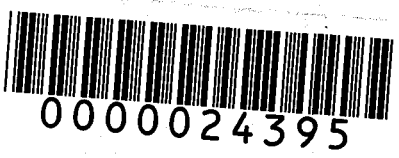

NEW APPLICATION
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AZ CORP COMMISSION
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FENNEMORE CRAIG
A Professional Corporation
Jay L. Shapiro (No. 014650)
Patrick J. Black (No. 017141)
3003 North Central Avenue
Suite 2600
Phoenix, Arizona 85012
Telephone (602) 916-5000

Attorneys for Balterra Sewer Corp.

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF BALTERRA SEWER CORP. FOR A CERTIFICATE OF CONVENIENCE AND NECESSITY TO PROVIDE WASTEWATER SERVICE IN MARICOPA COUNTY, ARIZONA.	DOCKET NO. SW-20403A-05-0586 **APPLICATION FOR CERTIFICATE OF CONVENIENCE AND NECESSITY**

Pursuant to A.R.S. § 40-282 and A.A.C. R14-2-602, Balterra Sewer Corp. ("Applicant"), an Arizona corporation, hereby applies to the Arizona Corporation Commission ("Commission") for an Order granting Applicant a new Certificate of Convenience and Necessity ("CC&N") to provide wastewater service in Maricopa County, Arizona. Applicant intends to provide wastewater service to the Balterra Development ("Balterra"), owned by Fronterra Village, LLC, and the Ruth Fisher Elementary School and the Tonopah Valley High School, both located in the Saddle Mountain Unified School District ("District").

INTRODUCTION

Balterra is an approximately 1,110-acre master planned, mixed-use community that will be constructed in multiple phases in western Maricopa County in the vicinity of 411th Avenue and Camelback Road. The site is bounded by Camelback Road to the north, 395th Avenue to the east, Indian School Road and Interstate 10 to the south and the 415th Avenue alignment to the west. At full build out, Balterra will require water and wastewater services for a maximum of 6,100 equivalent residential units, and 179 acres of commercial/industrial property assembled through a variety of land uses.

. The District's schools are located to the east of Balterra, and south of Indian School Road between 383rd Avenue and Wintersburg Road. The District is currently operating a small wastewater package plant that provides wastewater service to the Ruth Fisher Elementary School and is constructing a new larger wastewater facility to replace the existing and provide service to the new Tonopah Valley High School.

After conducting a preliminary analysis, the District and Applicant have concluded that a public-private partnership in a regional wastewater system for the area will best serve the public interest. Due to its location west of the current metropolitan area, Balterra must be a self-sustaining community, and the infrastructure and facilities necessary to provide both water and wastewater services will have to be properly planned and phased to accommodate development in the area, which includes the development of the District.

The Balterra Water and Wastewater Master Plan ("Plan") was submitted to Maricopa County on July 21, 2005, and is attached hereto as **Exhibit 1**. The Plan includes a general wastewater design report for Balterra. Currently, a portion of the east half of the site is agricultural, while the remainder is vacant and unimproved. The adjacent properties are also vacant and unimproved, with the exception of some agricultural parcels to the east, south and southeast and several commercial properties in the existing Tonopah community located south of Interstate 10 along 411th Avenue. Due to the present lack of urban services, most of the area in the Tonopah/Arlington Area Plan is designated "Rural." However, as noted in the Tonopah/Arlington Area Plan and County Comprehensive Plan, if urban services become available in the area, more intensive land uses would be appropriate.

Balterra is currently served with electric power and telephone service, while water and wastewater services, as well as parks, schools, recreational facilities, etc., are being planned and coordinated by Fronterra Village, LLC. A more detailed master utility analysis is underway to determine the full water and wastewater facilities needed to serve the project, as well as their appropriate locations. Water service is expected to be provided by Water Utility of Greater

Tonopah water company, which serves adjacent properties, or a new water utility company. The Water Utility of Greater Tonopah is presently not certified to provide water for a portion of the area, but it has expressed interest in adding the remainder of Balterra to its certificated service area.

There are no existing wastewater service providers in the area. The wastewater treatment facility is planned to be constructed in phases over time to accommodate the projections presented in the Plan, but the actual timing of the treatment phases will coincide with the wastewater capacity needs of the community. Applicant is in the process of seeking an amendment to the Maricopa Association of Governments' 208 Water Quality Management Plan.

Pivotal Utility Management, LLC, ("Pivotal") is expected to enter into an Operations and Maintenance Agreement with Applicant to provide the operations and management functions of the proposed wastewater treatment facility and related wastewater infrastructure. Pivotal, or its affiliated companies, has operated and managed several Arizona public service corporations, including Pine Meadows Utilities, LLC, Sweetwater Creek Utilities, Bensch Ranch Utilities, LLC, Cross Creek Ranch Water Company and Verde Santa Fe Wastewater Company.

Applicant maintains that by granting the CC&N requested herein, the Commission will: 1) curb the proliferation of wastewater package plants in portions of western Maricopa County; 2) allow the development of a regional wastewater treatment facility and related system to serve residents, commercial enterprise and public schools in an area of high growth; and 3) ensure proper regulation of such wastewater service through Commission oversight intended to serve the public interest.

APPLICATION

In support of this Application, Applicant states as follows:

1. Applicant is a public service corporation formed for the purpose of providing wastewater utility service in Maricopa County, Arizona. The proper name, address and corporate structure for Applicant are attached hereto as **Exhibit 2**.

2. Applicant's Articles of Incorporation and Bylaws are attached hereto as **Exhibit 3**.

3. The area covered by this Application includes approximately 1,170 acres, and will contain approximately 6,100 residences, and 179 acres of commercial properties.

4. A copy of requests for wastewater service from Fronterra Village, LLC and the District are attached hereto as **Exhibit 4**.

5. The type of wastewater infrastructure upgrades, including a new treatment plant, and a general description of the facilities to be constructed is attached hereto as **Exhibit 5**.

6. Applicant's management contact is Joel H. Farkas, Director, whose business address is 6720 North Scottsdale Road, Suite 250, Scottsdale, Arizona 85253. The telephone number is (480) 422-6900.

7. Applicant's operator, certified by the Arizona Department of Environmental Quality, will be Southwest Utility Management, Inc., whose business address is 2102 N. Forbes Blvd., Suite 107, Tucson, Arizona 85745. The telephone number is (520) 623-5172. Applicant's operator shall be provided through an Operations and Maintenance Agreement with Pivotal.

8. Applicant's attorneys are Fennemore Craig, whose address is 3003 North Central Avenue, Suite 2600, Phoenix, Arizona 85012-2913. The individual attorney responsible for this application is Jay L. Shapiro. Mr. Shapiro's telephone number is (602) 916-5366. **All Data Requests or other Requests for Information should be directed to Mr. Bradley A. Simons, with a copy to Mr. Shapiro's attention, on behalf of Balterra Sewer Corp.**. Mr. Simons' address is 6720 North Scottsdale Road, Suite 250, Scottsdale, Arizona 85253. Mr. Simons' phone number is (480) 422-6900.

9. A new rate schedule was developed taking into consideration the estimated costs of constructing facilities needed to serve the Development. A copy and description of the new tariff rate schedule is attached hereto as **Exhibit 6**.

10. The estimated cost for the wastewater system is attached hereto as **Exhibit 7**.

11. A detailed map indicating the area requested by this Application, and legal

descriptions of the properties, are attached hereto as **Exhibit 8**.

12. The manner of capitalization and methods of financing employed by Applicant will include a combination of paid-in shareholder capital contributions, and advances and/or contributions through line extension agreements. Should the Applicant require debt to finance system improvements, a financing application will be filed with the Commission.

13. A general Statement of Financial Condition is attached hereto as **Exhibit 9**.

14. The completion date for construction of the Phase 1 infrastructure improvements is currently estimated to be the first quarter of 2007.

15. The estimated numbers of customers to be served in each of the first five years of wastewater utility service to the area covered by this Application is as follows:

Estimated Number of Residential Customers

1st Year	300
2nd Year	780
3rd Year	1260
4th Year	1970
5th Year	2770

15. Applicant's estimated annual operating revenue and operating expenses for each of the first five years of operation in the new area covered by this Application, is as follows:

Operating Expenses		Operating Revenue	
1st Year	$230,607	1st Year	$75,348
2nd Year	$432,838	2nd Year	$273,729
3rd Year	$525,587	3rd Year	$517,319
4th Year	$755,122	4th Year	$816,198
5th Year	$1,089,533	5th Year	$1,195,447

16. The plant cost projections by year for the next five (5) years is as follows:

Plant Cost Projection

1st Year	$7,279,830
2nd Year	$10,275,456
3rd Year	$13,020,457
4th Year	$17,908,371
5th Year	$24,446,679

17. Water service will be provided to residents within the requested area by the Water Utility of Greater Tonopah, or by a new private water company.

18 Applicant shall obtain all appropriate city, county and/or state agency approvals required to provide wastewater service in the requested area.

19. Arizona Department of Environmental Quality ("ADEQ") Approvals to Construct concerning facilities to serve the requested extension area will be provided to the Commission as soon as Applicant receives them once issued by ADEQ.

20. Applicant is preparing to file an application for an Aquifer Protection Permit with ADEQ for its wastewater treatment plant. A copy of the application will be submitted to Commission Staff once it is filed with ADEQ.

21. An application is being prepared to amend the §208 Water Quality Management Plan amendment with MAG. A copy of the application will be submitted to Commission Staff once it is filed with MAG.

22. Notice of this Application will be given as required by the Commission.

23. For the reasons stated herein, Applicant maintains that this Application is in the public interest and should be granted. There is a present need for regulated wastewater service in order to foster orderly growth in Maricopa County.

WHEREFORE, Applicant respectfully requests the following:

A. That the Commission proceeds to consider and act upon this Application as timely as possible and to schedule a hearing, if necessary, on this matter;

B. That upon completion of said hearing that the Commission enter an Order approving application for a new Certificate of Convenience and Necessity, which shall include the geographic areas requested by this Application as shown in **Exhibit 8**;

C. That the Commission approve the new tariff schedule and rate design as shown in **Exhibit 6**; and

D. That the Commission grant such other and further relief as may be appropriate under the circumstances herein.

DATED this 12th day of August, 2005.

FENNEMORE CRAIG, P.C.

By: _____
Jay L. Shapiro
Patrick J. Black
Attorneys for Balterra Sewer Corp.

ORIGINAL and 13 copies delivered this 12th day of August, to:

Docket Control
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

By: _____

1647090.1/15410.001

EXHIBIT

2

Name: **BALTERRA SEWER CORP.**
Address: 6720 North Scottsdale Road, Suite 250
Scottsdale, Arizona 85253

Corporate Structure:

Joel H. Farkas - Director

EXHIBIT

3

ARIZONA CORPORATION COMMISSION

July 6, 2005

COPY

R NEIL IRWIN ESQ,
BRYAN CAVE LLP
2 NORTH CENTRAL AVE # 200
PHOENIX, AZ 85004

RE: BALTERRA SEWER CORP
File Number: -1210189-8

We are pleased to notify you that your Articles of Incorporation were filed on June 15, 2005.

You must publish a copy of your Articles of Incorporation. The publication must be in a newspaper of general circulation in the county of the known place of business in Arizona (as filed with the Commission) for three (3) consecutive publications. A list of newspapers is available on the Commission web site. An affidavit from the newpaper, evidencing such publication, must be delivered to the Commission for filing within NINETY (90) DAYS from the date of this letter. Make sure the newspaper publishes the corporation documents using the exact name filed with the Commission.

All corporations transacting business in Arizona are required to file an Annual Report with the Commission, on the anniversary of the date of incorporation. Each year, a preprinted Annual Report form will be mailed to the corporation's known place of business approximately two months prior to the due date of the report. Should the report fail to arrive, contact the Commission. It is imperative that corporations notify the Commission immediately (in writing) if they change their corporate address, statutory agent or agent address. Address change orders must be executed (signed) by a corporate officer. Postal forwarding orders are not sufficient.

The Commission strongly recommends that you periodically check Commission records regarding the corporation. The Commission web site www.cc.state.az.us/corp contains information specific to each corporation of record and is a good general source of information.

If you have questions or need of further information, please contact us at (602) 542-3135 in Phoenix, (520) 628-6560 in Tucson, or Toll Free (Arizona residents only) at 1-800-345-5819.

Sincerely,

LINDA SNYDER
Examiner
Corporations Division

CF:04
REV. 01/2004

AZ CORPORATION COMMISSION
FILED

JUN 15 2005 "EXP"

FILE NO -1210189-8

ARTICLES OF INCORPORATION
OF
BALTERRA SEWER CORP.

1. Name: The name of the Corporation shall be BALTERRA SEWER CORP.

2. Purpose: The purpose for which this Corporation is organized is the transaction of any and all lawful business for which corporations may be incorporated under the laws of the State of Arizona, as they may be amended from time to time.

3. Initial Business: The Corporation initially intends to construct, own, operate and maintain a sewer utility company and to engage in any and all activities related thereto.

4. Authorized Capital: The corporation shall have authority to issue ONE THOUSAND (1000) shares of common stock.

5. Indemnification: The Corporation shall indemnify any person against expenses, including without limitation, attorneys' fees, judgments, fines and amounts paid in settlement, actually and reasonably incurred by reason of the fact that he or she is or was a director, officer, employee or agent of the Corporation, or is or was serving at the request of the Corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, in all circumstances in which, and to the full extent that, such indemnification is permitted and provided for by the laws of the State of Arizona as then in effect.

6. Limitation of Liability: No director of the Corporation shall be personally liable to the Corporation or its shareholders for money damages for any action taken or any failure to take any action as a director, except liability for any of the following: (a) the amount of a financial benefit received by a director to which the director is not entitled; (b) an intentional infliction of harm on the Corporation or the shareholders; (c) a violation of section 10-833 of the Arizona Revised Statutes or any successor statute; or (d) an intentional violation of criminal law.

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6/24/05

The limitation of liability provided herein shall continue after a director has ceased to occupy such position as to acts or omissions occurring during such director's term or terms of office, and no amendment or repeal of this Article 6 shall apply to or have any effect on the liability or alleged liability of any director of the Corporation for or with respect to any acts or omissions of such director occurring prior to such amendment or repeal.

7. Known Place of Business. The street address of the known place of business in Arizona is 6720 North Scottsdale Road, Scottsdale, Arizona 85253.

8. Statutory Agent: The name and street address of the initial statutory agent of the Corporation is:

R. Neil Irwin, Esq., Bryan Cave LLP
2 North Central Avenue, Suite 2200
Phoenix, Arizona 85004

9. Board of Directors: The initial Board of Directors shall consist of one (1) director. The name and address of the person who is to serve as director until the first annual meeting of the shareholders or until his successor is elected and qualified is:

Joel H. Farkas
6720 North Scottsdale Road
Scottsdale, Arizona 85253

The number of directors may be increased or decreased from time to time in the manner provided in the Bylaws of the Corporation.

10. Incorporator: The name and address of the incorporator of the Corporation is:

Joel H. Farkas
6720 North Scottsdale Road
Scottsdale, Arizona 85253

Dated: ~~April~~ June 15, 2005.

Joel H. Farkas

502634.1

June 14, 2005 -1210189-8

Arizona Corporation Commission
Incorporating Division
1300 West Washington
Phoenix, Arizona 85007

Ladies and Gentlemen:

The undersigned, having been designated to act as Statutory Agent, consents to act in that capacity until its removal or resignation in accordance with the Arizona Revised Statutes.

R. Neil Irwin, Esq.
Bryan Cave LLP
2 North Central Avenue
Suite 2200
Phoenix, Arizona 85004

BYLAWS

OF

BALTERRA SEWER CORP.

ARTICLE I

OFFICES

1. Known Place of Business. The known place of business of Balterra Sewer Corp. (the "Corporation"), which shall also be known as its principal place of business, shall be at the address so designated in the Articles of Incorporation (the "articles"), or if no address is so designated, at the address of the Corporation's statutory agent as set forth in the articles. The address of the Corporation's known place of business may be changed from time to time by the Board of Directors (the "Board") in the manner provided in the Arizona Revised Statutes and without amending the articles.

2. Other Offices. In addition to its known place of business, the Corporation may maintain offices at such other place or places, either within or without the State of Arizona, as may be designated from time to time by the Board, or as the business of the Corporation may require.

ARTICLE II

SHAREHOLDERS

1. Annual Meeting. The annual meeting of the shareholders shall be held on such date and at such time as shall be designated from time to time by the Board and stated in the notice of the meeting. At the annual meeting, shareholders shall elect directors and transact such other business as may properly come before the meeting. If the election of directors is not held on the day designated herein for any annual meeting of the shareholders, or any adjournment thereof, the directors shall cause the election to be held at a special meeting of the shareholders as soon thereafter as convenient.

2. Special Meeting. Special meetings of the shareholders may be called for any purpose or purposes at any time by the Chairman of the Board, President, a Vice President or the Board. In the event that the Corporation shall have no directors in office, any officer or any shareholder may call a special meeting of shareholders for the purpose of electing at least one director.

3. Place of Meeting. Annual and special meetings of the shareholders shall be held at the principal place of business of the Corporation, unless a different place, either within or without the State of Arizona, is specified in the notice of such meeting, or in the event of a waiver of notice of such meeting, in such waiver of notice.

4. Notice of Meeting. Written notice stating the place, date and hour of the meeting and, in the case of a special meeting, the purpose or purposes for which the meeting is called, shall be delivered to each shareholder of record entitled to vote at such meeting not less than ten (10) nor more than sixty (60) days before the date of the meeting, either personally or by mail, by an officer of the Corporation at the direction of the person or persons calling the meeting. If mailed, notice shall be deemed to be delivered when mailed to the shareholder at his or her address as it appears on the stock transfer books of the Corporation. Notice need not be given of an adjourned meeting if the time and place thereof are announced at the meeting at which the adjournment is taken, provided that such adjournment is for less than thirty (30) days and further provided that a new record date is not fixed for the adjourned meeting, in either of which events, written notice of the adjourned meeting shall be given to each shareholder of record entitled to vote at such meeting. At any adjourned meeting, any business may be transacted which might have been transacted at the meeting as originally noticed. A written waiver of notice, whether given before or after the meeting to which it relates, shall be equivalent to the giving of notice of such meeting to the shareholder or shareholders signing such waiver. Attendance of a shareholder at a meeting shall constitute a waiver of notice of such meeting, except when the shareholder attends for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened.

5. Fixing Date for Determination of Shareholders of Record. In order that the Corporation may determine the shareholders entitled to notice of or to vote at any meeting of shareholders or any adjournment thereof, or to express consent to corporate action in writing without a meeting, or to receive payment of any dividend or other distribution or allotment of any rights, or to exercise any rights in respect of any other change, conversion or exchange of stock or for the purpose of any other lawful action, the Board may fix in advance a record date, which shall not be more than seventy (70) days prior to the date of such meeting or such action, as the case may be. If the Board has not fixed a record date for determining the shareholders entitled to notice of or to vote at a meeting of shareholders, the record date shall be at four o'clock in the afternoon on the day before the day on which notice is given, or if notice is waived, at the commencement of the meeting. If the Board has not fixed a record date for determining the shareholders entitled to express consent to corporate action in writing without a meeting, the record date shall be the time of the day on which the first written consent is served on the Corporation in the manner provided by the Arizona Revised Statutes. If the Board has not fixed a record date for determining shareholders for any other purpose, the record date shall be at the close of business on the day before the Board adopts the resolution relating thereto. A determination of shareholders of record entitled to notice of or to vote at a meeting of shareholders shall apply to any adjournment of the meeting if such adjournment or adjournments does not exceed one hundred twenty (120) days in the aggregate; provided, however, that the Board may fix a new record date for the adjourned meeting.

6. Voting Record. The Secretary or other officer having charge of the stock transfer books of the Corporation shall make, or cause to be made, a complete record of the shareholders entitled to vote at a meeting of shareholders or any adjournment thereof, arranged in alphabetical order, with the address of and the number of shares held by each shareholder. Such record shall be produced and kept open at the time and place of the meeting and shall be subject to inspection by the shareholders during the entire time of the meeting for the purposes thereof. Failure to

comply with the requirements of this Section 6, however, shall not affect the validity of any action taken at any such meeting.

7. Quorum and Manner of Acting. At any meeting of the shareholders, the presence, in person or by proxy, of the holders of a majority of the outstanding shares entitled to vote shall constitute a quorum. All shares represented and entitled to vote on any single subject matter which may be brought before the meeting shall be counted for quorum purposes. Only those shares entitled to vote on a particular subject matter shall be counted for the purpose of voting on that subject matter. Business may be conducted once a quorum is present and may continue to be conducted until adjournment sine die, notwithstanding the withdrawal or temporary absence of shareholders leaving less than a quorum. Except as otherwise provided in the Arizona Revised Statutes, the affirmative vote of the holders of a majority of the shares of stock then represented at the meeting and entitled to vote on the subject matter under consideration shall be the act of the shareholders; provided, however, that if the shares of stock then represented are less than the number required to constitute a quorum, the affirmative vote must be such as would constitute a majority if a quorum were present, except that the affirmative vote of the holders of a majority of the shares of stock then present is sufficient in all cases to adjourn a meeting.

8. Voting of Shares of Stock. Each shareholder shall be entitled to one vote or corresponding fraction thereof for each share of stock or fraction thereof standing in his or her name on the books of the Corporation on the record date. A shareholder may vote either in person or by proxy executed in writing by the shareholder or by his or her duly authorized attorney-in-fact, but no such proxy shall be voted or acted upon after eleven (11) months from the date of its execution unless the proxy provides for a longer period. Shares of its own stock belonging to the Corporation or to another corporation, if a majority of the shares of stock entitled to vote in the election of directors of such other corporation is held directly or indirectly by the Corporation, shall neither be entitled to vote nor counted for quorum purposes; provided, however, that the foregoing shall not be construed as limiting the right of the Corporation to vote its own stock when held by it in a fiduciary capacity. Shares of stock standing in the name of another corporation may be voted by such officer, agent or proxy as the bylaws of such other corporation may prescribe or, in the absence of such provision, as the board of directors of such other corporation may determine. Shares of stock standing in the name of an administrator, executor, guardian, conservator, trustee, receiver, trustee in bankruptcy or assignee for the benefit of creditors may be voted by such person, either in person or by proxy. Shares of stock held by an administrator, executor, guardian or conservator may be voted by such person, either in person or by proxy, without a transfer of such shares into his or her name. Shares of stock held by a trustee, other than a trustee in bankruptcy, may not be voted by such trustee without a transfer of such shares into his or her name. Shares of stock held by or under the control of a receiver or trustee in bankruptcy may be voted by such receiver or trustee, either in person or by proxy, without a transfer thereof into his or her name if authority so to do is contained in an appropriate order of the court by which such receiver or trustee was appointed. A person whose stock is pledged shall be entitled to vote such stock unless the stock has been transferred into the name of the pledgee on the books of the Corporation, in which case only the pledgee or his or her proxy shall be entitled to vote such stock. If shares of stock stand of record in the names of two or more persons, whether fiduciaries, members of a partnership, joint tenants, tenants in common, tenants by the entirety, tenants by community property or otherwise, or if two or more persons have the same fiduciary relationship respecting the same shares of stock, unless the

Corporation is given written notice in the manner required by the Arizona Revised Statutes to the contrary and is furnished with a copy of the instrument or order appointing them or creating the relationship wherein it is so provided, their acts with respect to voting shall have the following effect: (i) if only one votes, his or her act binds all; (ii) if more than one vote, the act of the majority so voting binds all; and (iii) if more than one vote, but the vote is evenly split on any particular matter, each faction may vote the shares in question proportionally. If any tenancy is held in unequal interests, the majority or even split, for the purpose of the preceding sentence, shall be a majority or even split in interest. Unless demanded by a shareholder present in person or by proxy at any meeting of the shareholders and entitled to vote thereat, or unless so directed by the chairman of the meeting, the vote thereat on any question need not be by ballot. If such demand or direction is made, a vote by ballot shall be taken, and each ballot shall be signed by the shareholder voting, or by his or her proxy, and shall state the number of shares voted.

9. Organization. At each meeting of the shareholders, the Chairman of the Board, or, if he or she is absent, the President, or, if he or she is absent, another officer of the Corporation chosen as chairman of such meeting by a majority in voting interest of the shareholders present in person or by proxy and entitled to vote thereat, or, if all the officers of the Corporation are absent, a shareholder of record so chosen, shall act as chairman of the meeting and preside thereat. The Secretary, or, if he or she is absent from the meeting or is required pursuant to the provisions of this Section 9 to act as chairman of such meeting, the person (who shall be an Assistant Secretary, if any and if present) whom the chairman of the meeting shall appoint shall act as secretary of the meeting and keep the minutes thereof.

10. Order of Business. The order of business at each meeting of the shareholders shall be determined by the chairman of such meeting, but the order of business may be changed by the vote of a majority in voting interest of those present in person or by proxy at such meeting and entitled to vote.

11. Election of Directors. At each election of directors, each shareholder entitled to vote thereat shall have the right to vote, in person or by proxy, the number of shares of stock owned by such shareholder for as many persons as there are directors to be elected and for whose election he or she has a right to vote, or to cumulate his or her votes by giving one candidate as many votes as the number of such directors multiplied by the number of his or her shares of stock shall equal, or by distributing such votes on the same principle among any number of candidates. The candidates receiving the greatest number of votes, up to the number of directors to be elected, shall be the directors.

12. Action By Shareholders Without a Meeting. Any action required or permitted to be taken at a meeting of the shareholders may be taken without a meeting, without notice and without a vote, if a consent in writing, setting forth the action so taken, is signed by all shareholders entitled to vote with respect to the subject matter thereof.

13. Irregularities. All informalities and irregularities at any meeting of the shareholders with respect to calls, notices of meeting, the manner of voting, the form of proxies and credentials, and the method of ascertaining those present shall be deemed waived if no objection is made at the meeting.

ARTICLE III

BOARD OF DIRECTORS

1. General Powers. The business and affairs of the Corporation shall be managed by the Board of Directors.

2. Number and Term of Office. Subject to the requirements of the Arizona Revised Statutes, the Board may from time to time determine the number of directors. Until the Board shall otherwise determine, the number of directors shall be that number comprising the initial Board as set forth in the articles. Each director shall hold office until his or her successor is elected, or until his or her death, or until his or her earlier resignation or removal in the manner hereinafter provided.

3. Place of Meeting. The Board may hold its meetings at such place or places, within or without the State of Arizona, as the Board may from time to time by resolution determine or as shall be designated in any notices or waivers of notice thereof. Any such meeting, whether regular or special, may be held by conference telephone or similar communications equipment by means of which all persons participating in the meeting can hear each other, and participation in a meeting in such manner shall constitute presence in person at such meeting.

4. First Meeting. As soon as practicable after each annual election of directors and on the same day, the Board may meet for the purpose of organization and the transaction of other business at the place where regular meetings of the Board are held, and no notice of such meeting shall be necessary in order to legally hold the meeting, provided that a quorum is present. If such meeting is not held as provided above, the meeting may be held at such time and place as shall be specified in a notice given as hereinafter provided for a special meeting of the Board, or in the event of waiver of notice as specified in the written waiver of notice.

5. Regular Meetings. Regular meetings of the Board may be held without notice at such times as the Board shall from time to time by resolution determine. If any day fixed for a regular meeting shall be a legal holiday in Arizona, the meeting that would otherwise be held on that day shall be held at the same hour on the next succeeding business day.

6. Special Meetings; Notice. Special meetings of the Board shall be held whenever called by the Chairman of the Board, the President, the Secretary or a majority of the directors at the time in office. Notice shall be given, in the manner hereinafter provided, of each such special meeting, which notice shall state the time and place of such meeting, but need not state the purposes thereof. Except as otherwise provided in Section 7 of this Article III, notice of each such meeting shall be mailed to each director, addressed to him or her at his or her residence or usual place of business, at least two (2) days before the day on which such meeting is to be held, or shall be sent addressed to him or her at such place by telegraph, cable, wireless or other form of recorded communication or delivered personally or by telephone not later than the day before the day on which such meeting is to be held. A written waiver of notice, whether given before or after the meeting to which it relates, shall be equivalent to the giving of notice of such meeting to the director or directors signing such waiver. Attendance of a director at a special meeting of the

Board shall constitute a waiver of notice of such meeting, except when he or she attends the meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened.

7. Quorum and Manner of Acting. A majority of the whole Board shall be present in person at any meeting of the Board in order to constitute a quorum for the transaction of business at such meeting, and except as otherwise specified in these Bylaws, and except also as otherwise expressly provided by the Arizona Revised Statutes, the vote of a majority of the directors present at any such meeting at which a quorum is present shall be the act of the Board. In the absence of a quorum from any such meeting, a majority of the directors present thereat may adjourn such meeting from time to time to another time or place, without notice other than announcement at the meeting, until a quorum shall be present thereat. The directors shall act only as a Board and the individual directors shall have no power as such.

8. Organization. At each meeting of the Board, the Chairman of the Board, or, if he or she is absent, the President, or if he or she is absent, a director chosen by a majority of the directors present, shall act as chairman of such meeting and preside thereat. The Secretary, or if he or she is absent, the person (who shall be an Assistant Secretary, if any and if present) whom the chairman of such meeting shall appoint, shall act as secretary of such meeting and keep the minutes thereof.

9. Action by Directors Without a Meeting. Any action required or permitted to be taken at a meeting of the Board may be taken without a meeting, without prior notice and without a vote, if a consent in writing, setting forth the action so taken, is signed by all directors entitled to vote with respect to the subject matter thereof.

10. Resignations. Any director may resign at any time by giving written notice of his or her resignation to the Corporation. Any such resignation shall take effect at the time specified therein, or, if the time when it shall become effective is not specified therein, it shall take effect immediately upon its receipt by the President or the Secretary; and, unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

11. Removal of Directors. Directors may be removed, with or without cause, as provided from time to time by the Arizona Revised Statutes as then in effect.

12. Vacancies. Any vacancy occurring in the Board, and any newly created directorship, may be filled by a majority of the directors then in office, including any director whose resignation from the Board becomes effective at a future time, or by a sole remaining director. If at any time the Corporation has no directors in office, any officer or any shareholder or any fiduciary entrusted with responsibility for the person or estate of a shareholder may call a special meeting of the shareholders for the purpose of filling vacancies in the Board.

13. Compensation. Unless otherwise provided by resolution adopted by the Board, no director shall receive any compensation for his or her services as a director. The Board may at any time and from time to time by resolution provide that directors shall be paid a fixed sum for attendance at each meeting of the Board or a stated salary as director. In addition, the Board may at any time and from time to time by resolution provide that directors shall be paid their

actual expenses, if any, of attendance at each meeting of the Board. Nothing in this section shall be construed as precluding any director from serving the Corporation in any other capacity and receiving compensation therefor, but the Board may by resolution provide that any director receiving compensation for his or her services to the Corporation in any other capacity shall not receive additional compensation for his or her services as a director.

ARTICLE IV

OFFICERS

1. Number. The Corporation shall have the following officers: a Chairman of the Board (who shall be a Director), a President, a Vice President, a Secretary and a Treasurer. At the discretion of the Board, the Corporation may also have additional Vice Presidents (however designated, including the designations Executive Vice President and Senior Vice President), one or more Assistant Vice Presidents, one or more Assistant Secretaries and one or more Assistant Treasurers. Any two or more offices may be held by the same person.

2. Election and Term of Office. The officers of the Corporation shall be elected annually by the Board. Each such officer shall hold office until his or her successor is duly elected or until his or her earlier death or resignation or removal in the manner hereinafter provided.

3. Agents. In addition to the officers mentioned in Section 1 of this Article IV, the Board may appoint such agents as the Board may deem necessary or advisable, each of which agents shall have such authority and perform such duties as are provided in these Bylaws or as the Board may from time to time determine. The Board may delegate to any officer or to any committee the power to appoint or remove any such agents.

4. Removal. Any officer may be removed, with or without cause, at any time by resolution adopted by a majority of the whole Board.

5. Resignations. Any officer may resign at any time by giving written notice of his or her resignation to the Board, the Chairman of the Board, the President or the Secretary. Any such resignation shall take effect at the time specified therein, or, if the time when it shall become effective is not specified therein, it shall take effect immediately upon its receipt by the Board, the Chairman of the Board, the President or the Secretary; and, unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

6. Vacancies. A vacancy in any office due to death, resignation, removal, disqualification or any other cause may be filled for the unexpired portion of the term thereof by the Board.

7. Chairman of the Board. The Chairman of the Board shall have, subject to the control of the Board, general and active supervision and direction over the business and affairs of the Corporation and over its several officers. The Chairman of the Board shall: (a) preside at all meetings of the stockholders and at all meetings of the Board; (b) make a report of the state of the business of the Corporation at each annual meeting of the stockholders; (c) see that all orders and resolutions of the Board are carried into effect; (d) sign, with the Secretary or an Assistant

Secretary, certificates for stock of the Corporation; (e) have the right to sign, execute and deliver in the name of the Corporation all deeds, mortgages, bonds, contracts or other instruments authorized by the Board, except in cases where the signing, execution or delivery thereof is expressly delegated by the Board or by these Bylaws to some other officer or agent of the Corporation or where any of them are required by law otherwise to be signed, executed or delivered; and (f) have the right to cause the corporate seal, if any, to be affixed to any instrument which requires it. In general, the Chairman of the Board shall perform all duties incident to the office of the Chairman of the Board and such other duties as from time to time may be assigned to him or her by the Board.

8. Chief Executive Officer. The Chief Executive Officer of the Corporation shall have, subject to the control of the Board and the Chairman of the Board, general supervision over the business of the Corporation. At the request of the Chairman of the Board, or in case of his or her absence or inability to act, the Chief Executive Officer shall perform the duties of the Chairman of the Board and, when so acting, shall have all the powers of, and be subject to all the restrictions upon, the Chairman of the Board. He or she may sign, with the Secretary or an Assistant Secretary, certificates for stock of the Corporation. He or she may sign, execute and deliver in the name of the Corporation all deeds, mortgages, bonds, contracts or other instruments authorized by the Board, except in cases where the signing, execution or delivery thereof is expressly delegated by the Board or by these Bylaws to some other officer or agent of the Corporation or where any of them are required by law otherwise to be signed, executed or delivered, and he or she may cause the corporate seal, if any, to be affixed to any instrument which requires it. In general, the Chief Executive Officer shall perform all duties incident to the office of the Chief Executive Officer and such other duties as from time to time may be assigned to him or her by the Board or the Chairman of the Board.

9. President. The President shall have, subject to the control of the Board, the Chairman of the Board and the Chief Executive Officer, general and active supervision and direction over the business and affairs of the Corporation and over its several officers. He or she may sign, with the Secretary or an Assistant Secretary, certificates for stock of the Corporation. He or she may sign, execute and deliver in the name of the Corporation all deeds, mortgages, bonds, contracts or other instruments authorized by the Board, except in cases where the signing, execution or delivery thereof is expressly delegated by the Board or by these Bylaws to some other officer or agent of the Corporation or where any of them are required by law otherwise to be signed, executed or delivered, and he or she may cause the corporate seal, if any, to be affixed to any instrument which requires it. In general, the President shall perform all duties incident to the office of the President and such other duties as from time to time may be assigned to him or her by the Board, the Chairman of the Board or the Chief Executive Officer.

10. Vice President. The Vice President and any additional Vice Presidents shall have such powers and perform such duties as the Chairman of the Board, the President or the Board may from time to time prescribe and shall perform such other duties as may be prescribed by these Bylaws. At the request of the President, or in case of his or her absence or inability to act, the Vice President shall perform the duties of the President and, when so acting, shall have all the powers of, and be subject to all the restrictions upon, the President. In the event that there is more than one Vice President, the Board shall designate which Vice President is to act for the President.

11. Secretary. The Secretary shall: (a) record all the proceedings of the meetings of the shareholders, the Board and the Executive Committee, if any, in one or more books kept for that purpose; (b) see that all notices are duly given in accordance with the provisions of these Bylaws or as required by law; (c) be the custodian of all contracts, deeds, documents, all other indicia of title to properties owned by the Corporation and of its other corporate records (except accounting records) and of the corporate seal, if any, and affix such seal to all documents the execution of which on behalf of the Corporation under its seal is duly authorized; (d) sign, with the Chairman of the Board, the President or a Vice President, certificates for stock of the Corporation; (e) have charge, directly or through the transfer clerk or transfer clerks, transfer agent or transfer agents and registrar or registrars appointed as provided in Section 3 of Article VII of these Bylaws, of the issue, transfer and registration of certificates for stock of the Corporation and of the records thereof, such records to be kept in such manner as to show at any time the amount of the stock of the Corporation issued and outstanding, the manner in which and the time when such stock was paid for, the names, alphabetically arranged, and the addresses of the holders of record thereof, the number of shares held by each, and the time when each became a holder of record; (f) upon request, exhibit or cause to be exhibited at all reasonable times to any Director such records of the issue, transfer and registration of the certificates for stock of the Corporation; (g) see that the books, reports, statements, certificates and all other documents and records required by law are properly kept and filed; and (h) see that the duties prescribed by Section 6 of Article II of these Bylaws are performed. In general, the Secretary shall perform all duties incident to the office of Secretary and such other duties as from time to time may be assigned to him or her by the Chairman of the Board, the President or the Board.

12. Treasurer. If required by the Board, the Treasurer shall give a bond for the faithful discharge of his or her duties in such sum and with such surety or sureties as the Board shall determine. The Treasurer shall: (a) have charge and custody of, and be responsible for, all funds, securities, notes and valuable effects of the Corporation; (b) receive and give receipt for moneys due and payable to the Corporation from any sources whatsoever; (c) deposit all such moneys to the credit of the Corporation or otherwise as the Board, the Chairman of the Board, or the President shall direct in such banks, trust companies or other depositories as shall be selected in accordance with the provisions of Article VI of these Bylaws; (d) cause such funds to be disbursed by checks or drafts on the authorized depositories of the Corporation signed as provided in Article VI of these Bylaws; (e) be responsible for the accuracy of the amounts of, and cause to be preserved proper vouchers for, all moneys so disbursed; (f) have the right to require from time to time reports or statements giving such information as he or she may desire with respect to any and all financial transactions of the Corporation from the officers or agents transacting the same; (g) render to the Chairman of the Board, the President or the Board, whenever they, respectively, shall request him or her so to do, an account of the financial condition of the Corporation and of all his or her transactions as Treasurer; and (h) upon request, exhibit or cause to be exhibited at all reasonable times the cash books and other records to the Chairman of the Board, the President or any of the directors of the Corporation. In general, the Treasurer shall perform all duties incident to the office of Treasurer and such other duties as from time to time may be assigned to him or her by the Chairman of the Board, the President or the Board.

13. Assistant Officers. Any persons elected as assistant officers shall assist in the performance of the duties of the designated office and such other duties as shall be assigned to

them by the Vice President, Secretary or Treasurer, as the case may be, or by the Board or the President.

ARTICLE V

COMMITTEES

1. Executive Committee; How Constituted and Powers. The Board, by resolution adopted by a majority of the whole Board, may designate one or more of the directors then in office, who shall include the Chairman of the Board, to constitute an Executive Committee, which shall have and may exercise between meetings of the Board all the delegable powers of the Board to the extent not expressly prohibited by the Arizona Revised Statutes or by resolution of the Board. The Board may designate one or more directors as alternate members of the Committee who may replace any absent or disqualified member at any meeting of the Committee. Each member of the Executive Committee shall continue to be a member thereof only during the pleasure of a majority of the whole Board.

2. Executive Committee; Organization. The Chairman of the Board shall act as chairman at all meetings of the Executive Committee and the Secretary shall act as secretary thereof. In case of the absence from any meeting of the Chairman of the Board or the Secretary, the Committee may appoint a chairman or secretary, as the case may be, of the meeting.

3. Executive Committee; Meetings. Regular meetings of the Executive Committee may be held without notice on such days and at such places, within or without the State of Arizona, as shall be fixed by resolution adopted by a majority of the Committee and communicated to all its members. Special meetings of the Committee shall be held whenever called by the Chairman of the Board or a majority of the members thereof then in office. Notice of each special meeting of the Committee shall be given in the manner provided in Section 6 of Article III of these Bylaws for special meetings of the Board. Notice of any such meeting of the Executive Committee, however, need not be given to any member of the Committee if waived by him or her in writing or by telegraph, cable, wireless or other form of recorded communication either before or after the meeting, or if he or she is present at such meeting, except when he or she attends for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened. Subject to the provisions of this Article V, the Committee, by resolution adopted by a majority of the whole Committee, shall fix its own rules of procedure and it shall keep a record of its proceedings and report them to the Board at the next regular meeting thereof after such proceedings have been taken. All such proceedings shall be subject to revision or alteration by the Board; provided, however, that third parties shall not be prejudiced by any such revision or alteration.

4. Executive Committee; Quorum and Manner of Acting. A majority of the Executive Committee shall constitute a quorum for the transaction of business, and, except as specified in Section 3 of this Article V, the act of a majority of those present at a meeting thereof at which a quorum is present shall be the act of the Committee. The members of the Committee shall act only as a committee, and the individual members shall have no power as such.

5. Other Committees. The Board, by resolution adopted by a majority of the whole Board, may constitute other committees, which shall in each case consist of one or more of the directors and, at the discretion of the Board, such officers who are not directors. The Board may designate one or more directors or officers who are not directors as alternate members of any committee who may replace any absent or disqualified member at any meeting of the committee. Each such committee shall have and may exercise such powers as the Board may determine and specify in the respective resolutions appointing them; provided, however, that (a) unless all of the members of any committee shall be directors, such committee shall not have authority to exercise any of the powers of the Board in the management of the business and affairs of the Corporation, and (b) if any committee shall have the power to determine the amounts of the respective fixed salaries of the officers of the Corporation or any of them, such committee shall consist of not less than three (3) members and none of its members shall have any vote in the determination of the amount that shall be paid to him or her as a fixed salary. A majority of all the members of any such committee may fix its rules of procedure, determine its action and fix the time and place, whether within or without the State of Arizona, of its meetings and specify what notice thereof, if any, shall be given, unless the Board shall otherwise by resolution provide.

6. Resignations. Any member of the Executive Committee or any other committee may resign therefrom at any time by giving written notice of his or her resignation to the Chairman of the Board, the President or the Secretary. Any such resignation shall take effect at the time specified therein, or if the time when it shall become effective is not specified therein, it shall take effect immediately upon its receipt by the Chairman of the Board, the President or the Secretary; and, unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

7. Vacancies. Any vacancy in the Executive Committee or any other committee shall be filled by the vote of a majority of the whole Board.

8. Compensation. Unless otherwise provided by resolution adopted by the Board, no member of the Executive Committee or any other committee shall receive any compensation for his or her services as a committee member. The Board may at any time and from time to time by resolution provide that committee members shall be paid a fixed sum for attendance at each committee meeting or a stated salary as a committee member. In addition, the Board may at any time and from time to time by resolution provide that such committee members shall be paid their actual expenses, if any, of attendance at each committee meeting. Nothing in this section shall be construed as precluding any committee member from serving the Corporation in any other capacity and receiving compensation therefor, but the Board may by resolution provide that any committee member receiving compensation for his or her services to the Corporation in any other capacity shall not receive additional compensation for his or her services as a committee member.

9. Dissolution of Committees; Removal of Committee Members. The Board, by resolution adopted by a majority of the whole Board, may, with or without cause, dissolve the Executive Committee or any other committee, and, with or without cause, remove any member thereof.

ARTICLE VI

CONTRACTS, CHECKS, DRAFTS, BANK ACCOUNTS, SECURITIES OF OTHER CORPORATIONS

1. Execution of Contracts. Except as otherwise required by law or by these Bylaws, any contract or other instrument may be executed and delivered in the name of the Corporation and on its behalf by the Chairman of the Board, the President or a Vice President. In addition, the Board may authorize any other officer or officers or agent or agents to execute and deliver any contract or other instrument in the name of the Corporation and on its behalf, and such authority may be general or confined to specific instances as the Board may by resolution determine.

2. Attestation. Any Vice President, the Secretary, or any Assistant Secretary may attest the execution of any instrument or document by the Chairman of the Board, the President or any other duly authorized officer or agent of the Corporation and may affix the corporate seal, if any, in witness thereof, but neither such attestation nor the affixing of a corporate seal shall be requisite to the validity of any such document or instrument.

3. Loans. Unless the Board shall otherwise determine, the Chairman of the Board or the President, acting together with any one of the following officers, to wit: the Vice President, the Treasurer or the Secretary, may effect loans and advances at any time for the Corporation from any bank, trust company or other institution or from any firm or individual and, for such loans and advances, may make, execute and deliver promissory notes or other evidences of indebtedness of the Corporation, but no officer or officers shall mortgage, pledge, hypothecate or otherwise transfer for security any property owned or held by the Corporation except when authorized by resolution adopted by the Board.

4. Checks, Drafts. All checks, drafts, orders for the payment of money, bills of lading, warehouse receipts, obligations, bills of exchange and insurance certificates shall be signed or endorsed (except endorsements for collection for the account of the Corporation or for deposit to its credit, which shall be governed by the provisions of Section 5 of this Article VI) by such officer or officers or agent or agents of the Corporation and in such manner as shall from time to time be determined by resolution of the Board.

5. Deposits. All funds of the Corporation not otherwise employed shall be deposited from time to time to the credit of the Corporation or otherwise as the Board, the Chairman of the Board or the President shall direct in general or special accounts at such banks, trust companies, savings and loan associations, or other depositories as the Board may select or as may be selected by any officer or officers or agent or agents of the Corporation to whom power in that respect has been delegated by the Board. For the purpose of deposit and for the purpose of collection for the account of the Corporation, checks, drafts and other orders for the payment of money which are payable to the order of the Corporation may be endorsed, assigned and delivered by any officer or agent of the Corporation. The Board may make such special rules and regulations with respect to such accounts, not inconsistent with the provisions of these Bylaws, as it may deem expedient.

6. Proxies in Respect of Stock or Other Securities of Other Corporations. Unless otherwise provided by resolution adopted by the Board, the Chairman of the Board, the President or any Vice President may exercise in the name and on behalf of the Corporation the powers and rights which the Corporation may have as the holder of stock or other securities in any other corporation, including without limitation the right to vote or consent with respect to such stock or other securities.

ARTICLE VII

STOCK

1. Certificates and Uncertificated Shares. Shares of the Corporation's capital stock may but need not be represented by certificates. The Board may authorize the issuance of some or all of the shares of any or all classes or series without certificates. Notwithstanding such authorization, every holder of uncertificated shares shall be entitled to receive a certificate representing such shares, which certificate shall be delivered or otherwise made available to a shareholder making a request therefor. Each share certificate shall be signed by one or more officers designated by the Board or, in the absence of such designation, by the Chairman of the Board, the President or a Vice President and by the Secretary or an Assistant Secretary. The signatures of such officers upon such certificate may be facsimiles. If any officer who has signed or whose facsimile signature has been placed upon a certificate has ceased for any reason to be such officer prior to issuance of the certificate, the certificate may be issued with the same effect as if that person were such officer at the date of issue. All certificates for stock of the Corporation shall be consecutively numbered, shall state the number of shares represented thereby and shall otherwise be in such form as shall be determined by the Board, subject to such requirements as are imposed by the Arizona Revised Statutes. The names and addresses of the persons to whom the shares represented by certificates are issued shall be entered on the stock transfer books of the Corporation, together with the number of shares and the date of issue, and in the case of cancellation, the date of cancellation. Certificates surrendered to the Corporation for transfer shall be cancelled, and no new certificate shall be issued in exchange for such shares until the original certificate has been cancelled; except that in the case of a lost, destroyed or mutilated certificate, a new certificate may be issued therefor upon such terms and indemnity to the Corporation as the Board may prescribe. Within a reasonable time after the issuance or transfer of shares without certificates, the Corporation shall send the shareholder a written statement of the information required by Section 10-625 and, if applicable, Section 10-627 of the Arizona Revised Statutes.

