief
Permit Section

BES:rme

c: City of Osage Beach
Big Island Home Owners Association
Jefferson City Regional Office