2. Transfers of Stock. Transfers of shares of stock of the Corporation shall be made only on the stock transfer books of the Corporation by the holder of record thereof or by his or her legal representative or attorney-in-fact, who shall furnish proper evidence of authority to transfer to the Secretary, or a transfer clerk or a transfer agent, and upon surrender of the certificate or certificates for such shares properly endorsed and payment of all taxes thereon. The person in whose name shares of stock stand on the books of the Corporation shall be deemed the owner thereof for all purposes as regards the Corporation.

3. Regulations. The Board may make such rules and regulations as it may deem expedient, not inconsistent with these Bylaws, concerning the issue, transfer and registration of

certificates for stock of the Corporation. The Board may appoint, or authorize any officer or officers or any committee to appoint, one or more transfer clerks or one or more transfer agents and one or more registrars, and may require all certificates for stock to bear the signature or signatures of any of them.

ARTICLE VIII

DIVIDENDS

The Board may from time to time declare, and the Corporation may pay, dividends on its outstanding shares of stock in the manner and upon the terms and conditions provided in the Arizona Revised Statutes.

ARTICLE IX

SEAL

A corporate seal shall not be requisite to the validity of any instrument executed by or on behalf of the Corporation. Nevertheless, if in any instance a corporate seal is used, the same shall be in the form of a circle and shall bear the full name of the Corporation and the year and state of incorporation, or words and figures of similar import.

ARTICLE X

AMENDMENTS

These Bylaws may be repealed, altered or amended, and new Bylaws may be adopted, at any time only by the Board.

ADOPTED by the Board of Directors of the Corporation at Scottsdale, Arizona, this 15th day of June, 2005.

By: _____
Joel H. Farkas, Secretary

EXHIBIT

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Fronterra Village

August 11, 2005

Mr. Joel Farkas
Balterra Sewer Corp.
6720 North Scottsdale Road, Suite 250
Scottsdale, Arizona 85253

Re: Request for Wastewater Utility Service – Fronterra Village, LLC

Dear Mr. Farkas:

As you are aware, Fronterra Village, LLC has purchased the property and development known as the Balterra Development, located in western Maricopa County.

As part of Fronterra Village, LLC's due diligence in this matter, please accept this letter as a formal request for wastewater utility service to the Balterra Development, located in the vicinity of 411th Avenue and Camelback Road. The site is bounded by Camelback Road to the north, 395th Avenue to the east, Indian School Road and Interstate 10 to the south and the 415th Avenue alignment to the west. The Development will require water and wastewater services for a maximum of 6,100 equivalent residential units and 179 acres of commercial/institutional property assembled through a variety of land uses. A legal description is attached for your records.

Should you have any questions, please contact me at (480) 422-6900. Thank you for your consideration in this matter.

FRONTERA VILLAGE, LLC

By: Keith Watkins
Its: Project Manager

KW:mk
Attachment

Saddle Mountain Unified School District #90
38201 West Indian School Road
Tonopah, AZ 85354
Phone 623-474-5100
Fax 623-691-6757
www.smusd.com

Roxanne Morris, Superintendent

August 11th, 2005

To Whom It May Concern:

RE: Certificate of Convenience and Necessity Application ("CC&N")and MAG 208 Amendment ("208 Amendment") – Balterra Sewer Corp.

Dear Sir/Madam:

Please consider the following information as it pertains to the above referenced documents related to the formation of the Balterra Sewer Corp.

Saddle Mountain Unified School District ("SMUSD") and Balterra Sewer Corp. are currently working together, as neighbors, to resolve regional sewer issues.

Currently SMUSD is constructing a small package plant for the new high school, Tonopah Valley High School. Balterra Sewer Corp. has reviewed our MAG 208 application and has completed preliminary analysis of the viability of a partnership in use of a regional wastewater treatment plant system.

As you know, the Balterra CC&N and 208 Amendment propose to design and construct as well as operate and maintain a regional wastewater treatment plant which will benefit both the Balterra development as well as SMUSD. SMUSD has requested that Balterra Sewer Corp. construct their plant with enough capacity to accept the sewer flows from the school district, which will mean the package plant at the district will ultimately be eliminated and the plant currently operating the Ruth Fisher elementary campus will be eliminated The partnership with Balterra Sewer Corp. will enable Saddle Mountain Unified School District to remove themselves from the business of the operation of sewer plants.

SMUSD has discussed the plans for the wastewater treatment plant and supports the CC&N and MAG 208 because the plant will allow for the elimination of the existing package treatment and the operation and maintenance obligations therewith. We have worked closely with Balterra Sewer Corp to confirm the viability of this project.

Let me know if I may provide you with any additional information.

Respectfully,

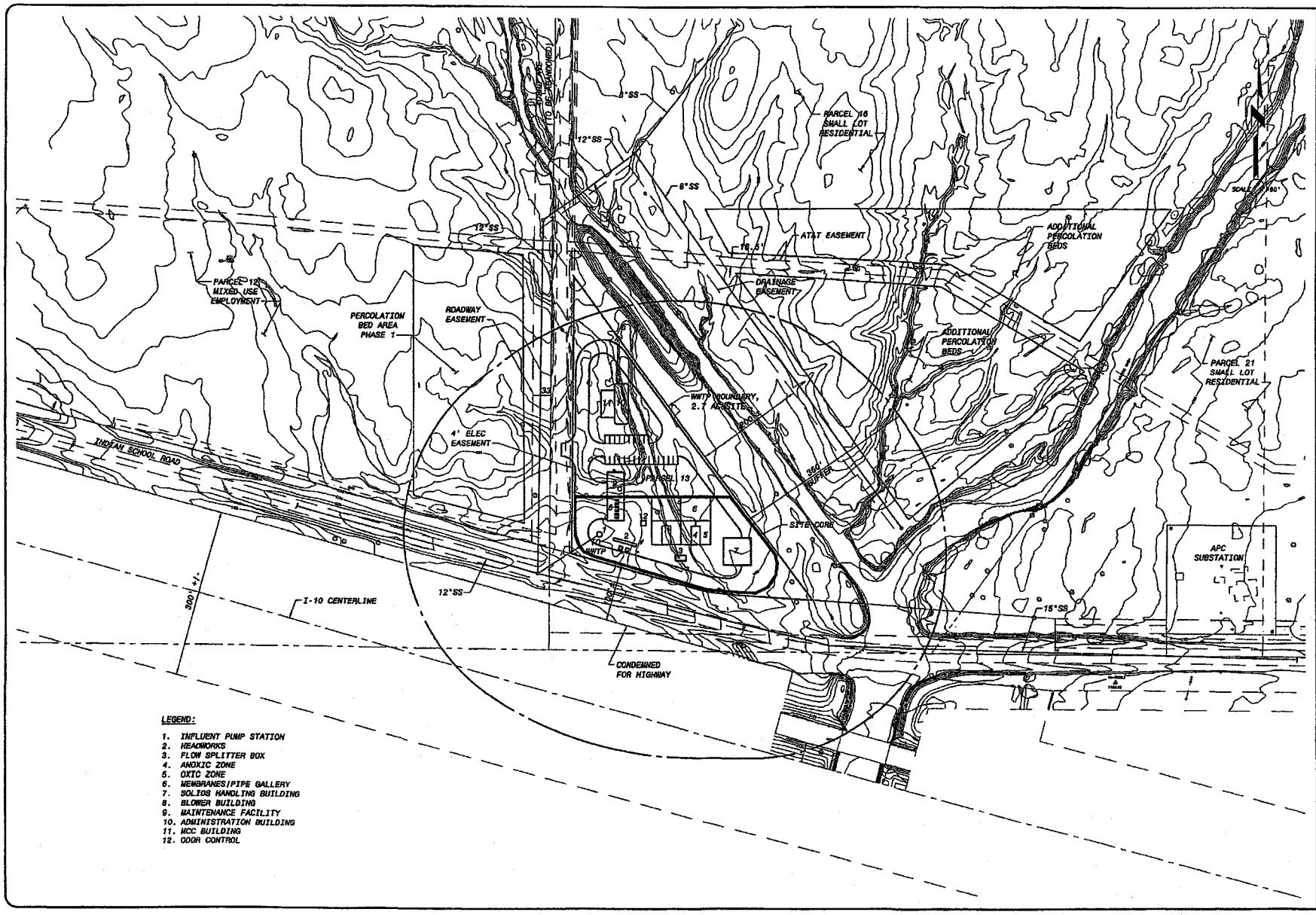
Roxanne G. Morris

Roxanne G. Morris
Superintendent of Schools – SMUSD

Cc: Mr. Kimo Seymour – Makai Development

EXHIBIT

5



BLACK & VEATCH Corporation
Phoenix, Arizona

BALTERRA WASTE WATER TREATMENT PLANT
TM3
SITE LOCATION

JF PROPERTIES

PROJECT NO.
140332

FIGURE 4
SITE LOCATION

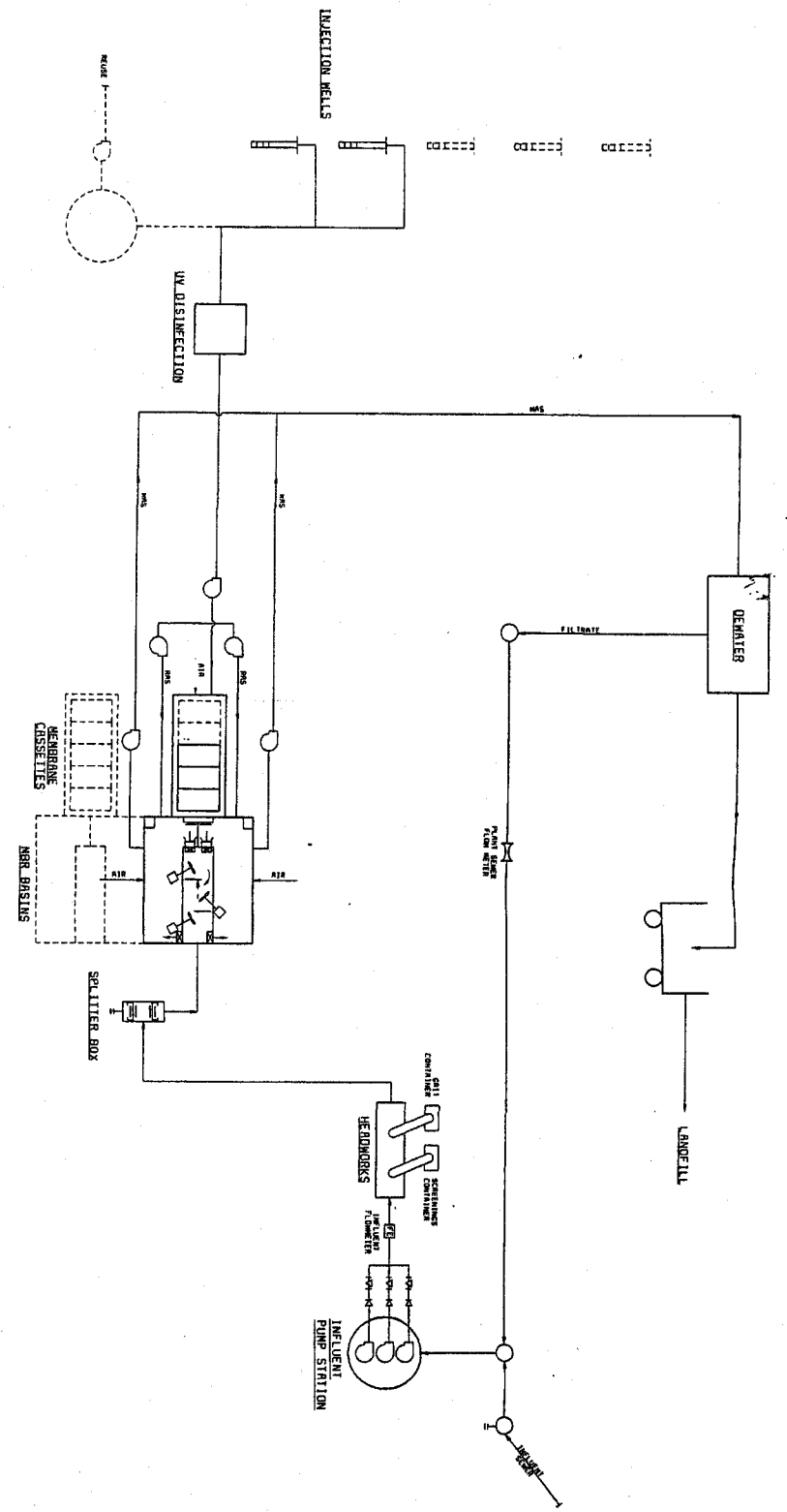
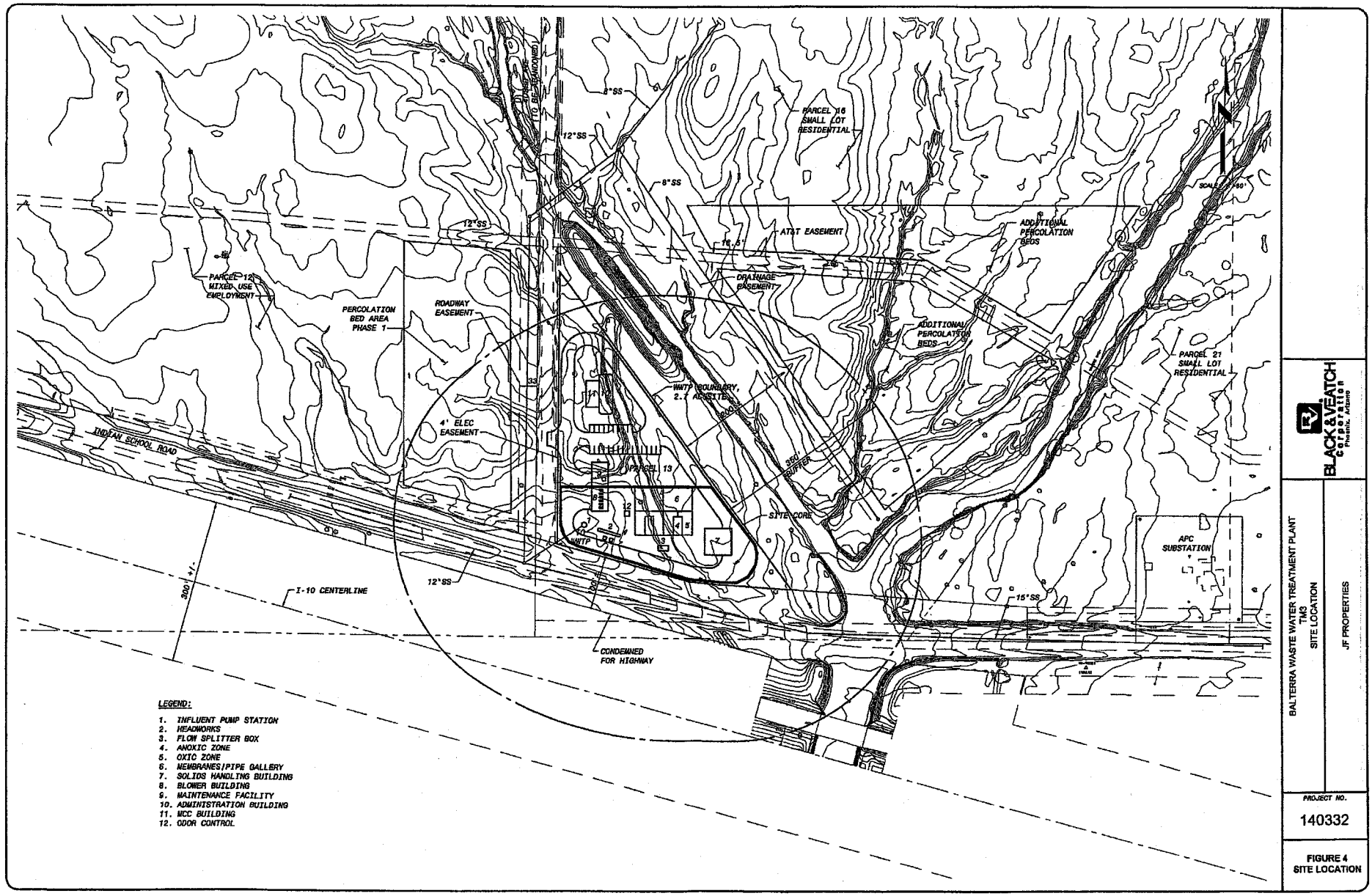


FIGURE X.X Phase 1A Liquid Process Schematic	PROJECT NO. 140332	BALTERRA WASTE WATER TREATMENT PLANT PRELIMINARY DESIGN REPORT MBR SCHEMATIC JF PROPERTIES	BLACK & VEATCH Corporation Phoenix, Arizona



BLACK & VEATCH Corporation
Phoenix, Arizona

BALTERRA WASTE WATER TREATMENT PLANT
TM3
SITE LOCATION

JF PROPERTIES

PROJECT NO.
140332

FIGURE 4
SITE LOCATION

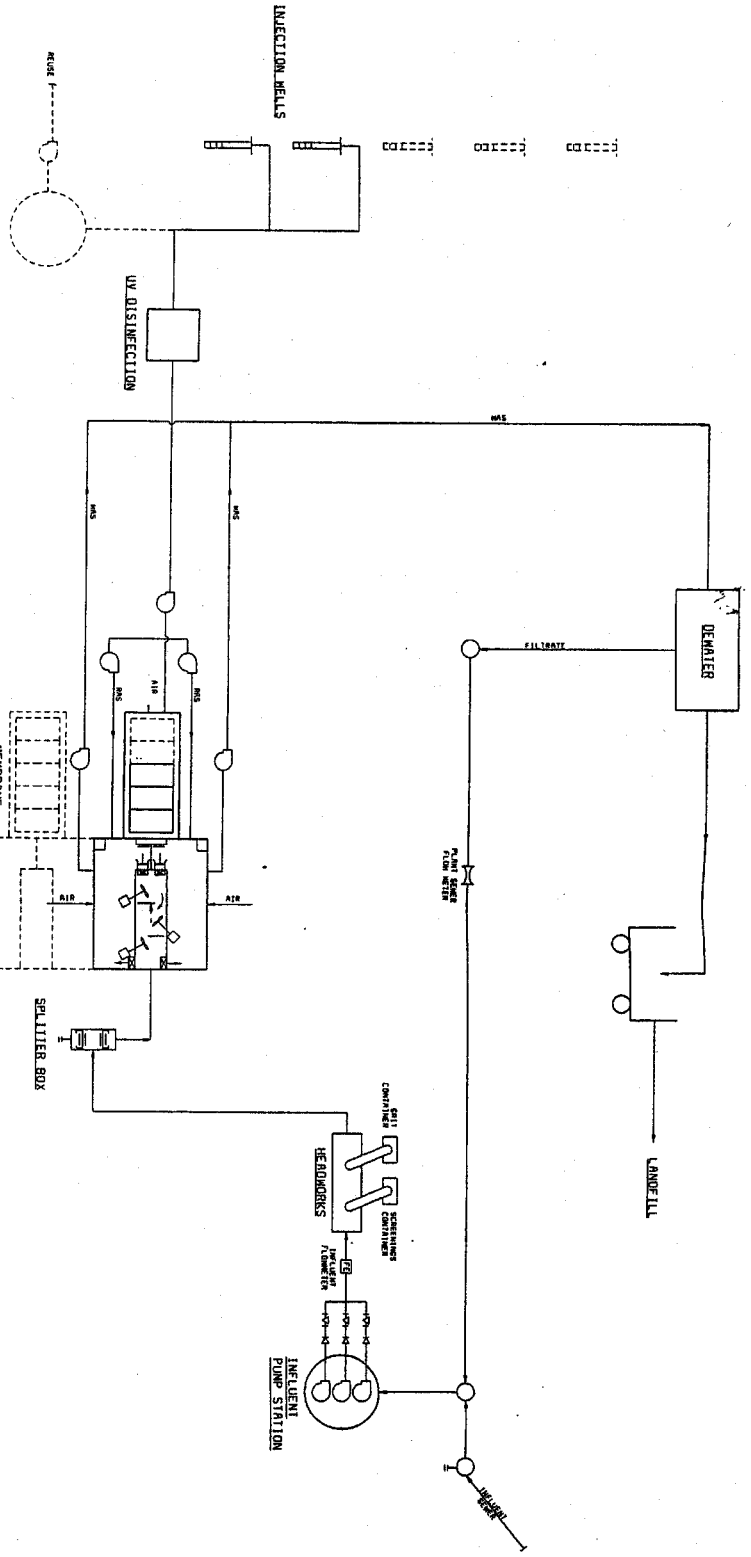


FIGURE X.X Phase 1A Liquid Process Schematic	PROJECT NO. 140332	BALTERRA WASTE WATER TREATMENT PLANT PRELIMINARY DESIGN REPORT MBR SCHEMATIC JF PROPERTIES	BLACK & VEATCH Corporation Phoenix, Arizona	

EXHIBIT

6

Balterra Wastewater
REPRESENTATIVE RATE SCHEDULE

Exhibit
Schedule 4
Page 1
Witness: Bourassa

LINE NO.		PROPOSED RATES MONTHLY CHARGE
1	METER SIZE	
2		
3	MONTHLY MINIMUMS:	
4	5/8 x 3/4	$ 40.00
5	3/4	$ 60.00
6	1	$ 100.00
7	1 1/2	$ 200.00
8	2	$ 320.00
9	3	$ 640.00
10	4	$ 1,000.00
11	6	$ 2,000.00
12		
13	Treated Effluent per 1,00 gallons	$ 0.62
14	Treated Effluent per acre foot	$ 202.00
15		
16		
17		
18		
19		
20		
21	5/8 x 3/4	
22	3/4	
23	1	
24	1 1/2	
25	2	
26	3	
27	4	
28	6	
29		
30		

Balterra Wastewater
REPRESENTATIVE RATE SCHEDULES
STATEMENT OF CHARGES

Exhibit
Schedule 5
Page 1
Witness: Bourassa

LINE NO.			Proposed
1	A. Establishment of Service		$ 25.00
2	Establishment of Service, after hours		$ 40.00
3	(Collected only if customer is sewer only)		
4	B. Re-establishment of Service		see (a)
5			
6	C. Reconnection of service		$ 30.00
7			
8	D. After hours service charge, per hour		$ 50.00
9			
10	E. Minimum Deposit	Two Times Monthly Bill	
11			
12	F. Charge for NSF Check		$ 15.00
13			
14	G. Late payment charge for delinquent bills		
15			
16	H. Deferred Payment Finance Charge		1.50%
17			
18	I. Main Extension and additional facilities agreements,		
19			@ COST (b)
20			
21	J. All Revenue related taxes will be charged customers.		
22			
23	K. Service Line Connection Charge (refundable)		$ 350.00
24			
25			
26	RULES AND REGULATIONS		
27	* The Company has adopted the Rules and Regulation established by the Commission		
28	as the basis for its operating procedures. Arizona Corporation Commission Rules		
29	will be controlling of Company procedures, unless specific Commission Orders		
30	provide otherwise.		
31	(a) Monthly minimum times months off the system		
32	(b) Cost to include parts, labor, overhead, and all applicable taxes, including		
33	income tax.		
34			
35			
36			
37			

EXHIBIT

7

Balterra Wastewater
Projected Capital Financing
Projected Years Ended

Exhibit
Schedule 1b

Line No.		Year 0	1	2	3	4	5
1							
2							
3							
4							
5	Plant to be Constructed	$ -	$ 7,279,830	$ 2,995,626	$ 2,745,001	$ 4,887,914	$ 6,538,308
6							
7	Financing:						
8	Sewer Lines Advanced		$ 1,653,800	$ 2,364,800	$ 2,114,175	$ 1,190,100	$ 3,408,150
9							
10	Plant Installed with Customer Deposits (Advances)		105,000	168,350	168,000	248,500	280,000
11							
12	Contributions-in-aid of Construction (Hook-up Fees)		-	-	-	-	-
13							
14	Common Equity Issued for Plant Construction	-	5,521,030	262,476	187,826	2,949,314	2,150,158
15							
16	Common Equity Issued For Working Capital	50,000	-	-	-	-	-
17							
18	Debt Financing Issued for Plant Construction						
19							
20	Internal Cash Used for Plant Additions	-	-	200,000	275,000	500,000	700,000
21							
22	Total Financing	$ 50,000	$ 7,279,830	$ 2,995,626	$ 2,745,001	$ 4,887,914	$ 6,538,308

Balterra Wastewater Plant
Projected Years

Exhibit
Schedule 1a
Page 1
Witness: Bourassa

Line No.	Account	Description	AIAC Spread	Depreciation Rate	Year 1 Estimate	Engineering Permits, Etc.	Gross Amt	Additions	Depreciation*	Balance	A/D Balance
1											
2											
3											
4	**Account**	**Description**	**AIAC Spread**	**Depreciation Rate**	**Estimate**	**Engineering Permits, Etc.**	**Gross Amt**	**Additions**	**Depreciation***	**Balance**	**A/D Balance**
5	351	Organization		0.00%			$ -	$ -	$ -	$ -	$ -
6	352	Franchises		0.00%			-	-	-	-	-
7	353	Land and Land Rights		0.00%			-	-	-	-	-
8	354	Structures and Improvements		3.33%	-	-	-	-	-	-	-
9	355	Power Generation Equipment		5.00%		-	-	-	-	-	-
10	360	Collection sewers -Force		2.00%		-	-	-	-	-	-
11	361	Collection Sewers - Gravity (AIAC)		2.00%	1,653,800	-	1,653,800	1,653,800	16,538	1,653,800	16,538
12	361	Collection Sewers - Gravity		2.00%	373,530	-	373,530	373,530	3,735	373,530	3,735
13	362	Special Collecting Structures		2.00%		-	-	-	-	-	-
14	363	Services to customers	100.00%	2.00%		-	-	-	-	-	-
15	364	Flow measuring Devices		10.00%		-	-	-	-	-	-
16	365	Flow measuring Installations		10.00%		-	-	-	-	-	-
17	366	Reuse Services '		2.00%		-	-	-	-	-	-
18	367	Reuse Meters and Meter Install		8.33%		-	-	-	-	-	-
19	370	Receiving Wells		3.33%		-	-	-	-	-	-
20	371	Pumping Equipment		12.50%	-	-	-	-	-	-	-
21	374	Reuse Distribution Reservoirs		2.50%		-	-	-	-	-	-
22	375	Reuse Transmission and Distrib		2.50%	-	-	-	-	-	-	-
23	380	Treatment and Disposal Equipment*		5.00%	5,252,500	-	5,252,500	5,252,500	131,313	5,252,500	131,313
24	381	Plant Sewers		5.00%		-	-	-	-	-	-
25	382	Outfall Sewer Lines		3.33%		-	-	-	-	-	-
26	389	Other Plant and Miscellaneous		6.67%		-	-	-	-	-	-
27	390	Office Furniture and Equipment		6.67%		-	-	-	-	-	-
28	391	Transportation Equipment		20.00%		-	-	-	-	-	-
29	392	Stores Equipment		4.00%		-	-	-	-	-	-
30	393	Tools, Shop and Garage Equipme		5.00%		-	-	-	-	-	-
31	394	Laboratory Equipment		10.00%		-	-	-	-	-	-
32	395	Power Operated Equipment		5.00%		-	-	-	-	-	-
33	396	Communication Equipment		10.00%		-	-	-	-	-	-
34	397	Miscellaneous Equipment		10.00%		-	-	-	-	-	-
35	398	Other Tangible Plant		10.00%		-	-	-	-	-	-
36							-	-	-	-	-
37											
38											
39											
40		Totals			$ 7,279,830	$ -	$ 7,279,830	$ 7,279,830	$ 151,586	$ 7,279,830	$ 151,586
41											
42		Composite Rate with 1/2 yr convention							2.08%		
43											
44											
45		Licenses, Taxes, Permits				$ -					
46		Engineering and Contingency	0%			-					
47		Total				$ -					
48											

Balterra Wastewater Plant
Projected Years

Exhibit
Schedule 1a
Page 2
Witness: Bourassa

Line No.	Account	Description	AIAC Spread	Depreciation Rate	Year 2 Estimate	Engineering Permits, Etc.	Gross Amt	Additions	Depreciation*	Balance	A/D Balance
1	351	Organization		0.00%			$ -	$ -	$ -	$ -	$ -
2	352	Franchises		0.00%			-	-	-	-	-
3	353	Land and Land Rights		0.00%			-	-	-	-	-
4	354	Structures and Improvements		3.33%		-	-	-	-	-	-
5	355	Power Generation Equipment		5.00%		-	-	-	-	-	-
6	360	Collection sewers -Force		2.00%		-	-	-	-	-	-
7	361	Collection Sewers - Gravity (AIAC)		2.00%	2,364,800	-	2,364,800	2,364,800	56,724	4,018,600	73,262
8	361	Collection Sewers - Gravity		2.00%	630,826	-	630,826	630,826	13,779	1,004,356	17,514
9	362	Special Collecting Structures		2.00%		-	-	-	-	-	-
10	363	Services to customers	100.00%	2.00%		-	-	-	-	-	-
11	364	Flow measuring Devices		10.00%		-	-	-	-	-	-
12	365	Flow measuring Installations		10.00%		-	-	-	-	-	-
13	366	Reuse Services '		2.00%		-	-	-	-	-	-
14	367	Reuse Meters and Meter Install		8.33%		-	-	-	-	-	-
15	370	Receiving Wells		3.33%		-	-	-	-	-	-
16	371	Pumping Equipment		12.50%		-	-	-	-	-	-
17	374	Reuse Distribution Reservoirs		2.50%		-	-	-	-	-	-
18	375	Reuse Transmission and Distrib		2.50%		-	-	-	-	-	-
19	380	Treatment and Disposal Equipment*		5.00%		-	-	-	262,625	5,252,500	393,938
20	381	Plant Sewers		5.00%		-	-	-	-	-	-
21	382	Outfall Sewer Lines		3.33%		-	-	-	-	-	-
22	389	Other Plant and Miscellaneous		6.67%		-	-	-	-	-	-
23	390	Office Furniture and Equipment		6.67%		-	-	-	-	-	-
24	391	Transportation Equipment		20.00%		-	-	-	-	-	-
25	392	Stores Equipment		4.00%		-	-	-	-	-	-
26	393	Tools, Shop and Garage Equipme		5.00%		-	-	-	-	-	-
27	394	Laboratory Equipment		10.00%		-	-	-	-	-	-
28	395	Power Operated Equipment		5.00%		-	-	-	-	-	-
29	396	Communication Equipment		10.00%		-	-	-	-	-	-
30	397	Miscellaneous Equipment		10.00%		-	-	-	-	-	-
31	398	Other Tangible Plant		10.00%		-	-	-	-	-	-
32							-	-	-	-	-
33											
34											
35		Totals			$ 2,995,626	$ -	$ 2,995,626	$ 2,995,626	$ 333,128	$ 10,275,456	$ 484,714
36											
37		Composite Rate with 1/2 yr convention							3.24%		
38											
39		Licenses, Taxes, Permits				$ -					
40		Engineering and Contingency	0%			-					
41		Total				$ -					
42											

Balterra Wastewater
Plant
Projected Years

Exhibit
Schedule 1a
Page 3
Witness: Bourassa

Line No.	Account	Description	AIAC Spread	Depreciation Rate	Estimate	Engineering Permits, Etc.	Year 3 Gross Amt	Additions	Depreciation*	Balance	A/D Balance
1	351	Organization		0.00%			$ -	$ -	$ -	$ -	$ -
2	352	Franchises		0.00%			-	-	-	-	-
3	353	Land and Land Rights		0.00%			-	-	-	-	-
4	354	Structures and Improvements		3.33%		-	-	-	-	-	-
5	355	Power Generation Equipment		5.00%		-	-	-	-	-	-
6	360	Collection sewers -Force		2.00%		-	-	-	-	-	-
7	361	Collection Sewers - Gravity (AIAC)		2.00%	2,114,175	-	2,114,175	2,114,175	101,514	6,132,775	174,776
8	361	Collection Sewers - Gravity		2.00%	630,826	-	630,826	630,826	26,395	1,635,182	43,910
9	362	Special Collecting Structures		2.00%		-	-	-	-	-	-
10	363	Services to customers	100.00%	2.00%		-	-	-	-	-	-
11	364	Flow measuring Devices		10.00%		-	-	-	-	-	-
12	365	Flow measuring Installations		10.00%		-	-	-	-	-	-
13	366	Reuse Services '		2.00%		-	-	-	-	-	-
14	367	Reuse Meters and Meter Install		8.33%		-	-	-	-	-	-
15	370	Receiving Wells		3.33%		-	-	-	-	-	-
16	371	Pumping Equipment		12.50%		-	-	-	-	-	-
17	374	Reuse Distribution Reservoirs		2.50%		-	-	-	-	-	-
18	375	Reuse Transmission and Distrib		2.50%		-	-	-	-	-	-
19	380	Treatment and Disposal Equipment*		5.00%		-	-	-	262,625	5,252,500	656,563
20	381	Plant Sewers		5.00%		-	-	-	-	-	-
21	382	Outfall Sewer Lines		3.33%		-	-	-	-	-	-
22	389	Other Plant and Miscellaneous		6.67%		-	-	-	-	-	-
23	390	Office Furniture and Equipment		6.67%		-	-	-	-	-	-
24	391	Transportation Equipment		20.00%		-	-	-	-	-	-
25	392	Stores Equipment		4.00%		-	-	-	-	-	-
26	393	Tools, Shop and Garage Equipme		5.00%		-	-	-	-	-	-
27	394	Laboratory Equipment		10.00%		-	-	-	-	-	-
28	395	Power Operated Equipment		5.00%		-	-	-	-	-	-
29	396	Communication Equipment		10.00%		-	-	-	-	-	-
30	397	Miscellaneous Equipment		10.00%		-	-	-	-	-	-
31	398	Other Tangible Plant		10.00%		-	-	-	-	-	-
32							-	-	-	-	-
33											
34											
35											
36		Totals			$ 2,745,001	$ -	$ 2,745,001	$ 2,745,001	$ 390,534	$ 13,020,457	$ 875,248
37											
38		Composite Rate with 1/2 yr convention							3.00%		
39											
40											
41		Licenses, Taxes, Permits				$ -					
42		Engineering and Contingency	0%			-					
43		Total				$ -					
44											
45											
46											
47											
48											

Balterra Wastewater Plant
Projected Years

Exhibit
Schedule 1a
Page 4
Witness: Bourassa

Line No.	Account	Description	AIAC Spread	Depreciation Rate	Year 4 Estimate	Engineering Permits, Etc.	Gross Amt	Additions	Depreciation*	Balance	A/D Balance
5	351	Organization		0.00%			$ -	$ -	$ -	$ -	$ -
6	352	Franchises		0.00%			-	-	-	-	-
7	353	Land and Land Rights		0.00%			-	-	-	-	-
8	354	Structures and Improvements		3.33%		-	-	-	-	-	-
9	355	Power Generation Equipment		5.00%		-	-	-	-	-	-
10	360	Collection sewers -Force		2.00%		-	-	-	-	-	-
11	361	Collection Sewers - Gravity (AIAC)		2.00%	1,190,100	-	1,190,100	1,190,100	134,557	7,322,875	309,332
12	361	Collection Sewers - Gravity		2.00%	120,522	-	120,522	120,522	33,909	1,755,704	77,818
13	362	Special Collecting Structures		2.00%		-	-	-	-	-	-
14	363	Services to customers	100.00%	2.00%		-	-	-	-	-	-
15	364	Flow measuring Devices		10.00%		-	-	-	-	-	-
16	365	Flow measuring Installations		10.00%		-	-	-	-	-	-
17	366	Reuse Services '		2.00%		-	-	-	-	-	-
18	367	Reuse Meters and Meter Install		8.33%		-	-	-	-	-	-
19	370	Receiving Wells		3.33%		-	-	-	-	-	-
20	371	Pumping Equipment		12.50%		-	-	-	-	-	-
21	374	Reuse Distribution Reservoirs		2.50%		-	-	-	-	-	-
22	375	Reuse Transmission and Distrib		2.50%		-	-	-	-	-	-
23	380	Treatment and Disposal Equipment*		5.00%	3,577,292	-	3,577,292	3,577,292	352,057	8,829,792	1,008,620
24	381	Plant Sewers		5.00%		-	-	-	-	-	-
25	382	Outfall Sewer Lines		3.33%		-	-	-	-	-	-
26	389	Other Plant and Miscellaneous		6.67%		-	-	-	-	-	-
27	390	Office Furniture and Equipment		6.67%		-	-	-	-	-	-
28	391	Transportation Equipment		20.00%		-	-	-	-	-	-
29	392	Stores Equipment		4.00%		-	-	-	-	-	-
30	393	Tools, Shop and Garage Equipme		5.00%		-	-	-	-	-	-
31	394	Laboratory Equipment		10.00%		-	-	-	-	-	-
32	395	Power Operated Equipment		5.00%		-	-	-	-	-	-
33	396	Communication Equipment		10.00%		-	-	-	-	-	-
34	397	Miscellaneous Equipment		10.00%		-	-	-	-	-	-
35	398	Other Tangible Plant		10.00%		-	-	-	-	-	-
36							-	-	-	-	-
37											
38											
39											
40		Totals			$ 4,887,914	$ -	$ 4,887,914	$ 4,887,914	$ 520,523	$ 17,908,371	$ 1,395,770
41											
42		Composite Rate with 1/2 yr convention							2.91%		
43											
44											
45		Licenses, Taxes, Permits				$ -					
46		Engineering and Contingency	0%			-					
47		Total				$ -					
48											

Balterra Wastewater
Plant
Projected Years

Exhibit
Schedule 1a
Page 5
Witness: Bourassa

Year 5

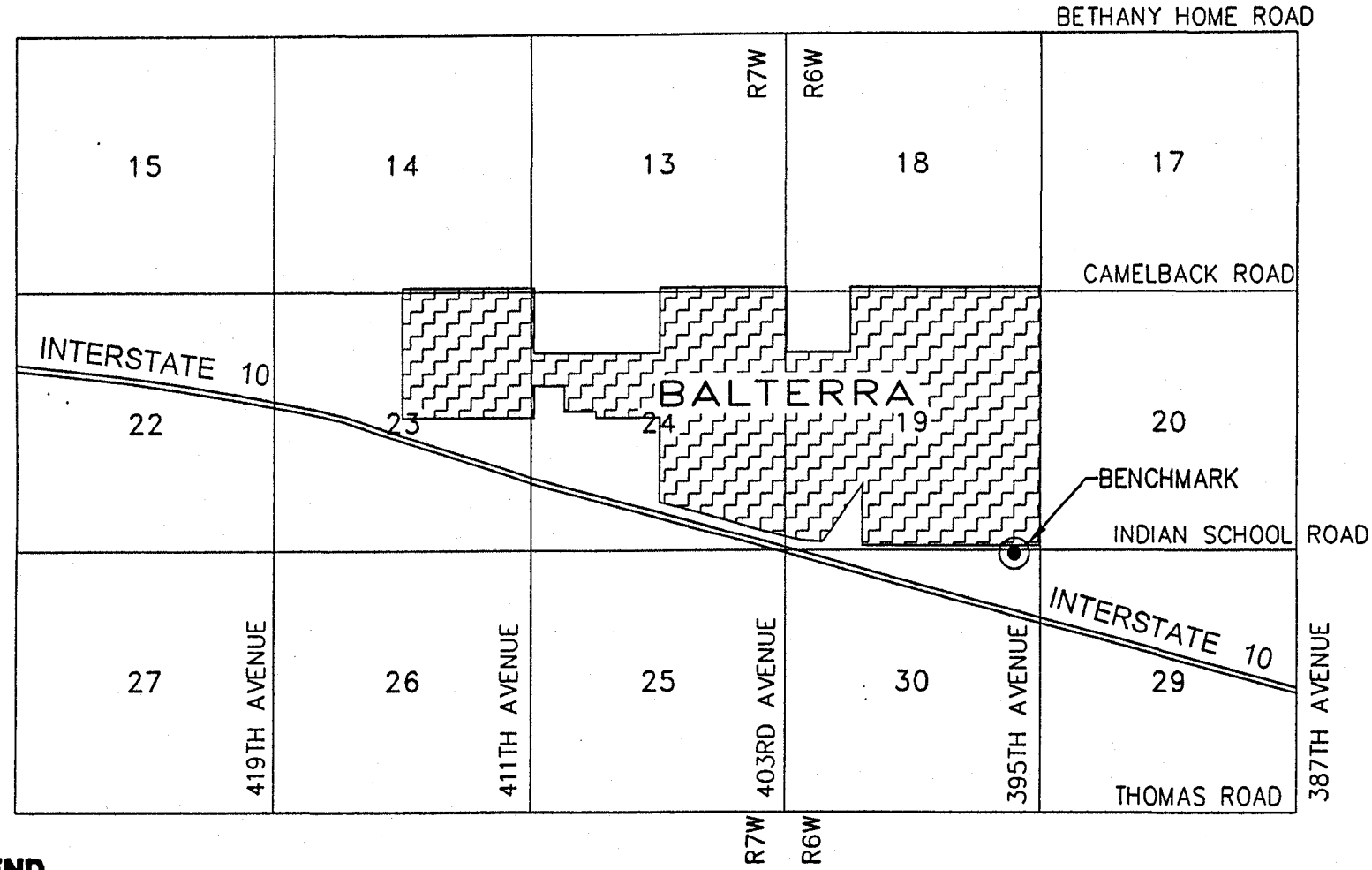
Line No.	Account	Description	AIAC Spread	Depreciation Rate	Estimate	Engineering Permits, Etc.	Gross Amt	Additions	Depreciation*	Balance	A/D Balance
5	351	Organization		0.00%			$ -	$ -	$ -	$ -	$ -
6	352	Franchises		0.00%			-	-	-	-	-
7	353	Land and Land Rights		0.00%			-	-	-	-	-
8	354	Structures and Improvements		3.33%		-	-	-	-	-	-
9	355	Power Generation Equipment		5.00%		-	-	-	-	-	-
10	360	Collection sewers -Force		2.00%		-	-	-	-	-	-
11	361	Collection Sewers - Gravity (AIAC)		2.00%	3,408,150	-	3,408,150	3,408,150	180,539	10,731,025	489,871
12	361	Collection Sewers - Gravity		2.00%	577,950	-	577,950	577,950	40,894	2,333,654	118,712
13	362	Special Collecting Structures		2.00%		-	-	-	-	-	-
14	363	Services to customers	100.00%	2.00%		-	-	-	-	-	-
15	364	Flow measuring Devices		10.00%		-	-	-	-	-	-
16	365	Flow measuring Installations		10.00%		-	-	-	-	-	-
17	366	Reuse Services '		2.00%		-	-	-	-	-	-
18	367	Reuse Meters and Meter Install		8.33%		-	-	-	-	-	-
19	370	Receiving Wells		3.33%		-	-	-	-	-	-
20	371	Pumping Equipment		12.50%		-	-	-	-	-	-
21	374	Reuse Distribution Reservoirs		2.50%		-	-	-	-	-	-
22	375	Reuse Transmission and Distrib		2.50%		-	-	-	-	-	-
23	380	Treatment and Disposal Equipment*		5.00%	2,552,208	-	2,552,208	2,552,208	505,295	11,382,000	1,513,915
24	381	Plant Sewers		5.00%		-	-	-	-	-	-
25	382	Outfall Sewer Lines		3.33%		-	-	-	-	-	-
26	389	Other Plant and Miscellaneous		6.67%		-	-	-	-	-	-
27	390	Office Furniture and Equipment		6.67%		-	-	-	-	-	-
28	391	Transportation Equipment		20.00%		-	-	-	-	-	-
29	392	Stores Equipment		4.00%		-	-	-	-	-	-
30	393	Tools, Shop and Garage Equipme		5.00%		-	-	-	-	-	-
31	394	Laboratory Equipment		10.00%		-	-	-	-	-	-
32	395	Power Operated Equipment		5.00%		-	-	-	-	-	-
33	396	Communication Equipment		10.00%		-	-	-	-	-	-
34	397	Miscellaneous Equipment		10.00%		-	-	-	-	-	-
35	398	Other Tangible Plant		10.00%		-	-	-	-	-	-
36							-	-	-	-	-
37											
38											
39											
40		Totals			$ 6,538,308	$ -	$ 6,538,308	$ 6,538,308	$ 726,727	$ 24,446,679	$ 2,122,498
41											
42		Composite Rate with 1/2 yr convention							2.97%		
43											
44											
45		Licenses, Taxes, Permits				$ -					
46		Engineering and Contingency	0%			-					
47		Total				$ -					
48											

EXHIBIT

8

BALTERRA DEVELOPMENT

AREA MAP AND LEGAL DESCRIPTION



LEGEND

- SECTION LINE
- BENCHMARK LOCATION
- PROJECT BOUNDARY

BENCHMARK:
NGS BRASS DISK, DESIGNATED X 475, AT THE NORTHWEST CORNER OF A CONCRETE WELL PAD ON THE SOUTH SIDE OF INDIAN SCHOOL ROAD, 0.1 MILES WEST OF THE INTERSECTION WITH 395TH AVENUE. DATUM IS NAVD88. ELEV. = 1107.44'

P:\J\JFP100000002\0400CAD\EC\DWG\Exhibits\ECFGXJFP100000002-EXHIBIT1.dwg dcho Apr 12, 2005 2:03:00pm

SCALE: NTS	**EXHIBIT 1 - BALTERRA VICINITY MAP WITH BENCHMARK LOCATION**	DRAWN BY: DCHO
SHEET 1 OF 1		CHECKED BY: WDR
JOB NO.: JFP100000002		DATE: 04/05

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

EXHIBIT A

LEGAL DESCRIPTION

PARCEL NO. 3: COUNTS-ASHMANN FREEWAY LIMITED PARTNERSHIP

The West half of the Southeast quarter of Section 19, Township 2 North, Range 6 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

PARCEL NO. 4: DAVIS-CONDON FREEWAY LIMITED PARTNERSHIP

The East half of the Southeast quarter of Section 19, Township 2 North, Range 6 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

PARCEL NO. 5: L & B FREEWAY LIMITED PARTNERSHIP, as successor in interest and assignee of G & B FREEWAY LIMITED PARTNERSHIP

The East half of the Northeast quarter of Section 19, Township 2 North, Range 6 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

PARCEL NO. 6: HARRIS FREEWAY LIMITED PARTNERSHIP

Lots 1 and 2 and the East half of the Northwest quarter of Section 19, Township 2 North, Range 6 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona;

EXCEPT BEGINNING at the Northwest corner of the Northwest quarter of said Section 19;

thence Easterly along the North line of said Northwest quarter, a distance of 1320 feet to a point;

thence South and parallel to the West line of the Northwest quarter, a distance of 1320 feet to a point;

thence West and parallel to the North line of the Northwest quarter, a distance of 1320 feet to a point on the West line of the Northwest quarter;

thence North along said West line of the Northwest quarter, a distance of 1320 feet to the POINT OF BEGINNING; and

EXCEPT any portion within the Southwest quarter of said Northwest quarter.

PARCEL 6A: ROMAN FREEWAY LIMITED PARTNERSHIP

The Southwest quarter of the Northwest quarter of Section 19, Township 2 North, Range 6 West, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

PARCEL NO. 7: L & L FREEWAY LIMITED PARTNERSHIP

The West half of the Northeast quarter of Section 19, Township 2 North, Range 6 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

PARCEL NO. 8: KITZSTEINER FREEWAY LIMITED PARTNERSHIP

The East half of the Southwest quarter of Section 19, Township 2 North, Range 6 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona;

EXCEPT that portion of the following described property which lies within the above described property;

BEGINNING at the Southwest corner of said Section 19;

thence North 89 degrees 56 minutes 00 seconds East along the South line of said section, a distance of 1130 feet;

thence North 0 degrees 04 minutes 00 seconds West to a point distant 40 feet North at right angles to the South line of said section, said point being the True Point of Beginning;

thence continuing North 0 degrees 04 minutes 00 seconds West a distance of 200 feet;

thence North 89 degrees 56 minutes 00 seconds East, parallel to the South line of said section, a distance of 200 feet;

hence South 0 degrees 04 minutes 00 seconds West, a distance of 200 feet to a point distant 40 feet North at right angles to the South line of said section;

thence South 89 degrees 56 minutes 00 seconds West, parallel to the South line of said section, a distance of 200 feet to the True Point of Beginning.

PARCEL NO. 9: NELSON I FREEWAY LIMITED PARTNERSHIP

The West half of the Southwest quarter of Section 19, Township 2 North Range 6 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona;

EXCEPT that part of the Southwest quarter of Section 19, Township 2 North, Range 6 West of the Gila and Salt River Base and Meridian, described as follows:

Beginning at the Southwest corner of said Section 19;

thence North 89 degrees 56 minutes 00 seconds East along the South line of said Section, a distance of 1130 feet;

thence North 0 degrees 04 minutes 00 seconds West to a point distant 40 feet North at right angles to the South line of said Section said point being the True Point of Beginning;

thence continuing North 0 degrees 04 minutes 00 seconds West, a distance of 200 feet;

thence 89 degrees 56 minutes 00 seconds East, parallel to the South line of said section, a distance of 200 feet;

thence South 0 degrees 04 minutes 00 seconds West, a distance of 200 feet to a point distance 40 feet North at right angles to the South line of said Section;

thence South 89 degrees 56 minutes 00 seconds West, parallel to the South line of said Section, a distance of 200 feet to the True Point of Beginning; and

EXCEPT that portion of said Southwest quarter of Section 19 which lies within the following described tract of land;

Beginning at the Southwest corner of said Section 19;

thence North 0 degrees 00 minutes 50 seconds East along the West line of said Section 19, a distance of 185.87 feet;

thence South 75 degrees 07 minutes 10 seconds East, a distance of 308.19 feet;

thence South 86 degrees 15 minutes 20 seconds East, a distance of 628.35 feet;

thence South 0 degrees 02 minutes 30 seconds East, a distance of 65 feet to the South line of said Section 19;

thence South 89 degrees 57 minutes 30 seconds West along said South Section line to the Point of Beginning

PARCEL NO. 10: NELSON II FREEWAY LIMITED PARTNERSHIP

The East half of the Southeast quarter of Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona;

EXCEPT that portion lying within the following described property:

BEGINNING at the Southeast corner of said Section 24;

thence North 00 degrees 00 minutes 50 seconds East along the East line of said Section 24, a distance of 185.87 feet;

thence North 75 degrees 07 minutes 10 seconds West, 1,368.14 feet;

thence South 00 degrees 00 minutes 20 seconds West, 538.01 feet to the South line of said Section 24;

thence North 89 degrees 57 minutes 30 seconds East along said South line of Section 24, a distance of 1,322.05 feet to the POINT OF BEGINNING.

PARCEL NO. 11: S-P FREEWAY LIMITED PARTNERSHIP

The Southeast quarter of the Northeast quarter of Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona;

Except all minerals and except all uranium, thorium or any other material which is or may be determined to be peculiarly essential to the production of fissionable materials, whether or not of commercial value, as reserved in Patent from the United States of America.

PARCEL NO. 13: STRATEMEIER P & M FREEWAY LIMITED PARTNERSHIP

The Northeast quarter of the Southwest quarter of the Northwest quarter and the Southeast quarter of the Southwest quarter of the Northwest quarter of Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian;

EXCEPT the South 132 feet of said Southeast quarter of the Southwest quarter of the Northwest quarter of said Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

PARCEL NO. 14: STRATEMEIER P & M FREEWAY LIMITED PARTNERSHIP

The Northwest quarter of the Southwest quarter of the Northwest quarter of Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona;

EXCEPT the North 150 feet.

PARCEL NO. 15: STRATEMEIER P & M FREEWAY LIMITED PARTNERSHIP

The North 150 feet of the Northwest quarter of the Southwest quarter of the Northwest quarter of Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

PARCEL NO. 16: W-O-K FREEWAY LIMITED PARTNERSHIP

The West half of the Southeast quarter of Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona;

EXCEPT that portion lying within the following described property;

BEGINNING at the Southeast corner of said Section 24;

thence North 00 degrees 00 minutes 50 seconds East along the East line of said Section 24, a distance of 185.87 feet;

thence North 75 degrees 07 minutes 10 seconds West, 1,368.14 feet, to the TRUE POINT OF BEGINNING;

thence continuing along the same line which bears North 75 degrees 07 minutes 10 seconds West, a distance of 1,368.13 feet to the East-West mid section line of said Section 24;

thence South 00 degrees 00 minutes 30 seconds West 890.14 feet to the South line of said Section 24;

thence North 89 degrees 57 minutes 30 seconds East, 1,322.05 feet;

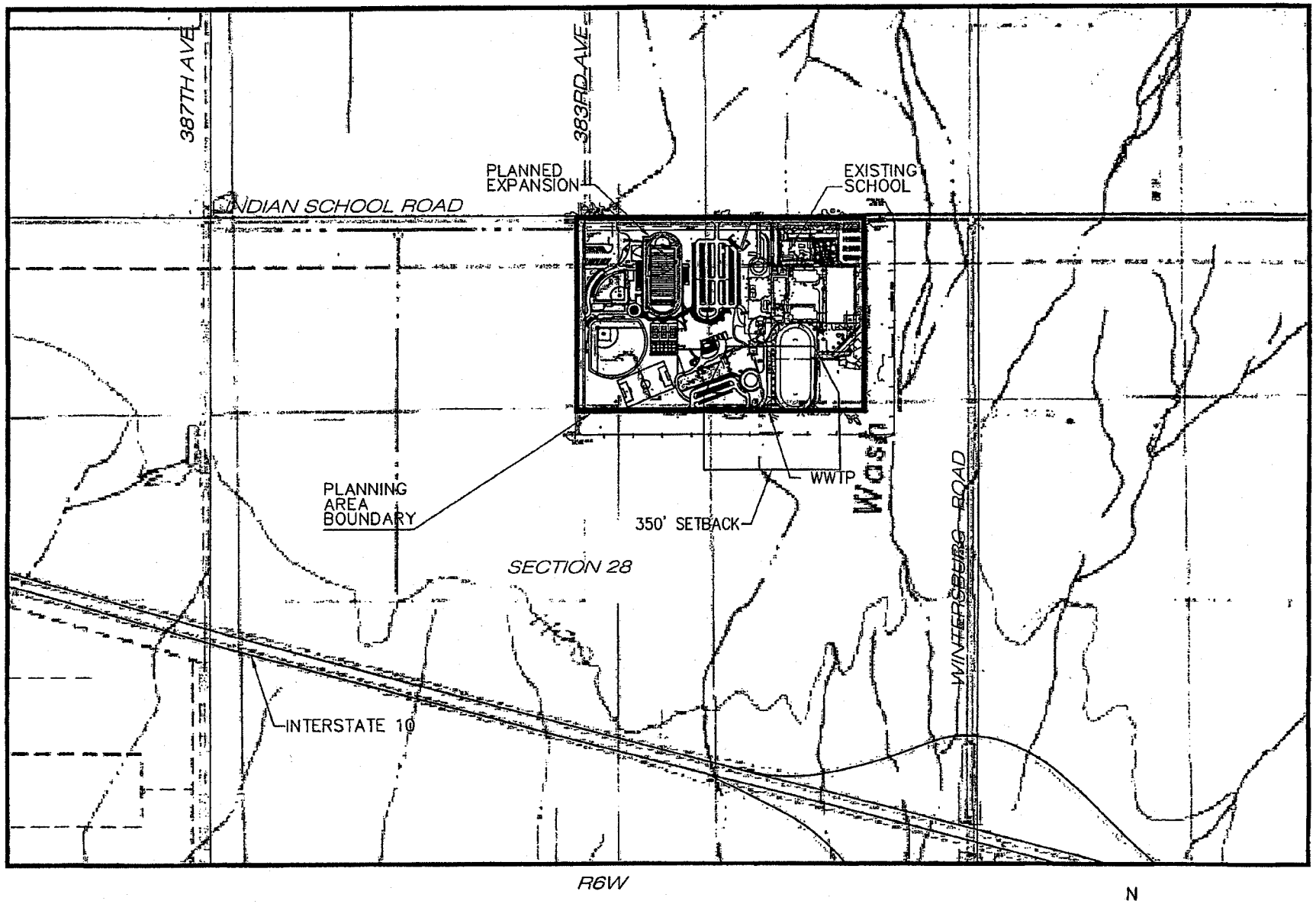
thence in a Northerly direction, 538.01 feet to the POINT OF BEGINNING.

PARCEL NO. 17: W-T FREEWAY LIMITED PARTNERSHIP

The Southeast quarter of the Northwest quarter of Section 24, Township 2 North, Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

RUTH FISHER ELEMENTARY SCHOOL

AREA MAP AND LEGAL DESCRIPTION



S:/CLIENTS/RUTH FISHER SCHOOL/SCHOOL OVERVIEW/208-FIGURES/FIG3.DWG 6/18/04

RUTH FISHER SCHOOL
208 SMALL PLANT REVIEW AND APPROVAL

FIGURE 3 - PLANNING AREA BOUNDARY

Fluid Solutions
Water, Wastewater, Engineering & Environmental Services
1121 EAST MISSOURI AVENUE • SUITE 100 • PHOENIX, ARIZONA 85014

ORDER NUMBER: 9F04866T-U5

EXHIBIT 'A' 89 245589

A PORTION OF THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 2 NORTH, RANGE 6 WEST, GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTH QUARTER CORNER OF SAID SECTION 28;

THENCE SOUTH 00 DEGREES 01 MINUTES 42 SECONDS EAST, 65.00 FEET, ALONG THE WEST LINE OF SAID NORTHEAST QUARTER, TO A POINT ON THE SOUTH LINE OF THE ROAD DECLARED AT DOCKET 3124, PAGE 573-575, MARICOPA COUNTY RECORDS, SAID POINT BEING THE POINT OF BEGINNING;

THENCE NORTH 89 DEGREES 52 MINUTES 28 SECONDS EAST, 1321.30 FEET, ALONG SAID SOUTH LINE, SAID LINE BEING 65.00 FEET SOUTH OF AND PARALLEL WITH THE NORTH LINE OF SAID NORTHEAST QUARTER TO A POINT ON THE EAST LINE OF THE NORTHWEST QUARTER OF SAID NORTHEAST QUARTER;

THENCE SOUTH 00 DEGREES 01 MINUTES 51 SECONDS EAST, 1257.08 FEET, ALONG SAID EAST LINE, TO THE SOUTHEAST CORNER OF SAID NORTHWEST QUARTER OF THE NORTHEAST QUARTER;

THENCE SOUTH 89 DEGREES 55 MINUTES 17 SECONDS WEST, 1321.35 FEET, ALONG THE SOUTH LINE OF SAID NORTHWEST QUARTER OF THE NORTHEAST QUARTER, TO THE SOUTHWEST CORNER OF SAID NORTHWEST QUARTER OF THE NORTHEAST QUARTER;

THENCE NORTH 00 DEGREES 01 MINUTES 42 SECONDS WEST, 1256.00 FEET, ALONG THE WEST LINE OF SAID NORTHEAST QUARTER TO THE POINT OF BEGINNING.

EXHIBIT

9

Balterra Wastewater
Projected Balance Sheets
For the Years Ended

Exhibit 1
Schedule 1

Line No.		Beginning of Year	Label	1st year Changes	Year 1	2	3	4	5
1									
2									
3	**Assets**								
4									
5	Utility Plant	-	(a)	7,279,830	7,279,830	10,275,456	13,020,457	17,908,371	24,446,679
6	Accumulated Depreciation	-	(b)	(151,586)	(151,586)	(484,714)	(875,248)	(1,395,770)	(2,122,498)
7									
8	Cash	50,000		(2,924)	47,076	11,249	78,332	83,676	96,319
9									
10									
11	**Total Assets**	$ 50,000		$ 7,125,321	$ 7,175,321	$ 9,801,992	$ 12,223,541	$ 16,596,277	$ 22,420,500
12									
13	Equity and Liabilities			-					
14									
15	**Equity**								
16									
17	Common Stock, Net of	50,000	(d)	5,521,030	5,571,030	5,833,506	6,021,332	8,970,646	11,120,804
18				-					
19	Retained Earnings	-	(e)	(154,509)	(154,509)	(312,162)	(319,555)	(257,135)	(148,790)
20	**Total Equity**	$ 50,000		$ 5,366,521	$ 5,416,521	$ 5,521,344	$ 5,701,777	$ 8,713,511	$ 10,972,014
21									
22	**Liabilities & Deferred Credits**			-					
23	Advances in Aid of Construction		(f)	1,758,800	1,758,800	4,280,648	6,521,764	7,882,766	11,448,486
24	Contributions in Aid of			-					
25	Construction		(g)	-	-	-	-	-	-
26	Less: Amortization		(h)	-	-	-	-	-	-
27	Customer Deposits		(i)	-					
28									
29	Long-Term Debt			-					
30									
31	**Total Liabilities and**								
32	**Deferred Credits**	-		1,758,800	1,758,800	4,280,648	6,521,764	7,882,766	11,448,486
33									
34									
35	**Total Equity & Liab.**	$ 50,000		$ 7,125,321	$ 7,175,321	$ 9,801,992	$ 12,223,541	$ 16,596,277	$ 22,420,500
36									
37									
38									
39	(a) Plant Additions (See Schedule 1a)								
40	(b) Depreciation Computations (See Schedule 1a)								
41	(c) Change in cash (Please Schedule 3)								
42	(d) Common Stock issuance and or repurchase. (See Schedule 1b)								
43	(e) Profit or loss from operations (See Schedule 2)								
44	(f) Advances in Aid of Construction (See Schedule 1c)								
45	(g) Contributions in Aid of Construction (See Schedule 1e)								
46	(h) Amortization of Contributions in Aid of Construction, if applicable (See Schedule 1e)								
47	(i) Security deposits (2 times average bill)								
48									
49									

EXHIBIT

1

WATER AND WASTEWATER MASTER PLAN

BALTERRA

JUNE 2005
DEA PROJECT NO. JPFI0000-0002

DAVID EVANS AND ASSOCIATES INC.

WATER AND WASTEWATER MASTER PLAN

BALTERRA

JUNE 2005
DEA PROJECT NO. JPFI0000-0002

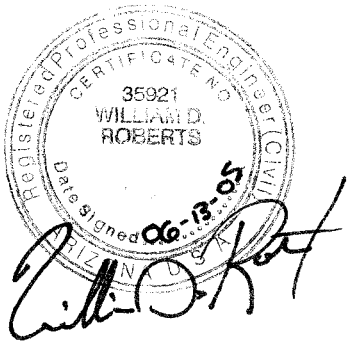
WATER AND WASTEWATER MASTER PLAN
FOR
BALTERRA

PREPARED FOR

JF PROPERTIES, INC.
6720 N SCOTTSDALE ROAD, SUITE 250
SCOTTSDALE, AZ 85253
(480) 422-6900

PREPARED BY

WILLIAM D. ROBERTS, P.E.
AND
DAVID HOLMAN, E.I.T.
DAVID EVANS AND ASSOCIATES, INC.
2141 EAST HIGHLAND AVE., SUITE 200
PHOENIX, AZ 85016
(602) 678-5151



JUNE 2005
DEA PROJECT NO. JFPI0000-0002

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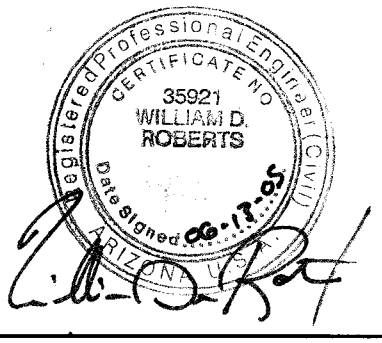


ABBREVIATIONS

ac	Acres
ADEQ	Arizona Department of Environmental Quality
ave.	Average
BOD	Biochemical Oxygen Demand
Cap.	Capacity
CCFRPM	Centrifugal Cast Fiberglass Reinforced Polymer Mortar Pipe
DIP	Ductile Iron Pipe
DU	Dwelling Unit
ft	Feet
ft/ft	Vertical Feet Per Horizontal Foot
fps	Feet Per Second
gpm	Gallons Per Minute
gpd	Gallons Per Day
gpcpd	Gallons Per Capita Per Day
gphud	Gallons Per Housing Unit Per Day
in.	Inches
lbs	Pounds
lf	Linear Feet
mgd	Million Gallons Per Day
MH	Manhole
mg/l	Milligrams Per Liter
ppm	Parts Per Million
PRV	Pressure Reducing Valve
psi	Pounds Per Square Inch
PVC	Polyvinyl Chloride
R	Range
s	Seconds
S	Slope
T	Township
VCP	Vitrified Clay Pipe
WRF	Water Reclamation Facility

1.0 INTRODUCTION

1.1 General

This master plan was completed under a contract with JF Properties, Inc. The proposed Balterra development will consist of approximately 1,100 acres of development. The anticipated Balterra land use plan is illustrated by Exhibit 2. An approximate break down of the anticipated land uses is provided in Appendix H.

1.2 Scope of Work

The purpose of this master plan is to size and locate the primary water and wastewater distribution and collection systems for the entire Balterra development. This master plan utilizes the general land use plan and proposed arterial and collector road alignments to size the backbone infrastructure required to serve the Balterra development's first phase and ultimate build out.

This master plan also discusses the water supply and wastewater treatment facilities required by the Balterra service area. These systems and facilities will serve the project in accordance with typical design standards for similar developments, the ADEQ Aquifer Protection Permit Rules (Reference 1), and ADEQ Engineering Bulletin 10 (Reference 2).

1.3 Project Location

The proposed site is located north of Interstate 10 and west of the Hassayampa River. Exhibit 1 illustrates the location of the site in relationship to the area's street system. The Balterra development includes portions of Section 19 of Township 2 North, Range 6 West, and Sections 24 and 23 of Township 2 North Range 7 West of the Gila and Salt River Base and Meridian, Maricopa County, Arizona.

1.4 Service Area

The proposed Balterra water and wastewater distribution and collection systems have been master planned to serve the Balterra development. The systems' service area is illustrated on Exhibit 6. It is anticipated that new water and wastewater companies will be created to operate, maintain, and manage the systems.

1.5 Topography

Generally, the existing topography of the Balterra development slopes down to the southeast at an average approximate slope of 0.50. Existing elevations range from 1,165 to 1,095 feet above sea level. All elevations found in this master plan are based on the benchmark that is shown on Exhibit 1.

1.6 Construction Phasing

Balterra will be developed in 5 successive phases as shown on Exhibit 3. The development of the 5 phases is anticipated to span approximately 9 years.

2.0 WATER MASTER PLAN

2.1 Analytic Methodology

DEA created WaterCAD™ (Reference 3) models of the proposed water system. WaterCAD is a water distribution system modeling software created by Haestad Methods. To run WaterCAD, a user inputs the water system map, waterline sizes, and demand locations. WaterCAD connects these elements as a system and uses mathematical equations to determine flow directions, flow magnitudes and pressures for the water system modeled.

2.2 Model Scenarios

Two WaterCAD models were created to analyze the proposed water distribution system. The first model (Phase 1 Stand Alone) represents the distribution system for just Phase 1, which has been provided to verify the Phase 1 system meets the project's master planning requirements without the aid of future improvements and outline the initial water improvements for the client. The second model (Ultimate Build Out) represents the entire Balterra service area. Average day, maximum day, peak hour, and maximum day plus fire flow scenarios were created for each of the models.

2.3 Existing Water Infrastructure

There were no existing waterlines or facilities near the project. New domestic well sites, well transmission mains, a storage/booster station, and distribution waterlines will be required for this development.

2.4 Design Criteria and Assumptions

The design criteria applied to this master plan was based on the demands of a similar development in the Town of Buckeye, called Sundance. These standards are outlined in Appendix I.

2.5 Demand Summary

Table 2.5.1 shows the total estimated demands used for the two water distribution system models (Phase 1 Stand Alone and Ultimate Build Out). These demands were estimated in accordance with the standards in Appendix I. Detailed demand table calculations for the above referenced scenarios are provided Appendix A.

TABLE 2.5.1 WATER DISTRIBUTION DEMAND SUMMARY

Model	Ave Day (gpm)	Max Day (gpm)	Peak Hour (gpm)
Phase 1	299	537	895
Ultimate Build Out	1,774	3,193	5,322

The required well output for the overall Balterra development will be dictated by max day demand for residential, mixed-use employment, and business park employment land uses. It is anticipated that only the mixed-use employment and business park developments will draw offsite users to the Balterra development. Other commercial land uses will only serve local residents. The demands used to calculate the number of wells required are shown in Table 2.5.2.

TABLE 2.5.2 WELL DEMAND SUMMARY

Model	Max Day (gpm)
Phase 1	467
Ultimate Build Out	2,919

2.6 Wells, Storage, and Pumping Requirements

This section discusses the wells, storage, and pumping requirements of the Balterra development. The development will have a booster/storage facility and 4 well sites.

2.6.1 Wells

The number of wells required is based on matching the max daily consumption of the residential, mixed-use employment, and business park developments, which is described in Section 2.5. As a conservative measure, 15% backup capacity is provided. Assuming an average well output of 1,000 gpm, the first phase of Balterra will require 1 well site to satisfy daily consumption and 1 well site for redundancy. At ultimate build out, 4 well

sites will be required. Well calculations are provided in Appendix B and the proposed well locations are shown on Exhibit 4.

System head calculations for each pump were used to determine the head requirements of each well facility. The system head calculations are found in Appendix F. The pumping levels and flowrates used in this model are assumed for all wells. After each well has been developed, its proposed pumps will be resized during the preparation of its construction plans. The sizes and quantities of the required well transmission lines are provided in Appendix J, page 1.

2.6.2 Disinfection

The water sent to the storage reservoir will be disinfected by injecting a chlorinated solution into the transmission line as the water enters the reservoir. The source of this chlorine will be a chlorine tablet system or a sodium hypochlorite generation system. The manufacturer of this system will be approved by the water company during the design of the storage/booster facility. Chlorine demand calculations for the water supply facility are provided in Appendix D, which assumes a chlorine demand of 1 ppm for the well water and a desired residual of 1.5 ppm in the storage reservoir. When the wells are developed, the water will be tested to verify the assumed demand.

Once the well water has been tested the water quality will be thoroughly investigated and additional water treatment may be required.

2.6.3 Storage

Fire fighting storage for Balterra will be provided in the water supply facility reservoir. The reservoir will also provide domestic, commercial, and school storage. Reservoir calculations are provided in Appendix C, page 1.

The reservoir will be an above ground welded steel tank. The tank will be protected from corrosion by an epoxy-based coating and an automatic cathodic protection system. Access on and into the tank will be provide by interior and exterior ladders, secured roof hatches, and several ground level hatches. The tank will also include inlet, outlet, overflow, and drain piping.

2.6.4 Booster Pumps

The proposed reservoir will be accompanied by a booster facility, which will include several VFD driven split case horizontal or vertical turbine centrifugal pumps. The head setting of the proposed booster pumps will be based on the HGL of the distribution system. The development's required booster capacity is outlined in Appendix C, page 2.

The total pumping rate of the facility will be broken into pump sizes specified by the water company and will be agreed upon by the designing Engineer.

2.6.5 Hydropneumatic Tank

The proposed water supply will include a hydropneumatic tank. The tank and its compressor will be installed after the booster pump discharge on a common supply/demand line. The tank will meet nuisance and low water demands within the system. Along with a surge/pressure relief valve that discharges into the proposed reservoir, the tank will reduce any water hammer or surges in the system. The presence of the tank will also limit short pump cycles.

The tank is expected to have a 10,000 gallon capacity and be served by a 13.6 cfm air compressor. The tank will include a single continuous level probe, which will control its compressor. The proposed tank will have a minimum pressure rating of 150 psi.

2.6.6 Controls and Communications

The wells and storage/booster facility will communicate using a radio system approved by the water company. Reservoir levels will start and stop the well pumps. A flowmeter will pace the injection rate of the disinfection system. The booster pumps will operate on a constant pressure configuration in which they start, stop, speed up, and slow down based on a preset system pressure.

2.7 Pressure Zones

The Balterra water system will consist of 1 pressure zone. The HGL of this zone has been established by the engineer based on maintaining a target pressure range between 55 and 85.

2.8 Distribution System Model Analysis and Results

The WaterCAD output for all domestic distribution demand scenarios modeled can be found in Appendix E. These scenarios include the Phase 1 stand alone and overall or ultimate build out condition. These outputs include system pressures, pipe velocities, demands, and headloss information.

Table 2.7.1 summarizes the Phase 1 Stand Alone system pressures. The pressures range from 85.6 psi to 70.7 psi for all scenarios.

TABLE 2.7.1 PHASE 1 STAND ALONE PRESSURE SUMMARY

Model Scenario		Min	Max	Ave
Average Day	Pressure (psi)	70.7	85.6	79.3
	Node	J-37	J-95	-
Max Day	Pressure (psi)	70.7	85.4	79.2
	Node	J-37	J-95	-
Peak Hour	Pressure (psi)	70.7	84.9	78.8
	Node	J-37	J-95	-

Table 2.7.2 summarizes the Ultimate Build Out system pressures. The pressures range from 85.2 psi to 56.1 psi for all scenarios.

TABLE 2.7.2 ULTIMATE BUILD OUT PRESSURE SUMMARY

Model Scenario		Min	Max	Ave
Average Day	Pressure (psi)	61.5	85.2	76
	Node	J-118	J-13	-
Max Day	Pressure (psi)	59.9	82.8	74.1
	Node	J-118	J-13	-
Peak Hour	Pressure (psi)	56.1	78.3	69.7
	Node	J-118	J-95	-

In addition to the summaries provided above, all scenarios meet the required max day plus fire flow demands with all residual pressures exceeding 20 psi.

2.8 Water Infrastructure Improvements

Based on the modeling results, several improvements are required to support backbone infrastructure for Balterra. Exhibit 4 shows the improvements required. Although the waterline

alignments illustrated on the exhibit follow paths dictated primarily by collector and arterial roads, the size of many of the waterlines allows them to be routed through the proposed neighborhoods once the final road and lot layouts have been determined. A summary of the size and quantity of water distribution lines and well transmission lines required for the ultimate build out can be found in Appendix J, page 1.

2.9 Conclusions

The following summarizes the findings of the water master plan.

1.) The proposed water distribution system meets all pressure and velocity requirements for average day, maximum day, peak hour, and fire flow conditions during the stand alone and ultimate build out scenarios.

2.) The well, storage, and booster facilities proposed in this master plan meet the demand and fire flow requirements for Balterra from the completion of Phase 1 until the community is built out.

It is recommended that the Balterra water infrastructure improvements be designed as dictated in this plan.

3.0 WASTEWATER MASTER PLAN

3.1 Analytic Methodology

DEA modeled the proposed wastewater collection system using Microsoft Excel spreadsheets. These spreadsheets are referred to as "Sanitary Sewer Design Tables" and are located in Appendix G. Each line in the spreadsheet represents a pipe segment, which is linked to its upstream and downstream pipes. Inputting land use information allows the spreadsheet to calculate the cumulative wastewater flow, velocity, and capacity of each sewer run using Manning's Equation. This information is then used to set inverts, slopes, and line diameters for the collection system. Exhibit 5 references the concentration points or nodes called out on the design tables. Although the sewer alignments illustrated on the exhibit follow paths dictated primarily by collector and arterial roads, the size of many of the sewer lines allows them to be routed through the proposed neighborhoods once the final road and lot layouts have been determined.

3.2 Model Scenarios

As discussed in the introduction section of this master plan, the purpose of this document is to size the wastewater system for the entire Balterra development. Properties surrounded by Balterra were included in the build out model to illustrate that they could ultimately be served by

the community's water reclamation facility and collection system. Two scenarios were analyzed, a Phase 1 stand alone scenario and Ultimate Build Out scenario. The stand alone scenario insures that the system will perform in accordance with applicable standards when it conveys the lower flows that are generated by the initial phase of the development. The design tables for both scenarios have been provided in Appendix G.

3.3 Existing Wastewater Facilities

Currently, there are no existing sanitary sewer lines or reclamation facilities near the project. New gravity sewer lines and a water reclamation facility will be required for this development.

3.4 Design Criteria and Assumptions

The design criteria applied to this master plan was based on the flows generated by a similar development in the Town of Buckeye, called Sundance. These standards are outlined in Appendix I.

3.5 Wastewater Flow Summary

Table 3.5.1 summarizes the wastewater flows for the Balterra community. A detailed flow calculation that breaks down the values listed below is provided in Appendix G. The peak flows are based on a peaking factor in accordance with Appendix I.

TABLE 3.5.1 - WASTEWATER FLOWS

Development	Wastewater Flow (mgd)		
	Average Daily Flow	Peaking Factor	Peak Daily Flow
Phase 1	0.440	2.04	0.898
Balterra Ultimate Build Out	1.758	1.788	3.143
Other Offsite Development by others (see Exhibit 6)	0.364	2.05	0.745
Total Flow to Reclamation Facility	2.122	1.755	3.724

3.6 Wastewater Loading

The wastewater discussed in this master plan will contain an estimated 250 mg/l BOD, 250 mg/l SS, and 40 mg/l TKN. Based on these values, Table 3.6.1 shows the future reclamation facility loading based on the flows listed in Table 3.5.1.

TABLE 3.6.1 – WASTEWATER LOADING

Development	Loading Characteristic (lbs/day)		
	Five Day BOD	Total Suspended Solids	Total Kjedahl Nitrogen
Phase 1	918	918	147
Balterra Ultimate Build Out	3,668	3,668	587
Offsite Development by others (see Exhibit 6)	759	759	122
Total Loading to Reclamation Facility	4,427	4,427	708

3.7 Wastewater Analysis and Results

This section of the master plan outlines the results of the analysis performed on the Balterra wastewater collection system. The Balterra wastewater collection system depicted in Appendix G and Exhibit 5 was designed to convey on-site and off-site flows to the future reclamation facility while meeting the design criteria set forth in Appendix I. The analysis was used to size main trunk lines for ultimate build-out.

Each sewer line was sized with a maximum capacity of no more than 82% full during the peak daily flow. Table 3.7.1 summarizes the percent capacity results for the Balterra collection system.

TABLE 3.7.1 - PERCENT CAPACITY SUMMARY

Average % Cap.	Minimum % Cap.	Minimum % Cap Run	Maximum % Cap.	Maximum % Cap. Run
47.3	14.9	53-52	81.3	63-56

A minimum and maximum flowing full velocity of 2.0 ft/s and 9.0 ft/s were used in the analysis of the Balterra system. These velocities are represented by the "Full Flow Velocity" columns in the design tables. Table 3.7.2 summarizes the full flow velocities for the Balterra collection system.

TABLE 3.7.2 - FULL FLOW VELOCITY SUMMARY

Development	Minimum Full Flow Velocity (fps)	Minimum Full Flow Velocity Run	Maximum Full Flow Velocity (fps)	Maximum Full Flow Velocity Run
Phase 1	2.3	33-31	5.5	1-WRF
Ultimate Build Out	2.3	Multiple	7.2	40-39

3.8 Wastewater Infrastructure Improvements

The objective of the wastewater collection system design is to serve the proposed development cost effectively while meeting the County and State guidelines. Exhibit 5 illustrates the entire Balterra wastewater infrastructure. Appendix J, page 2 includes backbone quantities for the sewer improvements within Balterra.

3.9 Water Reclamation Facility (WRF)

The proposed facility will be located in the south-central portion of the development. Exhibit 5 illustrates the plant location.

Access to the treatment plant shall be Indian School Road to prevent the trucking of screenings or solids through residential neighborhoods.

A 208 Amendment is currently being prepared by Black & Veatch Engineering for the proposed water reclamation facility.

3.10 Conclusions

In conclusion, the following summarizes the findings of the wastewater master plan:

1) The proposed sanitary sewer lines are designed at a slope equal to or exceeding the minimum requirements. Flow capacities do not exceed 82%

2) The full flow velocities of the proposed lines fall between the minimum of 2.0 fps and maximum of 9 fps.

3) Sewer inverts were set according to minimum cover requirements.

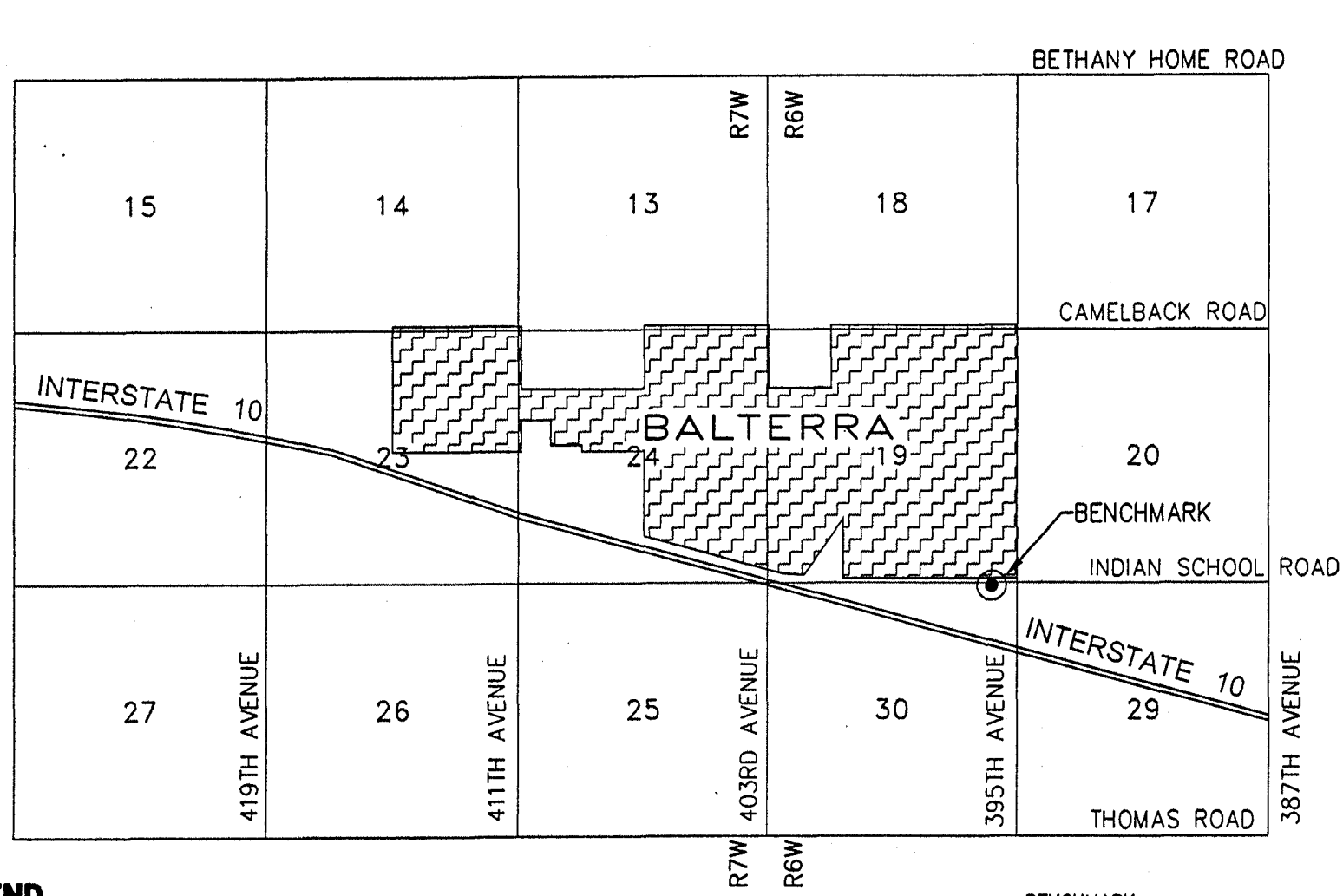
4) The proposed WRF will provide the capacity and level of treatment required to serve the first phase within Balterra. As the developments within the service area continue to grow, additional phases will be added to the facility to provide additional capacity.

With these factors in mind, it is recommended that the Balterra sanitary sewer improvements be designed as dictated in this plan.

4.0 REFERENCES

1. *ADEQ Aquifer Protection Permit Rules,* R18-9, March 2001 by ADEQ.
2. *Engineering Bulletin No. 10 – Guidelines for the Construction of Water Systems*, May 1978 by ADEQ
3. *WaterCAD v7.0,* by Haestad Methods, Inc., Waterbury CT.

1



LEGEND

- SECTION LINE
- BENCHMARK LOCATION
- PROJECT BOUNDARY

BENCHMARK:
NGS BRASS DISK, DESIGNATED X 475, AT THE NORTHWEST CORNER OF A CONCRETE WELL PAD ON THE SOUTH SIDE OF INDIAN SCHOOL ROAD, 0.1 MILES WEST OF THE INTERSECTION WITH 395TH AVENUE. DATUM IS NAVD88. ELEV. = 1107.44'

SCALE: NTS	**EXHIBIT 1 - BALTERRA VICINITY MAP WITH BENCHMARK LOCATION**	DRAWN BY: DCHO
SHEET 1 OF 1		CHECKED BY: WDR
JOB NO.: JFP100000002		DATE: 04/05

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

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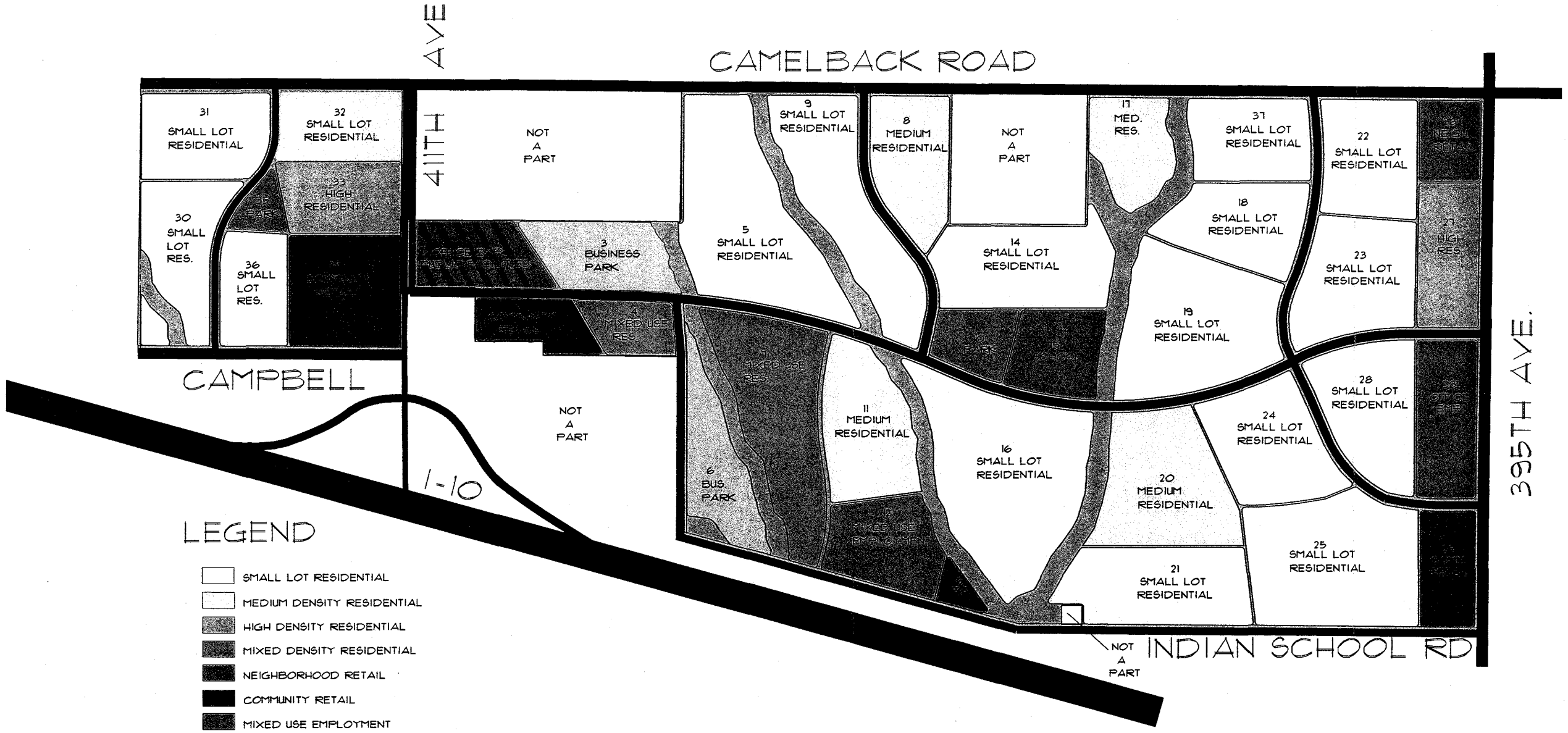

LEGEND

- SMALL LOT RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- MIXED DENSITY RESIDENTIAL
- NEIGHBORHOOD RETAIL
- COMMUNITY RETAIL
- MIXED USE EMPLOYMENT
- OFFICE EMPLOYMENT
- PUBLIC FACILITIES
- BUSINESS PARK
- SCHOOL
- PARK
- DRAINAGE/OPEN SPACE

SCALE: 1" = 500'
0 250' 500' 750' 1000' 1500'
NORTH

DAVID EVANS AND ASSOCIATES, INC.
2141East Highland Avenue Suite 200 Phoenix, Arizona. 85016
(602) 678-5151
(FAX) 678-5155

DATE: 05-18-05
PROJECT NO. :JFPI00000002

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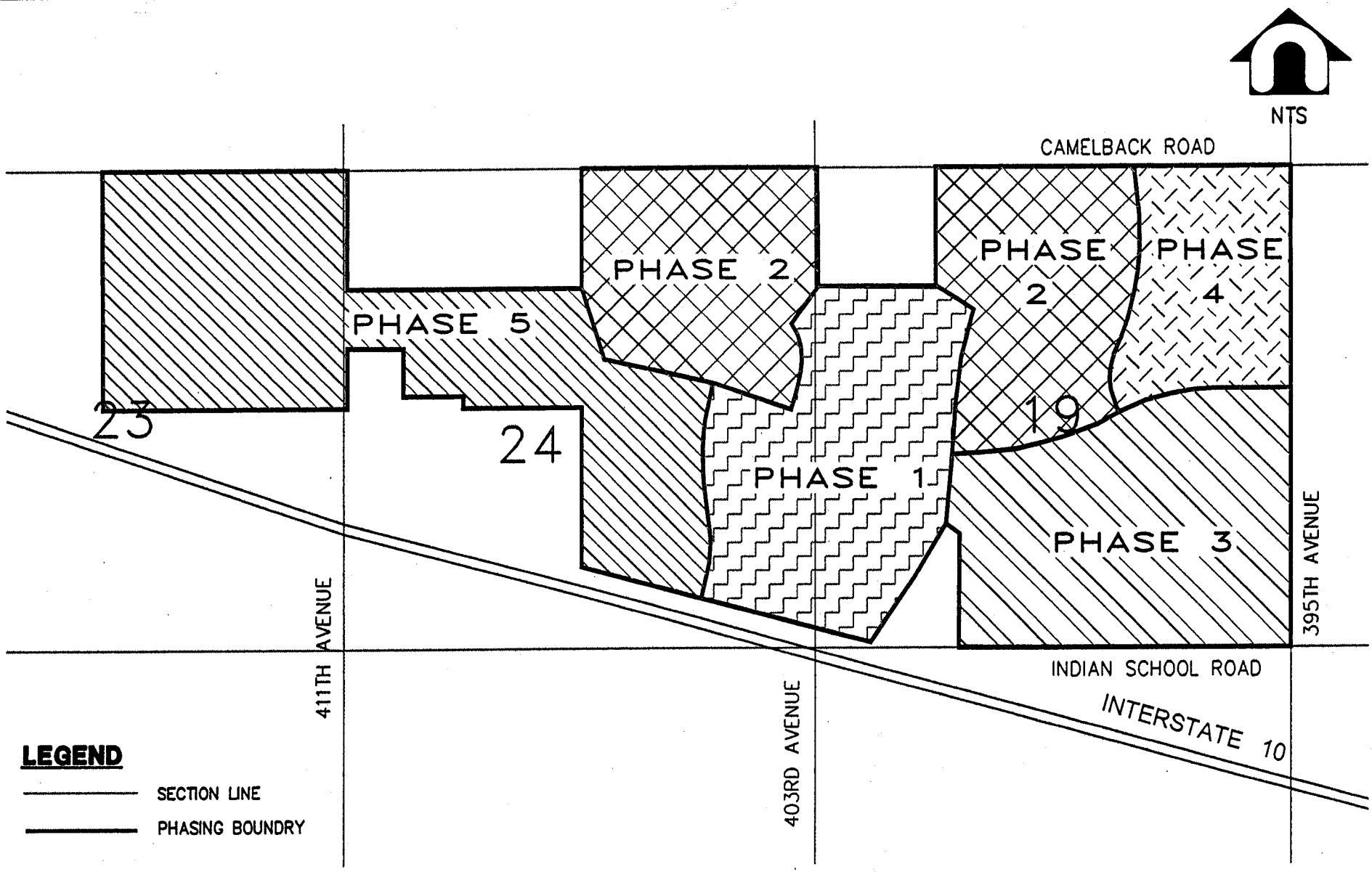
3



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SCALE: NTS	**EXHIBIT 3** **BALTERRA** **PHASING EXHIBIT**	DRAWN BY: DCHO
SHEET 1 OF 1		CHECKED BY: WDR
JOB NO.: JFP100000002		DATE: 04/05

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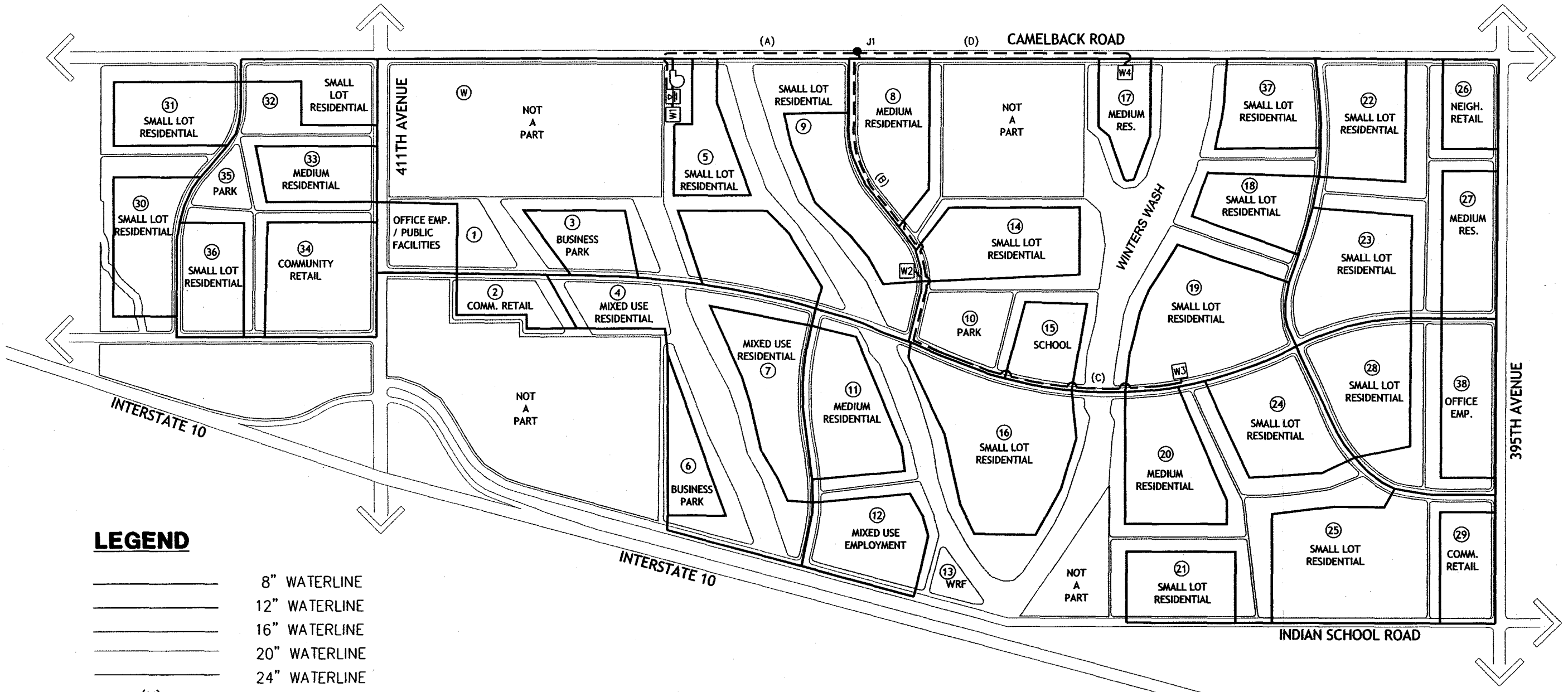
Phoenix Arizona 85016
Phone: 602.678.5151

4

1"=1000"

NOTE: ALTHOUGH THE WATERLINE ALIGNMENTS ILLUSTRATED ON THE EXHIBIT FOLLOW PATHS DICTATED PRIMARILY BY COLLECTOR AND ARTERIAL ROADS, THE SIZE OF MANY OF THE WATERLINES ALLOWS THEM TO BE ROUTED THROUGH THE PROPOSED NEIGHBORHOODS ONCE THE FINAL ROAD AND LOT LAYOUTS HAVE BEEN DETERMINED.



LEGEND

- 8" WATERLINE
- 12" WATERLINE
- 16" WATERLINE
- 20" WATERLINE
- 24" WATERLINE
- (X) WELL TRANSMISSION LINE SEGMENT
- ● J1 WELL TRANSMISSION LINE SEGMENT JUNCTION
- W WATER SUPPLY FACILITY
- W# WELL SITE
- (W) EXISTING ADOT WELL SITE

WELL TRANSMISSION LINE SEGMENTS		
SEGMENT ID	PIPE SIZE	LINKAGE
A	16"	J1 TO STORAGE RESERVOIR
B	16"	WELL 2 TO J1
C	12"	WELL 3 TO WELL 2
D	12"	WELL 4 TO J1

DRAWN BY: DCHO
CHECKED BY: WDR
DATE: 06/05

DATE	REVISION	BY

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

EXHIBIT 4
BALTERRA
WATER MASTER PLAN

SECTION: 19, 23, 24
TWNSHP: T3N
RANGE: R6W & R7W
SHEET 1 OF 1
JOB NO.: JFP10000-0002

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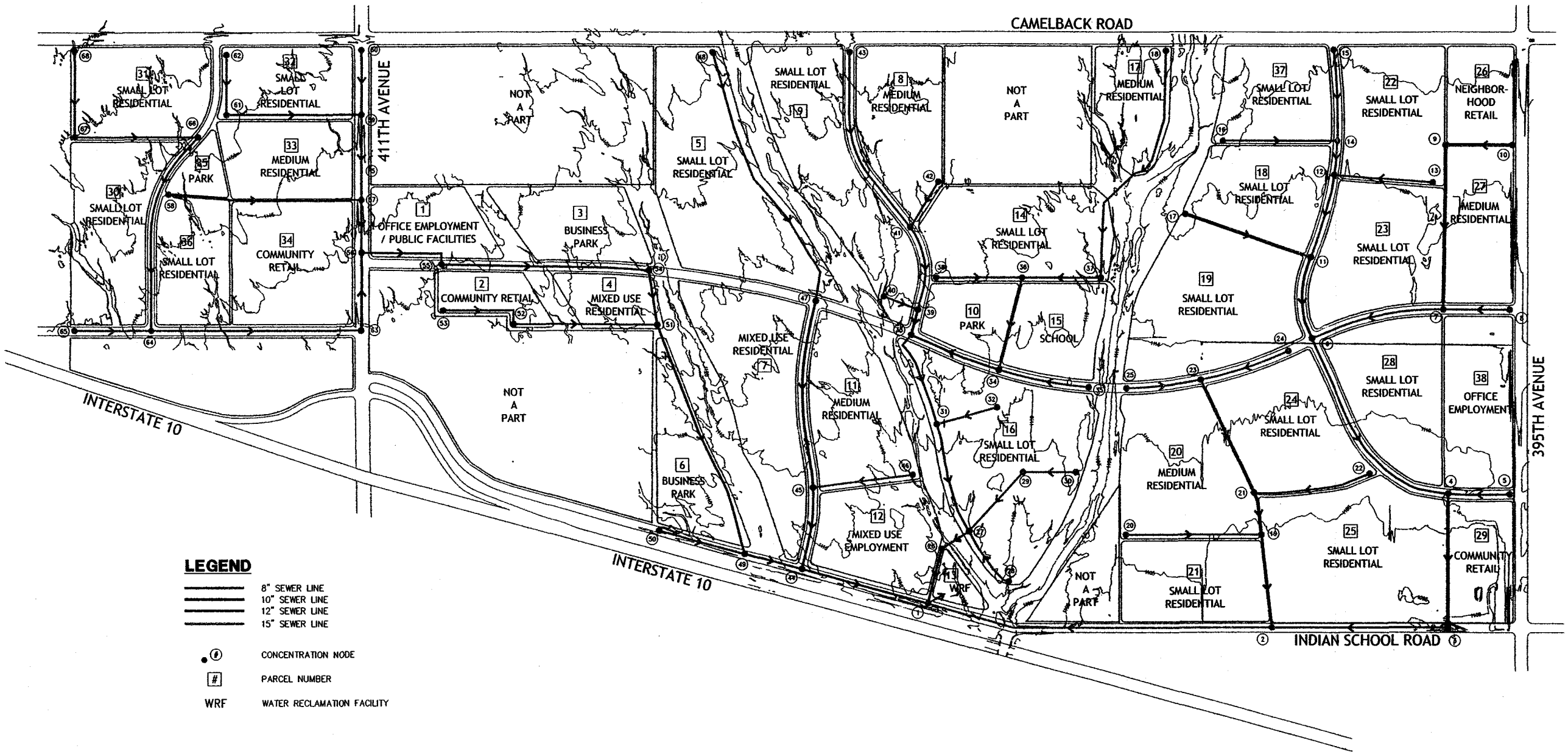
N.T.S.



LEGEND

- 8" SEWER LINE
- 10" SEWER LINE
- 12" SEWER LINE
- 15" SEWER LINE
- (#) CONCENTRATION NODE
- [#] PARCEL NUMBER
- WRF WATER RECLAMATION FACILITY

NOTE: ALTHOUGH THE SEWER ALIGNMENTS ILLUSTRATED ON THE EXHIBIT FOLLOW PATHS DICTATED PRIMARILY BY COLLECTOR AND ARTERIAL ROADS, THE SIZE OF MANY OF THE SEWER LINES ALLOWS THEM TO BE ROUTED THROUGH THE PROPOSED NEIGHBORHOODS ONCE THE FINAL ROAD AND LOT LAYOUTS HAVE BEEN DETERMINED.

BY	REVISION	DATE

DRAWN BY: DCHO
CHECKED BY: WDR
DATE: 06/2005

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix, Arizona 85016
Phone: 602.678.6151

EXHIBIT 5
BALTERRA
WASTEWATER SYSTEM

SCALE: N.T.S.
SECTION: 19 & 24
TWNSHP: T2N
RANGE: R5W & R7W
SHEET 1 OF 1
JOB NO.: JFP10002

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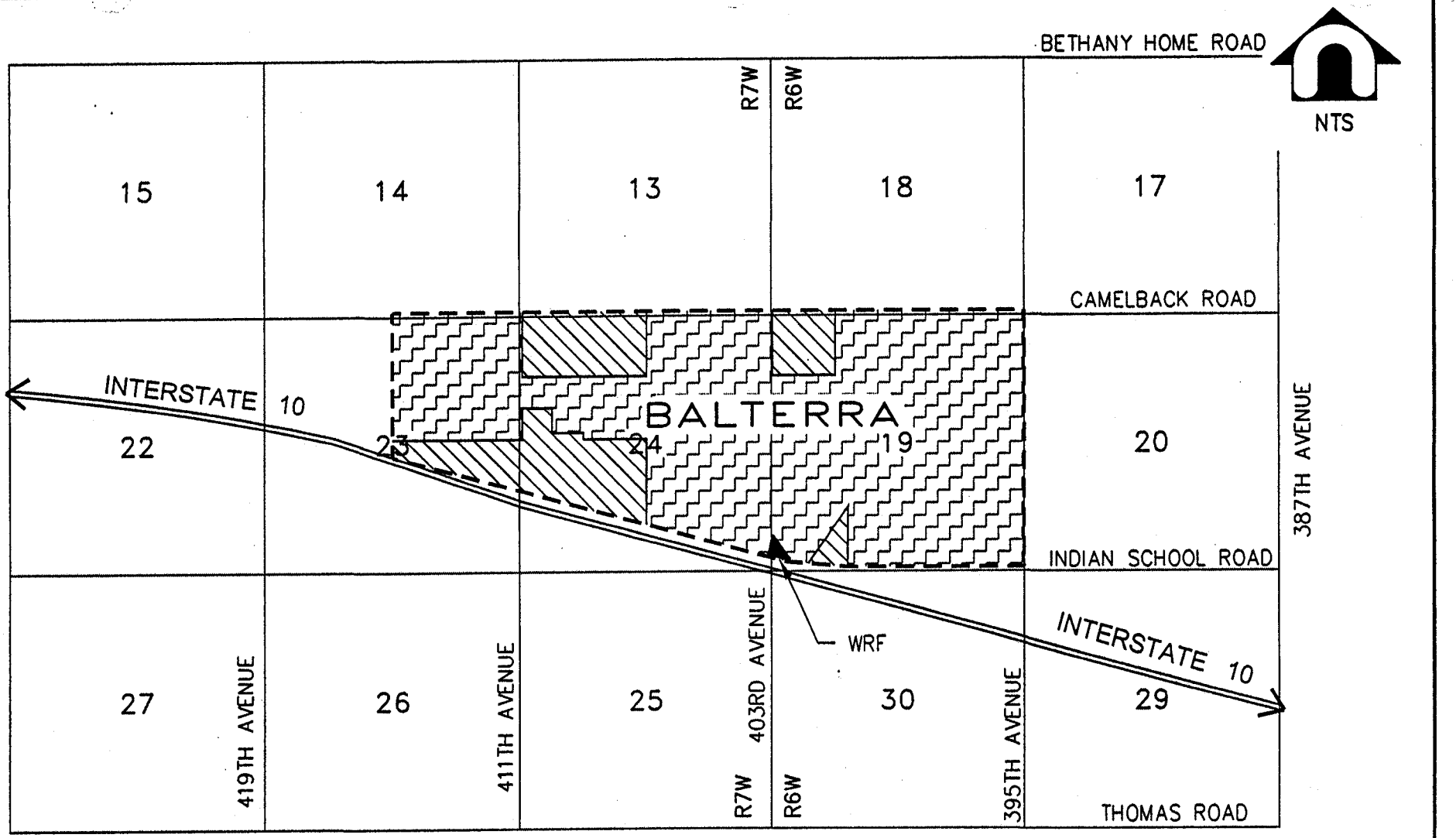

LEGEND

- SECTION LINE
- SERVICE AREA
- OFFSITE PROPERTY
- BALTERRA DEVELOPMENT

SCALE: NTS	**EXHIBIT 6** **BALTERRA WATER AND WASTEWATER SERVICE AREA**	DRAWN BY: DCHO
SHEET 1 OF 1		CHECKED BY: WDR
JOB NO.: JFP100000002		DATE: 04/05

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

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A

APPENDIX A
WATER DEMAND TABLES

BALTERRA
WATER DEMANDS

April, 2005

Parcel	J-Node	Land Use	Area (Acres)	Elevation	DU/ Acre	DU	Persons Per DU	Population	Ave Gal per per Capita, Acre, or Student per day (gpcd,gpad,gpsd)	Average Day Demand (gpm)	Cum. Ave. Demand Per Node (gpm)	Max Day Factor	Max Day Demand (gpm)	Cum. Max Demand Per Node (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)	Cum. Peak Demand Per Node (gpm)	Fire Flow Demand (gpm)
26	J-002	Neighborhood Retail	3.29	1,128					1,500	3.4	3.43	1.80	6.17	6.17	3.00	10.28	10.28	3000
26	J-003	Neighborhood Retail	3.29	1,122					1,500	3.4	3.43	1.80	6.17	6.17	3.00	10.28	10.28	3000
27	J-004	Medium Residential	5.30	1,121	15.00	79	2.0	159	150	16.6	16.55	1.80	29.80	29.80	3.00	49.66	49.66	2000
27	J-005	Medium Residential	5.30	1,117	15.00	79	2.0	159	150	16.6		1.80	29.80		3.00	49.66		3000
38		Office Employment	5.91	1,117					1,500	6.2	22.71	1.80	11.08	40.88	3.00	18.47	68.13	3000
38	J-006	Office Employment	5.91	1,115					1,500	6.2	6.16	1.80	11.08	11.08	3.00	18.47	18.47	3000
-	J-007	-		1,114					150	0.0	0.00	1.80	0.00	0.00	3.00	0.00	0.00	1500
29	J-008	Community Retail	3.91	1,114					1,500	4.1	4.07	1.80	7.33	7.33	3.00	12.22	12.22	3000
29	J-009	Community Retail	3.91	1,108					1,500	4.1	4.07	1.80	7.33	7.33	3.00	12.22	12.22	3000
29	J-010	Community Retail	3.91	1,105					1,500	4.1	4.07	1.80	7.33	7.33	3.00	12.22	12.22	3000
25	J-011	Small Lot Residential	11.63	1,105	5.00	58	3.2	186	150	19.4	19.38	1.80	34.88	34.88	3.00	58.13	58.13	1500
25	J-012	Small Lot Residential	11.63	1,103	5.00	58	3.2	186	150	19.4	19.38	1.80	34.88	34.88	3.00	58.13	58.13	1500
21	J-013	Small Lot Residential	5.92	1,102	5.00	30	3.2	95	150	9.9	9.86	1.80	17.75	17.75	3.00	29.58	29.58	1500
21	J-014	Small Lot Residential	5.92	1,103	5.00	30	3.2	95	150	9.9	9.86	1.80	17.75	17.75	3.00	29.58	29.58	1500
12	J-015	Mixed Use Employment	5.73	1,105					1,500	6.0	5.97	1.80	10.74	10.74	3.00	17.91	17.91	3000
12	J-016	Mixed Use Employment	5.73	1,110					1,500	6.0	5.97	1.80	10.74	10.74	3.00	17.91	17.91	3000
-	J-017	-		1,115			3.2	0	150	0.0	0.00	1.80	0.00	0.00	3.00	0.00	0.00	1500
6	J-018	Business Park	6.83	1,115					1,500	7.1	7.12	1.80	12.81	12.81	3.00	21.35	21.35	3000
6	J-019	Business Park	6.83	1,121					1,500	7.1	7.12	1.80	12.81	12.81	3.00	21.35	21.35	3000
4	J-020	Mixed Use Residential	2.50	1,124	22.00	55	2.0	110	150	11.4	11.45	1.80	20.60	20.60	3.00	34.34	34.34	2000
4	J-021	Mixed Use Residential	2.50	1,128	22.00	55	2.0	110	150	11.4	11.45	1.80	20.60	20.60	3.00	34.34	34.34	2000
2	J-022	Community Retail	3.39	1,130					1,500	3.5	3.53	1.80	6.35	6.35	3.00	10.58	10.58	3000
2	J-023	Community Retail	3.39	1,135					1,500	3.5	3.53	1.80	6.35	6.35	3.00	10.58	10.58	3000
1	J-024	Office Employment/Public Facilities	4.10	1,136					1,500	4.3	4.27	1.80	7.69	7.69	3.00	12.81	12.81	3000
1	J-025	Office Employment/Public Facilities	4.10	1,138					1,500	4.3	4.27	1.80	7.69	7.69	3.00	12.81	12.81	3000
34	J-026	Community Retail	7.37	1,134					1,500	7.7	7.68	1.80	13.82	13.82	3.00	23.04	23.04	3000
34	J-027	Community Retail	7.37	1,139					1,500	7.7	7.68	1.80	13.82	13.82	3.00	23.04	23.04	3000
36	J-028	Small Lot Residential	4.63	1,136	5.00	23	3.2	74	150	7.7	7.71	1.80	13.88	13.88	3.00	23.13	23.13	1500
36	J-029	Small Lot Residential	4.63	1,144	5.00	23	3.2	74	150	7.7	7.71	1.80	13.88	13.88	3.00	23.13	23.13	1500
30	J-030	Small Lot Residential	9.06	1,144	5.00	45	3.2	145	150	15.1	15.10	1.80	27.18	27.18	3.00	45.30	45.30	1500
36	J-031	Small Lot Residential	4.63	1,149	5.00	23	3.2	74	150	7.7	7.71	1.80	13.88	13.88	3.00	23.13	23.13	1500
30	J-032	Small Lot Residential	9.06	1,148	5.00	45	3.2	145	150	15.1		1.80	27.18		3.00	45.30		1500

BALTERRA
WATER DEMANDS

April, 2005

Parcel	J-Node	Land Use	Area (Acres)	Elevation	DU/ Acre	DU	Persons Per DU	Population	Ave Gal per per Capita, Acre, or Student per day (gpcd,gpad,gpsd)	Average Day Demand (gpm)	Cum. Ave. Demand Per Node (gpm)	Max Day Factor	Max Day Demand (gpm)	Cum. Max Demand Per Node (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)	Cum. Peak Demand Per Node (gpm)	Fire Flow Demand (gpm)
35		Park	2.66						1,500	2.8	17.87	1.80	4.99	32.17	3.00	8.31	53.61	1500
31	J-033	Small Lot Residential	8.32	1,152	5.00	42	3.2	133	150	13.9		1.80	24.96		3.00	41.60		1500
		Park	2.66						1,500	2.8	16.64	1.80	4.99	29.95	3.00	8.31	49.91	1500
31	J-034	Small Lot Residential	8.32	1,154	5.00	42	3.2	133	150	13.9		1.80	24.96		3.00	41.60		1500
32		Small Lot Residential	6.44		5.00	32	3.2	103	150	10.7	24.61	1.80	19.33	44.29	3.00	32.22	73.82	1500
-	J-035	-		1,155					1,500	0.0	0.00	1.80	0.00	0.00	3.00	0.00	0.00	-
-	J-036	-		1,149		0	3.2	0	150	0.0	0.00	1.80	0.00	0.00	3.00	0.00	0.00	-
5	J-037	Small Lot Residential	8.11	1,139	5.00	41	3.2	130	150	13.5	13.51	1.80	24.32	24.32	3.00	40.53	40.53	1500
5	J-038	Small Lot Residential	8.11	1,136	5.00	41	3.2	130	150	13.5	13.51	1.80	24.32	24.32	3.00	40.53	40.53	1500
8	J-039	Medium Residential	6.30	1,135	15.00	95	2.0	189	150	19.7	19.69	1.80	35.44	35.44	3.00	59.06	59.06	2000
8	J-040	Medium Residential	6.30	1,132	15.00	95	2.0	189	150	19.7	19.69	1.80	35.44	35.44	3.00	59.06	59.06	2000
17	J-041	Medium Residential	5.35	1,129	15.00	80	2.0	161	150	16.7	16.73	1.80	30.11	30.11	3.00	50.19	50.19	2000
17	J-042	Medium Residential	5.35	1,126	15.00	80	2.0	161	150	16.7	16.73	1.80	30.11	30.11	3.00	50.19	50.19	2000
37	J-043	Small Lot Residential	5.36	1,127	5.00	27	3.2	86	150	8.9	8.93	1.80	16.07	16.07	3.00	26.78	26.78	1500
37	J-044	Small Lot Residential	5.36	1,128	5.00	27	3.2	86	150	8.9		1.80	16.07		3.00	26.78		1500
22		Small Lot Residential	6.86		5.00	34	3.2	110	150	11.4	20.36	1.80	20.58	36.65	3.00	34.30	61.08	1500
22	J-045	Small Lot Residential	6.86	1,128	5.00	34	3.2	110	150	11.4	11.43	1.80	20.58	20.58	3.00	34.30	34.30	1500
26	J-046	Neighborhood Retail	3.29	1,128					1,500	3.4	3.43	1.80	6.17	6.17	3.00	10.28	10.28	3000
27	J-047	Medium Residential	5.30	1,116	15.00	79	2.0	159	150	16.6		1.80	29.80		3.00	49.66		3000
38		Office Employment	5.91						1,500	6.2	22.71	1.80	11.08	40.88	3.00	18.47	68.13	3000
23	J-048	Small Lot Residential	7.73	1,117	5.00	39	3.2	124	150	12.9		1.80	23.18		3.00	38.63		1500
28		Small Lot Residential	7.15		5.00	36	3.2	114	150	11.9	24.79	1.80	21.45	44.63	3.00	35.75	74.38	1500
19	J-049	Small Lot Residential	6.92	1,116	5.00	35	3.2	111	150	11.5		1.80	20.77		3.00	34.62		1500
23		Small Lot Residential	7.73		5.00	39	3.2	124	150	12.9		1.80	23.18		3.00	38.63		1500
24		Small Lot Residential	7.43		5.00	37	3.2	119	150	12.4		1.80	22.30		3.00	37.16		1500
28		Small Lot Residential	7.15		5.00	36	3.2	114	150	11.9	48.72	1.80	21.45	87.69	3.00	35.75	146.15	1500
19	J-050	Small Lot Residential	6.92	1,112	5.00	35	3.2	111	150	11.5		1.80	20.77		3.00	34.62		1500
24		Small Lot Residential	7.43		5.00	37	3.2	119	150	12.4	23.93	1.80	22.30	43.07	3.00	37.16	71.78	1500
19	J-051	Small Lot Residential	6.92	1,113	5.00	35	3.2	111	150	11.5		1.80	20.77		3.00	34.62		2000
20		Medium Residential	8.46		15.00	127	2.0	254	150	26.4	37.97	1.80	47.57	68.34	3.00	79.29	113.91	2000
19	J-052	Small Lot Residential	6.92	1,112	5.00	35	3.2	111	150	11.5		1.80	20.77		3.00	34.62		2000
20		Medium Residential	8.46		15.00	127	2.0	254	150	26.4	37.97	1.80	47.57	68.34	3.00	79.29	113.91	2000
15	J-053	1/3 School		1,113			3.2	250	75	13.0		1.80	23.44		3.00	39.06		3000
16		Small Lot Residential	10.19		5.00	51	3.2	163	150	17.0	30.00	1.80	30.56	54.00	3.00	50.94	90.00	3000
15	J-054	1/3 School		1,113			3.2	250	75	13.0		1.80	23.44		3.00	39.06		3000
16		Small Lot Residential	10.19		5.00	51	3.2	163	150	17.0	30.00	1.80	30.56	54.00	3.00	50.94	90.00	3000
10	J-055	Park	5.75	1,118					1,500	6.0		1.80	10.77		3.00	17.95		1500
16		Small Lot Residential	10.19		5.00	51	3.2	163	150	17.0	22.96	1.80	30.56	41.34	3.00	50.94	68.89	1500

BALTERRA
WATER DEMANDS

April, 2005

Parcel	J-Node	Land Use	Area (Acres)	Elevation	DU/ Acre	DU	Persons Per DU	Population	Ave Gal per per Capita, Acre, or Student per day (gpcd,gpad,gpsd)	Average Day Demand (gpm)	Cum. Ave. Demand Per Node (gpm)	Max Day Factor	Max Day Demand (gpm)	Cum. Max Demand Per Node (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)	Cum. Peak Demand Per Node (gpm)	Fire Flow Demand (gpm)
5	J-056	Small Lot Residential	8.11	1,121	5.00	41	3.2	130	150	13.5	13.51	1.80	24.32	24.32	3.00	40.53	40.53	1500
5	J-057	Small Lot Residential	8.11	1,126	5.00	41	3.2	130	150	13.5	13.51	1.80	24.32	24.32	3.00	40.53	40.53	1500
3	J-058	Business Park	6.27	1,126					1,500	6.5		1.80	11.76		3.00	19.60		3000
4		Mixed Use Residential	2.50		22.00	55	2.0	110	150	11.4	17.98	1.80	20.60	32.37	3.00	34.34	53.94	3000
3	J-059	Business Park	6.27	1,132					1,500	6.5		1.80	11.76		3.00	19.60		3000
4		Mixed Use Residential	2.50		22.00	55	2.0	110	150	11.4	17.98	1.80	20.60	32.37	3.00	34.34	53.94	3000
37	J-060	Small Lot Residential	5.36	1,122	5.00	27	3.2	86	150	8.9	8.93	1.80	16.07	16.07	3.00	26.78	26.78	1500
22	J-061	Small Lot Residential	6.86	1,121	5.00	34	3.2	110	150	11.4		1.80	20.58		3.00	34.30		1500
18		Small Lot Residential	7.58		5.00	38	3.2	121	150	12.6	24.07	1.80	22.75	43.33	3.00	37.92	72.22	1500
23	J-062	Small Lot Residential	7.73	1,119	5.00	39	3.2	124	150	12.9	12.88	1.80	23.18	23.18	3.00	38.63	38.63	1500
18	J-063	Small Lot Residential	7.58	1,118	5.00	38	3.2	121	150	12.6	12.64	1.80	22.75	22.75	3.00	37.92	37.92	1500
19	J-064	Small Lot Residential	6.92	1,117	5.00	35	3.2	111	150	11.5	11.54	1.80	20.77	20.77	3.00	34.62	34.62	1500
24	J-065	Small Lot Residential	7.43	1,108	5.00	37	3.2	119	150	12.4		1.80	22.30		3.00	37.16		1500
28		Small Lot Residential	7.15		5.00	36	3.2	114	150	11.9	24.30	1.80	21.45	43.75	3.00	35.75	72.91	1500
25	J-066	Small Lot Residential	11.63	1,108	5.00	58	3.2	186	150	19.4	19.38	1.80	34.88	34.88	3.00	58.13	58.13	1500
9	J-067	Small Lot Residential	9.40	1,128	5.00	47	3.2	150	150	15.7	15.66	1.80	28.19	28.19	3.00	46.99	46.99	1500
8	J-068	Medium Residential	6.30	1,124	15.00	95	2.0	189	150	19.7	19.69	1.80	35.44	35.44	3.00	59.06	59.06	2000
14	J-069	Small Lot Residential	8.32	1,124	5.00	42	3.2	133	150	13.9	13.87	1.80	24.96	24.96	3.00	41.60	41.60	1500
9	J-070	Small Lot Residential	9.40	1,120	5.00	47	3.2	150	150	15.7		1.80	28.19		3.00	46.99		1500
10		Park	5.75						1,500	6.0		1.80	10.77		3.00	17.95		1500
14		Small Lot Residential	8.32		5.00	42	3.2	133	150	13.9	35.51	1.80	24.96	63.92	3.00	41.60	106.54	1500
7	J-071	Mixed Use Residential	11.59	1,121	22.00	255	2.0	510	150	53.1		1.80	95.65		3.00	159.41		2000
11		Medium Residential	6.66		15.00	100	2.0	200	150	20.8	73.93	1.80	37.43	133.08	3.00	62.39	221.80	2000
11	J-072	Medium Residential	6.66	1,114	15.00	100	2.0	200	150	20.8	20.80	1.80	37.43	37.43	3.00	62.39	62.39	2000
7	J-073	Mixed Use Residential	11.59	1,112	22.00	255	2.0	510	150	53.1		1.80	95.65		3.00	159.41		3000
12		Mixed Use Employment	5.73						1,500	6.0	59.10	1.80	10.74	106.39	3.00	17.91	177.31	3000
32	J-074	Small Lot Residential	6.44	1,146	5.00	32	3.2	103	150	10.7	10.74	1.80	19.33	19.33	3.00	32.22	32.22	2000
33	J-075	Medium Residential	6.61	1,145	15.00	99	2.0	198	150	20.6	20.65	1.80	37.16	37.16	3.00	61.94	61.94	2000
1	J-076	Office Employment/Public Facilities	4.10	1,142					1,500	4.3		1.80	7.69		3.00	12.81		3000
33		Medium Residential	6.61		15.00	99	2.0	198	150	20.6	24.92	1.80	37.16	44.85	3.00	61.94	74.75	3000
34	J-077	Community Retail	7.37	1,140					1,500	7.7	7.68	1.80	13.82	13.82	3.00	23.04	23.04	3000
26	J-078	Neighborhood Retail	3.29	1,123					1,500	3.4	3.43	1.80	6.17	6.17	3.00	10.28	10.28	3000
27	J-079	Medium Residential	5.30	1,122	15.00	79	2.0	159	150	16.6	16.55	1.80	29.80	29.80	3.00	49.66	49.66	2000
38	J-080	Office Employment	5.91	1,109					1,500	6.2	6.16	1.80	11.08	11.08	3.00	18.47	18.47	3000
29	J-081	Community Retail	3.91	1,110					1,500	4.1	4.07	1.80	7.33	7.33	3.00	12.22	12.22	3000
22	J-082	Small Lot Residential	6.86	1,121	5.00	34	3.2	110	150	11.4	11.43	1.80	20.58	20.58	3.00	34.30	34.30	1500

BALTERRA
WATER DEMANDS

April, 2005

Parcel	J-Node	Land Use	Area (Acres)	Elevation	DU/ Acre	DU	Persons Per DU	Population	Ave Gal per per Capita, Acre, or Student per day (gpcd,gpad,gpsd)	Average Day Demand (gpm)	Cum. Ave. Demand Per Node (gpm)	Max Day Factor	Max Day Demand (gpm)	Cum. Max Demand Per Node (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)	Cum. Peak Demand Per Node (gpm)	Fire Flow Demand (gpm)
37	J-083	Small Lot Residential	5.36	1,126	5.00	27	3.2	86	150	8.9	8.93	1.80	16.07	16.07	3.00	26.78	26.78	1500
18	J-084	Small Lot Residential	7.58	1,125	5.00	38	3.2	121	150	12.6	12.64	1.80	22.75	22.75	3.00	37.92	37.92	1500
23	J-085	Small Lot Residential	7.73	1,120	5.00	39	3.2	124	150	12.9	12.88	1.80	23.18	23.18	3.00	38.63	38.63	1500
28	J-086	Small Lot Residential	7.15	1,109	5.00	36	3.2	114	150	11.9	11.92	1.80	21.45	21.45	3.00	35.75	35.75	1500
19	J-087	Small Lot Residential	6.92	1,120	5.00	35	3.2	111	150	11.5	11.54	1.80	20.77	20.77	3.00	34.62	34.62	1500
24	J-088	Small Lot Residential	7.43	1,108	5.00	37	3.2	119	150	12.4	12.39	1.80	22.30	22.30	3.00	37.16	37.16	1500
20	J-089	Medium Residential	8.46	1,107	15.00	127	2.0	254	150	26.4	26.43	1.80	47.57	47.57	3.00	79.29	79.29	1500
20	J-090	Medium Residential	8.46	1,105	15.00	127	2.0	254	150	26.4	26.43	1.80	47.57	47.57	3.00	79.29	79.29	1500
25	J-091	Small Lot Residential	11.63	1,105	5.00	58	3.2	186	150	19.4	19.38	1.80	34.88	34.88	3.00	58.13	58.13	1500
21	J-092	Small Lot Residential	5.92	1,104	5.00	30	3.2	95	150	9.9	9.86	1.80	17.75	17.75	3.00	29.58	29.58	1500
21	J-093	Small Lot Residential	5.92	1,106	5.00	30	3.2	95	150	9.9	9.86	1.80	17.75	17.75	3.00	29.58	29.58	1500
16	J-094	Small Lot Residential	10.19	1,105	5.00	51	3.2	163	150	17.0	16.98	1.80	30.56	30.56	3.00	50.94	50.94	1500
16	J-095	Small Lot Residential	10.19	1,104	5.00	51	3.2	163	150	17.0	16.98	1.80	30.56	30.56	3.00	50.94	50.94	1500
15	J-096	1/3 School		1,116				250	75	13.0	13.02	1.80	23.44	23.44	3.00	39.06	39.06	3000
14	J-097	Small Lot Residential	8.32	1,117	5.00	42	3.2	133	150	13.9	13.87	1.80	24.96	24.96	3.00	41.60	41.60	1500
14	J-098	Small Lot Residential	8.32	1,120	5.00	42	3.2	133	150	13.9	13.87	1.80	24.96	24.96	3.00	41.60	41.60	1500
17	J-099	Medium Residential	5.35	1,120	15.00	80	2.0	161	150	16.7	16.73	1.80	30.11	30.11	3.00	50.19	50.19	2000
8	J-100	Medium Residential	6.30	1,127	15.00	95	2.0	189	150	19.7	19.69	1.80	35.44	35.44	3.00	59.06	59.06	2000
9	J-101	Small Lot Residential	9.40	1,131	5.00	47	3.2	150	150	15.7	15.66	1.80	28.19	28.19	3.00	46.99	46.99	1500
9	J-102	Small Lot Residential	9.40	1,123	5.00	47	3.2	150	150	15.7	15.66	1.80	28.19	28.19	3.00	46.99	46.99	1500
5	J-103	Small Lot Residential	8.11	1,125	5.00	41	3.2	130	150	13.5	13.51	1.80	24.32	24.32	3.00	40.53	40.53	1500
5	J-104	Small Lot Residential	8.11	1,130	5.00	41	3.2	130	150	13.5	13.51	1.80	24.32	24.32	3.00	40.53	40.53	1500
11	J-105	Medium Residential	6.66	1,117	15.00	100	2.0	200	150	20.8	20.80	1.80	37.43	37.43	3.00	62.39	62.39	2000
11	J-106	Medium Residential	6.66	1,105	15.00	100	2.0	200	150	20.8	20.80	1.80	37.43	37.43	3.00	62.39	62.39	2000
12	J-107	Mixed Use Employment	5.73	1,106					1,500	6.0	5.97	1.80	10.74	10.74	3.00	17.91	17.91	3000
7	J-108	Mixed Use Residential	11.59	1,125	22.00	255	2.0	510	150	53.1	53.14	1.80	95.65	95.65	3.00	159.41	159.41	2000
6	J-109	Business Park	6.83	1,115					1,500	7.1	7.12	1.80	12.81	12.81	3.00	21.35	21.35	3000
3	J-110	Business Park	6.27	1,137					1,500	6.5	6.53	1.80	11.76	11.76	3.00	19.60	19.60	3000
1	J-111	Office Employment/Public Facilities	4.10	1,140					1,500	4.3	4.27	1.80	7.69	7.69	3.00	12.81	12.81	3000
2	J-112	Community Retail	3.39	1,132					1,500	3.5	3.53	1.80	6.35	6.35	3.00	10.58	10.58	3000
32	J-113	Small Lot Residential	6.44	1,151	5.00	32	3.2	103	150	10.7	10.74	1.80	19.33	19.33	3.00	32.22	32.22	1500

BALTERRA
WATER DEMANDS

April, 2005

Parcel	J-Node	Land Use	Area (Acres)	Elevation	DU/ Acre	DU	Persons Per DU	Population	Ave Gal per per Capita, Acre, or Student per day (gpcd,gpad,gpsd)	Average Day Demand (gpm)	Cum. Ave. Demand Per Node (gpm)	Max Day Factor	Max Day Demand (gpm)	Cum. Max Demand Per Node (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)	Cum. Peak Demand Per Node (gpm)	Fire Flow Demand (gpm)
33	J-114	Medium Residential	6.61	1,150	15.00	99	2.0	198	150	20.6	20.65	1.80	37.16	37.16	3.00	61.94	61.94	2000
34	J-115	Community Retail	7.37	1,145					1,500	7.7	7.68	1.80	13.82	13.82	3.00	23.04	23.04	3000
36	J-116	Small Lot Residential	4.63	1,147	5.00	23	3.2	74	150	7.7	7.71	1.80	13.88	13.88	3.00	23.13	23.13	1500
30	J-117	Small Lot Residential	9.06	1,153	5.00	45	3.2	145	150	15.1	15.10	1.80	27.18	27.18	3.00	45.30	45.30	1500
31	J-118	Small Lot Residential	8.32	1,158	5.00	42	3.2	133	150	13.9	13.87	1.80	24.96	24.96	3.00	41.60	41.60	1500
		PHASE 1									**298.46**			**537.23**			**895.38**	
		BUILD OUT TOTALS									**1773.88**			**3192.98**			**5321.64**	

B

APPENDIX B
WELL CALCULATIONS

BALTERRA
WELL REQUIREMENTS

April, 2005

PHASE 1
WELL REQUIREMENTS

Daily consumption			773,609.4	gal
No. of Wells :	1000	gpm each	0.54	
Backup Wells (15%)			0.08	
		Total No. of Wells*	**1.00**	
Total well pumping w/backup			1000	gpm

*One well is required based on Phase 1 daily consumption. However, a second well will also be required for the Phase 1 development for redundancy.

BALTERRA ULTIMATE BUILD OUT
WELL REQUIREMENTS

Daily consumption			4,597,894.8	gal
No. of Wells :	1000	gpm each	3.19	
Backup Wells (15%)			0.48	
		Total No. of Wells	**4.00**	
Total well pumping w/backup			4000	gpm

C

APPENDIX C
STORAGE AND PUMPING REQUIREMENTS

BALTERRA
STORAGE CALCULATIONS

April, 2005

BALTERRA PHASE 1
STORAGE RESERVOIR CALCULATIONS

Max Day Consumption	773,609	gal
20% =	154,722	gal
Fire Flow (3000 gpm for 3 hrs)	540,000	gal
Emergency Storage (5% of Max Day)	38,680	gal
TOTAL	**740,000**	**gal**

BALTERRA ULTIMATE BUILD OUT
STORAGE RESERVOIR CALCULATIONS*

Max Day Consumption	4,597,895	gal
20% =	919,579	gal
Fire Flow (3000 gpm for 3 hrs)	540,000	gal
Emergency Storage (5% of Max Day)	229,895	gal
TOTAL	**1,690,000**	**gal**

*It is anticipated that one storage reservoir will be built during Phase 1 with the capacity to satisfy the Ultimate Build Out storage demands.

BALTERRA
BOOSTER CAPACITY

April, 2005

REQUIRED BOOSTER CAPACITY*

Phase 1

MAX DAY + FIRE FLOW METHOD		
Max Daily Demand	537	gpm
Fire Flow	3,000	gpm
TOTAL	**3,537**	**gpm**

PEAK HOUR METHOD		
Peak Hour Demand	895	gpm
TOTAL	**895**	**gpm**

*With largest pump out of service

The required booster capacity with the largest pump out of service is: **3,537 gpm**

REQUIRED BOOSTER CAPACITY*

Ultimate Build Out

MAX DAY + FIRE FLOW METHOD		
Max Daily Demand	3,193	gpm
Fire Flow	3,000	gpm
TOTAL	**6,193**	**gpm**

PEAK HOUR METHOD		
Peak Hour Demand	5,322	gpm
TOTAL	**5,322**	**gpm**

*With largest pump out of service

The required booster capacity with the largest pump out of service is: **6,193 gpm**

D

APPENDIX D
CHLORINE DEMAND REQUIREMENTS

BALTERRA
DISINFECTION

April, 2005

General Sizing

Peak Flowrate	**2919.25**	gpm
Chlorine Demand	**1.00**	ppm
Desired Residual	**1.50**	ppm
Injection Concentration	**2.50**	ppm
Chlorine Required	**87.65**	lbs/day
Hypochlorination Requirement	**0.008**	lb Cl2/ lb water
Day Tank Sizing	**1313.31**	gal
Metering Pump Size	**54.72**	gal/hr
Salt	**262.94**	lbs/day
Salt Duration	**19.02**	days (assuming 5000 lbs of salt available)

Brine tank and blower are sized by manufacturer.
Water softener and chiller are sized and provided by manufacturer.

E

APPENDIX E
WATERCAD WATER SYSTEM MODELING RESULTS

PHASE 1

CAMELBACK ROAD

N.T.S.

J-119 P-161 J-37 J-38 P-37 J-39

P-160 P-36 R-1

NOT A PART

SMALL LOT RESIDENTIAL

P-69

J-67

8 MEDIUM RESIDENTIAL

NOT A PART

17 MEDIUM RES.

37 SMALL LOT RESIDENTIAL

9

P-70

P-120 J-98

J-68 P-71 J-69

14 SMALL LOT RESIDENTIAL

P-119

P-72 J-70 P-118 J-97

18 SMALL LOT RESIDENTIAL

OFFICE EMP. / PUBLIC FACILITIES 1

3 BUSINESS PARK

5 SMALL LOT RESIDENTIAL

2 COMM. RETIAL

4 MIXED USE RES.

P-73 J-96

J-56 P-74 J-71 P-55 J-55

10 PARK

15 SCHOOL

P-116 P-117

19 SMALL LOT RESIDENTIAL

P-132 J-105

MIXED USE RESIDENTIAL 7

P-54 J-54 P-53 J-53

NOT A PART

11 MEDIUM RESIDENTIAL

P-75 P-133

16 SMALL LOT RESIDENTIAL

24 SMALL LOT RESIDENTIAL

P-113

6 BUSINESS PARK

J-72 P-134 J-106

P-115

20 MEDIUM RESIDENTIAL

P-76 P-135 J-107

J-73

12 MIXED USE EMPLOYMENT

J-95 P-114 J-94

25 SMALL LOT RESIDENTIAL

P-77

J-16

P-136

13 J-15 WRF

NOT A PART

21 SMALL LOT RESIDENTIAL

P-14

INTERSTATE 10

INDIAN SCHOOL ROAD

Color Coding Legend
Link: Diameter (in)

	<=	8.0
	<=	12.0
	<=	16.0
	<=	20.0
	<=	24.0

PHASE 1

DRAWN BY: DCHO
CHECKED BY: WOR
DATE: 04/2005

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

BALTERRA
PHASE 1
WATER MODEL

SCALE: N.T.S.
SHEET 1 OF 1
JOB NO.: JFP10000-0002

P:\J\JFP10000002\06000INFO\EP\W-WW\WaterCAD\ECWA\JFP10002-Phase1.dwg ZJCP Jun 13, 2005 1:30:07pm

Scenario: Avg Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-15	1,105.00	Zone 1	5.97	5.97	Demand	Fixed	1,301.72	85.11
J-16	1,110.00	Zone 1	5.97	5.97	Demand	Fixed	1,301.72	82.95
J-37	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,302.00	70.69
J-38	1,136.10	Zone 1	0.00	0.00	Demand	Fixed	1,301.99	71.77
J-39	1,135.40	Zone 1	0.00	0.00	Demand	Fixed	1,301.96	72.06
J-53	1,112.10	Zone 1	30.00	30.00	Demand	Fixed	1,301.76	82.06
J-54	1,113.00	Zone 1	30.00	30.00	Demand	Fixed	1,301.76	81.67
J-55	1,118.00	Zone 1	22.96	22.96	Demand	Fixed	1,301.79	79.52
J-56	1,121.00	Zone 1	0.00	0.00	Demand	Fixed	1,301.75	78.20
J-67	1,127.90	Zone 1	0.00	0.00	Demand	Fixed	1,301.93	75.29
J-68	1,123.90	Zone 1	0.00	0.00	Demand	Fixed	1,301.85	76.99
J-69	1,123.70	Zone 1	13.87	13.87	Demand	Fixed	1,301.83	77.07
J-70	1,120.30	Zone 1	19.85	19.85	Demand	Fixed	1,301.81	78.53
J-71	1,120.90	Zone 1	20.80	20.80	Demand	Fixed	1,301.74	78.24
J-72	1,113.80	Zone 1	20.80	20.80	Demand	Fixed	1,301.73	81.31
J-73	1,112.30	Zone 1	5.97	5.97	Demand	Fixed	1,301.72	81.95
J-94	1,105.00	Zone 1	16.98	16.98	Demand	Fixed	1,301.75	85.13
J-95	1,104.00	Zone 1	16.98	16.98	Demand	Fixed	1,301.75	85.56
J-96	1,116.40	Zone 1	13.02	13.02	Demand	Fixed	1,301.76	80.20
J-97	1,116.50	Zone 1	13.87	13.87	Demand	Fixed	1,301.81	80.17
J-98	1,120.00	Zone 1	13.87	13.87	Demand	Fixed	1,301.81	78.66
J-105	1,117.00	Zone 1	20.80	20.80	Demand	Fixed	1,301.73	79.92
J-106	1,105.10	Zone 1	20.80	20.80	Demand	Fixed	1,301.72	85.07
J-107	1,106.00	Zone 1	5.97	5.97	Demand	Fixed	1,301.72	84.68
J-119	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,302.00	70.69

Scenario: Avg Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-14	1,118.00	8.0	Ductile Iron	130.0	5.24	0.00	0.00	Open	0.03
P-36	303.00	20.0	Ductile Iron	130.0	-298.48	0.01	0.02	Open	0.30
P-37	1,259.00	20.0	Ductile Iron	130.0	-298.48	0.03	0.02	Open	0.30
P-53	632.00	12.0	Ductile Iron	130.0	40.79	0.00	0.01	Open	0.12
P-54	944.00	12.0	Ductile Iron	130.0	83.64	0.02	0.03	Open	0.24
P-55	934.00	12.0	Ductile Iron	130.0	107.08	0.04	0.04	Open	0.30
P-69	507.00	16.0	Ductile Iron	130.0	-298.48	0.03	0.07	Open	0.48
P-70	1,190.00	16.0	Ductile Iron	130.0	298.48	0.08	0.07	Open	0.48
P-71	283.00	16.0	Ductile Iron	130.0	-298.48	0.02	0.07	Open	0.48
P-72	316.00	16.0	Ductile Iron	130.0	-265.61	0.02	0.05	Open	0.42
P-73	583.00	16.0	Ductile Iron	130.0	-237.02	0.03	0.04	Open	0.38
P-74	165.00	12.0	Ductile Iron	130.0	107.08	0.01	0.04	Open	0.30
P-75	1,453.00	12.0	Ductile Iron	130.0	54.10	0.02	0.01	Open	0.15
P-76	222.00	12.0	Ductile Iron	130.0	23.88	0.00	0.00	Open	0.07
P-77	604.00	12.0	Ductile Iron	130.0	11.21	0.00	0.00	Open	0.03
P-113	1,431.00	8.0	Ductile Iron	130.0	-10.62	0.01	0.00	Open	0.07
P-114	593.00	8.0	Ductile Iron	130.0	6.36	0.00	0.00	Open	0.04
P-115	1,919.00	8.0	Ductile Iron	130.0	23.34	0.03	0.02	Open	0.15
P-116	745.00	8.0	Ductile Iron	130.0	12.85	0.00	0.01	Open	0.08
P-117	1,398.00	8.0	Ductile Iron	130.0	-0.17	0.00	0.00	Open	0.00
P-118	1,459.00	8.0	Ductile Iron	130.0	8.74	0.00	0.00	Open	0.06
P-119	633.00	8.0	Ductile Iron	130.0	-5.13	0.00	0.00	Open	0.03
P-120	1,719.00	8.0	Ductile Iron	130.0	-19.00	0.02	0.01	Open	0.12
P-132	420.00	8.0	Ductile Iron	130.0	32.18	0.01	0.03	Open	0.21
P-133	1,350.00	8.0	Ductile Iron	130.0	11.38	0.01	0.00	Open	0.07
P-134	869.00	8.0	Ductile Iron	130.0	-9.42	0.00	0.00	Open	0.06
P-135	910.00	8.0	Ductile Iron	130.0	6.70	0.00	0.00	Open	0.04
P-136	1,043.00	8.0	Ductile Iron	130.0	0.73	0.00	0.00	Open	0.00
P-160	176.00	24.0	Ductile Iron	130.0	-298.48	0.00	0.01	Open	0.21
P-161	146.00	20.0	Ductile Iron	130.0	298.48	0.00	0.02	Open	0.30

Scenario: Avg Day
Steady State Analysis
Reservoir Report

Label	Reservoir Surface Elevation (ft)	Zone	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
R-1	1,302.00	Zone 1	1,302.00	-298.48	298.48

Scenario: Max Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-15	1,105.00	Zone 1	10.75	10.75	Demand	Fixed	1,301.18	84.88
J-16	1,110.00	Zone 1	10.75	10.75	Demand	Fixed	1,301.18	82.71
J-37	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,301.99	70.69
J-38	1,136.10	Zone 1	0.00	0.00	Demand	Fixed	1,301.97	71.76
J-39	1,135.40	Zone 1	0.00	0.00	Demand	Fixed	1,301.88	72.03
J-53	1,112.10	Zone 1	54.00	54.00	Demand	Fixed	1,301.28	81.85
J-54	1,113.00	Zone 1	54.00	54.00	Demand	Fixed	1,301.29	81.47
J-55	1,118.00	Zone 1	41.33	41.33	Demand	Fixed	1,301.36	79.33
J-56	1,121.00	Zone 1	0.00	0.00	Demand	Fixed	1,301.25	77.99
J-67	1,127.90	Zone 1	0.00	0.00	Demand	Fixed	1,301.78	75.23
J-68	1,123.90	Zone 1	0.00	0.00	Demand	Fixed	1,301.55	76.86
J-69	1,123.70	Zone 1	24.97	24.97	Demand	Fixed	1,301.49	76.92
J-70	1,120.30	Zone 1	35.73	35.73	Demand	Fixed	1,301.44	78.37
J-71	1,120.90	Zone 1	37.43	37.43	Demand	Fixed	1,301.23	78.02
J-72	1,113.80	Zone 1	37.44	37.44	Demand	Fixed	1,301.18	81.07
J-73	1,112.30	Zone 1	10.74	10.74	Demand	Fixed	1,301.18	81.72
J-94	1,105.00	Zone 1	30.56	30.56	Demand	Fixed	1,301.26	84.91
J-95	1,104.00	Zone 1	30.56	30.56	Demand	Fixed	1,301.27	85.35
J-96	1,116.40	Zone 1	23.44	23.44	Demand	Fixed	1,301.28	79.99
J-97	1,116.50	Zone 1	24.97	24.97	Demand	Fixed	1,301.43	80.01
J-98	1,120.00	Zone 1	24.97	24.97	Demand	Fixed	1,301.43	78.50
J-105	1,117.00	Zone 1	37.44	37.44	Demand	Fixed	1,301.19	79.69
J-106	1,105.10	Zone 1	37.44	37.44	Demand	Fixed	1,301.18	84.83
J-107	1,106.00	Zone 1	10.75	10.75	Demand	Fixed	1,301.18	84.44
J-119	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,302.00	70.69

Scenario: Max Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-14	1,118.00	8.0	Ductile Iron	130.0	9.43	0.00	0.00	Open	0.06
P-36	303.00	20.0	Ductile Iron	130.0	-537.25	0.02	0.07	Open	0.55
P-37	1,259.00	20.0	Ductile Iron	130.0	-537.25	0.08	0.07	Open	0.55
P-53	632.00	12.0	Ductile Iron	130.0	73.39	0.01	0.02	Open	0.21
P-54	944.00	12.0	Ductile Iron	130.0	150.56	0.07	0.08	Open	0.43
P-55	934.00	12.0	Ductile Iron	130.0	192.73	0.11	0.12	Open	0.55
P-69	507.00	16.0	Ductile Iron	130.0	-537.25	0.10	0.20	Open	0.86
P-70	1,190.00	16.0	Ductile Iron	130.0	537.25	0.24	0.20	Open	0.86
P-71	283.00	16.0	Ductile Iron	130.0	-537.25	0.06	0.20	Open	0.86
P-72	316.00	16.0	Ductile Iron	130.0	-478.09	0.05	0.16	Open	0.76
P-73	583.00	16.0	Ductile Iron	130.0	-426.62	0.08	0.13	Open	0.68
P-74	165.00	12.0	Ductile Iron	130.0	192.73	0.02	0.12	Open	0.55
P-75	1,453.00	12.0	Ductile Iron	130.0	97.37	0.05	0.03	Open	0.28
P-76	222.00	12.0	Ductile Iron	130.0	42.98	0.00	0.01	Open	0.12
P-77	604.00	12.0	Ductile Iron	130.0	20.18	0.00	0.00	Open	0.06
P-113	1,431.00	8.0	Ductile Iron	130.0	-19.12	0.02	0.01	Open	0.12
P-114	593.00	8.0	Ductile Iron	130.0	11.44	0.00	0.00	Open	0.07
P-115	1,919.00	8.0	Ductile Iron	130.0	42.01	0.10	0.05	Open	0.27
P-116	745.00	8.0	Ductile Iron	130.0	23.17	0.01	0.02	Open	0.15
P-117	1,398.00	8.0	Ductile Iron	130.0	-0.27	0.00	0.00	Open	0.00
P-118	1,459.00	8.0	Ductile Iron	130.0	15.74	0.01	0.01	Open	0.10
P-119	633.00	8.0	Ductile Iron	130.0	-9.23	0.00	0.00	Open	0.06
P-120	1,719.00	8.0	Ductile Iron	130.0	-34.20	0.06	0.04	Open	0.22
P-132	420.00	8.0	Ductile Iron	130.0	57.92	0.04	0.09	Open	0.37
P-133	1,350.00	8.0	Ductile Iron	130.0	20.48	0.02	0.01	Open	0.13
P-134	869.00	8.0	Ductile Iron	130.0	-16.96	0.01	0.01	Open	0.11
P-135	910.00	8.0	Ductile Iron	130.0	12.06	0.00	0.01	Open	0.08
P-136	1,043.00	8.0	Ductile Iron	130.0	1.31	0.00	0.00	Open	0.01
P-160	176.00	24.0	Ductile Iron	130.0	-537.25	0.00	0.03	Open	0.38
P-161	146.00	20.0	Ductile Iron	130.0	537.25	0.01	0.07	Open	0.55

Scenario: Max Day
Steady State Analysis
Reservoir Report

Label	Reservoir Surface Elevation (ft)	Zone	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
R-1	1,302.00	Zone 1	1,302.00	-537.25	537.25

Scenario: Peak Hour
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-15	1,105.00	Zone 1	17.91	17.91	Demand	Fixed	1,299.88	84.32
J-16	1,110.00	Zone 1	17.91	17.91	Demand	Fixed	1,299.89	82.16
J-37	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,301.96	70.68
J-38	1,136.10	Zone 1	0.00	0.00	Demand	Fixed	1,301.91	71.74
J-39	1,135.40	Zone 1	0.00	0.00	Demand	Fixed	1,301.69	71.95
J-53	1,112.10	Zone 1	90.00	90.00	Demand	Fixed	1,300.15	81.36
J-54	1,113.00	Zone 1	90.00	90.00	Demand	Fixed	1,300.18	80.98
J-55	1,118.00	Zone 1	68.88	68.88	Demand	Fixed	1,300.36	78.90
J-56	1,121.00	Zone 1	0.00	0.00	Demand	Fixed	1,300.08	77.48
J-67	1,127.90	Zone 1	0.00	0.00	Demand	Fixed	1,301.44	75.08
J-68	1,123.90	Zone 1	0.00	0.00	Demand	Fixed	1,300.83	76.55
J-69	1,123.70	Zone 1	41.61	41.61	Demand	Fixed	1,300.69	76.57
J-70	1,120.30	Zone 1	59.55	59.55	Demand	Fixed	1,300.56	77.99
J-71	1,120.90	Zone 1	62.39	62.39	Demand	Fixed	1,300.02	77.50
J-72	1,113.80	Zone 1	62.40	62.40	Demand	Fixed	1,299.90	80.52
J-73	1,112.30	Zone 1	17.91	17.91	Demand	Fixed	1,299.89	81.16
J-94	1,105.00	Zone 1	50.94	50.94	Demand	Fixed	1,300.10	84.41
J-95	1,104.00	Zone 1	50.94	50.94	Demand	Fixed	1,300.11	84.85
J-96	1,116.40	Zone 1	39.06	39.06	Demand	Fixed	1,300.15	79.50
J-97	1,116.50	Zone 1	41.61	41.61	Demand	Fixed	1,300.53	79.62
J-98	1,120.00	Zone 1	41.61	41.61	Demand	Fixed	1,300.53	78.11
J-105	1,117.00	Zone 1	62.40	62.40	Demand	Fixed	1,299.92	79.14
J-106	1,105.10	Zone 1	62.40	62.40	Demand	Fixed	1,299.88	84.27
J-107	1,106.00	Zone 1	17.91	17.91	Demand	Fixed	1,299.88	83.88
J-119	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,301.99	70.69

Scenario: Peak Hour
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-14	1,118.00	8.0	Ductile Iron	130.0	15.72	0.01	0.01	Open	0.10
P-36	303.00	20.0	Ductile Iron	130.0	-895.43	0.05	0.17	Open	0.91
P-37	1,259.00	20.0	Ductile Iron	130.0	-895.43	0.22	0.17	Open	0.91
P-53	632.00	12.0	Ductile Iron	130.0	122.37	0.03	0.05	Open	0.35
P-54	944.00	12.0	Ductile Iron	130.0	250.92	0.18	0.20	Open	0.71
P-55	934.00	12.0	Ductile Iron	130.0	321.23	0.29	0.31	Open	0.91
P-69	507.00	16.0	Ductile Iron	130.0	-895.43	0.26	0.51	Open	1.43
P-70	1,190.00	16.0	Ductile Iron	130.0	895.43	0.61	0.51	Open	1.43
P-71	283.00	16.0	Ductile Iron	130.0	-895.43	0.14	0.51	Open	1.43
P-72	316.00	16.0	Ductile Iron	130.0	-796.82	0.13	0.41	Open	1.27
P-73	583.00	16.0	Ductile Iron	130.0	-711.05	0.19	0.33	Open	1.13
P-74	165.00	12.0	Ductile Iron	130.0	321.23	0.05	0.31	Open	0.91
P-75	1,453.00	12.0	Ductile Iron	130.0	162.30	0.13	0.09	Open	0.46
P-76	222.00	12.0	Ductile Iron	130.0	71.64	0.00	0.02	Open	0.20
P-77	604.00	12.0	Ductile Iron	130.0	33.63	0.00	0.00	Open	0.10
P-113	1,431.00	8.0	Ductile Iron	130.0	-31.86	0.04	0.03	Open	0.20
P-114	593.00	8.0	Ductile Iron	130.0	19.08	0.01	0.01	Open	0.12
P-115	1,919.00	8.0	Ductile Iron	130.0	70.02	0.25	0.13	Open	0.45
P-116	745.00	8.0	Ductile Iron	130.0	38.55	0.03	0.04	Open	0.25
P-117	1,398.00	8.0	Ductile Iron	130.0	-0.51	0.00	0.00	Open	0.00
P-118	1,459.00	8.0	Ductile Iron	130.0	26.22	0.03	0.02	Open	0.17
P-119	633.00	8.0	Ductile Iron	130.0	-15.39	0.01	0.01	Open	0.10
P-120	1,719.00	8.0	Ductile Iron	130.0	-57.00	0.16	0.09	Open	0.36
P-132	420.00	8.0	Ductile Iron	130.0	96.54	0.10	0.24	Open	0.62
P-133	1,350.00	8.0	Ductile Iron	130.0	34.14	0.05	0.04	Open	0.22
P-134	869.00	8.0	Ductile Iron	130.0	-28.26	0.02	0.02	Open	0.18
P-135	910.00	8.0	Ductile Iron	130.0	20.10	0.01	0.01	Open	0.13
P-136	1,043.00	8.0	Ductile Iron	130.0	2.19	0.00	0.00	Open	0.01
P-160	176.00	24.0	Ductile Iron	130.0	-895.43	0.01	0.07	Open	0.64
P-161	146.00	20.0	Ductile Iron	130.0	895.43	0.03	0.17	Open	0.91

Scenario: Peak Hour
Steady State Analysis
Reservoir Report

Label	Reservoir Surface Elevation (ft)	Zone	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
R-1	1,302.00	Zone 1	1,302.00	-895.43	895.43

Fire Flow Analysis

Fire Flow Report

Label	Zone	Needed Fire Flow (gpm)	Demand (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Satisfies Fire Flow Constraints?	Minimum Zone Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Fire Flow Upper Limit (gpm)	Minimum Zone Junction	Calculated Residual Pressure (psi)
J-15	Zone 1	3,000.00	10.75	3,010.75	3,281.24	true	20.00	35.44	4,000.00	J-107	20.00
J-16	Zone 1	3,000.00	10.75	3,010.75	4,010.75	true	20.00	30.75	4,000.00	J-15	26.20
J-37	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	70.59	4,000.00	J-119	70.37
J-38	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	70.37	4,000.00	J-37	71.00
J-39	Zone 1	2,000.00	0.00	2,000.00	4,000.00	true	20.00	70.37	4,000.00	J-37	69.41
J-53	Zone 1	3,000.00	54.00	3,054.00	4,054.00	true	20.00	52.82	4,000.00	J-96	51.53
J-54	Zone 1	3,000.00	54.00	3,054.00	4,054.00	true	20.00	54.02	4,000.00	J-96	55.46
J-55	Zone 1	1,500.00	41.33	1,541.33	4,041.33	true	20.00	63.04	4,000.00	J-56	64.39
J-56	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	48.56	4,000.00	J-71	48.53
J-67	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	69.41	4,000.00	J-39	70.40
J-68	Zone 1	2,000.00	0.00	2,000.00	4,000.00	true	20.00	66.91	4,000.00	J-69	66.84
J-69	Zone 1	1,500.00	24.97	1,524.97	4,024.97	true	20.00	66.74	4,000.00	J-56	65.67
J-70	Zone 1	1,500.00	35.73	1,535.73	4,035.73	true	20.00	65.48	4,000.00	J-56	65.87
J-71	Zone 1	2,000.00	37.43	2,037.43	4,037.43	true	20.00	47.67	4,000.00	J-105	46.00
J-72	Zone 1	2,000.00	37.44	2,037.44	4,037.44	true	20.00	35.25	4,000.00	J-73	34.60
J-73	Zone 1	3,000.00	10.74	3,010.74	4,010.74	true	20.00	33.01	4,000.00	J-16	32.01
J-94	Zone 1	1,500.00	30.56	1,530.56	3,758.63	true	20.00	32.32	4,000.00	J-95	20.00
J-95	Zone 1	1,500.00	30.56	1,530.56	3,722.94	true	20.00	33.08	4,000.00	J-94	20.00
J-96	Zone 1	3,000.00	23.44	3,023.44	4,023.44	true	20.00	55.09	4,000.00	J-53	25.10
J-97	Zone 1	1,500.00	24.97	1,524.97	3,863.80	true	20.00	31.55	4,000.00	J-98	20.00
J-98	Zone 1	1,500.00	24.97	1,524.97	3,751.79	true	20.00	35.82	4,000.00	J-97	20.00
J-105	Zone 1	2,000.00	37.44	2,037.44	4,037.44	true	20.00	41.60	4,000.00	J-106	23.46
J-106	Zone 1	2,000.00	37.44	2,037.44	3,816.65	true	20.00	41.90	4,000.00	J-105	20.00
J-107	Zone 1	3,000.00	10.75	3,010.75	3,358.37	true	20.00	33.34	4,000.00	J-15	20.00
J-119	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	70.58	4,000.00	J-37	70.59

ULTIMATE BUILD OUT

ULTIMATE BUILD OUT

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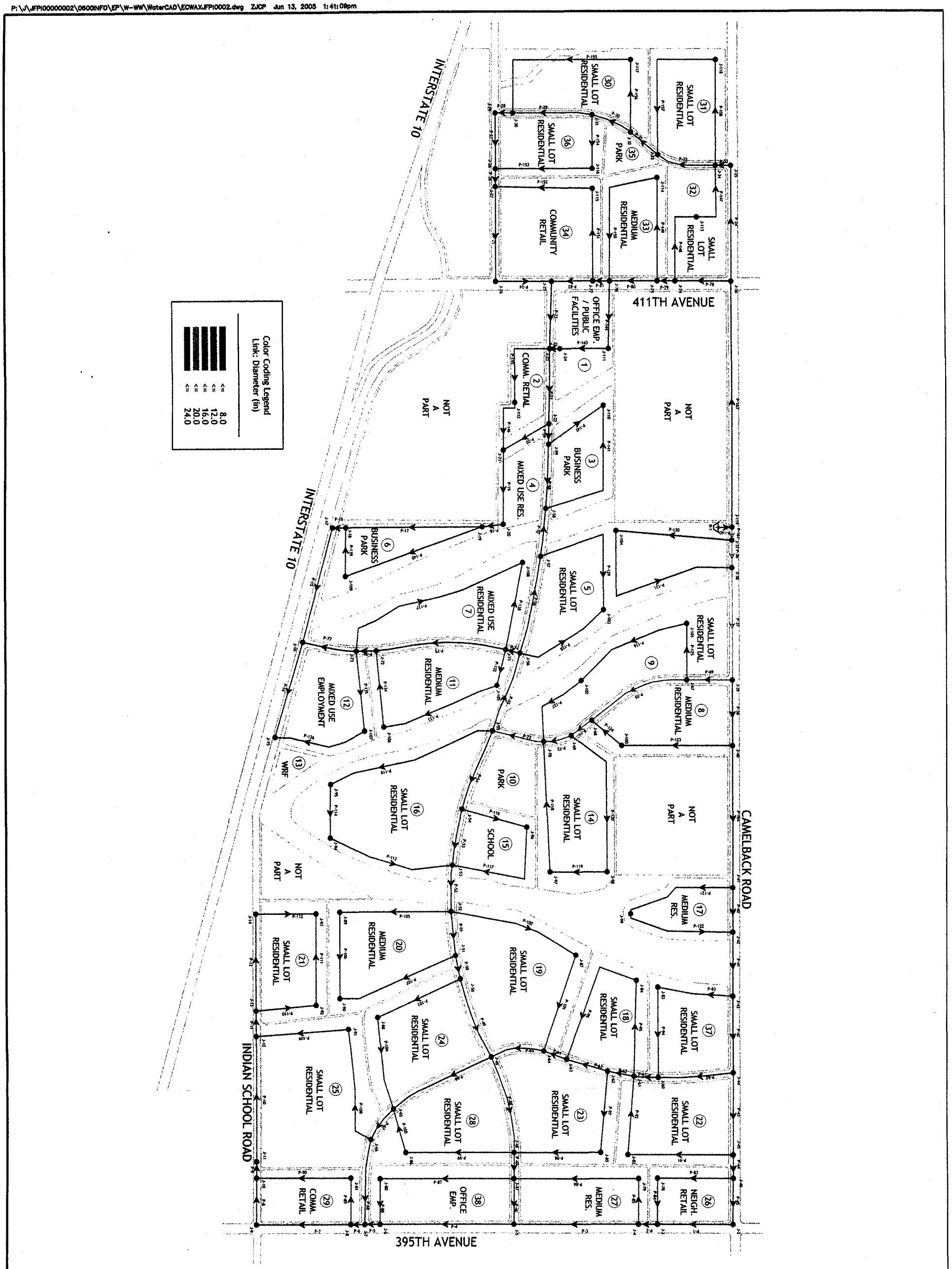

BALTERRA
ULTIMATE BUILD OUT
WATER MODEL

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

DRAWN BY:	DCHO
CHECKED BY:	WDR
DATE:	04/2005

SCALE:	N.T.S.
SHEET	1 OF 1
JOB NO.:	JFPI0000-0002

Scenario: Avg Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-2	1,127.70	Zone 1	3.43	3.43	Demand	Fixed	1,299.29	74.24
J-3	1,122.00	Zone 1	3.43	3.43	Demand	Fixed	1,299.24	76.68
J-4	1,121.20	Zone 1	16.55	16.55	Demand	Fixed	1,299.21	77.02
J-5	1,117.00	Zone 1	22.71	22.71	Demand	Fixed	1,299.17	78.82
J-6	1,115.00	Zone 1	6.16	6.16	Demand	Fixed	1,299.15	79.67
J-7	1,114.00	Zone 1	0.00	0.00	Demand	Fixed	1,299.15	80.11
J-8	1,114.00	Zone 1	4.07	4.07	Demand	Fixed	1,299.13	80.10
J-9	1,108.00	Zone 1	4.07	4.07	Demand	Fixed	1,299.10	82.68
J-10	1,105.00	Zone 1	4.07	4.07	Demand	Fixed	1,299.09	83.97
J-11	1,105.00	Zone 1	19.38	19.38	Demand	Fixed	1,299.08	83.97
J-12	1,103.00	Zone 1	19.38	19.38	Demand	Fixed	1,299.04	84.82
J-13	1,102.20	Zone 1	9.86	9.86	Demand	Fixed	1,299.03	85.16
J-14	1,103.00	Zone 1	9.86	9.86	Demand	Fixed	1,299.02	84.81
J-15	1,105.00	Zone 1	5.97	5.97	Demand	Fixed	1,299.78	84.27
J-16	1,110.00	Zone 1	5.97	5.97	Demand	Fixed	1,299.78	82.11
J-17	1,114.80	Zone 1	0.00	0.00	Demand	Fixed	1,299.79	80.03
J-18	1,114.50	Zone 1	7.12	7.12	Demand	Fixed	1,299.79	80.16
J-19	1,121.00	Zone 1	7.12	7.12	Demand	Fixed	1,299.79	77.36
J-20	1,124.00	Zone 1	11.45	11.45	Demand	Fixed	1,299.80	76.06
J-21	1,128.00	Zone 1	11.45	11.45	Demand	Fixed	1,299.84	74.35
J-22	1,130.30	Zone 1	3.53	3.53	Demand	Fixed	1,299.86	73.36
J-23	1,135.20	Zone 1	3.53	3.53	Demand	Fixed	1,299.88	71.25
J-24	1,136.00	Zone 1	4.27	4.27	Demand	Fixed	1,299.88	70.90
J-25	1,138.00	Zone 1	4.27	4.27	Demand	Fixed	1,299.89	70.04
J-26	1,134.00	Zone 1	7.68	7.68	Demand	Fixed	1,299.89	71.77
J-27	1,138.50	Zone 1	7.68	7.68	Demand	Fixed	1,299.91	69.83
J-28	1,136.00	Zone 1	7.71	7.71	Demand	Fixed	1,299.91	70.92
J-29	1,144.00	Zone 1	7.71	7.71	Demand	Fixed	1,299.92	67.46
J-30	1,144.20	Zone 1	15.10	15.10	Demand	Fixed	1,299.92	67.37
J-31	1,148.50	Zone 1	7.71	7.71	Demand	Fixed	1,299.93	65.52
J-32	1,148.10	Zone 1	17.87	17.87	Demand	Fixed	1,299.97	65.71
J-33	1,152.00	Zone 1	16.64	16.64	Demand	Fixed	1,300.08	64.07
J-34	1,154.00	Zone 1	24.61	24.61	Demand	Fixed	1,300.21	63.26
J-35	1,154.50	Zone 1	0.00	0.00	Demand	Fixed	1,300.29	63.08
J-36	1,149.00	Zone 1	0.00	0.00	Demand	Fixed	1,300.91	65.73
J-37	1,138.60	Zone 1	13.51	13.51	Demand	Fixed	1,301.90	70.65
J-38	1,136.10	Zone 1	13.51	13.51	Demand	Fixed	1,301.78	71.68
J-39	1,135.40	Zone 1	19.69	19.69	Demand	Fixed	1,301.31	71.78
J-40	1,131.80	Zone 1	19.69	19.69	Demand	Fixed	1,300.85	73.14
J-41	1,129.00	Zone 1	16.73	16.73	Demand	Fixed	1,300.20	74.07
J-42	1,126.00	Zone 1	16.73	16.73	Demand	Fixed	1,300.06	75.31
J-43	1,126.60	Zone 1	8.93	8.93	Demand	Fixed	1,299.84	74.95
J-44	1,127.70	Zone 1	20.36	20.36	Demand	Fixed	1,299.70	74.42
J-45	1,127.50	Zone 1	11.43	11.43	Demand	Fixed	1,299.38	74.36
J-46	1,128.00	Zone 1	3.43	3.43	Demand	Fixed	1,299.32	74.12
J-47	1,116.00	Zone 1	22.71	22.71	Demand	Fixed	1,299.17	79.25
J-48	1,116.60	Zone 1	24.79	24.79	Demand	Fixed	1,299.18	78.99
J-49	1,115.70	Zone 1	48.72	48.72	Demand	Fixed	1,299.22	79.40
J-50	1,112.00	Zone 1	23.93	23.93	Demand	Fixed	1,299.27	81.02
J-51	1,113.40	Zone 1	37.97	37.97	Demand	Fixed	1,299.30	80.43
J-52	1,112.00	Zone 1	37.97	37.97	Demand	Fixed	1,299.38	81.07
J-53	1,112.10	Zone 1	30.00	30.00	Demand	Fixed	1,299.58	81.11

Scenario: Avg Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-54	1,113.00	Zone 1	30.00	30.00	Demand	Fixed	1,299.74	80.79
J-55	1,118.00	Zone 1	22.96	22.96	Demand	Fixed	1,300.14	78.80
J-56	1,121.00	Zone 1	13.51	13.51	Demand	Fixed	1,299.87	77.39
J-57	1,126.00	Zone 1	13.51	13.51	Demand	Fixed	1,299.86	75.22
J-58	1,126.00	Zone 1	17.98	17.98	Demand	Fixed	1,299.86	75.22
J-59	1,131.70	Zone 1	17.98	17.98	Demand	Fixed	1,299.86	72.76
J-60	1,122.00	Zone 1	8.93	8.93	Demand	Fixed	1,299.53	76.81
J-61	1,120.70	Zone 1	24.07	24.07	Demand	Fixed	1,299.37	77.30
J-62	1,119.10	Zone 1	12.88	12.88	Demand	Fixed	1,299.30	77.96
J-63	1,118.10	Zone 1	12.64	12.64	Demand	Fixed	1,299.29	78.39
J-64	1,116.90	Zone 1	11.54	11.54	Demand	Fixed	1,299.28	78.91
J-65	1,107.87	Zone 1	24.30	24.30	Demand	Fixed	1,299.17	82.77
J-66	1,108.00	Zone 1	19.38	19.38	Demand	Fixed	1,299.16	82.70
J-67	1,127.90	Zone 1	15.66	15.66	Demand	Fixed	1,301.05	74.92
J-68	1,123.90	Zone 1	19.69	19.69	Demand	Fixed	1,300.61	76.45
J-69	1,123.70	Zone 1	13.87	13.87	Demand	Fixed	1,300.49	76.49
J-70	1,120.30	Zone 1	35.51	35.51	Demand	Fixed	1,300.38	77.91
J-71	1,120.90	Zone 1	73.93	73.93	Demand	Fixed	1,299.83	77.42
J-72	1,113.80	Zone 1	20.80	20.80	Demand	Fixed	1,299.79	80.47
J-73	1,112.30	Zone 1	59.10	59.10	Demand	Fixed	1,299.78	81.11
J-74	1,146.40	Zone 1	10.74	10.74	Demand	Fixed	1,300.24	66.56
J-75	1,145.00	Zone 1	20.65	20.65	Demand	Fixed	1,300.09	67.10
J-76	1,141.70	Zone 1	24.92	24.92	Demand	Fixed	1,299.94	68.46
J-77	1,139.70	Zone 1	7.68	7.68	Demand	Fixed	1,299.92	69.32
J-78	1,123.20	Zone 1	3.43	3.43	Demand	Fixed	1,299.27	76.18
J-79	1,122.00	Zone 1	16.55	16.55	Demand	Fixed	1,299.19	76.66
J-80	1,108.70	Zone 1	6.16	6.16	Demand	Fixed	1,299.16	82.40
J-81	1,110.00	Zone 1	4.07	4.07	Demand	Fixed	1,299.12	81.82
J-82	1,121.00	Zone 1	11.43	11.43	Demand	Fixed	1,299.37	77.17
J-83	1,126.00	Zone 1	8.93	8.93	Demand	Fixed	1,299.68	75.14
J-84	1,124.60	Zone 1	12.64	12.64	Demand	Fixed	1,299.32	75.59
J-85	1,120.30	Zone 1	12.88	12.88	Demand	Fixed	1,299.23	77.41
J-86	1,109.40	Zone 1	11.92	11.92	Demand	Fixed	1,299.17	82.11
J-87	1,119.80	Zone 1	11.54	11.54	Demand	Fixed	1,299.31	77.66
J-88	1,108.00	Zone 1	12.39	12.39	Demand	Fixed	1,299.21	82.73
J-89	1,106.70	Zone 1	26.43	26.43	Demand	Fixed	1,299.31	83.33
J-90	1,105.00	Zone 1	26.43	26.43	Demand	Fixed	1,299.29	84.06
J-91	1,105.20	Zone 1	19.38	19.38	Demand	Fixed	1,299.07	83.88
J-92	1,104.00	Zone 1	9.86	9.86	Demand	Fixed	1,299.02	84.38
J-93	1,105.60	Zone 1	9.86	9.86	Demand	Fixed	1,299.02	83.68
J-94	1,105.00	Zone 1	16.98	16.98	Demand	Fixed	1,299.69	84.23
J-95	1,104.00	Zone 1	16.98	16.98	Demand	Fixed	1,299.76	84.70
J-96	1,116.40	Zone 1	13.02	13.02	Demand	Fixed	1,299.67	79.29
J-97	1,116.50	Zone 1	13.87	13.87	Demand	Fixed	1,300.39	79.56
J-98	1,120.00	Zone 1	13.87	13.87	Demand	Fixed	1,300.40	78.05
J-99	1,119.60	Zone 1	16.73	16.73	Demand	Fixed	1,300.11	78.10
J-100	1,127.00	Zone 1	19.69	19.69	Demand	Fixed	1,300.65	75.13
J-101	1,131.00	Zone 1	15.66	15.66	Demand	Fixed	1,300.86	73.49
J-102	1,123.00	Zone 1	15.66	15.66	Demand	Fixed	1,300.53	76.81
J-103	1,125.00	Zone 1	13.51	13.51	Demand	Fixed	1,299.86	75.65
J-104	1,130.40	Zone 1	13.51	13.51	Demand	Fixed	1,301.83	74.17
J-105	1,117.00	Zone 1	20.80	20.80	Demand	Fixed	1,299.81	79.09

Scenario: Avg Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-106	1,105.10	Zone 1	20.80	20.80	Demand	Fixed	1,299.79	84.23
J-107	1,106.00	Zone 1	5.97	5.97	Demand	Fixed	1,299.78	83.84
J-108	1,125.00	Zone 1	53.14	53.14	Demand	Fixed	1,299.78	75.62
J-109	1,115.00	Zone 1	7.12	7.12	Demand	Fixed	1,299.79	79.95
J-110	1,137.00	Zone 1	6.53	6.53	Demand	Fixed	1,299.86	70.46
J-111	1,139.80	Zone 1	4.27	4.27	Demand	Fixed	1,299.90	69.27
J-112	1,132.00	Zone 1	3.53	3.53	Demand	Fixed	1,299.86	72.62
J-113	1,151.00	Zone 1	10.74	10.74	Demand	Fixed	1,300.22	64.56
J-114	1,150.40	Zone 1	20.65	20.65	Demand	Fixed	1,300.00	64.72
J-115	1,143.30	Zone 1	7.68	7.68	Demand	Fixed	1,299.91	67.76
J-116	1,146.70	Zone 1	7.71	7.71	Demand	Fixed	1,299.92	66.29
J-117	1,153.00	Zone 1	15.10	15.10	Demand	Fixed	1,299.94	63.57
J-118	1,158.00	Zone 1	13.87	13.87	Demand	Fixed	1,300.13	61.49
J-119	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,301.96	70.68

Scenario: Avg Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-1	838.00	8.0	Ductile Iron	130.0	42.65	0.04	0.05	Open	0.27
P-2	209.00	8.0	Ductile Iron	130.0	80.92	0.04	0.17	Open	0.52
P-3	1,387.00	8.0	Ductile Iron	130.0	-29.33	0.04	0.03	Open	0.19
P-4	1,494.00	8.0	Ductile Iron	130.0	-18.40	0.02	0.01	Open	0.12
P-5	168.00	8.0	Ductile Iron	130.0	-24.39	0.00	0.02	Open	0.16
P-6	157.00	8.0	Ductile Iron	130.0	-65.59	0.02	0.12	Open	0.42
P-7	1,045.00	8.0	Ductile Iron	130.0	-30.06	0.03	0.03	Open	0.19
P-8	517.00	8.0	Ductile Iron	130.0	-25.99	0.01	0.02	Open	0.17
P-9	180.00	8.0	Ductile Iron	130.0	-49.31	0.01	0.07	Open	0.31
P-10	1,396.00	8.0	Ductile Iron	130.0	-29.93	0.04	0.03	Open	0.19
P-11	290.00	8.0	Ductile Iron	130.0	-39.44	0.01	0.05	Open	0.25
P-12	1,084.00	8.0	Ductile Iron	130.0	-13.57	0.01	0.01	Open	0.09
P-14	1,118.00	8.0	Ductile Iron	130.0	5.63	0.00	0.00	Open	0.04
P-15	1,317.00	8.0	Ductile Iron	130.0	-9.70	0.00	0.00	Open	0.06
P-16	148.00	8.0	Ductile Iron	130.0	-9.70	0.00	0.00	Open	0.06
P-17	1,517.00	8.0	Ductile Iron	130.0	-12.35	0.01	0.01	Open	0.08
P-18	236.00	8.0	Ductile Iron	130.0	-31.06	0.01	0.03	Open	0.20
P-19	822.00	8.0	Ductile Iron	130.0	42.51	0.04	0.05	Open	0.27
P-20	587.00	8.0	Ductile Iron	130.0	31.73	0.02	0.03	Open	0.20
P-21	839.00	12.0	Ductile Iron	130.0	-64.22	0.01	0.02	Open	0.18
P-22	114.00	8.0	Ductile Iron	130.0	-33.81	0.00	0.03	Open	0.22
P-23	752.00	12.0	Ductile Iron	130.0	59.70	0.01	0.01	Open	0.17
P-24	624.00	8.0	Ductile Iron	130.0	-15.17	0.00	0.01	Open	0.10
P-25	1,055.00	8.0	Ductile Iron	130.0	-22.85	0.02	0.02	Open	0.15
P-26	200.00	8.0	Ductile Iron	130.0	-24.21	0.00	0.02	Open	0.15
P-27	631.00	8.0	Ductile Iron	130.0	-15.70	0.01	0.01	Open	0.10
P-28	198.00	8.0	Ductile Iron	130.0	-23.41	0.00	0.02	Open	0.15
P-29	883.00	8.0	Ductile Iron	130.0	-20.31	0.01	0.01	Open	0.13
P-30	476.00	8.0	Ductile Iron	130.0	-51.95	0.04	0.08	Open	0.33
P-31	392.00	8.0	Ductile Iron	130.0	103.12	0.11	0.27	Open	0.66
P-32	670.00	8.0	Ductile Iron	130.0	86.72	0.13	0.20	Open	0.55
P-33	170.00	8.0	Ductile Iron	130.0	140.83	0.08	0.48	Open	0.90
P-34	1,289.00	8.0	Ductile Iron	130.0	140.83	0.62	0.48	Open	0.90
P-36	303.00	20.0	Ductile Iron	130.0	-1,360.61	0.11	0.37	Open	1.39
P-37	1,259.00	20.0	Ductile Iron	130.0	-1,374.68	0.48	0.38	Open	1.40
P-38	737.00	12.0	Ductile Iron	130.0	469.33	0.46	0.62	Open	1.33
P-40	497.00	12.0	Ductile Iron	130.0	303.67	0.14	0.28	Open	0.86
P-41	714.00	12.0	Ductile Iron	130.0	321.85	0.22	0.31	Open	0.91
P-42	857.00	12.0	Ductile Iron	130.0	228.25	0.14	0.16	Open	0.65
P-43	913.00	8.0	Ductile Iron	130.0	119.00	0.32	0.35	Open	0.76
P-44	258.00	8.0	Ductile Iron	130.0	94.64	0.06	0.23	Open	0.60
P-45	510.00	8.0	Ductile Iron	130.0	46.08	0.03	0.06	Open	0.29
P-46	505.00	8.0	Ductile Iron	130.0	11.78	0.00	0.01	Open	0.08
P-47	287.00	8.0	Ductile Iron	130.0	34.31	0.01	0.04	Open	0.22
P-48	1,100.00	8.0	Ductile Iron	130.0	32.45	0.04	0.03	Open	0.21
P-49	942.00	12.0	Ductile Iron	130.0	120.68	0.05	0.05	Open	0.34
P-50	266.00	12.0	Ductile Iron	130.0	189.11	0.03	0.12	Open	0.54
P-51	499.00	12.0	Ductile Iron	130.0	233.79	0.09	0.17	Open	0.66
P-52	516.00	12.0	Ductile Iron	130.0	359.00	0.20	0.38	Open	1.02
P-53	632.00	12.0	Ductile Iron	130.0	290.07	0.16	0.26	Open	0.82
P-54	944.00	12.0	Ductile Iron	130.0	379.89	0.40	0.42	Open	1.08
P-55	934.00	12.0	Ductile Iron	130.0	310.84	0.27	0.29	Open	0.88

Scenario: Avg Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-56	1,107.00	12.0	Ductile Iron	130.0	29.70	0.00	0.00	Open	0.08
P-57	536.00	12.0	Ductile Iron	130.0	13.53	0.00	0.00	Open	0.04
P-58	709.00	12.0	Ductile Iron	130.0	-6.80	0.00	0.00	Open	0.02
P-59	231.00	12.0	Ductile Iron	130.0	-28.96	0.00	0.00	Open	0.08
P-60	838.00	8.0	Ductile Iron	130.0	88.90	0.17	0.21	Open	0.57
P-61	270.00	8.0	Ductile Iron	130.0	155.70	0.16	0.58	Open	0.99
P-62	300.00	8.0	Ductile Iron	130.0	-94.29	0.07	0.23	Open	0.60
P-63	472.00	8.0	Ductile Iron	130.0	-27.89	0.01	0.02	Open	0.18
P-64	271.00	8.0	Ductile Iron	130.0	-41.45	0.01	0.05	Open	0.26
P-65	608.00	8.0	Ductile Iron	130.0	-59.47	0.06	0.10	Open	0.38
P-66	1,240.00	12.0	Ductile Iron	130.0	98.98	0.04	0.04	Open	0.28
P-67	426.00	12.0	Ductile Iron	130.0	108.85	0.02	0.04	Open	0.31
P-68	944.00	12.0	Ductile Iron	130.0	-41.20	0.01	0.01	Open	0.12
P-69	507.00	16.0	Ductile Iron	130.0	-885.65	0.25	0.50	Open	1.41
P-70	1,190.00	16.0	Ductile Iron	130.0	759.03	0.45	0.37	Open	1.21
P-71	283.00	16.0	Ductile Iron	130.0	-797.26	0.12	0.41	Open	1.27
P-72	316.00	16.0	Ductile Iron	130.0	-741.53	0.11	0.36	Open	1.18
P-73	583.00	16.0	Ductile Iron	130.0	-799.78	0.24	0.41	Open	1.28
P-74	165.00	12.0	Ductile Iron	130.0	256.78	0.03	0.20	Open	0.73
P-75	1,453.00	12.0	Ductile Iron	130.0	94.37	0.05	0.03	Open	0.27
P-76	222.00	12.0	Ductile Iron	130.0	75.82	0.00	0.02	Open	0.22
P-77	604.00	12.0	Ductile Iron	130.0	1.90	0.00	0.00	Open	0.01
P-78	621.00	8.0	Ductile Iron	130.0	217.95	0.68	1.09	Open	1.39
P-79	198.00	8.0	Ductile Iron	130.0	179.06	0.15	0.76	Open	1.14
P-80	530.00	8.0	Ductile Iron	130.0	-104.39	0.15	0.28	Open	0.67
P-81	187.00	8.0	Ductile Iron	130.0	-70.49	0.03	0.13	Open	0.45
P-82	457.00	8.0	Ductile Iron	130.0	-48.80	0.03	0.07	Open	0.31
P-83	844.00	8.0	Ductile Iron	130.0	45.13	0.05	0.06	Open	0.29
P-84	510.00	8.0	Ductile Iron	130.0	41.70	0.03	0.05	Open	0.27
P-85	506.00	8.0	Ductile Iron	130.0	35.04	0.02	0.04	Open	0.22
P-86	1,387.00	8.0	Ductile Iron	130.0	-18.49	0.02	0.01	Open	0.12
P-87	1,495.00	8.0	Ductile Iron	130.0	-18.31	0.02	0.01	Open	0.12
P-88	505.00	8.0	Ductile Iron	130.0	-12.15	0.00	0.01	Open	0.08
P-89	515.00	8.0	Ductile Iron	130.0	-31.46	0.02	0.03	Open	0.20
P-90	1,045.00	8.0	Ductile Iron	130.0	-27.39	0.02	0.02	Open	0.17
P-91	1,171.00	8.0	Ductile Iron	130.0	12.93	0.01	0.01	Open	0.08
P-92	874.00	8.0	Ductile Iron	130.0	-1.50	0.00	0.00	Open	0.01
P-93	842.00	8.0	Ductile Iron	130.0	84.66	0.16	0.19	Open	0.54
P-94	1,010.00	8.0	Ductile Iron	130.0	75.73	0.16	0.15	Open	0.48
P-95	1,071.00	8.0	Ductile Iron	130.0	38.84	0.05	0.04	Open	0.25
P-96	1,525.00	8.0	Ductile Iron	130.0	-26.20	0.03	0.02	Open	0.17
P-97	906.00	8.0	Ductile Iron	130.0	53.52	0.07	0.08	Open	0.34
P-98	963.00	8.0	Ductile Iron	130.0	-40.64	0.05	0.05	Open	0.26
P-99	1,209.00	8.0	Ductile Iron	130.0	13.98	0.01	0.01	Open	0.09
P-100	505.00	8.0	Ductile Iron	130.0	-2.06	0.00	0.00	Open	0.01
P-101	1,130.00	8.0	Ductile Iron	130.0	29.56	0.03	0.03	Open	0.19
P-102	1,498.00	8.0	Ductile Iron	130.0	41.10	0.07	0.05	Open	0.26
P-103	1,015.00	8.0	Ductile Iron	130.0	44.49	0.06	0.06	Open	0.28
P-104	1,045.00	8.0	Ductile Iron	130.0	32.10	0.03	0.03	Open	0.20
P-105	1,237.00	8.0	Ductile Iron	130.0	46.15	0.08	0.06	Open	0.29
P-106	965.00	8.0	Ductile Iron	130.0	19.72	0.01	0.01	Open	0.13
P-107	1,385.00	8.0	Ductile Iron	130.0	6.71	0.00	0.00	Open	0.04

Scenario: Avg Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-108	1,340.00	8.0	Ductile Iron	130.0	-48.27	0.09	0.07	Open	0.31
P-109	1,028.00	8.0	Ductile Iron	130.0	-28.89	0.03	0.03	Open	0.18
P-110	669.00	8.0	Ductile Iron	130.0	-16.01	0.01	0.01	Open	0.10
P-111	1,022.00	8.0	Ductile Iron	130.0	-6.15	0.00	0.00	Open	0.04
P-112	666.00	8.0	Ductile Iron	130.0	3.71	0.00	0.00	Open	0.02
P-113	1,431.00	8.0	Ductile Iron	130.0	52.13	0.11	0.08	Open	0.33
P-114	593.00	8.0	Ductile Iron	130.0	69.11	0.08	0.13	Open	0.44
P-115	1,919.00	8.0	Ductile Iron	130.0	86.09	0.37	0.19	Open	0.55
P-116	745.00	8.0	Ductile Iron	130.0	59.82	0.07	0.10	Open	0.38
P-117	1,398.00	8.0	Ductile Iron	130.0	46.80	0.09	0.06	Open	0.30
P-118	1,459.00	8.0	Ductile Iron	130.0	-14.12	0.01	0.01	Open	0.09
P-119	633.00	8.0	Ductile Iron	130.0	-27.99	0.02	0.02	Open	0.18
P-120	1,719.00	8.0	Ductile Iron	130.0	-41.86	0.09	0.05	Open	0.27
P-121	1,250.00	8.0	Ductile Iron	130.0	51.63	0.09	0.08	Open	0.33
P-122	1,209.00	8.0	Ductile Iron	130.0	-34.90	0.04	0.04	Open	0.22
P-123	1,232.00	8.0	Ductile Iron	130.0	-77.61	0.20	0.16	Open	0.50
P-124	433.00	8.0	Ductile Iron	130.0	57.92	0.04	0.09	Open	0.37
P-125	636.00	8.0	Ductile Iron	130.0	-110.96	0.20	0.31	Open	0.71
P-126	1,375.00	8.0	Ductile Iron	130.0	-95.30	0.32	0.23	Open	0.61
P-127	915.00	8.0	Ductile Iron	130.0	-79.64	0.15	0.17	Open	0.51
P-128	1,110.00	8.0	Ductile Iron	130.0	10.84	0.00	0.00	Open	0.07
P-129	1,575.00	8.0	Ductile Iron	130.0	-2.67	0.00	0.00	Open	0.02
P-130	1,292.00	8.0	Ductile Iron	130.0	41.09	0.06	0.05	Open	0.26
P-131	2,070.00	8.0	Ductile Iron	130.0	-27.58	0.05	0.02	Open	0.18
P-132	420.00	8.0	Ductile Iron	130.0	43.85	0.02	0.06	Open	0.28
P-133	1,350.00	8.0	Ductile Iron	130.0	23.05	0.02	0.02	Open	0.15
P-134	869.00	8.0	Ductile Iron	130.0	2.25	0.00	0.00	Open	0.01
P-135	910.00	8.0	Ductile Iron	130.0	6.31	0.00	0.00	Open	0.04
P-136	1,043.00	8.0	Ductile Iron	130.0	0.34	0.00	0.00	Open	0.00
P-137	2,240.00	8.0	Ductile Iron	130.0	-8.51	0.01	0.00	Open	0.05
P-138	993.00	8.0	Ductile Iron	130.0	44.63	0.06	0.06	Open	0.28
P-139	540.00	8.0	Ductile Iron	130.0	-4.47	0.00	0.00	Open	0.03
P-140	1,615.00	8.0	Ductile Iron	130.0	-11.59	0.01	0.00	Open	0.07
P-141	1,615.00	8.0	Ductile Iron	130.0	2.35	0.00	0.00	Open	0.02
P-142	748.00	8.0	Ductile Iron	130.0	-4.18	0.00	0.00	Open	0.03
P-143	539.00	8.0	Ductile Iron	130.0	-38.08	0.02	0.04	Open	0.24
P-144	754.00	8.0	Ductile Iron	130.0	-42.35	0.04	0.05	Open	0.27
P-145	990.00	8.0	Ductile Iron	130.0	-25.77	0.02	0.02	Open	0.16
P-146	663.00	8.0	Ductile Iron	130.0	-22.24	0.01	0.02	Open	0.14
P-147	794.00	8.0	Ductile Iron	130.0	17.41	0.01	0.01	Open	0.11
P-148	950.00	8.0	Ductile Iron	130.0	28.15	0.02	0.02	Open	0.18
P-149	1,149.00	8.0	Ductile Iron	130.0	54.02	0.09	0.08	Open	0.34
P-150	1,577.00	8.0	Ductile Iron	130.0	-33.37	0.05	0.03	Open	0.21
P-151	1,030.00	8.0	Ductile Iron	130.0	14.00	0.01	0.01	Open	0.09
P-152	1,079.00	8.0	Ductile Iron	130.0	6.32	0.00	0.00	Open	0.04
P-153	1,077.00	8.0	Ductile Iron	130.0	-16.22	0.01	0.01	Open	0.10
P-154	607.00	8.0	Ductile Iron	130.0	-23.93	0.01	0.02	Open	0.15
P-155	1,907.00	8.0	Ductile Iron	130.0	-18.20	0.02	0.01	Open	0.12
P-156	816.00	8.0	Ductile Iron	130.0	33.30	0.03	0.03	Open	0.21
P-157	1,721.00	8.0	Ductile Iron	130.0	-33.04	0.06	0.03	Open	0.21
P-158	1,191.00	8.0	Ductile Iron	130.0	46.91	0.08	0.06	Open	0.30
P-160	176.00	24.0	Ductile Iron	130.0	-1,773.98	0.04	0.25	Open	1.26

Scenario: Avg Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-161	146.00	20.0	Ductile Iron	130.0	1,415.21	0.06	0.40	Open	1.45
P-163	2,743.00	12.0	Ductile Iron	130.0	-358.77	1.04	0.38	Open	1.02
P-164	1,585.00	12.0	Ductile Iron	130.0	372.04	0.64	0.41	Open	1.06

Scenario: Avg Day
Steady State Analysis
Reservoir Report

Label	Reservoir Surface Elevation (ft)	Zone	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
R-1	1,302.00	Zone 1	1,302.00	-1,773.98	1,773.98

Scenario: Max Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-2	1,127.70	Zone 1	6.17	6.17	Demand	Fixed	1,293.94	71.93
J-3	1,122.00	Zone 1	6.17	6.17	Demand	Fixed	1,293.81	74.33
J-4	1,121.20	Zone 1	29.79	29.79	Demand	Fixed	1,293.70	74.63
J-5	1,117.00	Zone 1	40.88	40.88	Demand	Fixed	1,293.59	76.40
J-6	1,115.00	Zone 1	11.09	11.09	Demand	Fixed	1,293.54	77.25
J-7	1,114.00	Zone 1	0.00	0.00	Demand	Fixed	1,293.54	77.68
J-8	1,114.00	Zone 1	7.33	7.33	Demand	Fixed	1,293.48	77.65
J-9	1,108.00	Zone 1	7.33	7.33	Demand	Fixed	1,293.39	80.21
J-10	1,105.00	Zone 1	7.33	7.33	Demand	Fixed	1,293.36	81.50
J-11	1,105.00	Zone 1	34.88	34.88	Demand	Fixed	1,293.32	81.48
J-12	1,103.00	Zone 1	34.88	34.88	Demand	Fixed	1,293.21	82.30
J-13	1,102.20	Zone 1	17.75	17.75	Demand	Fixed	1,293.17	82.62
J-14	1,103.00	Zone 1	17.75	17.75	Demand	Fixed	1,293.15	82.27
J-15	1,105.00	Zone 1	10.75	10.75	Demand	Fixed	1,295.41	82.38
J-16	1,110.00	Zone 1	10.75	10.75	Demand	Fixed	1,295.41	80.22
J-17	1,114.80	Zone 1	0.00	0.00	Demand	Fixed	1,295.42	78.15
J-18	1,114.50	Zone 1	12.82	12.82	Demand	Fixed	1,295.43	78.28
J-19	1,121.00	Zone 1	12.82	12.82	Demand	Fixed	1,295.45	75.48
J-20	1,124.00	Zone 1	20.61	20.61	Demand	Fixed	1,295.47	74.19
J-21	1,128.00	Zone 1	20.61	20.61	Demand	Fixed	1,295.60	72.51
J-22	1,130.30	Zone 1	6.35	6.35	Demand	Fixed	1,295.65	71.54
J-23	1,135.20	Zone 1	6.35	6.35	Demand	Fixed	1,295.69	69.44
J-24	1,136.00	Zone 1	7.69	7.69	Demand	Fixed	1,295.70	69.10
J-25	1,138.00	Zone 1	7.69	7.69	Demand	Fixed	1,295.72	68.24
J-26	1,134.00	Zone 1	13.82	13.82	Demand	Fixed	1,295.74	69.98
J-27	1,138.50	Zone 1	13.82	13.82	Demand	Fixed	1,295.79	68.05
J-28	1,136.00	Zone 1	13.88	13.88	Demand	Fixed	1,295.80	69.14
J-29	1,144.00	Zone 1	13.88	13.88	Demand	Fixed	1,295.82	65.68
J-30	1,144.20	Zone 1	27.18	27.18	Demand	Fixed	1,295.83	65.60
J-31	1,148.50	Zone 1	13.88	13.88	Demand	Fixed	1,295.86	63.76
J-32	1,148.10	Zone 1	32.17	32.17	Demand	Fixed	1,295.97	63.98
J-33	1,152.00	Zone 1	29.95	29.95	Demand	Fixed	1,296.29	62.43
J-34	1,154.00	Zone 1	44.30	44.30	Demand	Fixed	1,296.68	61.73
J-35	1,154.50	Zone 1	0.00	0.00	Demand	Fixed	1,296.92	61.62
J-36	1,149.00	Zone 1	0.00	0.00	Demand	Fixed	1,298.78	64.80
J-37	1,138.60	Zone 1	24.32	24.32	Demand	Fixed	1,301.70	70.56
J-38	1,136.10	Zone 1	24.32	24.32	Demand	Fixed	1,301.36	71.50
J-39	1,135.40	Zone 1	35.44	35.44	Demand	Fixed	1,299.94	71.19
J-40	1,131.80	Zone 1	35.44	35.44	Demand	Fixed	1,298.57	72.16
J-41	1,129.00	Zone 1	30.11	30.11	Demand	Fixed	1,296.66	72.54
J-42	1,126.00	Zone 1	30.11	30.11	Demand	Fixed	1,296.25	73.66
J-43	1,126.60	Zone 1	16.07	16.07	Demand	Fixed	1,295.59	73.12
J-44	1,127.70	Zone 1	36.65	36.65	Demand	Fixed	1,295.17	72.46
J-45	1,127.50	Zone 1	20.57	20.57	Demand	Fixed	1,294.21	72.13
J-46	1,128.00	Zone 1	6.17	6.17	Demand	Fixed	1,294.04	71.84
J-47	1,116.00	Zone 1	40.88	40.88	Demand	Fixed	1,293.60	76.84
J-48	1,116.60	Zone 1	44.62	44.62	Demand	Fixed	1,293.63	76.59
J-49	1,115.70	Zone 1	87.70	87.70	Demand	Fixed	1,293.74	77.03
J-50	1,112.00	Zone 1	43.07	43.07	Demand	Fixed	1,293.88	78.69
J-51	1,113.40	Zone 1	68.35	68.35	Demand	Fixed	1,293.97	78.12
J-52	1,112.00	Zone 1	68.35	68.35	Demand	Fixed	1,294.22	78.84
J-53	1,112.10	Zone 1	54.00	54.00	Demand	Fixed	1,294.81	79.05

Scenario: Max Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-54	1,113.00	Zone 1	54.00	54.00	Demand	Fixed	1,295.29	78.87
J-55	1,118.00	Zone 1	41.33	41.33	Demand	Fixed	1,296.47	77.22
J-56	1,121.00	Zone 1	24.32	24.32	Demand	Fixed	1,295.66	75.57
J-57	1,126.00	Zone 1	24.32	24.32	Demand	Fixed	1,295.65	73.40
J-58	1,126.00	Zone 1	32.36	32.36	Demand	Fixed	1,295.65	73.40
J-59	1,131.70	Zone 1	32.36	32.36	Demand	Fixed	1,295.65	70.93
J-60	1,122.00	Zone 1	16.07	16.07	Demand	Fixed	1,294.66	74.70
J-61	1,120.70	Zone 1	43.33	43.33	Demand	Fixed	1,294.19	75.06
J-62	1,119.10	Zone 1	23.18	23.18	Demand	Fixed	1,293.99	75.67
J-63	1,118.10	Zone 1	22.75	22.75	Demand	Fixed	1,293.95	76.08
J-64	1,116.90	Zone 1	20.77	20.77	Demand	Fixed	1,293.91	76.59
J-65	1,107.87	Zone 1	43.74	43.74	Demand	Fixed	1,293.61	80.36
J-66	1,108.00	Zone 1	34.88	34.88	Demand	Fixed	1,293.55	80.28
J-67	1,127.90	Zone 1	28.19	28.19	Demand	Fixed	1,299.19	74.11
J-68	1,123.90	Zone 1	35.44	35.44	Demand	Fixed	1,297.87	75.27
J-69	1,123.70	Zone 1	24.97	24.97	Demand	Fixed	1,297.52	75.20
J-70	1,120.30	Zone 1	63.92	63.92	Demand	Fixed	1,297.19	76.53
J-71	1,120.90	Zone 1	133.07	133.07	Demand	Fixed	1,295.56	75.57
J-72	1,113.80	Zone 1	37.44	37.44	Demand	Fixed	1,295.42	78.58
J-73	1,112.30	Zone 1	106.38	106.38	Demand	Fixed	1,295.41	79.22
J-74	1,146.40	Zone 1	19.33	19.33	Demand	Fixed	1,296.77	65.06
J-75	1,145.00	Zone 1	37.17	37.17	Demand	Fixed	1,296.33	65.47
J-76	1,141.70	Zone 1	44.86	44.86	Demand	Fixed	1,295.89	66.71
J-77	1,139.70	Zone 1	13.82	13.82	Demand	Fixed	1,295.81	67.54
J-78	1,123.20	Zone 1	6.17	6.17	Demand	Fixed	1,293.89	73.85
J-79	1,122.00	Zone 1	29.79	29.79	Demand	Fixed	1,293.65	74.26
J-80	1,108.70	Zone 1	11.09	11.09	Demand	Fixed	1,293.55	79.98
J-81	1,110.00	Zone 1	7.33	7.33	Demand	Fixed	1,293.43	79.36
J-82	1,121.00	Zone 1	20.57	20.57	Demand	Fixed	1,294.19	74.93
J-83	1,126.00	Zone 1	16.07	16.07	Demand	Fixed	1,295.12	73.17
J-84	1,124.60	Zone 1	22.75	22.75	Demand	Fixed	1,294.05	73.31
J-85	1,120.30	Zone 1	23.18	23.18	Demand	Fixed	1,293.77	75.05
J-86	1,109.40	Zone 1	21.46	21.46	Demand	Fixed	1,293.61	79.70
J-87	1,119.80	Zone 1	20.77	20.77	Demand	Fixed	1,294.00	75.37
J-88	1,108.00	Zone 1	22.30	22.30	Demand	Fixed	1,293.70	80.35
J-89	1,106.70	Zone 1	47.57	47.57	Demand	Fixed	1,294.00	81.04
J-90	1,105.00	Zone 1	47.57	47.57	Demand	Fixed	1,293.96	81.75
J-91	1,105.20	Zone 1	34.88	34.88	Demand	Fixed	1,293.29	81.38
J-92	1,104.00	Zone 1	17.75	17.75	Demand	Fixed	1,293.15	81.84
J-93	1,105.60	Zone 1	17.75	17.75	Demand	Fixed	1,293.15	81.14
J-94	1,105.00	Zone 1	30.56	30.56	Demand	Fixed	1,295.13	82.26
J-95	1,104.00	Zone 1	30.56	30.56	Demand	Fixed	1,295.36	82.79
J-96	1,116.40	Zone 1	23.44	23.44	Demand	Fixed	1,295.07	77.30
J-97	1,116.50	Zone 1	24.97	24.97	Demand	Fixed	1,297.21	78.19
J-98	1,120.00	Zone 1	24.97	24.97	Demand	Fixed	1,297.26	76.69
J-99	1,119.60	Zone 1	30.11	30.11	Demand	Fixed	1,296.38	76.49
J-100	1,127.00	Zone 1	35.44	35.44	Demand	Fixed	1,297.99	73.98
J-101	1,131.00	Zone 1	28.19	28.19	Demand	Fixed	1,298.60	72.51
J-102	1,123.00	Zone 1	28.19	28.19	Demand	Fixed	1,297.64	75.56
J-103	1,125.00	Zone 1	24.32	24.32	Demand	Fixed	1,295.65	73.83
J-104	1,130.40	Zone 1	24.32	24.32	Demand	Fixed	1,301.51	74.03
J-105	1,117.00	Zone 1	37.44	37.44	Demand	Fixed	1,295.49	77.23

Scenario: Max Day
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-106	1,105.10	Zone 1	37.44	37.44	Demand	Fixed	1,295.43	82.34
J-107	1,106.00	Zone 1	10.75	10.75	Demand	Fixed	1,295.41	81.95
J-108	1,125.00	Zone 1	95.65	95.65	Demand	Fixed	1,295.39	73.72
J-109	1,115.00	Zone 1	12.82	12.82	Demand	Fixed	1,295.43	78.06
J-110	1,137.00	Zone 1	11.75	11.75	Demand	Fixed	1,295.65	68.64
J-111	1,139.80	Zone 1	7.69	7.69	Demand	Fixed	1,295.77	67.48
J-112	1,132.00	Zone 1	6.35	6.35	Demand	Fixed	1,295.63	70.79
J-113	1,151.00	Zone 1	19.33	19.33	Demand	Fixed	1,296.70	63.04
J-114	1,150.40	Zone 1	37.17	37.17	Demand	Fixed	1,296.05	63.01
J-115	1,143.30	Zone 1	13.82	13.82	Demand	Fixed	1,295.79	65.98
J-116	1,146.70	Zone 1	13.88	13.88	Demand	Fixed	1,295.83	64.52
J-117	1,153.00	Zone 1	27.18	27.18	Demand	Fixed	1,295.89	61.82
J-118	1,158.00	Zone 1	24.97	24.97	Demand	Fixed	1,296.45	59.90
J-119	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,301.87	70.64

Scenario: Max Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-1	838.00	8.0	Ductile Iron	130.0	76.76	0.13	0.16	Open	0.49
P-2	209.00	8.0	Ductile Iron	130.0	145.65	0.11	0.52	Open	0.93
P-3	1,387.00	8.0	Ductile Iron	130.0	-52.79	0.11	0.08	Open	0.34
P-4	1,494.00	8.0	Ductile Iron	130.0	-33.12	0.05	0.03	Open	0.21
P-5	168.00	8.0	Ductile Iron	130.0	-43.91	0.01	0.06	Open	0.28
P-6	157.00	8.0	Ductile Iron	130.0	-118.07	0.05	0.35	Open	0.75
P-7	1,045.00	8.0	Ductile Iron	130.0	-54.11	0.09	0.08	Open	0.35
P-8	517.00	8.0	Ductile Iron	130.0	-46.78	0.03	0.06	Open	0.30
P-9	180.00	8.0	Ductile Iron	130.0	-88.76	0.04	0.21	Open	0.57
P-10	1,396.00	8.0	Ductile Iron	130.0	-53.88	0.11	0.08	Open	0.34
P-11	290.00	8.0	Ductile Iron	130.0	-70.99	0.04	0.14	Open	0.45
P-12	1,084.00	8.0	Ductile Iron	130.0	-24.43	0.02	0.02	Open	0.16
P-14	1,118.00	8.0	Ductile Iron	130.0	10.14	0.00	0.00	Open	0.06
P-15	1,317.00	8.0	Ductile Iron	130.0	-17.46	0.01	0.01	Open	0.11
P-16	148.00	8.0	Ductile Iron	130.0	-17.46	0.00	0.01	Open	0.11
P-17	1,517.00	8.0	Ductile Iron	130.0	-22.24	0.02	0.02	Open	0.14
P-18	236.00	8.0	Ductile Iron	130.0	-55.91	0.02	0.09	Open	0.36
P-19	822.00	8.0	Ductile Iron	130.0	76.52	0.13	0.16	Open	0.49
P-20	587.00	8.0	Ductile Iron	130.0	57.11	0.05	0.09	Open	0.36
P-21	839.00	12.0	Ductile Iron	130.0	-115.59	0.04	0.05	Open	0.33
P-22	114.00	8.0	Ductile Iron	130.0	-60.86	0.01	0.10	Open	0.39
P-23	752.00	12.0	Ductile Iron	130.0	107.47	0.03	0.04	Open	0.30
P-24	624.00	8.0	Ductile Iron	130.0	-27.31	0.01	0.02	Open	0.17
P-25	1,055.00	8.0	Ductile Iron	130.0	-41.13	0.05	0.05	Open	0.26
P-26	200.00	8.0	Ductile Iron	130.0	-43.58	0.01	0.05	Open	0.28
P-27	631.00	8.0	Ductile Iron	130.0	-28.26	0.02	0.02	Open	0.18
P-28	198.00	8.0	Ductile Iron	130.0	-42.14	0.01	0.05	Open	0.27
P-29	883.00	8.0	Ductile Iron	130.0	-36.57	0.04	0.04	Open	0.23
P-30	476.00	8.0	Ductile Iron	130.0	-93.52	0.11	0.23	Open	0.60
P-31	392.00	8.0	Ductile Iron	130.0	185.61	0.32	0.81	Open	1.18
P-32	670.00	8.0	Ductile Iron	130.0	156.09	0.39	0.59	Open	1.00
P-33	170.00	8.0	Ductile Iron	130.0	253.49	0.24	1.44	Open	1.62
P-34	1,289.00	8.0	Ductile Iron	130.0	253.49	1.85	1.44	Open	1.62
P-36	303.00	20.0	Ductile Iron	130.0	-2,449.10	0.34	1.11	Open	2.50
P-37	1,259.00	20.0	Ductile Iron	130.0	-2,474.42	1.42	1.13	Open	2.53
P-38	737.00	12.0	Ductile Iron	130.0	844.80	1.37	1.85	Open	2.40
P-40	497.00	12.0	Ductile Iron	130.0	546.61	0.41	0.83	Open	1.55
P-41	714.00	12.0	Ductile Iron	130.0	579.32	0.66	0.92	Open	1.64
P-42	857.00	12.0	Ductile Iron	130.0	410.86	0.42	0.49	Open	1.17
P-43	913.00	8.0	Ductile Iron	130.0	214.20	0.96	1.05	Open	1.37
P-44	258.00	8.0	Ductile Iron	130.0	170.35	0.18	0.69	Open	1.09
P-45	510.00	8.0	Ductile Iron	130.0	82.94	0.09	0.18	Open	0.53
P-46	505.00	8.0	Ductile Iron	130.0	21.21	0.01	0.01	Open	0.14
P-47	287.00	8.0	Ductile Iron	130.0	61.77	0.03	0.11	Open	0.39
P-48	1,100.00	8.0	Ductile Iron	130.0	58.41	0.10	0.09	Open	0.37
P-49	942.00	12.0	Ductile Iron	130.0	217.23	0.14	0.15	Open	0.62
P-50	266.00	12.0	Ductile Iron	130.0	340.39	0.09	0.34	Open	0.97
P-51	499.00	12.0	Ductile Iron	130.0	420.82	0.25	0.51	Open	1.19
P-52	516.00	12.0	Ductile Iron	130.0	646.21	0.58	1.13	Open	1.83
P-53	632.00	12.0	Ductile Iron	130.0	522.13	0.48	0.76	Open	1.48
P-54	944.00	12.0	Ductile Iron	130.0	683.80	1.18	1.25	Open	1.94
P-55	934.00	12.0	Ductile Iron	130.0	559.50	0.81	0.86	Open	1.59

Scenario: Max Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-56	1,107.00	12.0	Ductile Iron	130.0	53.47	0.01	0.01	Open	0.15
P-57	536.00	12.0	Ductile Iron	130.0	24.35	0.00	0.00	Open	0.07
P-58	709.00	12.0	Ductile Iron	130.0	-12.14	0.00	0.00	Open	0.03
P-59	231.00	12.0	Ductile Iron	130.0	-52.13	0.00	0.01	Open	0.15
P-60	838.00	8.0	Ductile Iron	130.0	160.01	0.51	0.61	Open	1.02
P-61	270.00	8.0	Ductile Iron	130.0	280.26	0.47	1.73	Open	1.79
P-62	300.00	8.0	Ductile Iron	130.0	-169.73	0.21	0.68	Open	1.08
P-63	472.00	8.0	Ductile Iron	130.0	-50.20	0.03	0.07	Open	0.32
P-64	271.00	8.0	Ductile Iron	130.0	-74.61	0.04	0.15	Open	0.48
P-65	608.00	8.0	Ductile Iron	130.0	-107.04	0.18	0.29	Open	0.68
P-66	1,240.00	12.0	Ductile Iron	130.0	178.16	0.13	0.10	Open	0.51
P-67	426.00	12.0	Ductile Iron	130.0	195.93	0.05	0.12	Open	0.56
P-68	944.00	12.0	Ductile Iron	130.0	-74.16	0.02	0.02	Open	0.21
P-69	507.00	16.0	Ductile Iron	130.0	-1,594.18	0.75	1.48	Open	2.54
P-70	1,190.00	16.0	Ductile Iron	130.0	1,366.26	1.32	1.11	Open	2.18
P-71	283.00	16.0	Ductile Iron	130.0	-1,435.07	0.34	1.22	Open	2.29
P-72	316.00	16.0	Ductile Iron	130.0	-1,334.75	0.34	1.07	Open	2.13
P-73	583.00	16.0	Ductile Iron	130.0	-1,439.61	0.71	1.23	Open	2.30
P-74	165.00	12.0	Ductile Iron	130.0	462.20	0.10	0.61	Open	1.31
P-75	1,453.00	12.0	Ductile Iron	130.0	169.86	0.14	0.10	Open	0.48
P-76	222.00	12.0	Ductile Iron	130.0	136.47	0.01	0.06	Open	0.39
P-77	604.00	12.0	Ductile Iron	130.0	3.42	0.00	0.00	Open	0.01
P-78	621.00	8.0	Ductile Iron	130.0	392.31	2.01	3.23	Open	2.50
P-79	198.00	8.0	Ductile Iron	130.0	322.30	0.44	2.24	Open	2.06
P-80	530.00	8.0	Ductile Iron	130.0	-187.89	0.44	0.83	Open	1.20
P-81	187.00	8.0	Ductile Iron	130.0	-126.87	0.07	0.40	Open	0.81
P-82	457.00	8.0	Ductile Iron	130.0	-87.85	0.09	0.20	Open	0.56
P-83	844.00	8.0	Ductile Iron	130.0	81.24	0.15	0.17	Open	0.52
P-84	510.00	8.0	Ductile Iron	130.0	75.06	0.08	0.15	Open	0.48
P-85	506.00	8.0	Ductile Iron	130.0	63.07	0.06	0.11	Open	0.40
P-86	1,387.00	8.0	Ductile Iron	130.0	-33.28	0.05	0.03	Open	0.21
P-87	1,495.00	8.0	Ductile Iron	130.0	-32.96	0.05	0.03	Open	0.21
P-88	505.00	8.0	Ductile Iron	130.0	-21.87	0.01	0.02	Open	0.14
P-89	515.00	8.0	Ductile Iron	130.0	-56.63	0.05	0.09	Open	0.36
P-90	1,045.00	8.0	Ductile Iron	130.0	-49.30	0.07	0.07	Open	0.31
P-91	1,171.00	8.0	Ductile Iron	130.0	23.28	0.02	0.02	Open	0.15
P-92	874.00	8.0	Ductile Iron	130.0	-2.70	0.00	0.00	Open	0.02
P-93	842.00	8.0	Ductile Iron	130.0	152.39	0.47	0.56	Open	0.97
P-94	1,010.00	8.0	Ductile Iron	130.0	136.32	0.46	0.46	Open	0.87
P-95	1,071.00	8.0	Ductile Iron	130.0	69.91	0.14	0.13	Open	0.45
P-96	1,525.00	8.0	Ductile Iron	130.0	-47.15	0.10	0.06	Open	0.30
P-97	906.00	8.0	Ductile Iron	130.0	96.34	0.22	0.24	Open	0.61
P-98	963.00	8.0	Ductile Iron	130.0	-73.15	0.14	0.14	Open	0.47
P-99	1,209.00	8.0	Ductile Iron	130.0	25.17	0.02	0.02	Open	0.16
P-100	505.00	8.0	Ductile Iron	130.0	-3.71	0.00	0.00	Open	0.02
P-101	1,130.00	8.0	Ductile Iron	130.0	53.20	0.09	0.08	Open	0.34
P-102	1,498.00	8.0	Ductile Iron	130.0	73.97	0.22	0.15	Open	0.47
P-103	1,015.00	8.0	Ductile Iron	130.0	80.09	0.17	0.17	Open	0.51
P-104	1,045.00	8.0	Ductile Iron	130.0	57.79	0.10	0.09	Open	0.37
P-105	1,237.00	8.0	Ductile Iron	130.0	83.06	0.23	0.18	Open	0.53
P-106	965.00	8.0	Ductile Iron	130.0	35.49	0.04	0.04	Open	0.23
P-107	1,385.00	8.0	Ductile Iron	130.0	12.08	0.01	0.01	Open	0.08

Scenario: Max Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-108	1,340.00	8.0	Ductile Iron	130.0	-86.88	0.27	0.20	Open	0.55
P-109	1,028.00	8.0	Ductile Iron	130.0	-52.00	0.08	0.08	Open	0.33
P-110	669.00	8.0	Ductile Iron	130.0	-28.82	0.02	0.03	Open	0.18
P-111	1,022.00	8.0	Ductile Iron	130.0	-11.07	0.00	0.00	Open	0.07
P-112	666.00	8.0	Ductile Iron	130.0	6.68	0.00	0.00	Open	0.04
P-113	1,431.00	8.0	Ductile Iron	130.0	93.84	0.33	0.23	Open	0.60
P-114	593.00	8.0	Ductile Iron	130.0	124.41	0.23	0.38	Open	0.79
P-115	1,919.00	8.0	Ductile Iron	130.0	154.97	1.11	0.58	Open	0.99
P-116	745.00	8.0	Ductile Iron	130.0	107.68	0.22	0.29	Open	0.69
P-117	1,398.00	8.0	Ductile Iron	130.0	84.24	0.26	0.19	Open	0.54
P-118	1,459.00	8.0	Ductile Iron	130.0	-25.42	0.03	0.02	Open	0.16
P-119	633.00	8.0	Ductile Iron	130.0	-50.38	0.05	0.07	Open	0.32
P-120	1,719.00	8.0	Ductile Iron	130.0	-75.35	0.26	0.15	Open	0.48
P-121	1,250.00	8.0	Ductile Iron	130.0	92.94	0.28	0.22	Open	0.59
P-122	1,209.00	8.0	Ductile Iron	130.0	-62.82	0.13	0.11	Open	0.40
P-123	1,232.00	8.0	Ductile Iron	130.0	-139.69	0.59	0.48	Open	0.89
P-124	433.00	8.0	Ductile Iron	130.0	104.25	0.12	0.28	Open	0.67
P-125	636.00	8.0	Ductile Iron	130.0	-199.73	0.59	0.92	Open	1.27
P-126	1,375.00	8.0	Ductile Iron	130.0	-171.55	0.96	0.70	Open	1.09
P-127	915.00	8.0	Ductile Iron	130.0	-143.36	0.46	0.50	Open	0.92
P-128	1,110.00	8.0	Ductile Iron	130.0	19.52	0.01	0.01	Open	0.12
P-129	1,575.00	8.0	Ductile Iron	130.0	-4.80	0.00	0.00	Open	0.03
P-130	1,292.00	8.0	Ductile Iron	130.0	73.96	0.19	0.15	Open	0.47
P-131	2,070.00	8.0	Ductile Iron	130.0	-49.64	0.15	0.07	Open	0.32
P-132	420.00	8.0	Ductile Iron	130.0	78.92	0.07	0.17	Open	0.50
P-133	1,350.00	8.0	Ductile Iron	130.0	41.48	0.07	0.05	Open	0.26
P-134	869.00	8.0	Ductile Iron	130.0	4.04	0.00	0.00	Open	0.03
P-135	910.00	8.0	Ductile Iron	130.0	11.36	0.00	0.00	Open	0.07
P-136	1,043.00	8.0	Ductile Iron	130.0	0.61	0.00	0.00	Open	0.00
P-137	2,240.00	8.0	Ductile Iron	130.0	-15.31	0.02	0.01	Open	0.10
P-138	993.00	8.0	Ductile Iron	130.0	80.34	0.17	0.17	Open	0.51
P-139	540.00	8.0	Ductile Iron	130.0	-8.04	0.00	0.00	Open	0.05
P-140	1,615.00	8.0	Ductile Iron	130.0	-20.86	0.02	0.01	Open	0.13
P-141	1,615.00	8.0	Ductile Iron	130.0	4.12	0.00	0.00	Open	0.03
P-142	748.00	8.0	Ductile Iron	130.0	-7.63	0.00	0.00	Open	0.05
P-143	539.00	8.0	Ductile Iron	130.0	-68.54	0.07	0.13	Open	0.44
P-144	754.00	8.0	Ductile Iron	130.0	-76.23	0.12	0.16	Open	0.49
P-145	990.00	8.0	Ductile Iron	130.0	-46.38	0.06	0.06	Open	0.30
P-146	663.00	8.0	Ductile Iron	130.0	-40.03	0.03	0.05	Open	0.26
P-147	794.00	8.0	Ductile Iron	130.0	31.34	0.02	0.03	Open	0.20
P-148	950.00	8.0	Ductile Iron	130.0	50.67	0.07	0.07	Open	0.32
P-149	1,149.00	8.0	Ductile Iron	130.0	97.23	0.28	0.24	Open	0.62
P-150	1,577.00	8.0	Ductile Iron	130.0	-60.06	0.16	0.10	Open	0.38
P-151	1,030.00	8.0	Ductile Iron	130.0	25.20	0.02	0.02	Open	0.16
P-152	1,079.00	8.0	Ductile Iron	130.0	11.38	0.00	0.00	Open	0.07
P-153	1,077.00	8.0	Ductile Iron	130.0	-29.20	0.03	0.03	Open	0.19
P-154	607.00	8.0	Ductile Iron	130.0	-43.07	0.03	0.05	Open	0.27
P-155	1,907.00	8.0	Ductile Iron	130.0	-32.75	0.06	0.03	Open	0.21
P-156	816.00	8.0	Ductile Iron	130.0	59.93	0.08	0.10	Open	0.38
P-157	1,721.00	8.0	Ductile Iron	130.0	-59.48	0.17	0.10	Open	0.38
P-158	1,191.00	8.0	Ductile Iron	130.0	84.44	0.22	0.19	Open	0.54
P-160	176.00	24.0	Ductile Iron	130.0	-3,193.17	0.13	0.74	Open	2.26

Scenario: Max Day
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-161	146.00	20.0	Ductile Iron	130.0	2,547.37	0.17	1.19	Open	2.60
P-163	2,743.00	12.0	Ductile Iron	130.0	-645.79	3.09	1.13	Open	1.83
P-164	1,585.00	12.0	Ductile Iron	130.0	669.66	1.91	1.21	Open	1.90

Scenario: Max Day
Steady State Analysis
Reservoir Report

Label	Reservoir Surface Elevation (ft)	Zone	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
R-1	1,302.00	Zone 1	1,302.00	-3,193.17	3,193.17

Scenario: Peak Hour
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-2	1,127.70	Zone 1	10.29	10.29	Demand	Fixed	1,281.25	66.43
J-3	1,122.00	Zone 1	10.29	10.29	Demand	Fixed	1,280.91	68.75
J-4	1,121.20	Zone 1	49.65	49.65	Demand	Fixed	1,280.63	68.98
J-5	1,117.00	Zone 1	68.13	68.13	Demand	Fixed	1,280.35	70.67
J-6	1,115.00	Zone 1	18.48	18.48	Demand	Fixed	1,280.22	71.48
J-7	1,114.00	Zone 1	0.00	0.00	Demand	Fixed	1,280.20	71.91
J-8	1,114.00	Zone 1	12.21	12.21	Demand	Fixed	1,280.06	71.85
J-9	1,108.00	Zone 1	12.21	12.21	Demand	Fixed	1,279.84	74.35
J-10	1,105.00	Zone 1	12.21	12.21	Demand	Fixed	1,279.75	75.61
J-11	1,105.00	Zone 1	58.14	58.14	Demand	Fixed	1,279.66	75.57
J-12	1,103.00	Zone 1	58.14	58.14	Demand	Fixed	1,279.36	76.30
J-13	1,102.20	Zone 1	29.58	29.58	Demand	Fixed	1,279.26	76.61
J-14	1,103.00	Zone 1	29.58	29.58	Demand	Fixed	1,279.21	76.24
J-15	1,105.00	Zone 1	17.91	17.91	Demand	Fixed	1,285.02	77.89
J-16	1,110.00	Zone 1	17.91	17.91	Demand	Fixed	1,285.03	75.73
J-17	1,114.80	Zone 1	0.00	0.00	Demand	Fixed	1,285.06	73.66
J-18	1,114.50	Zone 1	21.36	21.36	Demand	Fixed	1,285.07	73.80
J-19	1,121.00	Zone 1	21.36	21.36	Demand	Fixed	1,285.13	71.01
J-20	1,124.00	Zone 1	34.35	34.35	Demand	Fixed	1,285.18	69.74
J-21	1,128.00	Zone 1	34.35	34.35	Demand	Fixed	1,285.51	68.15
J-22	1,130.30	Zone 1	10.59	10.59	Demand	Fixed	1,285.65	67.21
J-23	1,135.20	Zone 1	10.59	10.59	Demand	Fixed	1,285.75	65.14
J-24	1,136.00	Zone 1	12.81	12.81	Demand	Fixed	1,285.78	64.80
J-25	1,138.00	Zone 1	12.81	12.81	Demand	Fixed	1,285.83	63.96
J-26	1,134.00	Zone 1	23.04	23.04	Demand	Fixed	1,285.87	65.71
J-27	1,138.50	Zone 1	23.04	23.04	Demand	Fixed	1,286.00	63.82
J-28	1,136.00	Zone 1	23.13	23.13	Demand	Fixed	1,286.03	64.91
J-29	1,144.00	Zone 1	23.13	23.13	Demand	Fixed	1,286.07	61.47
J-30	1,144.20	Zone 1	45.30	45.30	Demand	Fixed	1,286.10	61.39
J-31	1,148.50	Zone 1	23.13	23.13	Demand	Fixed	1,286.19	59.57
J-32	1,148.10	Zone 1	53.61	53.61	Demand	Fixed	1,286.47	59.86
J-33	1,152.00	Zone 1	49.92	49.92	Demand	Fixed	1,287.28	58.53
J-34	1,154.00	Zone 1	73.83	73.83	Demand	Fixed	1,288.29	58.10
J-35	1,154.50	Zone 1	0.00	0.00	Demand	Fixed	1,288.92	58.16
J-36	1,149.00	Zone 1	0.00	0.00	Demand	Fixed	1,293.70	62.60
J-37	1,138.60	Zone 1	40.53	40.53	Demand	Fixed	1,301.22	70.36
J-38	1,136.10	Zone 1	40.53	40.53	Demand	Fixed	1,300.35	71.06
J-39	1,135.40	Zone 1	59.07	59.07	Demand	Fixed	1,296.70	69.79
J-40	1,131.80	Zone 1	59.07	59.07	Demand	Fixed	1,293.18	69.82
J-41	1,129.00	Zone 1	50.19	50.19	Demand	Fixed	1,288.25	68.90
J-42	1,126.00	Zone 1	50.19	50.19	Demand	Fixed	1,287.19	69.74
J-43	1,126.60	Zone 1	26.79	26.79	Demand	Fixed	1,285.50	68.75
J-44	1,127.70	Zone 1	61.08	61.08	Demand	Fixed	1,284.42	67.81
J-45	1,127.50	Zone 1	34.29	34.29	Demand	Fixed	1,281.95	66.82
J-46	1,128.00	Zone 1	10.29	10.29	Demand	Fixed	1,281.49	66.41
J-47	1,116.00	Zone 1	68.13	68.13	Demand	Fixed	1,280.37	71.12
J-48	1,116.60	Zone 1	74.37	74.37	Demand	Fixed	1,280.45	70.89
J-49	1,115.70	Zone 1	146.16	146.16	Demand	Fixed	1,280.72	71.39
J-50	1,112.00	Zone 1	71.79	71.79	Demand	Fixed	1,281.08	73.15
J-51	1,113.40	Zone 1	113.91	113.91	Demand	Fixed	1,281.32	72.65
J-52	1,112.00	Zone 1	113.91	113.91	Demand	Fixed	1,281.97	73.54
J-53	1,112.10	Zone 1	90.00	90.00	Demand	Fixed	1,283.47	74.14

Scenario: Peak Hour
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-54	1,113.00	Zone 1	90.00	90.00	Demand	Fixed	1,284.71	74.29
J-55	1,118.00	Zone 1	68.88	68.88	Demand	Fixed	1,287.76	73.45
J-56	1,121.00	Zone 1	40.53	40.53	Demand	Fixed	1,285.68	71.25
J-57	1,126.00	Zone 1	40.53	40.53	Demand	Fixed	1,285.65	69.07
J-58	1,126.00	Zone 1	53.94	53.94	Demand	Fixed	1,285.64	69.07
J-59	1,131.70	Zone 1	53.94	53.94	Demand	Fixed	1,285.64	66.60
J-60	1,122.00	Zone 1	26.79	26.79	Demand	Fixed	1,283.10	69.70
J-61	1,120.70	Zone 1	72.21	72.21	Demand	Fixed	1,281.89	69.74
J-62	1,119.10	Zone 1	38.64	38.64	Demand	Fixed	1,281.36	70.20
J-63	1,118.10	Zone 1	37.92	37.92	Demand	Fixed	1,281.28	70.60
J-64	1,116.90	Zone 1	34.62	34.62	Demand	Fixed	1,281.17	71.07
J-65	1,107.87	Zone 1	72.90	72.90	Demand	Fixed	1,280.38	74.64
J-66	1,108.00	Zone 1	58.14	58.14	Demand	Fixed	1,280.25	74.52
J-67	1,127.90	Zone 1	46.98	46.98	Demand	Fixed	1,294.76	72.19
J-68	1,123.90	Zone 1	59.07	59.07	Demand	Fixed	1,291.35	72.45
J-69	1,123.70	Zone 1	41.61	41.61	Demand	Fixed	1,290.47	72.15
J-70	1,120.30	Zone 1	106.53	106.53	Demand	Fixed	1,289.60	73.25
J-71	1,120.90	Zone 1	221.79	221.79	Demand	Fixed	1,285.42	71.18
J-72	1,113.80	Zone 1	62.40	62.40	Demand	Fixed	1,285.06	74.10
J-73	1,112.30	Zone 1	177.30	177.30	Demand	Fixed	1,285.03	74.73
J-74	1,146.40	Zone 1	32.22	32.22	Demand	Fixed	1,288.53	61.49
J-75	1,145.00	Zone 1	61.95	61.95	Demand	Fixed	1,287.39	61.60
J-76	1,141.70	Zone 1	74.76	74.76	Demand	Fixed	1,286.26	62.54
J-77	1,139.70	Zone 1	23.04	23.04	Demand	Fixed	1,286.07	63.33
J-78	1,123.20	Zone 1	10.29	10.29	Demand	Fixed	1,281.11	68.32
J-79	1,122.00	Zone 1	49.65	49.65	Demand	Fixed	1,280.49	68.57
J-80	1,108.70	Zone 1	18.48	18.48	Demand	Fixed	1,280.24	74.22
J-81	1,110.00	Zone 1	12.21	12.21	Demand	Fixed	1,279.94	73.52
J-82	1,121.00	Zone 1	34.29	34.29	Demand	Fixed	1,281.89	69.61
J-83	1,126.00	Zone 1	26.79	26.79	Demand	Fixed	1,284.28	68.48
J-84	1,124.60	Zone 1	37.92	37.92	Demand	Fixed	1,281.53	67.90
J-85	1,120.30	Zone 1	38.64	38.64	Demand	Fixed	1,280.80	69.44
J-86	1,109.40	Zone 1	35.76	35.76	Demand	Fixed	1,280.39	73.98
J-87	1,119.80	Zone 1	34.62	34.62	Demand	Fixed	1,281.40	69.92
J-88	1,108.00	Zone 1	37.17	37.17	Demand	Fixed	1,280.64	74.69
J-89	1,106.70	Zone 1	79.29	79.29	Demand	Fixed	1,281.39	75.58
J-90	1,105.00	Zone 1	79.29	79.29	Demand	Fixed	1,281.30	76.28
J-91	1,105.20	Zone 1	58.14	58.14	Demand	Fixed	1,279.57	75.44
J-92	1,104.00	Zone 1	29.58	29.58	Demand	Fixed	1,279.22	75.81
J-93	1,105.60	Zone 1	29.58	29.58	Demand	Fixed	1,279.21	75.11
J-94	1,105.00	Zone 1	50.94	50.94	Demand	Fixed	1,284.31	77.58
J-95	1,104.00	Zone 1	50.94	50.94	Demand	Fixed	1,284.90	78.27
J-96	1,116.40	Zone 1	39.06	39.06	Demand	Fixed	1,284.15	72.58
J-97	1,116.50	Zone 1	41.61	41.61	Demand	Fixed	1,289.68	74.92
J-98	1,120.00	Zone 1	41.61	41.61	Demand	Fixed	1,289.79	73.46
J-99	1,119.60	Zone 1	50.19	50.19	Demand	Fixed	1,287.53	72.66
J-100	1,127.00	Zone 1	59.07	59.07	Demand	Fixed	1,291.66	71.24
J-101	1,131.00	Zone 1	46.98	46.98	Demand	Fixed	1,293.25	70.20
J-102	1,123.00	Zone 1	46.98	46.98	Demand	Fixed	1,290.78	72.59
J-103	1,125.00	Zone 1	40.53	40.53	Demand	Fixed	1,285.64	69.50
J-104	1,130.40	Zone 1	40.53	40.53	Demand	Fixed	1,300.73	73.69
J-105	1,117.00	Zone 1	62.40	62.40	Demand	Fixed	1,285.24	72.79

Scenario: Peak Hour
Steady State Analysis
Junction Report

Label	Elevation (ft)	Zone	Demand (gpm)	Demand (Calculated) (gpm)	Demand Type	Demand Pattern	Calculated Hydraulic Grade (ft)	Pressure (psi)
J-106	1,105.10	Zone 1	62.40	62.40	Demand	Fixed	1,285.07	77.86
J-107	1,106.00	Zone 1	17.91	17.91	Demand	Fixed	1,285.02	77.45
J-108	1,125.00	Zone 1	159.42	159.42	Demand	Fixed	1,284.98	69.22
J-109	1,115.00	Zone 1	21.36	21.36	Demand	Fixed	1,285.07	73.58
J-110	1,137.00	Zone 1	19.59	19.59	Demand	Fixed	1,285.64	64.31
J-111	1,139.80	Zone 1	12.81	12.81	Demand	Fixed	1,285.96	63.24
J-112	1,132.00	Zone 1	10.59	10.59	Demand	Fixed	1,285.59	66.45
J-113	1,151.00	Zone 1	32.22	32.22	Demand	Fixed	1,288.35	59.43
J-114	1,150.40	Zone 1	61.95	61.95	Demand	Fixed	1,286.67	58.96
J-115	1,143.30	Zone 1	23.04	23.04	Demand	Fixed	1,286.02	61.75
J-116	1,146.70	Zone 1	23.13	23.13	Demand	Fixed	1,286.10	60.31
J-117	1,153.00	Zone 1	45.30	45.30	Demand	Fixed	1,286.26	57.65
J-118	1,158.00	Zone 1	41.61	41.61	Demand	Fixed	1,287.72	56.12
J-119	1,138.60	Zone 1	0.00	0.00	Demand	Fixed	1,301.66	70.55

Scenario: Peak Hour
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-1	838.00	8.0	Ductile Iron	130.0	127.94	0.34	0.41	Open	0.82
P-2	209.00	8.0	Ductile Iron	130.0	242.75	0.28	1.33	Open	1.55
P-3	1,387.00	8.0	Ductile Iron	130.0	-87.98	0.28	0.20	Open	0.56
P-4	1,494.00	8.0	Ductile Iron	130.0	-55.21	0.13	0.09	Open	0.35
P-5	168.00	8.0	Ductile Iron	130.0	-73.18	0.02	0.14	Open	0.47
P-6	157.00	8.0	Ductile Iron	130.0	-196.78	0.14	0.90	Open	1.26
P-7	1,045.00	8.0	Ductile Iron	130.0	-90.18	0.22	0.21	Open	0.58
P-8	517.00	8.0	Ductile Iron	130.0	-77.97	0.08	0.16	Open	0.50
P-9	180.00	8.0	Ductile Iron	130.0	-147.94	0.10	0.53	Open	0.94
P-10	1,396.00	8.0	Ductile Iron	130.0	-89.80	0.29	0.21	Open	0.57
P-11	290.00	8.0	Ductile Iron	130.0	-118.32	0.10	0.35	Open	0.76
P-12	1,084.00	8.0	Ductile Iron	130.0	-40.71	0.05	0.05	Open	0.26
P-14	1,118.00	8.0	Ductile Iron	130.0	16.89	0.01	0.01	Open	0.11
P-15	1,317.00	8.0	Ductile Iron	130.0	-29.11	0.03	0.03	Open	0.19
P-16	148.00	8.0	Ductile Iron	130.0	-29.11	0.00	0.03	Open	0.19
P-17	1,517.00	8.0	Ductile Iron	130.0	-37.06	0.06	0.04	Open	0.24
P-18	236.00	8.0	Ductile Iron	130.0	-93.19	0.05	0.23	Open	0.59
P-19	822.00	8.0	Ductile Iron	130.0	127.54	0.33	0.40	Open	0.81
P-20	587.00	8.0	Ductile Iron	130.0	95.18	0.14	0.23	Open	0.61
P-21	839.00	12.0	Ductile Iron	130.0	-192.65	0.10	0.12	Open	0.55
P-22	114.00	8.0	Ductile Iron	130.0	-101.43	0.03	0.26	Open	0.65
P-23	752.00	12.0	Ductile Iron	130.0	179.11	0.08	0.10	Open	0.51
P-24	624.00	8.0	Ductile Iron	130.0	-45.52	0.04	0.06	Open	0.29
P-25	1,055.00	8.0	Ductile Iron	130.0	-68.56	0.13	0.13	Open	0.44
P-26	200.00	8.0	Ductile Iron	130.0	-72.63	0.03	0.14	Open	0.46
P-27	631.00	8.0	Ductile Iron	130.0	-47.10	0.04	0.06	Open	0.30
P-28	198.00	8.0	Ductile Iron	130.0	-70.23	0.03	0.13	Open	0.45
P-29	883.00	8.0	Ductile Iron	130.0	-60.94	0.09	0.10	Open	0.39
P-30	476.00	8.0	Ductile Iron	130.0	-155.86	0.28	0.58	Open	0.99
P-31	392.00	8.0	Ductile Iron	130.0	309.36	0.82	2.08	Open	1.97
P-32	670.00	8.0	Ductile Iron	130.0	260.15	1.01	1.51	Open	1.66
P-33	170.00	8.0	Ductile Iron	130.0	422.48	0.63	3.70	Open	2.70
P-34	1,289.00	8.0	Ductile Iron	130.0	422.48	4.77	3.70	Open	2.70
P-36	303.00	20.0	Ductile Iron	130.0	-4,081.78	0.86	2.85	Open	4.17
P-37	1,259.00	20.0	Ductile Iron	130.0	-4,124.03	3.65	2.90	Open	4.21
P-38	737.00	12.0	Ductile Iron	130.0	1,408.00	3.52	4.78	Open	3.99
P-40	497.00	12.0	Ductile Iron	130.0	911.02	1.06	2.13	Open	2.58
P-41	714.00	12.0	Ductile Iron	130.0	965.54	1.70	2.38	Open	2.74
P-42	857.00	12.0	Ductile Iron	130.0	684.76	1.08	1.26	Open	1.94
P-43	913.00	8.0	Ductile Iron	130.0	356.99	2.48	2.71	Open	2.28
P-44	258.00	8.0	Ductile Iron	130.0	283.91	0.46	1.77	Open	1.81
P-45	510.00	8.0	Ductile Iron	130.0	138.23	0.24	0.47	Open	0.88
P-46	505.00	8.0	Ductile Iron	130.0	35.35	0.02	0.04	Open	0.23
P-47	287.00	8.0	Ductile Iron	130.0	102.94	0.08	0.27	Open	0.66
P-48	1,100.00	8.0	Ductile Iron	130.0	97.34	0.27	0.24	Open	0.62
P-49	942.00	12.0	Ductile Iron	130.0	362.05	0.36	0.39	Open	1.03
P-50	266.00	12.0	Ductile Iron	130.0	567.32	0.24	0.89	Open	1.61
P-51	499.00	12.0	Ductile Iron	130.0	701.37	0.66	1.31	Open	1.99
P-52	516.00	12.0	Ductile Iron	130.0	1,077.01	1.50	2.91	Open	3.06
P-53	632.00	12.0	Ductile Iron	130.0	870.21	1.24	1.96	Open	2.47
P-54	944.00	12.0	Ductile Iron	130.0	1,139.67	3.05	3.23	Open	3.23
P-55	934.00	12.0	Ductile Iron	130.0	932.51	2.08	2.23	Open	2.65

Scenario: Peak Hour
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-56	1,107.00	12.0	Ductile Iron	130.0	89.11	0.03	0.03	Open	0.25
P-57	536.00	12.0	Ductile Iron	130.0	40.59	0.00	0.01	Open	0.12
P-58	709.00	12.0	Ductile Iron	130.0	-20.24	0.00	0.00	Open	0.06
P-59	231.00	12.0	Ductile Iron	130.0	-86.88	0.01	0.03	Open	0.25
P-60	838.00	8.0	Ductile Iron	130.0	266.69	1.32	1.58	Open	1.70
P-61	270.00	8.0	Ductile Iron	130.0	467.09	1.20	4.46	Open	2.98
P-62	300.00	8.0	Ductile Iron	130.0	-282.87	0.53	1.76	Open	1.81
P-63	472.00	8.0	Ductile Iron	130.0	-83.67	0.09	0.18	Open	0.53
P-64	271.00	8.0	Ductile Iron	130.0	-124.34	0.10	0.38	Open	0.79
P-65	608.00	8.0	Ductile Iron	130.0	-178.40	0.46	0.75	Open	1.14
P-66	1,240.00	12.0	Ductile Iron	130.0	296.94	0.33	0.27	Open	0.84
P-67	426.00	12.0	Ductile Iron	130.0	326.54	0.14	0.32	Open	0.93
P-68	944.00	12.0	Ductile Iron	130.0	-123.60	0.05	0.05	Open	0.35
P-69	507.00	16.0	Ductile Iron	130.0	-2,656.96	1.93	3.81	Open	4.24
P-70	1,190.00	16.0	Ductile Iron	130.0	2,277.09	3.41	2.87	Open	3.63
P-71	283.00	16.0	Ductile Iron	130.0	-2,391.77	0.89	3.14	Open	3.82
P-72	316.00	16.0	Ductile Iron	130.0	-2,224.58	0.87	2.74	Open	3.55
P-73	583.00	16.0	Ductile Iron	130.0	-2,399.34	1.84	3.16	Open	3.83
P-74	165.00	12.0	Ductile Iron	130.0	770.33	0.26	1.56	Open	2.19
P-75	1,453.00	12.0	Ductile Iron	130.0	283.11	0.36	0.24	Open	0.80
P-76	222.00	12.0	Ductile Iron	130.0	227.45	0.04	0.16	Open	0.65
P-77	604.00	12.0	Ductile Iron	130.0	5.69	0.00	0.00	Open	0.02
P-78	621.00	8.0	Ductile Iron	130.0	653.84	5.16	8.32	Open	4.17
P-79	198.00	8.0	Ductile Iron	130.0	537.16	1.14	5.78	Open	3.43
P-80	530.00	8.0	Ductile Iron	130.0	-313.16	1.13	2.13	Open	2.00
P-81	187.00	8.0	Ductile Iron	130.0	-211.46	0.19	1.03	Open	1.35
P-82	457.00	8.0	Ductile Iron	130.0	-146.41	0.24	0.52	Open	0.93
P-83	844.00	8.0	Ductile Iron	130.0	135.39	0.38	0.45	Open	0.86
P-84	510.00	8.0	Ductile Iron	130.0	125.10	0.20	0.39	Open	0.80
P-85	506.00	8.0	Ductile Iron	130.0	105.12	0.14	0.28	Open	0.67
P-86	1,387.00	8.0	Ductile Iron	130.0	-55.47	0.12	0.09	Open	0.35
P-87	1,495.00	8.0	Ductile Iron	130.0	-54.93	0.13	0.08	Open	0.35
P-88	505.00	8.0	Ductile Iron	130.0	-36.45	0.02	0.04	Open	0.23
P-89	515.00	8.0	Ductile Iron	130.0	-94.38	0.12	0.23	Open	0.60
P-90	1,045.00	8.0	Ductile Iron	130.0	-82.17	0.19	0.18	Open	0.52
P-91	1,171.00	8.0	Ductile Iron	130.0	38.79	0.05	0.04	Open	0.25
P-92	874.00	8.0	Ductile Iron	130.0	-4.50	0.00	0.00	Open	0.03
P-93	842.00	8.0	Ductile Iron	130.0	253.99	1.22	1.44	Open	1.62
P-94	1,010.00	8.0	Ductile Iron	130.0	227.20	1.19	1.17	Open	1.45
P-95	1,071.00	8.0	Ductile Iron	130.0	116.51	0.37	0.34	Open	0.74
P-96	1,525.00	8.0	Ductile Iron	130.0	-78.59	0.25	0.16	Open	0.50
P-97	906.00	8.0	Ductile Iron	130.0	160.56	0.56	0.62	Open	1.02
P-98	963.00	8.0	Ductile Iron	130.0	-121.92	0.36	0.37	Open	0.78
P-99	1,209.00	8.0	Ductile Iron	130.0	41.95	0.06	0.05	Open	0.27
P-100	505.00	8.0	Ductile Iron	130.0	-6.19	0.00	0.00	Open	0.04
P-101	1,130.00	8.0	Ductile Iron	130.0	88.67	0.23	0.21	Open	0.57
P-102	1,498.00	8.0	Ductile Iron	130.0	123.29	0.57	0.38	Open	0.79
P-103	1,015.00	8.0	Ductile Iron	130.0	133.48	0.45	0.44	Open	0.85
P-104	1,045.00	8.0	Ductile Iron	130.0	96.31	0.25	0.24	Open	0.61
P-105	1,237.00	8.0	Ductile Iron	130.0	138.44	0.58	0.47	Open	0.88
P-106	965.00	8.0	Ductile Iron	130.0	59.15	0.09	0.10	Open	0.38
P-107	1,385.00	8.0	Ductile Iron	130.0	20.14	0.02	0.01	Open	0.13

Scenario: Peak Hour
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-108	1,340.00	8.0	Ductile Iron	130.0	-144.80	0.68	0.51	Open	0.92
P-109	1,028.00	8.0	Ductile Iron	130.0	-86.66	0.20	0.20	Open	0.55
P-110	669.00	8.0	Ductile Iron	130.0	-48.03	0.04	0.07	Open	0.31
P-111	1,022.00	8.0	Ductile Iron	130.0	-18.45	0.01	0.01	Open	0.12
P-112	666.00	8.0	Ductile Iron	130.0	11.13	0.00	0.00	Open	0.07
P-113	1,431.00	8.0	Ductile Iron	130.0	156.40	0.84	0.59	Open	1.00
P-114	593.00	8.0	Ductile Iron	130.0	207.34	0.59	0.99	Open	1.32
P-115	1,919.00	8.0	Ductile Iron	130.0	258.28	2.86	1.49	Open	1.65
P-116	745.00	8.0	Ductile Iron	130.0	179.46	0.57	0.76	Open	1.15
P-117	1,398.00	8.0	Ductile Iron	130.0	140.40	0.67	0.48	Open	0.90
P-118	1,459.00	8.0	Ductile Iron	130.0	-42.36	0.08	0.05	Open	0.27
P-119	633.00	8.0	Ductile Iron	130.0	-83.97	0.12	0.19	Open	0.54
P-120	1,719.00	8.0	Ductile Iron	130.0	-125.58	0.67	0.39	Open	0.80
P-121	1,250.00	8.0	Ductile Iron	130.0	154.89	0.72	0.58	Open	0.99
P-122	1,209.00	8.0	Ductile Iron	130.0	-104.70	0.34	0.28	Open	0.67
P-123	1,232.00	8.0	Ductile Iron	130.0	-232.82	1.51	1.23	Open	1.49
P-124	433.00	8.0	Ductile Iron	130.0	173.75	0.31	0.71	Open	1.11
P-125	636.00	8.0	Ductile Iron	130.0	-332.89	1.52	2.38	Open	2.12
P-126	1,375.00	8.0	Ductile Iron	130.0	-285.91	2.47	1.80	Open	1.82
P-127	915.00	8.0	Ductile Iron	130.0	-238.93	1.18	1.29	Open	1.53
P-128	1,110.00	8.0	Ductile Iron	130.0	32.53	0.04	0.03	Open	0.21
P-129	1,575.00	8.0	Ductile Iron	130.0	-8.00	0.00	0.00	Open	0.05
P-130	1,292.00	8.0	Ductile Iron	130.0	123.30	0.49	0.38	Open	0.79
P-131	2,070.00	8.0	Ductile Iron	130.0	-82.77	0.37	0.18	Open	0.53
P-132	420.00	8.0	Ductile Iron	130.0	131.54	0.18	0.43	Open	0.84
P-133	1,350.00	8.0	Ductile Iron	130.0	69.14	0.18	0.13	Open	0.44
P-134	869.00	8.0	Ductile Iron	130.0	6.74	0.00	0.00	Open	0.04
P-135	910.00	8.0	Ductile Iron	130.0	18.93	0.01	0.01	Open	0.12
P-136	1,043.00	8.0	Ductile Iron	130.0	1.02	0.00	0.00	Open	0.01
P-137	2,240.00	8.0	Ductile Iron	130.0	-25.52	0.05	0.02	Open	0.16
P-138	993.00	8.0	Ductile Iron	130.0	133.90	0.44	0.44	Open	0.85
P-139	540.00	8.0	Ductile Iron	130.0	-13.41	0.00	0.01	Open	0.09
P-140	1,615.00	8.0	Ductile Iron	130.0	-34.77	0.06	0.04	Open	0.22
P-141	1,615.00	8.0	Ductile Iron	130.0	6.89	0.00	0.00	Open	0.04
P-142	748.00	8.0	Ductile Iron	130.0	-12.70	0.00	0.01	Open	0.08
P-143	539.00	8.0	Ductile Iron	130.0	-114.24	0.18	0.33	Open	0.73
P-144	754.00	8.0	Ductile Iron	130.0	-127.05	0.30	0.40	Open	0.81
P-145	990.00	8.0	Ductile Iron	130.0	-77.30	0.16	0.16	Open	0.49
P-146	663.00	8.0	Ductile Iron	130.0	-66.71	0.08	0.12	Open	0.43
P-147	794.00	8.0	Ductile Iron	130.0	52.24	0.06	0.08	Open	0.33
P-148	950.00	8.0	Ductile Iron	130.0	84.46	0.18	0.19	Open	0.54
P-149	1,149.00	8.0	Ductile Iron	130.0	162.06	0.72	0.63	Open	1.03
P-150	1,577.00	8.0	Ductile Iron	130.0	-100.11	0.41	0.26	Open	0.64
P-151	1,030.00	8.0	Ductile Iron	130.0	42.01	0.05	0.05	Open	0.27
P-152	1,079.00	8.0	Ductile Iron	130.0	18.97	0.01	0.01	Open	0.12
P-153	1,077.00	8.0	Ductile Iron	130.0	-48.66	0.07	0.07	Open	0.31
P-154	607.00	8.0	Ductile Iron	130.0	-71.79	0.08	0.14	Open	0.46
P-155	1,907.00	8.0	Ductile Iron	130.0	-54.59	0.16	0.08	Open	0.35
P-156	816.00	8.0	Ductile Iron	130.0	99.89	0.21	0.26	Open	0.64
P-157	1,721.00	8.0	Ductile Iron	130.0	-99.13	0.43	0.25	Open	0.63
P-158	1,191.00	8.0	Ductile Iron	130.0	140.74	0.58	0.48	Open	0.90
P-160	176.00	24.0	Ductile Iron	130.0	-5,321.94	0.34	1.92	Open	3.77

Scenario: Peak Hour
Steady State Analysis
Pipe Report

Label	Length (ft)	Diameter (in)	Material	Roughness	Discharge (gpm)	Headloss (ft)	Friction Slope (ft/1000ft)	Initial Status	Velocity (ft/s)
P-161	146.00	20.0	Ductile Iron	130.0	4,245.62	0.45	3.06	Open	4.34
P-163	2,743.00	12.0	Ductile Iron	130.0	-1,076.32	7.97	2.90	Open	3.05
P-164	1,585.00	12.0	Ductile Iron	130.0	1,116.11	4.92	3.11	Open	3.17

Scenario: Peak Hour
Steady State Analysis
Reservoir Report

Label	Reservoir Surface Elevation (ft)	Zone	Calculated Hydraulic Grade (ft)	Inflow (gpm)	Outflow (gpm)
R-1	1,302.00	Zone 1	1,302.00	-5,321.94	5,321.94

Fire Flow Analysis
Fire Flow Report

Label	Zone	Needed Fire Flow (gpm)	Demand (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Satisfies Fire Flow Constraints?	Minimum Zone Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Fire Flow Upper Limit (gpm)	Minimum Zone Junction	Calculated Residual Pressure (psi)
J-2	Zone 1	3,000.00	6.17	3,006.17	3,498.48	true	20.00	34.19	4,000.00	J-46	20.01
J-3	Zone 1	3,000.00	6.17	3,006.17	4,006.17	true	20.00	25.08	4,000.00	J-78	21.62
J-4	Zone 1	2,000.00	29.79	2,029.79	4,029.79	true	20.00	27.40	4,000.00	J-79	23.27
J-5	Zone 1	3,000.00	40.88	3,040.88	4,040.88	true	20.00	37.14	4,000.00	J-79	26.61
J-6	Zone 1	3,000.00	11.09	3,011.09	4,011.09	true	20.00	37.59	4,000.00	J-80	32.09
J-7	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	35.71	4,000.00	J-8	35.63
J-8	Zone 1	3,000.00	7.33	3,007.33	4,007.33	true	20.00	26.18	4,000.00	J-81	24.08
J-9	Zone 1	3,000.00	7.33	3,007.33	3,348.97	true	20.00	31.72	4,000.00	J-10	20.01
J-10	Zone 1	3,000.00	7.33	3,007.33	3,529.07	true	20.00	21.13	4,000.00	J-11	20.00
J-11	Zone 1	1,500.00	34.88	1,534.88	3,379.35	true	20.00	27.21	4,000.00	J-10	20.00
J-12	Zone 1	1,500.00	34.88	1,534.88	2,899.54	true	20.00	20.00	4,000.00	J-93	21.15
J-13	Zone 1	1,500.00	17.75	1,517.75	2,496.75	true	20.00	20.00	4,000.00	J-93	21.48
J-14	Zone 1	1,500.00	17.75	1,517.75	2,162.01	true	20.00	22.74	4,000.00	J-93	20.00
J-15	Zone 1	3,000.00	10.75	3,010.75	3,653.48	true	20.00	38.57	4,000.00	J-107	20.01
J-16	Zone 1	3,000.00	10.75	3,010.75	4,010.75	true	20.00	47.20	4,000.00	J-118	45.26
J-17	Zone 1	1,500.00	0.00	1,500.00	3,601.96	true	20.00	23.11	4,000.00	J-18	20.00
J-18	Zone 1	3,000.00	12.82	3,012.82	3,599.56	true	20.00	22.51	4,000.00	J-109	20.01
J-19	Zone 1	3,000.00	12.82	3,012.82	3,555.56	true	20.00	25.50	4,000.00	J-20	20.01
J-20	Zone 1	2,000.00	20.61	2,020.61	3,613.56	true	20.00	24.88	4,000.00	J-19	20.00
J-21	Zone 1	2,000.00	20.61	2,020.61	4,020.61	true	20.00	37.60	4,000.00	J-112	32.66
J-22	Zone 1	3,000.00	6.35	3,006.35	4,006.35	true	20.00	42.63	4,000.00	J-117	45.75
J-23	Zone 1	3,000.00	6.35	3,006.35	4,006.35	true	20.00	40.45	4,000.00	J-117	42.55
J-24	Zone 1	3,000.00	7.69	3,007.69	4,007.69	true	20.00	37.67	4,000.00	J-111	35.67
J-25	Zone 1	3,000.00	7.69	3,007.69	4,007.69	true	20.00	38.34	4,000.00	J-117	38.29
J-26	Zone 1	3,000.00	13.82	3,013.82	3,875.38	true	20.00	34.39	4,000.00	J-117	20.00
J-27	Zone 1	3,000.00	13.82	3,013.82	3,919.72	true	20.00	22.25	4,000.00	J-116	20.00
J-28	Zone 1	1,500.00	13.88	1,513.88	3,729.63	true	20.00	20.00	4,000.00	J-116	21.03
J-29	Zone 1	1,500.00	13.88	1,513.88	3,180.74	true	20.00	23.66	4,000.00	J-30	20.00
J-30	Zone 1	1,500.00	27.18	1,527.18	3,225.89	true	20.00	22.86	4,000.00	J-29	20.00
J-31	Zone 1	1,500.00	13.88	1,513.88	3,242.84	true	20.00	24.66	4,000.00	J-116	20.00
J-32	Zone 1	1,500.00	32.17	1,532.17	3,384.55	true	20.00	20.00	4,000.00	J-117	20.53
J-33	Zone 1	1,500.00	29.95	1,529.95	3,500.25	true	20.00	24.03	4,000.00	J-118	20.00
J-34	Zone 1	1,500.00	44.30	1,544.30	3,842.34	true	20.00	20.00	4,000.00	J-118	20.62
J-35	Zone 1	1,500.00	0.00	1,500.00	3,708.95	true	20.00	24.41	4,000.00	J-118	20.00
J-36	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	40.79	4,000.00	J-118	42.77

Fire Flow Analysis
Fire Flow Report

Label	Zone	Needed Fire Flow (gpm)	Demand (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Satisfies Fire Flow Constraints?	Minimum Zone Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Fire Flow Upper Limit (gpm)	Minimum Zone Junction	Calculated Residual Pressure (psi)
J-37	Zone 1	1,500.00	24.32	1,524.32	4,024.32	true	20.00	59.51	4,000.00	J-118	70.01
J-38	Zone 1	1,500.00	24.32	1,524.32	4,024.32	true	20.00	59.14	4,000.00	J-118	70.27
J-39	Zone 1	2,000.00	35.44	2,035.44	4,035.44	true	20.00	57.59	4,000.00	J-118	67.28
J-40	Zone 1	2,000.00	35.44	2,035.44	4,035.44	true	20.00	56.46	4,000.00	J-118	61.11
J-41	Zone 1	2,000.00	30.11	2,030.11	4,030.11	true	20.00	51.41	4,000.00	J-42	49.80
J-42	Zone 1	2,000.00	30.11	2,030.11	4,030.11	true	20.00	49.60	4,000.00	J-43	49.06
J-43	Zone 1	1,500.00	16.07	1,516.07	4,016.07	true	20.00	46.10	4,000.00	J-44	45.83
J-44	Zone 1	1,500.00	36.65	1,536.65	4,036.65	true	20.00	45.99	4,000.00	J-45	41.79
J-45	Zone 1	1,500.00	20.57	1,520.57	4,020.57	true	20.00	30.59	4,000.00	J-46	27.71
J-46	Zone 1	3,000.00	6.17	3,006.17	4,006.17	true	20.00	24.40	4,000.00	J-2	21.64
J-47	Zone 1	3,000.00	40.88	3,040.88	4,040.88	true	20.00	37.52	4,000.00	J-79	35.79
J-48	Zone 1	1,500.00	44.62	1,544.62	4,044.62	true	20.00	42.38	4,000.00	J-79	38.24
J-49	Zone 1	1,500.00	87.70	1,587.70	4,087.70	true	20.00	46.33	4,000.00	J-79	46.19
J-50	Zone 1	1,500.00	43.07	1,543.07	4,043.07	true	20.00	48.27	4,000.00	J-2	49.84
J-51	Zone 1	2,000.00	68.35	2,068.35	4,068.35	true	20.00	49.13	4,000.00	J-2	50.43
J-52	Zone 1	2,000.00	68.35	2,068.35	4,068.35	true	20.00	50.68	4,000.00	J-2	53.84
J-53	Zone 1	3,000.00	54.00	3,054.00	4,054.00	true	20.00	53.85	4,000.00	J-2	57.68
J-54	Zone 1	3,000.00	54.00	3,054.00	4,054.00	true	20.00	53.69	4,000.00	J-118	59.82
J-55	Zone 1	1,500.00	41.33	1,541.33	4,041.33	true	20.00	52.98	4,000.00	J-118	66.03
J-56	Zone 1	1,500.00	24.32	1,524.32	4,024.32	true	20.00	47.90	4,000.00	J-118	56.01
J-57	Zone 1	1,500.00	24.32	1,524.32	4,024.32	true	20.00	46.11	4,000.00	J-117	49.87
J-58	Zone 1	3,000.00	32.36	3,032.36	4,032.36	true	20.00	44.66	4,000.00	J-110	48.44
J-59	Zone 1	3,000.00	32.36	3,032.36	4,032.36	true	20.00	43.28	4,000.00	J-117	45.26
J-60	Zone 1	1,500.00	16.07	1,516.07	4,016.07	true	20.00	43.88	4,000.00	J-83	38.57
J-61	Zone 1	1,500.00	43.33	1,543.33	4,043.33	true	20.00	40.59	4,000.00	J-84	40.27
J-62	Zone 1	1,500.00	23.18	1,523.18	4,023.18	true	20.00	41.97	4,000.00	J-84	37.47
J-63	Zone 1	1,500.00	22.75	1,522.75	4,022.75	true	20.00	40.22	4,000.00	J-84	37.07
J-64	Zone 1	1,500.00	20.77	1,520.77	4,020.77	true	20.00	43.51	4,000.00	J-63	38.79
J-65	Zone 1	1,500.00	43.74	1,543.74	4,043.74	true	20.00	43.09	4,000.00	J-8	45.12
J-66	Zone 1	1,500.00	34.88	1,534.88	4,034.88	true	20.00	40.05	4,000.00	J-8	41.93
J-67	Zone 1	1,500.00	28.19	1,528.19	4,028.19	true	20.00	56.49	4,000.00	J-118	68.08
J-68	Zone 1	2,000.00	35.44	2,035.44	4,035.44	true	20.00	54.78	4,000.00	J-118	66.59
J-69	Zone 1	1,500.00	24.97	1,524.97	4,024.97	true	20.00	54.33	4,000.00	J-118	65.90
J-70	Zone 1	1,500.00	63.92	1,563.92	4,063.92	true	20.00	53.92	4,000.00	J-118	66.67
J-71	Zone 1	2,000.00	133.07	2,133.07	4,133.07	true	20.00	47.72	4,000.00	J-118	53.65

Fire Flow Analysis
Fire Flow Report

Label	Zone	Needed Fire Flow (gpm)	Demand (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Satisfies Fire Flow Constraints?	Minimum Zone Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Fire Flow Upper Limit (gpm)	Minimum Zone Junction	Calculated Residual Pressure (psi)
J-72	Zone 1	2,000.00	37.44	2,037.44	4,037.44	true	20.00	47.36	4,000.00	J-118	48.74
J-73	Zone 1	3,000.00	106.38	3,106.38	4,106.38	true	20.00	47.31	4,000.00	J-118	48.16
J-74	Zone 1	2,000.00	19.33	2,019.33	4,019.33	true	20.00	36.06	4,000.00	J-113	33.57
J-75	Zone 1	2,000.00	37.17	2,037.17	4,037.17	true	20.00	31.86	4,000.00	J-114	31.47
J-76	Zone 1	3,000.00	44.86	3,044.86	4,044.86	true	20.00	33.93	4,000.00	J-114	34.72
J-77	Zone 1	3,000.00	13.82	3,013.82	4,013.82	true	20.00	36.11	4,000.00	J-115	34.29
J-78	Zone 1	3,000.00	6.17	3,006.17	3,567.23	true	20.00	33.25	4,000.00	J-2	20.00
J-79	Zone 1	2,000.00	29.79	2,029.79	3,635.04	true	20.00	36.58	4,000.00	J-4	20.00
J-80	Zone 1	3,000.00	11.09	3,011.09	3,926.20	true	20.00	37.74	4,000.00	J-6	20.00
J-81	Zone 1	3,000.00	7.33	3,007.33	3,469.02	true	20.00	34.58	4,000.00	J-10	20.01
J-82	Zone 1	1,500.00	20.57	1,520.57	3,813.78	true	20.00	41.93	4,000.00	J-45	20.00
J-83	Zone 1	1,500.00	16.07	1,516.07	3,998.20	true	20.00	46.18	4,000.00	J-60	20.00
J-84	Zone 1	1,500.00	22.75	1,522.75	3,459.53	true	20.00	49.57	4,000.00	J-61	20.00
J-85	Zone 1	1,500.00	23.18	1,523.18	3,889.44	true	20.00	45.81	4,000.00	J-2	20.00
J-86	Zone 1	1,500.00	21.46	1,521.46	4,021.46	true	20.00	43.71	4,000.00	J-79	25.43
J-87	Zone 1	1,500.00	20.77	1,520.77	3,688.38	true	20.00	50.61	4,000.00	J-64	20.00
J-88	Zone 1	1,500.00	22.30	1,522.30	4,022.30	true	20.00	47.21	4,000.00	J-79	21.45
J-89	Zone 1	1,500.00	47.57	1,547.57	3,618.58	true	20.00	36.42	4,000.00	J-90	20.00
J-90	Zone 1	1,500.00	47.57	1,547.57	3,584.45	true	20.00	36.78	4,000.00	J-89	20.00
J-91	Zone 1	1,500.00	34.88	1,534.88	3,075.59	true	20.00	29.98	4,000.00	J-93	20.00
J-92	Zone 1	1,500.00	17.75	1,517.75	2,220.55	true	20.00	23.39	4,000.00	J-93	20.00
J-93	Zone 1	1,500.00	17.75	1,517.75	2,105.19	true	20.00	26.79	4,000.00	J-14	20.00
J-94	Zone 1	1,500.00	30.56	1,530.56	3,838.78	true	20.00	32.67	4,000.00	J-95	20.00
J-95	Zone 1	1,500.00	30.56	1,530.56	3,783.85	true	20.00	33.56	4,000.00	J-94	20.00
J-96	Zone 1	3,000.00	23.44	3,023.44	4,023.44	true	20.00	53.72	4,000.00	J-118	29.77
J-97	Zone 1	1,500.00	24.97	1,524.97	3,870.57	true	20.00	31.58	4,000.00	J-98	20.00
J-98	Zone 1	1,500.00	24.97	1,524.97	3,750.17	true	20.00	35.82	4,000.00	J-97	20.00
J-99	Zone 1	2,000.00	30.11	2,030.11	3,962.59	true	20.00	50.73	4,000.00	J-41	20.00
J-100	Zone 1	2,000.00	35.44	2,035.44	4,035.44	true	20.00	55.53	4,000.00	J-118	47.30
J-101	Zone 1	1,500.00	28.19	1,528.19	4,028.19	true	20.00	55.80	4,000.00	J-118	34.97
J-102	Zone 1	1,500.00	28.19	1,528.19	4,028.19	true	20.00	54.45	4,000.00	J-101	30.93
J-103	Zone 1	1,500.00	24.32	1,524.32	3,874.52	true	20.00	48.03	4,000.00	J-118	20.00
J-104	Zone 1	1,500.00	24.32	1,524.32	4,024.32	true	20.00	59.37	4,000.00	J-118	26.91
J-105	Zone 1	2,000.00	37.44	2,037.44	4,037.44	true	20.00	47.65	4,000.00	J-118	31.56
J-106	Zone 1	2,000.00	37.44	2,037.44	4,037.44	true	20.00	46.46	4,000.00	J-105	23.30

Fire Flow Analysis

Fire Flow Report

Label	Zone	Needed Fire Flow (gpm)	Demand (gpm)	Total Flow Needed (gpm)	Total Flow Available (gpm)	Satisfies Fire Flow Constraints?	Minimum Zone Pressure (psi)	Calculated Minimum Zone Pressure (psi)	Fire Flow Upper Limit (gpm)	Minimum Zone Junction	Calculated Residual Pressure (psi)
J-107	Zone 1	3,000.00	10.75	3,010.75	3,752.02	true	20.00	36.54	4,000.00	J-15	20.00
J-108	Zone 1	2,000.00	95.65	2,095.65	3,667.24	true	20.00	49.37	4,000.00	J-118	20.00
J-109	Zone 1	3,000.00	12.82	3,012.82	3,153.60	true	20.00	34.95	4,000.00	J-19	20.00
J-110	Zone 1	3,000.00	11.75	3,011.75	3,746.84	true	20.00	45.72	4,000.00	J-117	20.00
J-111	Zone 1	3,000.00	7.69	3,007.69	4,007.69	true	20.00	38.60	4,000.00	J-114	21.59
J-112	Zone 1	3,000.00	6.35	3,006.35	3,971.24	true	20.00	40.97	4,000.00	J-21	20.00
J-113	Zone 1	1,500.00	19.33	1,519.33	3,503.03	true	20.00	33.64	4,000.00	J-118	20.00
J-114	Zone 1	2,000.00	37.17	2,037.17	3,093.60	true	20.00	44.90	4,000.00	J-118	20.00
J-115	Zone 1	3,000.00	13.82	3,013.82	3,360.68	true	20.00	38.70	4,000.00	J-117	20.00
J-116	Zone 1	1,500.00	13.88	1,513.88	2,944.21	true	20.00	30.71	4,000.00	J-31	20.00
J-117	Zone 1	1,500.00	27.18	1,527.18	2,607.55	true	20.00	37.52	4,000.00	J-32	20.00
J-118	Zone 1	1,500.00	24.97	1,524.97	2,616.86	true	20.00	40.52	4,000.00	J-33	20.00
J-119	Zone 1	1,500.00	0.00	1,500.00	4,000.00	true	20.00	59.70	4,000.00	J-118	70.44

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F

APPENDIX F
WELL SYSTEM HEAD CALCULATIONS

Balterra
Well Summary
April, 2005

Well	Location	Anticipated Flowrate (gpm)	Anticipated Head (ft)
Well 1	Parcel 5 (within the Water Supply Facility)	1000	476
Well 2	Parcel 9	1000	511
Well 3	Parcel 19	1000	557
Well 4	Parcel 17	1000	510

Balterra
Well 1
System Head Calculations

Well 1 System Elevations

Well FG Elevation	1137	ft
Water Surface	265.0	ft (Below Grade)
Drawdown	180.0	ft (Below Grade)
Projected Pumping Water Level	445.0	ft (Below Grade)
Start Elevation	692.0	ft
End Elevation (Top of Tank)	1153.0	ft
Static Head	**461.0**	ft

Equations:

1) $$H_F = 3.022 \times \frac{V^{1.85} \times L_e}{(C_W)^{1.85} \times (\frac{D}{12})^{1.165}}$$

2) $$H_V = \frac{V^2}{2g}$$

Where: V = Q / A (Velocity)
C_w = 120 (Hazen Williams C)
g = 32.2 ft/s^2 (Gravity)
D = Pipe diameter
L_e = Equivalent length of pipe
H_F = Headloss due to friction
H_V = Headloss due to velocity

Pump Discharge Assembly

INDIVIDUAL LOSSES
FOR 10 in
Equiv L = 462.20 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	4.09	0.26	3.32
2000	8.17	1.04	11.98
3000	12.26	2.33	25.37
4000	16.34	4.15	43.20
5000	20.43	6.48	65.27

Tank Inlet Assembly

INDIVIDUAL LOSSES
FOR 20 in
Equiv L = 600.00 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.02	0.02	0.15
2000	2.04	0.06	0.53
3000	3.06	0.15	1.13
4000	4.09	0.26	1.92
5000	5.11	0.40	2.91

*Transmission Line segments are shown on Exhibit 4 of the Balterra Water and Wastewater Master Plan.
**Flowrates vary based on the number of wells contributing to the transmission line segment.

Total Head on Pump

Vel H (ft)	Fric H (ft)	Column H (ft)	Static H (ft)	Total H
0.5	5.2	9.1	461.0	**476**

Pressure @ Pump Discharge

Head Loss (ft)	Head (ft)	Pressure (psi)
459.87	16.0	6.9

Well 1 Pump Summary

Flow Rate **1000** gpm

Total Head **476** ft

Balterra
Well 1
Equivalent Lengths

	Description	QTY	Material	DIA (in)	HW-C	Le	Total Length
Pump Discharge Assembly	Flow Through	20	DIP	10	120	20.0	20.0
	Check Valve	1	DIP	10	120	120.0	120.0
	Tee (Branch Flow)	1	DIP	10	120	30.0	30.0
	Gate Valve	1	DIP	10	120	3.2	3.2
	Prop Flow Meter	1	DIP	10	120	120.0	120.0
	Control Valve	1	DIP	10	120	120.0	120.0
	Pump Entrance Loss	1	DIP	10	120	49.0	49.0
	Tank Inlet Assembly	1	DIP	20	120	600	600

Pump Discharge Assembly	Equivalent Length 10" =	462.2	**flowrate****	1000	gpm
			velocity	4.09	fps

Tank Inlet Assembly	Equivalent Length 20" =	600.0	**flowrate****	4000	gpm
			velocity	4.09	fps

**Flowrates vary based on the number of wells contributing to the transmission line segment.

Balterra
Well 2
System Head Calculations

Well 2 System Elevations

Well FG Elevation	1122	ft
Water Surface	265.0	ft (Below Grade)
Drawdown	180.0	ft (Below Grade)
Projected Pumping Water Level	445.0	ft (Below Grade)
Start Elevation	677.0	ft
End Elevation (Top of Tank)	1153.0	ft
Static Head	**476.0**	ft

Equations:

1) $$H_F = 3.022 \times \frac{V^{1.85} \times L_e}{(C_w)^{1.85} \times (\frac{D}{12})^{1.165}}$$

2) $$H_V = \frac{V^2}{2g}$$

Where: V = Q / A (Velocity)
C_w = 120 (Hazen Williams C)
g = 32.2 ft/s^2 (Gravity)
D = Pipe diameter
L_e = Equivalent length of pipe
H_F = Headloss due to friction
H_V = Headloss due to velocity

Pump Discharge Assembly

INDIVIDUAL LOSSES
FOR 10 in
Equiv L = 462.20 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	4.09	0.26	3.32
2000	8.17	1.04	11.98
3000	12.26	2.33	25.37
4000	16.34	4.15	43.20
5000	20.43	6.48	65.27

Transmission Segment B* - 16"

INDIVIDUAL LOSSES
FOR 16 in
Equiv L = 2661.60 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.60	0.04	1.94
2000	3.19	0.16	7.01
3000	4.79	0.36	14.85
4000	6.38	0.63	25.28
5000	7.98	0.99	38.19

Transmission Segment A* - 16"

INDIVIDUAL LOSSES
FOR 16 in
Equiv L = 2211.60 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.60	0.04	1.62
2000	3.19	0.16	5.83
3000	4.79	0.36	12.34
4000	6.38	0.63	21.00
5000	7.98	0.99	31.74

Tank Inlet Assembly

INDIVIDUAL LOSSES
FOR 20 in
Equiv L = 600.00 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.02	0.02	0.15
2000	2.04	0.06	0.53
3000	3.06	0.15	1.13
4000	4.09	0.26	1.92
5000	5.11	0.40	2.91

*Transmission Line segments are shown on Exhibit 4 of the Balterra Water and Wastewater Master Plan.
**Flowrates vary based on the number of wells contributing to the transmission line segment.

Total Head on Pump

Vel H (ft)	Fric H (ft)	Column H (ft)	Static H (ft)	Total H
1.0	24.6	9.1	476.0	**511**

Pressure @ Pump Discharge

Head Loss (ft)	Head (ft)	Pressure (psi)
479.73	31.0	13.4

Well 2 Pump Summary

Flow Rate	1000	gpm
Total Head	511	ft

Balterra
Well 2
Equivalent Lengths

	Description	QTY	Material	DIA (in)	HW-C	Le	Total Length
Pump Discharge Assembly	Flow Through	20	DIP	10	120	20.0	20.0
	Check Valve	1	DIP	10	120	120.0	120.0
	Tee (Branch Flow)	1	DIP	10	120	30.0	30.0
	Gate Valve	1	DIP	10	120	3.2	3.2
	Prop Flow Meter	1	DIP	10	120	120.0	120.0
	Control Valve	1	DIP	10	120	120.0	120.0
	Pump Entrance Loss	1	DIP	10	120	49.0	49.0
Transmission Line Segment B*	Flow Through	2585	DIP	16	120	2585.0	2585.0
	Tee (Through Flow)	1	DIP	16	120	7.2	7.2
	Gate Valve	2	DIP	16	120	3.2	6.4
	90 Degree Bend	3	DIP	16	120	21.0	63.0
Transmission Line Segment A*	Flow Through	2134	DIP	16	120	2134.0	2134.0
	Tee (Through Flow)	1	DIP	16	120	7.2	7.2
	Gate Valve	2	DIP	16	120	3.2	6.4
	90 Degree Bend	1	DIP	16	120	21.0	21.0
	Reducers	1	DIP	16	120	43.0	43.0
	Tank Inlet Assembly	1	DIP	20	120	600	600

Pump Discharge Assembly	Equivalent Length 10" =	462.2	**flowrate****	1000	gpm
			velocity	4.09	fps

Transmission Line Segment B*	Equivalent Length 16" =	2661.6	**flowrate****	2000	gpm
			velocity	3.19	fps

Transmission Line Segment A*	Equivalent Length 16" =	2211.6	**flowrate****	3000	gpm
			velocity	4.79	fps

Tank Inlet Assembly	Equivalent Length 20" =	600.0	**flowrate****	4000	gpm
			velocity	4.09	fps

*Transmission Line segments are shown on Exhibit 4 of the Balterra Water and Wastewater Master Plan.
**Flowrates vary based on the number of wells contributing to the transmission line segment.

Balterra
Well 3
System Head Calculations

Well 3 System Elevations

Well FG Elevation	1114	ft
Water Surface	265.0	ft (Below Grade)
Drawdown	180.0	ft (Below Grade)
Projected Pumping Water Level	445.0	ft (Below Grade)
Start Elevation	669.0	ft
End Elevation (Top of Tank)	1153.0	ft
Static Head	484.0	ft

Equations:

1) $$H_F = 3.022 \times \frac{V^{1.85} \times L_e}{(C_w)^{1.85} \times (\frac{D}{12})^{1.165}}$$

2) $$H_V = \frac{V^2}{2g}$$

Where: V = Q / A (Velocity)
C_w = 120 (Hazen Williams C)
g = 32.2 ft/s^2 (Gravity)
D = Pipe diameter
L_e = Equivalent length of pipe
H_F = Headloss due to friction
H_V = Headloss due to velocity

Pump Discharge Assembly

INDIVIDUAL LOSSES
FOR 10 in
Equiv L = 462.20 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	4.09	0.26	3.32
2000	8.17	1.04	11.98
3000	12.26	2.33	25.37
4000	16.34	4.15	43.20
5000	20.43	6.48	65.27

Transmission Segment C* - 12"

INDIVIDUAL LOSSES
FOR 12 in
Equiv L = 3301.20 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	2.84	0.12	9.78
2000	5.67	0.50	35.25
3000	8.51	1.12	74.63
4000	11.35	2.00	127.08
5000	14.18	3.12	192.03

Transmission Segment B* - 16"

INDIVIDUAL LOSSES
FOR 16 in
Equiv L = 0.00 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	2.84	0.12	9.78
2000	5.67	0.50	35.25
3000	8.51	1.12	74.63
4000	11.35	2.00	127.08
5000	14.18	3.12	192.03

Transmission Segment A* - 16"

INDIVIDUAL LOSSES
FOR 16 in
Equiv L = 2211.60 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.60	0.04	1.62
2000	3.19	0.16	5.83
3000	4.79	0.36	12.34
4000	6.38	0.63	21.00
5000	7.98	0.99	31.74

Tank Inlet Assembly

INDIVIDUAL LOSSES
FOR 20 in
Equiv L = 600.00 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.02	0.02	0.15
2000	2.04	0.06	0.53
3000	3.06	0.15	1.13
4000	4.09	0.26	1.92
5000	5.11	0.40	2.91

Total Head on Pump

Vel H (ft)	Fric H (ft)	Column H (ft)	Static H (ft)	Total H
1.5	62.6	9.1	484.0	557

Pressure @ Pump Discharge

Head Loss (ft)	Head (ft)	Pressure (psi)
518.21	39.0	16.9

Well 3 Pump Summary

Flow Rate 1000 gpm

Total Head 557 ft

*Transmission Line segments are shown on Exhibit 4 of the Balterra Water and Wastewater Master Plan.

**Flowrates vary based on the number of wells contributing to the transmission line segment.

Balterra
Well 3
Equivalent Lengths

	Description	QTY	Material	DIA (in)	HW-C	Le	Total Length
Pump Discharge Assembly	Flow Through	20	DIP	10	120	20.0	20.0
	Check Valve	1	DIP	10	120	120.0	120.0
	Tee (Branch Flow)	1	DIP	10	120	30.0	30.0
	Gate Valve	1	DIP	10	120	3.2	3.2
	Prop Flow Meter	1	DIP	10	120	120.0	120.0
	Control Valve	1	DIP	10	120	120.0	120.0
	Pump Entrance Loss	1	DIP	10	120	49.0	49.0
Transmission Line Segment C*	Flow Through	3230	DIP	12	120	3230.0	3230.0
	Gate Valve	1	DIP	12	120	3.2	3.2
	90 Degree Bend	4	DIP	12	120	17.0	68.0
Transmission Line Segment B*	Flow Through	2585	DIP	16	120	2585.0	2585.0
	Tee (Through Flow)	1	DIP	16	120	7.2	7.2
	Gate Valve	2	DIP	16	120	3.2	6.4
	90 Degree Bend	3	DIP	16	120	21.0	63.0
Transmission Line Segment A*	Flow Through	2134	DIP	16	120	2134.0	2134.0
	Tee (Through Flow)	1	DIP	16	120	7.2	7.2
	Gate Valve	2	DIP	16	120	3.2	6.4
	90 Degree Bend	1	DIP	16	120	21.0	21.0
	Reducers	1	DIP	16	120	43.0	43.0
	Tank Inlet Assembly	1	DIP	20	120	600	600

Pump Discharge Assembly	Equivalent Length 10" =	462.2	**flowrate****	1000	gpm
			velocity	4.09	fps
Transmission Line Segment C*	Equivalent Length 12" =	3301.2	**flowrate****	1000	gpm
			velocity	2.84	fps
Transmission Line Segment B*	Equivalent Length 16" =	2661.6	**flowrate****	2000	gpm
			velocity	3.19	fps
Transmission Line Segment A*	Equivalent Length 16" =	2211.6	**flowrate****	3000	gpm
			velocity	4.79	fps
Tank Inlet Assembly	Equivalent Length 20" =	600.0	**flowrate****	4000	gpm
			velocity	4.09	fps

*Transmission Line segments are shown on Exhibit 4 of the Balterra Water and Wastewater Master Plan.
**Flowrates vary based on the number of wells contributing to the transmission line segment.

Balterra
Well 4
System Head Calculations

Well 4 System Elevations

Well FG Elevation	1124	ft
Water Surface	265.0	ft (Below Grade)
Drawdown	180.0	ft (Below Grade)
Projected Pumping Water Level	445.0	ft (Below Grade)
Start Elevation	679.0	ft
End Elevation (Top of Tank)	1153.0	ft
Static Head	**474.0**	ft

Equations:

1) $$H_F = 3.022 \times \frac{V^{1.85} \times L_e}{(C_W)^{1.85} \times (\frac{D}{12})^{1.165}}$$

2) $$H_V = \frac{V^2}{2g}$$

Where: V = Q / A (Velocity)
C_w = 120 (Hazen Williams C)
g = 32.2 ft/s^2 (Gravity)
D = Pipe diameter
L_e = Equivalent length of pipe
H_F = Headloss due to friction
H_V = Headloss due to velocity

Pump Discharge Assembly

INDIVIDUAL LOSSES
FOR 10 in
Equiv L = 462.20 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	4.09	0.26	3.32
2000	8.17	1.04	11.98
3000	12.26	2.33	25.37
4000	16.34	4.15	43.20
5000	20.43	6.48	65.27

Transmission Segment D* - 12"

INDIVIDUAL LOSSES
FOR 12 in
Equiv L = 2784.60 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	2.84	0.12	8.25
2000	5.67	0.50	29.73
3000	8.51	1.12	62.96
4000	11.35	2.00	107.19
5000	14.18	3.12	161.98

Transmission Segment A* - 16"

INDIVIDUAL LOSSES
FOR 16 in
Equiv L = 2211.60 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.60	0.04	1.62
2000	3.19	0.16	5.83
3000	4.79	0.36	12.34
4000	6.38	0.63	21.00
5000	7.98	0.99	31.74

Tank Inlet Assembly

INDIVIDUAL LOSSES
FOR 20 in
Equiv L = 600.00 ft

Q (gpm)**	V (ft/s^2)	Vel H (ft)	Fric H (ft)
0	0.00	0.00	0.00
1000	1.02	0.02	0.15
2000	2.04	0.06	0.53
3000	3.06	0.15	1.13
4000	4.09	0.26	1.92
5000	5.11	0.40	2.91

*Transmission Line segments are shown on Exhibit 4 of the Balterra Water and Wastewater Master Plan.
**Flowrates vary based on the number of wells contributing to the transmission line segment.

Total Head on Pump

Vel H (ft)	Fric H (ft)	Column H (ft)	Static H (ft)	Total H
1.0	25.8	9.1	474.0	**510**

Pressure @ Pump Discharge

Head Loss (ft)	Head (ft)	Pressure (psi)
480.93	29.0	12.6

Well 4 Pump Summary

Flow Rate	**1000**	**gpm**
Total Head	**510**	**ft**

Balterra
Well 4
Equivalent Lengths

	Description	QTY	Material	DIA (in)	HW-C	Le	Total Length
Pump Discharge Assembly	Flow Through	20	DIP	10	120	20.0	20.0
	Check Valve	1	DIP	10	120	120.0	120.0
	Tee (Branch Flow)	1	DIP	10	120	30.0	30.0
	Gate Valve	1	DIP	10	120	3.2	3.2
	Prop Flow Meter	1	DIP	10	120	120.0	120.0
	Control Valve	1	DIP	10	120	120.0	120.0
	Pump Entrance Loss	1	DIP	10	120	49.0	49.0
Transmission Line Segment D*	Flow Through	2720	DIP	12	120	2720.0	2720.0
	Tee (Through Flow)	1	DIP	12	120	7.2	7.2
	Gate Valve	2	DIP	12	120	3.2	6.4
	90 Degree Bend	3	DIP	12	120	17.0	51.0
Transmission Line Segment A*	Flow Through	2134	DIP	16	120	2134.0	2134.0
	Tee (Through Flow)	1	DIP	16	120	7.2	7.2
	Gate Valve	2	DIP	16	120	3.2	6.4
	90 Degree Bend	1	DIP	16	120	21.0	21.0
	Reducers	1	DIP	16	120	43.0	43.0
	Tank Inlet Assembly	1	DIP	20	120	600	600

Pump Discharge Assembly	Equivalent Length 10" =	462.2	**flowrate** **velocity**	1000 4.09	gpm fps
Transmission Line Segment D*	Equivalent Length 12" =	2784.6	**flowrate**** **velocity**	1000 2.84	gpm fps
Transmission Line Segment A*	Equivalent Length 16" =	2211.6	**flowrate**** **velocity**	3000 4.79	gpm fps
Tank Inlet Assembly	Equivalent Length 20" =	600.0	**flowrate**** **velocity**	4000 4.09	gpm fps

*Transmission Line segments are shown on Exhibit 4 of the Balterra Water and Wastewater Master Plan.
**Flowrates vary based on the number of wells contributing to the transmission line segment.

G

APPENDIX G
SANITARY SEWER DESIGN TABLES

PHASE 1

BALTERRA
PHASE 1
SANITARY SEWER DESIGN TABLE

Printed: 6/13/2005

Upstream MH	Down-Stream MH	Flow Notes	Area (acre)	DU / acre	DU	Persons per DU	Population	Cum. Pop	Max Gal/Cap/ Day (gpcpd)	ADWF (Mgd)	Peak Factor	PDF (Mgd)	Cum. PDF (Mgd)	Upstream MH Drop	Upstream MH Invert (ft)	Existing Grade Upstream (ft)	Upstream Depth (ft)	Inline MH Drops	Down-Stream MH Invert (ft)	Existing Grade Downstream (ft)	Down-Stream Depth (ft)	Length (ft)	Slope (ft/ft)	Diameter (in)	% Cap.	Peak Daily Flow Velocity (fps)	Full Flow Velocity (fps)
47	45	2/3 Mixed Use Residential Parcel 7	23.19	22	510	2.0	1020	1020	100	0.102	4.00	0.408	0.408														
		1/2 Medium Residential Parcel 11	13.31	15	200	2.0	399	1420	100	0.040	4.00	0.160	0.568	0.0	1113.17	1121.00	7.83	0.3	1095.50	1113.32	17.82	1698.54	0.0102	10	43.70	3.8	4.6
46	45	1/2 Medium Residential Parcel 11	13.31	15	200	2.0	399	399	100	0.040	4.00	0.160	0.160	0.0	1099.33	1107.00	7.67	0.0	1095.66	1113.32	17.66	917.91	0.0040	8	39.07	2.0	2.5
45	44	Flow from line 46-45						399		0.040	4.00	0.160	0.160														
		Flow from line 47-45						1420		0.142	4.00	0.568	0.728														
		1/3 Mixed Use Residential Parcel 7	11.59	22	255	2.0	510	2329	100	0.051	4.00	0.204	0.932	0.0	1095.33	1113.32	17.99	0.0	1093.10	1110.00	16.90	742.43	0.0030	12	63.80	2.7	2.8
44	1	Flow from line 45-44						2329		0.233	2.14	0.499	0.499														
		1/2 Mixed Use Business Parcel 12	11.46					2329		0.017	2.14	0.037	0.536	0.0	1093.10	1110.00	16.90	0.0	1083.43	1102.00	18.57	1191.04	0.0081	12	34.63	3.4	4.7
37	36	1/2 Small Lot Residential Parcel 14	16.64	5	83	3.2	266	266	100	0.027	4.00	0.106	0.106	0.0	1105.83	1113.50	7.67	0.0	1103.01	1117.33	14.32	706.01	0.0040	8	31.48	1.8	2.5
38	36	1/2 Small Lot Residential Parcel 14	16.64	5	83	3.2	266	266	100	0.027	4.00	0.106	0.106	0.0	1111.92	1119.59	7.67	0.0	1103.01	1117.33	14.32	774.31	0.0115	8	24.05	2.6	4.2
36	34	Flow from line 37-36						266		0.027	4.00	0.106	0.106														
		Flow from line 38-36						266		0.027	4.00	0.106	0.213														
		1/2 School Parcel 15	7.97				375	532	28	0.011	4.00	0.042	0.255														
		Park Parcel 10	5.75							0.009	4.00	0.034	0.289	0.2	1102.81	1117.33	14.52	0.0	1099.37	1112.19	12.82	860.37	0.0040	8	54.95	2.3	2.5
35	34	1/2 School Parcel 15	7.97				375		28	0.011	4.00	0.042	0.042	0.0	1103.33	1111.00	7.67	0.0	1099.37	1112.19	12.82	827.63	0.0048	8	18.82	1.4	2.7
34	33	Flow from line 35-34								0.011	4.00	0.042	0.042														
		Flow from line 36-34						532		0.072	4.00	0.289	0.331														
		Park Parcel 10	5.75							0.009	4.00	0.034	0.366	0.2	1099.17	1112.19	13.02	0.0	1095.75	1118.00	22.25	853.60	0.0040	8	63.92	2.4	2.5
33	31	Flow from line 34-33						532		0.091	2.49	0.228	0.228														
		1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	695	100	0.016	2.49	0.041	0.268	0.2	1095.22	1118.00	22.78	0.3	1093.19	1113.68	20.49	908.60	0.0019	12	35.27	1.7	2.3
32	31	1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	163	100	0.016	4.00	0.065	0.065	0.0	1103.17	1110.84	7.67	0.0	1093.53	1113.68	20.15	560.60	0.0172	8	17.08	2.5	5.2
31	27	Flow from line 32-31						163		0.016	2.42	0.040	0.040														
		Flow from line 33-31						695		0.108	2.42	0.261	0.301	0.0	1093.19	1113.68	20.49	0.2	1088.45	1103.93	15.48	1012.31	0.0045	12	29.87	2.4	3.5
30	29	1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	163	100	0.016	4.00	0.065	0.065	0.0	1103.20	1110.87	7.67	0.0	1101.30	1109.00	7.70	476.22	0.0040	8	24.50	1.5	2.5
29	27	Flow from line 30-29						163		0.016	4.00	0.065	0.065														
		1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	326	100	0.016	4.00	0.065	0.130	0.2	1101.10	1109.00	7.90	0.0	1088.78	1103.93	15.15	720.58	0.0171	8	24.10	3.1	5.2
28	27	1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	163	100	0.016	4.00	0.065	0.065	0.0	1091.33	1099.00	7.67	0.2	1088.78	1103.93	15.15	587.97	0.0040	8	24.50	1.5	2.5
27	26	Flow from line 28-27						163		0.033	2.41	0.079	0.079														
		Flow from line 29-27						326		0.016	2.41	0.039	0.118														
		Flow from line 31-27						858		0.124	2.41	0.299	0.417	0.2	1088.25	1103.93	15.68	0.0	1086.93	1104.00	17.07	292.09	0.0045	12	35.43	2.6	3.5
26	1	Flow from line 27-26						1348		0.173	2.28	0.394	0.394														
		1/2 Mixed Use Employment Parcel 12	11.46							0.017	2.28	0.039	0.434	0.2	1086.73	1104.00	17.27	0.0	1083.43	1102.00	18.57	507.43	0.0065	12	32.83	3.0	4.2
1	WRF	Flow from line 26-1						1348		0.190	2.04	0.388	0.388														
		Flow from line 44-1						2329		0.250	2.04	0.510	0.898	0.2	1082.98	1102.00	19.02	0.0	1081.32	1102.00	20.68	200.00	0.0083	15	33.01	3.9	5.5

ULTIMATE BUILD OUT

BALTERRA
ULTIMATE BUILD OUT
SANITARY SEWER DESIGN TABLE

Printed: 6/13/2005

Upstream MH	Down-Stream MH	Flow Notes	Area (acre)	DU / acre	DU	Persons per DU	Population	Cum. Pop	Max Gal/Cap/ Day (gpcpd)	ADWF (Mgd)	Peak Factor	PDF (Mgd)	Cum. PDF (Mgd)	Upstream MH Drop	Upstream MH Invert (ft)	Existing Grade Upstream (ft)	Upstream Depth (ft)	Inline MH Drops	Down-Stream MH Invert (ft)	Existing Grade Downstream (ft)	Down-Stream Depth (ft)	Length (ft)	Slope (ft/ft)	Diameter (in)	% Cap.	Peak Daily Flow Velocity (fps)	Full Flow Velocity (fps)
68	67	1/2 Small Lot Residential Parcel 31	12.48	5	62	3.2	200	200	100	0.020	4.00	0.080	0.080	0.0	1151.50	1159.17	7.67	0.0	1147.21	1154.88	7.67	782.47	0.0055	8	25.07	1.8	2.93
67	66	Flow from line 68-67						200		0.020	4.00	0.080	0.080														
		1/2 Small Lot Residential Parcel 31	12.48	5	62	3.2	200	399	100	0.020	4.00	0.080	0.160	0.2	1147.01	1154.88	7.87	0.0	1142.57	1151.43	8.86	1110.91	0.0040	8	39.07	2.0	2.50
66	64	Flow from line 68-67						399		0.040	4.00	0.160	0.160														
		1/2 Small Lot Residential Parcel 30	13.59	5	68	3.2	217	217	100	0.022	4.00	0.087	0.247														
		1/2 Small Lot Residential Parcel 36	9.25	5	46	3.2	148	765	100	0.015	4.00	0.059	0.306	0.2	1142.37	1151.43	9.06	0.3	1132.70	1143.97	11.27	1625.81	0.0058	8	50.84	2.7	3.00
65	64	1/2 Small Lot Residential Parcel 30	13.59	5	68	3.2	217	217	100	0.022	4.00	0.087	0.087	0.0	1135.45	1143.12	7.67	0.0	1132.70	1143.97	11.27	689.57	0.0040	8	28.35	1.7	2.50
64	63	Flow from line 66-64						765		0.076	4.00	0.306	0.306														
		Flow from line 65-64						217		0.022	4.00	0.087	0.393														
		1/2 Small Lot Residential Parcel 36	9.25	5	46	3.2	148	1130	100	0.015	4.00	0.059	0.452														
		1/2 Community Retail Parcel 34	14.75							0.022	4.00	0.088	0.541	0.2	1132.50	1143.97	11.47	0.0	1123.15	1134.04	10.89	1906.18	0.0049	8	80.70	2.8	2.77
F2	F3	Small Lot Residential	11.09	5	55	3.2	177	177	100	0.018	4.00	0.071	0.071	0.0	1136.33	1144.00	7.67	0.0	1130.90	1140.00	9.10	1358.31	0.0040	8	25.58	1.6	2.50
F3	F4	Flow from line F2-F3						177		0.018	4.00	0.071	0.071														
		Small Lot Residential	6.23	5	31	3.2	100	277	100	0.010	4.00	0.040	0.111	0.2	1130.70	1140.00	9.30	0.0	1127.33	1135.00	7.67	475.56	0.0071	8	22.16	1.9	3.33
F4	63	Flow from line F3-F4						277		0.028	4.00	0.111	0.111														
		Small Lot Residential	7.91	5	40	3.2	127	404	100	0.013	4.00	0.051	0.161	0.2	1127.13	1135.00	7.87	0.0	1123.15	1134.04	10.89	475.56	0.0084	8	26.60	2.3	3.61
63	56	Flow from line 64-63						1130		0.135	4.00	0.541	0.541														
		Flow from line 64-63						404		0.040	4.00	0.161	0.702														
		1/4 Community Retail Parcel 34	7.37					1534		0.011	4.00	0.044	0.746	0.2	1122.79	1134.04	11.25	0.0	1120.82	1138.00	17.18	704.10	0.0028	10	81.30	2.4	2.43
62	61	1/3 Small Lot Residential Parcel 32	6.44	5	32	3.2	103	103	100	0.010	4.00	0.041	0.041	0.0	1145.55	1153.22	7.67	0.0	1142.32	1151.42	9.10	538.76	0.0060	8	17.65	1.5	3.06
61	59	Flow from line 62-61						103		0.010	4.00	0.041	0.041														
		1/3 Small Lot Residential Parcel 32	6.44	5	32	3.2	103	206	100	0.010	4.00	0.041	0.082	0.2	1142.12	1151.42	9.30	0.0	1137.21	1146.00	8.79	1227.64	0.0040	8	27.60	1.6	2.50
60	59	1/3 Small Lot Residential Parcel 32	6.44	5	32	3.2	103	103	100	0.010	4.00	0.041	0.041	0.0	1141.16	1148.83	7.67	0.0	1137.21	1146.00	8.79	582.15	0.0068	8	17.14	1.6	3.26
59	57	Flow from line 60-59						103		0.010	4.00	0.041	0.041														
		Flow from line 61-59						206		0.021	4.00	0.082	0.124														
		1/2 Medium Residential Parcel 33	9.91	15	149	2.0	297	607	100	0.030	4.00	0.119	0.243	0.2	1137.01	1146.00	8.99	0.0	1128.33	1141.00	12.67	771.09	0.0113	8	37.01	3.2	4.19
58	57	Park Parcel 35	5.32							0.008	4.00	0.032	0.032														
		1/2 Medium Residential Parcel 33	9.91	15	149	2.0	297	297	100	0.030	4.00	0.119	0.151	0.0	1138.33	1146.00	7.67	0.1	1128.33	1141.00	12.67	1751.91	0.0057	8	34.54	2.2	2.97
57	56	Flow from line 58-57						297		0.038	4.00	0.151	0.151														
		Flow from line 59-57						607		0.061	4.00	0.243	0.393														
		1/4 Community Retail Parcel 34	7.37					904		0.011	4.00	0.044	0.438	0.0	1128.33	1141.00	12.67	0.0	1120.98	1138.00	17.02	474.33	0.0155	8	46.97	4.2	4.92
56	55	Flow from line 57-56						904		0.109	2.14	0.234	0.234														
		Flow from line 63-56						1534		0.187	2.14	0.399	0.633														
		1/2 Office Employment Parcel 1	8.20					2438		0.012	2.14	0.026	0.659	0.2	1120.45	1138.00	17.55	0.2	1118.69	1135.26	16.57	818.54	0.0019	12	59.03	2.1	2.26
55	54	Flow from line 56-55						2438		0.308	2.14	0.659	0.659														
		Business Park Parcel 3	18.82							0.028	2.14	0.060	0.720														
		1/2 Office Employment Parcel 1	8.20							0.012	2.14	0.026	0.746	0.2	1118.49	1135.26	16.77	0.0	1110.99	1124.28	13.29	1875.49	0.0040	12	50.64	2.9	3.28
F5	F6	Small Lot Residential	78.88	5	394	3.2	1262	1262	100	0.126	4.00	0.505	0.505	0.0	1136.24	1143.91	7.67	0.0	1122.33	1130.00	7.67	2281.61	0.0061	8	69.27	3.0	3.09
F6	54	Flow from line F5-F6						1262		0.126	4.00	0.505	0.505	0.2	1122.13	1130.00	7.87	0.0	1111.33	1124.28	12.95	851.47	0.0127	8	54.18	4.0	4.45
54	51	Flow from line 55-54						2438		0.349	2.03	0.708	0.708														
		Flow from line F6-54						1262		0.126	2.03	0.256	0.964														
		1/2 Mixed Use Residential Parcel 4	5.00	22	110	2.0	220	3920	100	0.022	2.03	0.045	1.009	0.2	1110.79	1124.28	13.49	0.0	1109.80	1123.94	14.14	496.82	0.0020	12	79.98	2.3	2.32

BALTERRA
ULTIMATE BUILD OUT
SANITARY SEWER DESIGN TABLE

Upstream MH	Down-Stream MH	Flow Notes	Area (acre)	DU / acre	DU	Persons per DU	Population	Cum. Pop	Max Gal/Cap/ Day (gpcpd)	ADWF (Mgd)	Peak Factor	PDF (Mgd)	Cum. PDF (Mgd)	Upstream MH Drop	Upstream MH Invert (ft)	Existing Grade Upstream (ft)	Upstream Depth (ft)	Inline MH Drops	Down-Stream MH Invert (ft)	Existing Grade Downstream (ft)	Down-Stream Depth (ft)	Length (ft)	Slope (ft/ft)	Diameter (in)	% Cap.	Peak Daily Flow Velocity (fps)	Full Flow Velocity (fps)
53	52	1/2 Community Retial Parcel 2	5.08					0		0.008	4.00	0.030	0.030	0.0	1120.83	1133.50	12.67	0.2	1115.57	1131.00	15.43	767.59	0.0066	8	14.90	1.5	3.21
52	51	Flow from line 53-52						0		0.008	4.00	0.030	0.030														
		1/2 Community Retial Parcel 2	5.08					0		0.008	4.00	0.030	0.061														
		1/2 Mixed Use Residential Parcel 4	5.00	22	110	2.0	220	220	100	0.022	4.00	0.088	0.149	0.2	1115.37	1131.00	15.63	0.0	1110.13	1123.94	13.81	1293.89	0.0040	8	23.62	1.5	2.51
51	49	Flow from line 52-51						220		0.015	2.02	0.031	0.031														
		Flow from line 54-51						3920		0.497	2.02	1.003	1.034														
		1/2 Business Park Parcel 6	10.25					4139		0.015	2.02	0.031	1.065	0.0	1109.80	1123.94	14.14	0.2	1098.00	1111.00	13.00	2212.53	0.0052	12	57.96	3.5	3.75
F1	50	Small Lot Residential	83.48	5	417	3.2	1336	1336	100	0.134	4.00	0.534	0.534	0.0	1126.33	1134.00	7.67	0.6	1104.33	1117.00	12.67	3186.73	0.0067	8	69.74	3.2	3.24
50	49	Flow from line F1-50						1336		0.134	4.00	0.534	0.534														
50	49	1/2 Business Park Parcel 6	10.25					1336		0.015	4.00	0.062	0.596	0.0	1104.33	1117.00	12.67	0.0	1098.33	1111.00	12.67	802.66	0.0075	8	72.77	3.4	3.42
49	44	Flow from line 50-49						1336		0.149	1.96	0.292	0.292														
		Flow from line 51-49						4139		0.528	1.96	1.034	1.327	0.2	1097.80	1111.00	13.20	0.0	1093.10	1110.00	16.90	538.52	0.0087	12	56.68	4.5	4.84
48	47	Small Lot Residential Parcel 5	48.64	5	243	3.2	778	778	100	0.078	4.00	0.311	0.311	0.0	1127.74	1135.41	7.67	0.5	1113.33	1121.00	7.67	2505.97	0.0056	8	52.00	2.6	2.94
47	45	Flow from line 48-47						778		0.078	4.00	0.311	0.311														
		2/3 Mixed Use Residential Parcel 7	23.19	22	510	2.0	1020	1020	100	0.102	4.00	0.408	0.719														
		1/2 Medium Residential Parcel 11	13.31	15	200	2.0	399	2198	100	0.040	4.00	0.160	0.879	0.0	1113.17	1121.00	7.83	0.3	1095.50	1113.32	17.82	1698.54	0.0102	10	56.55	4.3	4.64
46	45	1/2 Medium Residential Parcel 11	13.31	15	200	2.0	399	399	100	0.040	4.00	0.160	0.160	0.0	1099.33	1107.00	7.67	0.0	1095.66	1113.32	17.66	917.91	0.0040	8	39.07	2.0	2.50
45	44	Flow from line 46-45						399		0.040	4.00	0.160	0.160														
		Flow from line 47-45						2198		0.220	4.00	0.879	1.039														
		1/3 Mixed Use Residential Parcel 7	11.59	22	255	2.0	510	3107	100	0.051	4.00	0.204	1.243	0.0	1095.33	1113.32	17.99	0.0	1093.10	1110.00	16.90	742.43	0.0030	12	80.49	2.8	2.84
44	1	Flow from line 45-44						3107		0.311	1.88	0.583	0.583														
		Flow from line 49-44						5475		0.677	1.88	1.270	1.853														
		1/2 Mixed Use Business Parcel 12	11.46					8582		0.017	1.88	0.032	1.885	0.0	1093.10	1110.00	16.90	0.0	1083.43	1102.00	18.57	1191.04	0.0081	12	74.59	4.6	4.67
43	41	2/3 Small Lot Residential Parcel 9	25.06	5	125	3.2	401	401	100	0.040	4.00	0.160	0.160														
		1/2 Medium Residential Parcel 8	12.60	15	189	2.0	378	779	100	0.038	4.00	0.151	0.312	0.0	1126.56	1134.23	7.67	0.3	1105.33	1124.34	19.01	1752.13	0.0119	8	41.73	3.5	4.32
F7	42	Small Lot Residential	40.00	5	200	3.2	640	640	100	0.064	4.00	0.256	0.256	0.0	1112.74	1120.41	7.67	0.0	1107.48	1126.00	18.52	1316.88	0.0040	8	50.97	2.2	2.50
42	41	Flow from line F7-42						640		0.064	4.00	0.256	0.256														
42	41	1/2 Medium Residential Parcel 8	12.60	15	189	2.0	378	1018	100	0.038	4.00	0.151	0.407	0.2	1107.28	1126.00	18.72	0.0	1105.33	1124.34	19.01	485.58	0.0040	8	50.97	2.2	2.50
41	39	Flow from line 42-41						1018		0.102	4.00	0.407	0.407														
		Flow from line 43-41						779		0.078	4.00	0.312	0.719	0.0	1105.33	1124.34	19.01	0.3	1098.26	1119.45	21.19	778.72	0.0087	8	80.49	3.7	3.69
40	39	1/3 Small Lot Residential Parcel 9	12.53	5	63	3.2	200	200	100	0.020	4.00	0.080	0.080	0.0	1109.16	1116.83	7.67	0.0	1098.26	1119.45	21.19	329.95	0.0330	8	16.11	3.4	7.19
39	33	Flow from line 40-39						200		0.020	4.00	0.080	0.080														
		Flow from line 41-39						1797		0.180	4.00	0.719	0.799	0.0	1098.09	1119.45	21.36	0.0	1096.95	1118.00	21.05	236.17	0.0048	10	68.31	3.1	3.19
18	37	Medium Residential Parcel 17	16.06	15	241	2.0	482	482	100	0.048	4.00	0.193	0.193	0.0	1118.33	1126.00	7.67	0.6	1105.83	1113.50	7.67	2277.00	0.0052	8	40.21	2.3	2.86
		Flow from line 18-37						482		0.048	4.00	0.193	0.193														
37	36	1/2 Small Lot Residential Parcel 14	16.64	5	83	3.2	266	748	100	0.027	4.00	0.106	0.299	0.0	1105.83	1113.50	7.67	0.0	1103.01	1117.33	14.32	706.01	0.0040	8	56.04	2.3	2.50
38	36	1/2 Small Lot Residential Parcel 14	16.64	5	83	3.2	266	266	100	0.027	4.00	0.106	0.106	0.0	1111.92	1119.59	7.67	0.0	1103.01	1117.33	14.32	774.31	0.0115	8	24.05	2.6	4.24

BALTERRA
ULTIMATE BUILD OUT
SANITARY SEWER DESIGN TABLE

Upstream MH	Down-Stream MH	Flow Notes	Area (acre)	DU / acre	DU	Persons per DU	Population	Cum. Pop	Max Gal/Cap/ Day (gpcpd)	ADWF (Mgd)	Peak Factor	PDF (Mgd)	Cum. PDF (Mgd)	Upstream MH Drop	Upstream MH Invert (ft)	Existing Grade Upstream (ft)	Upstream Depth (ft)	Inline MH Drops	Down-Stream MH Invert (ft)	Existing Grade Downstream (ft)	Down-Stream Depth (ft)	Length (ft)	Slope (ft/ft)	Diameter (in)	% Cap.	Peak Daily Flow Velocity (fps)	Full Flow Velocity (fps)
36	34	Flow from line 37-36						748		0.075	4.00	0.299	0.299														
		Flow from line 38-36						266		0.027	4.00	0.106	0.406														
		1/2 School Parcel 15	7.97				375	1014	28	0.011	4.00	0.042	0.448														
		Park Parcel 10	5.75							0.009	4.00	0.034	0.482	0.2	1102.81	1117.33	14.52	0.0	1099.37	1112.19	12.82	860.37	0.0040	8	79.67	2.5	2.50
35	34	1/2 School Parcel 15	7.97				375		28	0.011	4.00	0.042	0.042	0.0	1103.33	1111.00	7.67	0.0	1099.37	1112.19	12.82	827.63	0.0048	8	18.82	1.4	2.74
34	33	Flow from line 35-34								0.011	4.00	0.042	0.042														
		Flow from line 36-34						1014		0.121	4.00	0.482	0.524														
		Park Parcel 10	5.75							0.009	4.00	0.034	0.559	0.2	1099.00	1112.19	13.19	0.0	1096.95	1118.00	21.05	853.60	0.0024	10	67.83	2.2	2.25
33	31	Flow from line 34-33						1014		0.140	2.08	0.290	0.290														
		Flow from line 39-33						1997		0.200	2.08	0.415	0.705														
		1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	3175	100	0.016	2.08	0.034	0.739	0.2	1096.59	1118.00	21.41	0.3	1094.56	1113.68	19.12	908.60	0.0019	12	63.68	2.2	2.26
32	31	1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	163	100	0.016	4.00	0.065	0.065	0.0	1103.17	1110.84	7.67	0.0	1094.89	1113.68	18.79	560.60	0.0148	8	17.73	2.4	4.80
31	27	Flow from line 32-31						163		0.016	2.07	0.034	0.034														
		Flow from line 33-31						3175		0.356	2.07	0.735	0.768	0.0	1094.56	1113.68	19.12	0.2	1088.45	1103.93	15.48	1012.31	0.0058	12	46.14	3.4	3.96
30	29	1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	163	100	0.016	4.00	0.065	0.065	0.0	1103.20	1110.87	7.67	0.0	1101.30	1109.00	7.70	476.22	0.0040	8	24.50	1.5	2.50
29	27	Flow from line 30-29						163		0.016	4.00	0.065	0.065														
		1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	326	100	0.016	4.00	0.065	0.130	0.2	1101.10	1109.00	7.90	0.0	1088.78	1103.93	15.15	720.58	0.0171	8	24.10	3.1	5.17
28	27	1/5 Small Lot Residential Parcel 16	10.19	5	51	3.2	163	163	100	0.016	4.00	0.065	0.065	0.0	1091.33	1099.00	7.67	0.2	1088.78	1103.93	15.15	587.97	0.0040	8	24.50	1.5	2.50
27	26	Flow from line 28-27						163		0.033	2.06	0.067	0.067														
		Flow from line 29-27						326		0.016	2.06	0.034	0.101														
		Flow from line 31-27						3338		0.372	2.06	0.767	0.867	0.2	1088.25	1103.93	15.68	0.0	1086.93	1104.00	17.07	292.09	0.0045	12	53.54	3.1	3.47
26	1	Flow from line 27-26						3827		0.421	2.03	0.855	0.855														
		1/2 Mixed Use Employment Parcel 12	11.46							0.017	2.03	0.035	0.890	0.2	1086.73	1104.00	17.27	0.0	1083.43	1102.00	18.57	507.43	0.0065	12	48.71	3.6	4.18
17	11	1/2 Small Lot Residential Parcel 18	11.38	5	57	3.2	182	182	100	0.018	4.00	0.073	0.073	0.0	1113.33	1121.00	7.67	0.0	1106.64	1118.00	11.36	1209.83	0.0055	8	23.87	1.8	2.94
15	14	1/2 Small Lot Residential Parcel 37	10.71	5	54	3.2	171	171	100	0.017	4.00	0.069	0.069														
		1/2 Small Lot Residential Parcel 22	13.72	5	69	3.2	220	391	100	0.022	4.00	0.088	0.156	0.0	1118.33	1126.00	7.67	0.0	1113.91	1121.58	7.67	824.03	0.0054	8	35.67	2.2	2.89
16	14	1/2 Small Lot Residential Parcel 37	10.71	5	54	3.2	171	171	100	0.017	4.00	0.069	0.069	0.0	1118.33	1126.00	7.67	0.0	1113.91	1121.58	7.67	1054.91	0.0042	8	24.84	1.6	2.56
14	12	Flow from line 15-14						391		0.039	4.00	0.156	0.156														
		Flow from line 16-14						171		0.017	4.00	0.069	0.225	0.2	1113.71	1121.58	7.87	0.0	1109.74	1120.03	10.29	308.51	0.0129	8	34.29	3.3	4.48
13	12	1/2 Small Lot Residential Parcel 22	13.72	5	69	3.2	220	220	100	0.022	4.00	0.088	0.088	0.0	1113.33	1121.00	7.67	0.0	1109.74	1120.03	10.29	897.69	0.0040	8	28.50	1.7	2.50
12	11	Flow from line 13-12						220		0.022	4.00	0.088	0.088														
		Flow from line 14-12						562		0.056	4.00	0.225	0.313														
		1/2 Small Lot Residential Parcel 18	11.38	5	57	3.2	182	182	100	0.018	4.00	0.073	0.386														
		1/3 Small Lot Residential Parcel 23	10.30	5	52	3.2	165	1129	100	0.016	4.00	0.066	0.451	0.0	1109.74	1120.03	10.29	0.0	1106.64	1118.00	11.36	776.74	0.0040	8	74.93	2.5	2.50
11	6	Flow from line 12-11						1129		0.113	4.00	0.451	0.451														
		Flow from line 17-11						182		0.018	4.00	0.073	0.524														
		1/3 Small Lot Residential Parcel 23	10.30	5	52	3.2	165	1475	100	0.016	4.00	0.066	0.590	0.2	1106.27	1118.00	11.73	0.2	1101.56	1115.69	14.13	759.98	0.0059	10	52.32	3.2	3.53
10	9	Neighborhood Retail	13.16							0.020	4.00	0.079	0.079	0.0	1116.32	1123.99	7.67	0.0	1113.91	1122.78	8.87	602.25	0.0040	8	27.00	1.6	2.50
9	7	Flow from line 10-9						0		0.020	4.00	0.079	0.079														
		1/2 Medium Residential Parcel 27	10.60	15	159	2.0	318	318	100	0.032	4.00	0.127	0.206	0.2	1113.71	1122.78	9.07	0.0	1106.97	1116.00	9.03	1486.89	0.0045	8	43.42	2.2	2.66
8	7	1/2 Medium Residential Parcel 27	10.60	15	159	2.0	318	318	100	0.032	4.00	0.127	0.127	0.0	1109.36	1117.03	7.67	0.0	1106.97	1116.00	9.03	598.22	0.0040	8	34.57	1.8	2.50

BALTERRA
ULTIMATE BUILD OUT
SANITARY SEWER DESIGN TABLE

Upstream MH	Down-Stream MH	Flow Notes	Area (acre)	DU / acre	DU	Persons per DU	Population	Cum. Pop	Max Gal/Cap/ Day (gpcpd)	ADWF (Mgd)	Peak Factor	PDF (Mgd)	Cum. PDF (Mgd)	Upstream MH Drop	Upstream MH Invert (ft)	Existing Grade Upstream (ft)	Upstream Depth (ft)	Inline MH Drops	Down-Stream MH Invert (ft)	Existing Grade Downstream (ft)	Down-Stream Depth (ft)	Length (ft)	Slope (ft/ft)	Diameter (in)	% Cap.	Peak Daily Flow Velocity (fps)	Full Flow Velocity (fps)
7	6	Flow from line 8-7						318		0.032	4.00	0.127	0.127														
		Flow from line 9-7						318		0.052	4.00	0.206	0.333														
		1/3 Small Lot Residential Parcel 23	10.30	5	52	3.2	165	801	100	0.016	4.00	0.066	0.399	0.2	1106.77	1116.00	9.23	0.1	1101.73	1115.69	13.96	1235.83	0.0040	8	68.07	2.4	2.50
6	4	Flow from line 7-6						801		0.100	2.11	0.210	0.210														
		Flow from line 11-6						1475		0.148	2.11	0.311	0.521														
		Small Lot Residential Parcel 28	28.60	5	143	3.2	458	2733	100	0.046	2.11	0.096	0.617	0.2	1101.19	1115.69	14.50	0.4	1093.81	1110.57	16.76	1996.21	0.0035	12	47.13	2.6	3.06
5	4	Office Employment Parcel 38	23.64							0.035	4.00	0.142	0.142	0.0	1104.33	1112.00	7.67	0.0	1094.14	1110.57	16.43	556.69	0.0183	8	24.71	3.3	5.35
4	3	Flow from line 5-4						0		0.035	2.11	0.075	0.075														
		Flow from line 6-4						2733		0.293	2.11	0.617	0.692														
		Community Retail Parcel 29	15.64							0.023	2.11	0.049	0.741	0.2	1093.61	1110.57	16.96	0.0	1091.32	1105.00	13.68	1203.12	0.0019	12	63.80	2.2	2.26
3	2	Flow from line 4-3						2733		0.352	2.08	0.731	0.731														
		1/2 Small Lot Residential Parcel 25	23.25	5	116	3.2	372	3105	100	0.037	2.08	0.077	0.808	0.2	1091.12	1105.00	13.88	0.0	1088.07	1103.00	14.93	1606.42	0.0019	12	67.83	2.2	2.26
25	23	1/2 Small Lot Residential Parcel 19	20.77	5	104	3.2	332	332	100	0.033	4.00	0.133	0.133	0.0	1104.20	1111.87	7.67	0.0	1101.24	1113.96	12.72	686.63	0.0043	8	34.66	1.9	2.60
24	23	1/2 Small Lot Residential Parcel 19	20.77	5	104	3.2	332	332	100	0.033	4.00	0.133	0.133	0.0	1104.64	1112.31	7.67	0.0	1101.24	1113.96	12.72	851.61	0.0040	8	35.40	1.9	2.50
23	21	Flow from line 24-23						332		0.033	4.00	0.133	0.133														
		Flow from line 25-33						332		0.033	4.00	0.133	0.266														
		1/2 Small Lot Residential Parcel 24	14.87	5	74	3.2	238	238	100	0.024	4.00	0.095	0.361														
		1/2 Medium Residential Parcel 20	16.92	15	254	2.0	507	1410	100	0.051	4.00	0.203	0.564	0.2	1101.04	1113.96	12.92	0.0	1094.57	1105.95	11.38	1129.19	0.0057	8	77.88	3.0	2.99
22	21	1/2 Small Lot Residential Parcel 24	14.87	5	74	3.2	238	238	100	0.024	4.00	0.095	0.095	0.0	1099.55	1107.22	7.67	0.1	1094.57	1105.95	11.38	1085.91	0.0045	8	28.82	1.8	2.65
21	19	Flow from line 22-21						238		0.024	4.00	0.095	0.095														
		Flow from line 23-21						1410		0.141	4.00	0.564	0.659	0.0	1094.40	1105.95	11.55	0.1	1093.31	1104.57	11.26	387.16	0.0026	10	75.48	2.3	2.32
20	19	1/2 Medium Residential Parcel 20	16.92	15	254	2.0	507	507	100	0.051	4.00	0.203	0.203	0.0	1098.47	1106.14	7.67	0.0	1093.48	1104.57	11.09	1248.93	0.0040	8	44.60	2.1	2.50
19	2	Flow from line 20-19						507		0.051	4.00	0.203	0.203														
		Flow from line 21-19						1648		0.165	4.00	0.659	0.862														
		1/2 Small Lot Residential Parcel 25	23.25	5	116	3.2	372	372	100	0.037	4.00	0.149	1.011														
		1/2 Small Lot Residential Parcel 21	11.83	5	59	3.2	189	2717	100	0.019	4.00	0.076	1.087	0.0	1093.14	1104.57	11.43	0.0	1088.07	1103.00	14.93	840.99	0.0060	12	56.17	3.7	4.02
2	1	Flow from line 3-2						3105		0.389	1.94	0.756	0.756														
		Flow from line 19-2						2717		0.272	1.94	0.527	1.283														
		1/2 Small Lot Residential Parcel 21	11.83	5	59	3.2	189	6011	100	0.019	1.94	0.037	1.320	0.0	1087.82	1103.00	15.18	0.2	1083.18	1102.00	18.82	3168.56	0.0014	15	70.33	2.2	2.25
1	WRF	Flow from line 2-1						6011		0.680	1.75	1.193	1.193														
		Flow from line 26-1						3827		0.438	1.75	0.769	1.961														
		Flow from line 44-1						8582		1.004	1.75	1.762	3.724	0.2	1082.98	1102.00	19.02	0.0	1081.32	1102.00	20.68	200.00	0.0083	15	79.88	5.5	5.47

H

APPENDIX H
LAND USE SUMMARY

Balterra Land Use Plan Data Table

Parcel	Land Use	Area (Acres)	Maximum. Density (DU/AC.)	Maximum Units
1	OFFICE EMP./ PUBLIC FACILITIES	17.47	N/A	N/A
2	COMMUNITY RETAIL	11.43	N/A	N/A
3	BUS. PARK	18.82	N/A	N/A
4	MIXED USE RES.	9.90	22	218
5	SMALL LOT RES.	49.91	5	250
6	BUSINESS PARK	19.49	N/A	N/A
7	MIXED USE RESIDENTIAL	39.55	22	870
8	MEDIUM RES.	22.31	15	335
9	SMALL LOT RES.	37.15	5	186
10	PARK	10.54	N/A	N/A
11	MEDIUM RES.	27.69	15	415
12	MIXED USE EMPLOYMENT	20.79	N/A	N/A
13	PUBLIC FACILITIES	3.07	N/A	N/A
14	SMALL LOT RES.	32.04	5	160
15	SCHOOL	16.25	N/A	N/A
16	SMALL LOT RES.	56.93	5	285
17	MEDIUM RES.	17.18	15	258
18	SMALL LOT RES.	23.83	5	119
19	SMALL LOT RES.	44.32	5	222
20	MEDIUM RES.	35.63	15	534
21	SMALL LOT RES.	30.70	5	118
22	SMALL LOT RES.	24.10	5	120
23	SMALL LOT RES.	29.20	5	146
24	SMALL LOT RES.	28.13	5	141
25	SMALL LOT RES.	46.18	5	231
26	NEIGHBORHOOD RETAIL	10.84	N/A	N/A
27	HIGH RES.	19.42	22	427
28	SMALL LOT RES.	26.86	5	134
29	COMMUNITY RETAIL	13.88	N/A	N/A
30	SMALL LOT RES.	24.03	5	120
31	SMALL LOT RES.	23.57	5	118
32	SMALL LOT RES.	17.82	5	89
33	HIGH RES.	18.78	22	413
34	COMMUNITY RETAIL	27.25	N/A	N/A
35	PARK	4.59	N/A	N/A
36	SMALL LOT RES.	16.68	5	83
37	SMALL LOT RES.	21.68	5	108
38	OFFICE EMPLOYMENT	20.97	N/A	N/A
OS	DRAINAGE/OPEN SPACE	116.11	N/A	N/A
ROW	ARTERIAL & COLLECTOR ROADS	74.99	N/A	N/A
				6100
16-May-05	GROSS PROPERTY AREA	1110.08	DU/AC.	5.50

I

APPENDIX I
DESIGN CRITERIA

WATER AND SEWER DESIGN STANDARDS

Dwelling Unit (DU) Densities

Low Density (LD)	3.2	Persons/DU
Medium Density (MD)	2.0	"
High Density (HD)	2.0	"
Active Adult (AA)	2.0	"

Building Densities

School 750* Students per School

*Per Saddle Mountain Unified School District

WATER

Average Day Demand

Residential	150	Gallons per Capita per Day (gpcpd)
Commercial	1,500	Gallons per Acre per Day (gpapd)
School	75	Gallons per Student per Day (gpspd)
Developed Open Space	1,800	gpapd
Turf	See Equation Below	

$$\textit{Demand (gpd)}^{*} = \frac{\textit{Acres of Turf x ET (inches) x Gallons per Acre Inch x Crop Coefficient}}{\textit{Irrigation Efficiency}}$$

where
Daily ET (Inches in June) = 0.35
Gallons per Acre Inch = 27,154
Crop Coefficient = 0.65
Irrigation Efficiency = 0.70

*An additional factor may be multiplied to the result if only a portion of the area will be irrigated (i.e. 0.8 if 80% of the area will be irrigated). To convert gpd to gpm, it may also be necessary to assume a watering window (i.e. assuming an overnight 8-hour watering window would yield a gpm of (Demand (gpd)) / ((8 hour) * (60 min)).

Max Day Demand

Factor 1.8 x Average Day Demand

Peak Hour Demand

Factor 3.0 x Average Day Demand

Fire Flows[1]

Residential (LD & MD)	1,500	gpm for 2 hours
Residential (HD & AA)	2,000	gpm for 2 hours
Commercial	2,000	gpm for 3 hours (Retail)
Commercial Park	3,000	gpm for 4 hours (Warehouse/Commercial Sales)
Business Park	3,000	gpm for 6 hours (Office Complex)
School	3,000	gpm for 3 hours

Booster Station

Must meet Max Day Demand + FF with the largest pump out or meet Peak Hour Demand with the largest pump out, which ever is greater.

Storage

25% of Max Day Demand + Required Fire Flow

Wells

- Meet Max Day Demand with each well running a max duration of 18 hr/day.
- Include 15% backup capabilities.

Water System Design Standards

- Minimum pipe size in a residential street is 8 inches.
- Minimum pipe size in a collector road is 12 inches.
- Minimum pipe size in an arterial road is 16 inches.
- Maximum flow velocity in waterlines is 5 ft/s.
- Maximum headloss in any pipe is 10 ft / 1,000 ft.
- Peak hour residual pressures must meet or exceed 40 psi.
- Residual fire flow pressures must meet or exceed the maximum daily demand plus fire flow at 20 psi.

SEWER

Flow Generation (ADWF)

Residential	100	gpcpd
Commercial	1,500	gpapd
School	28	gpspd

Peaking Factors

- For lines less than 12" in diameter, Peaking Factor = 4.00
- For lines 12" in diameter and greater, Peaking Factor based on population per ADEQ R18-9-E301 Part D.

Capacity

82% during Peak Flow (d/D ratio)

Velocity

Min = 2.0 fps (Flowing Full)
Max = 9.0 fps (Flowing Full)

Cover

Minimum cover for all sewer lines is 7 feet.

Slopes

Size	Slope (ft/ft)
8"	0.0040
10"	0.0024
12"	0.0019
15"	0.0014
18"	0.0011
21"	0.00092
24" and larger	0.00080

J

APPENDIX J
QUANTITIES

BALTERRA
WATER DISTRIBUTION AND TRANSMISSION LINE QUANTITIES

April, 2005

PHASE 1

WATER DISTRIBUTION LINE*

Line Size	Linear Feet
8"	1,118
12"	4,954
16"	2,879
20"	1,708
24"	176

WELL TRANSMISSION LINE**

Line Size	Linear Feet
16"	4,750
20"	100

* Quantities only account for backbone infrastructure pipelines.

** Quantities reflect well transmission line required for redundant well. It is anticipated that the Well 2 will be built as the redundant well for Phase 1.

BALTERRA ULTIMATE BUILD OUT

WATER DISTRIBUTION LINE*

Line Size	Linear Feet
8"	26,113
12"	21,094
16"	2,879
20"	1,708
24	176

WELL TRANSMISSION LINE

Line Size	Linear Feet
12"	5,950
16"	4,750
20"	100

* Quantities only account for backbone infrastructure pipelines.

BALTERRA
SANITARY SEWER SYSTEM
QUANTITIES

April, 2005

PHASE 1

SANITARY SEWER SYSTEM*

Line Size	Linear Feet
8"	7,285
10"	1,699
12"	4,654
15"	200

* Quantities only account for backbone infrastructure pipelines.

BALTERRA ULTIMATE BUILD OUT

SANITARY SEWER SYSTEM*

Line Size	Linear Feet
8"	53,386
10"	4,640
12"	16,242
15"	3,369

* Quantities only account for backbone infrastructure pipelines.